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Individual, agency, and state economic characteristics: a comparative analysis across state-federal vocational rehabilitation agencies

Tawny Chamberlain
University of Iowa

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Individual, Agency, and State Economic Characteristics: A Comparative Analysis Across
State-Federal Vocational Rehabilitation Agencies

by

Tawny Chamberlain

A thesis submitted in partial fulfillment
of the requirements for the Doctor of Philosophy
degree in Rehabilitation and Counselor Education in the
Graduate College of
The University of Iowa

August 2018

Thesis Supervisor: Assistant Professor Noel Estrada-Hernandez

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Graduate College
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Iowa City, Iowa

CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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has been approved by the Examining Committee for
the thesis requirement for the Doctor of Philosophy degree
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To my husband and my family
For you unwavering support and continuous care and love throughout the years

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ABSTRACT

State federal vocational rehabilitation (VR) agencies are one of the widest spread and oldest programs designed to help individuals with disabilities. Currently, VR agencies provide various services designed to aide individuals with disabilities obtaining and maintaining employment. Currently, VR agencies serve approximately 1 million individuals with disabilities and spend about 3 billion dollars annually. Given how large and the amount of state and federal dollars are spent on VR, it is important that the outcomes of this program are researched and evaluated.

The purpose of this study was to examine how different variables are related to VR outcomes across states. More specifically, this study utilized the International Classification of Functioning, Disability and Health (ICF) as a framework to study how contextual factors such as personal characteristics, agency level factors, and state-economic variables impact the employment rate of three different groupings based on state VR agency performance.

This study utilized secondary data analysis to explore these relationships using the FY 2013 RSA-911 dataset was paired with the 2013 American Community Survey (ACS). Multiple regression analysis was used to investigate the relationships that exist between personal characteristics and state economic factors across the VR performance groups. Further, a hierarchical linear model (HLM) was used to investigate how the relationship between personal level characteristics and state economic variables may be influenced by investigating this data by considering the levels of the agencies.

Results of this study revealed that agency-level factors and state economic variables are important predictors of the employment rate. The final model of the HLM found that state economic variables and agency-level factors moderate the relationship between personal

characteristics and the employment rate. Further, all agency-level factors and state economic variables except poverty resulted in a significant relationship regarding the employment rate. In this final model, none of the personal characteristics were significant. The results of the multiple regressions revealed different relationships exist among personal characteristics, agency-level factors, and state economic variables and employment rate given the performance group.

PUBLIC ABSTRACT

The employment needs of individuals with disabilities is an important concern in order to have a fulfilling life. The state federal vocational rehabilitation (VR) program is designed to aide individuals with disabilities obtain and maintain employment. This program is jointly funded through both the federal and state governments. State VR agencies serve approximately 1 million people annually. However, only 60% of the individuals with disabilities who utilize VR services exit with an employment outcome. It is important to further investigate and explore what contributes to successful employment and how these differ among different states.

To further investigate the employment of individuals with disabilities, this study investigated various contextual factors that may impact an employment outcome. This study, specifically investigated how personal characteristics, agency-level factors, and state economic variables may influence the employment rate of individuals with disabilities across the United States.

An important finding of this study, is the relationship that exist between the economic climate of a state and the employment rate of individuals with disabilities. It seems that these variables influence the strength of the relationship between personal characteristics and employment rate. Importantly, these agency-level and state economic factors seem to minimize the strength of the relationship between personal characteristics and employment rates. The results of these findings suggest the need for integration of policy to ensure states have the proper resources in order to help individuals with disabilities obtain and maintain employment.

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CHAPTER ONE

INTRODUCTION

This study is intended to explore the relationship between personal characteristics, state vocational rehabilitation (VR) agency factors, and state economic variables on placement rates of VR agencies. The aim of this research is to further investigate the contributing factors that may impact performance differences between agencies. Specific personal characteristics, agency-level factors, and state economic variables are studied within this project. Chapter 1 presents an overview of the description of the problem; justification for this study; the theoretical framework; the International Classification of Functioning, Disability, and Health; the purpose of this study; research questions and hypotheses; and definitions of relevant concepts.

Statement of the Problem

State-federal vocational rehabilitation (VR) agencies are part of the most wide-reaching and among the oldest employment programs for individuals with disabilities in the United States. The VR program was first initiated in 1920 as part of the Smith-Fess Act and was later authorized under the Rehabilitation Act of 1973 (Fleming, Del Valle, Kim, & Leahy, 2012). Today, the VR program is funded through the Social Security Administration (SSA) and individual states provide a variety of employment services that aid individuals with disabilities to obtain and maintain gainful employment (Fleming et al., 2012). These services address strengths of the client, resource availability, concerns, abilities, capabilities, supports, and interests. A few examples of VR services include assessment, vocational counseling and guidance, on-the-job supports and training, job placement, job readiness, job search, transportation assistance, work place accommodations, work adjustment, and occupational/vocational training (Schonbrun, Sales, & Kampfe, 2007).

Today, VR agencies serve approximately 1 million individuals with severe disabilities per year and receive about \$3 billion in VR state grants to serve these individuals (RSA, 2016b; U.S. Government Accountability Office, 2005). Further, 60% of individuals who utilize VR agencies exit with a successful closure (Fleming et al., 2012). VR agencies have a unique role in serving individuals with disabilities to obtain and maintain employment and quality of life and in meeting the varying needs of the individuals whom they serve. Even with the over 60% of competitive employment rates achieved by individuals with disabilities who receive VR services, research is still limited regarding the factors that impact the closure rates between VR agencies across the 50 states. Previous research has shown that state VR agencies differ in their reported closure rates for successful job placements (Stapleton, Honeycutt, & Schechter, 2010). However, there is scant literature about what may be contributing to these variations in closure rates. Patterns of services differ vastly among agencies especially across various demographic groups and geographical regions, and these service patterns have been shown to contribute to variation in competitive employment outcomes (Stapleton et al., 2010). There may be some factors that contribute to low competitive employment rates that are not within an agency's control. For example, agencies with lower levels of organization, less collaboration with the state leadership and other stakeholders, and lack of opportunities for outreach within the community may have lower competitive employment rates (Honeycutt, Bardos, & McLeod, 2015). Additional, internal agency-specific factors may contribute to lower competitive employment rates, such as longer wait times between application and receipt of services, internal-agency problems with service delivery, and evaluation of counselors' performance (Honeycutt et al., 2015; Schimmel Hyde, Honeycutt, Stapleton, & 2014).

Justification for the Study

Currently, there are agency disparities between agencies among different variables, such as services provided and overall employment outcomes of individuals who utilize these services (Stapleton et al., 2010). Investigating the different factors between low-performing and high-performing agencies will provide more insight into what may be impeding agency performance and can facilitate changes in VR process and policy to increase competitive employment placements for all agencies and especially for low-performing agencies. The purpose of this project is to investigate factors that may be contributing to differences among VR agencies' performance. Variation in employment outcomes across VR agencies presents an opportunity to learn about factors that increase the placement rates of agencies and possible opportunities for the development of policy, program and service delivery changes. Investigating the relationship between personal characteristics and environmental factors and how these variables influence agency performance creates a shift from previous research, which has mainly focused on service and personal characteristics related to an employment status outcome. This perspective of studying VR outcomes as a larger system can facilitate further understanding the various levels of barriers that individuals with disabilities may encounter when engaging in the VR process and ultimately lead to changes within this system that incorporate both the personal characteristics and the environmental factors that may contribute to these outcomes.

Background Information

Previous research and statistics have shown that individuals with disabilities face greater challenges obtaining employment compared to those who do not have disabilities. In 2016, the employment-population ratio for individuals with a disability was 17.9%, compared to 65.3% for people without a disability (U.S. Bureau of Labor Statistics, 2016). Not only do individuals with

disabilities struggle with unemployment, the U.S. Census Bureau data have indicated that individuals with disabilities have lower mean monthly earnings than their counterparts without disabilities (Brault, 2012).

State VR agencies are the primary resource for individuals with disabilities to receive services to obtain gainful employment. Due to the joint funding sources via federal and state governments, VR agencies have flexibility regarding the populations served and services provided. Each agency may differ in the implementation of services, types of services provided and who receives these services (Chan et al., 2016). Previous research has explored some of these differences, primarily studying how individual characteristics impact closure rates and employment (Dutta, Gerve, Chan, Chou, & Ditchman, 2008; Sevak, Houtenville, Brucker, & O'Neill, 2015; Stapleton et al., 2010).

Personal characteristics

Age, gender, race, disability, disability severity, education level, and receipt of SSA benefits have been highly researched individual characteristics that impact the employment status of persons with disabilities who have used VR services (Dutta et al., 2008). Not surprisingly, age has been found to be associated with lower employment rates regardless of disability status (Sevak et al., 2015). Across disability types, age has shown a negative relationship with employment status, meaning that older individuals typically have lower employment rates and unsuccessful VR closures than younger individuals. For example, Wadsworth, Estrada-Hernandez, Kampfe, and Smith (2008) found that 67% of individuals aged 65 or older exited VR without gainful employment. Gender has shown inconsistent significant impact on VR closures and employment rates. Chan and colleagues (2016), found that gender (favoring males) was a significant predictor of a successful closure. This finding has also been

supported in previous research indicating that male closure rates outnumbered female closure rates by 17% (Stapleton et al., 2010). However, Dutta and colleagues (2008) found gender to be an insignificant variable when investigating the closure patterns of VR agencies. Race has also been shown to be a significant variable in predicting successful closure rates. Specifically, African Americans and Native Americans when compared to Asian Americans and Caucasians tend to have lower rates of being accepted into VR agencies and successfully exiting VR with employment (Chan et al., 2016; Wilson, 2000). Disability type and severity have also been shown to significantly impact exiting VR with employment. Dutta et al. (2008) reported that individuals with sensory/communicative disabilities have had the highest success rate of obtaining employment, with approximately 75% exiting VR successfully, whereas individuals with physical disabilities had a success rate of 56% and those with mental impairments had a 55% rate of obtaining employment. Further, significant disability as a predictor for successful case closures has presented mixed findings in the literature. Yamamoto and Alverson (2013), found that across the fiscal years of 2003 through 2007, significant disability status was a significant predictor of employment except during the fiscal year of 2004. In addition, an individual's level of education an individual has significantly impacts the likelihood of successfully exiting VR. Education level has shown a positive relationship with successfully exiting VR, meaning that the more education an individual has the higher the likelihood of exiting VR with gainful employment (Chan et al., 2016; Cook et al., 2006). Lastly, the amount of disability-related benefits, such as Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI), Medicaid, or Medicare, an individual may receive also is negatively correlated with the likelihood of a successful closure. SSA beneficiaries are less likely to receive VR services and obtain employment; they also work fewer hours and overall have a lower

income than other VR applicants who are not receiving SSA-related benefits (Stapleton & Erikson, 2004; Mwachoif, Broyles & Khaliq, 2009; Wilson, 2000). It can be hypothesized that receiving SSA benefits creates a disincentive to achieve sustained employment and earnings since there is a risk of losing those benefits. It is clear there are many unique personal characteristics that may impact the variation among VR successful closure rates.

Agency characteristics

The role of personal characteristics of consumers is important; however, it is not the only determinant related to obtaining and maintaining jobs. Previous studies have shown that agency-level variables, such as programs available to specific populations, agency type, wait times between application and receiving services, cost of services, and if an agency has entered order of selection status (OOS), may also impact a successful closure (Dutta et al., 2008; Honeycutt et al., 2015; Honeycutt & Stapleton, 2013). In relation to agency type, in 1997, the National Council on Disability recommended that separate vocational grants designate specific agencies to serve individuals who are visually impaired (Cavanaugh, Giesen, & Pierce, 2000). Numerous studies have indicated that agencies specifically designed to serve individuals with visual impairments have higher acceptance rates and rehabilitation rates (Cavanaugh et al., 2000; Estrada-Hernandez, 2008; Kitchner, 1982). A VR agency enters OOS when it does not have enough funding or resources to serve all applicants who may be eligible for services. An OOS status requires that an agency use a selection process that restricts services to those with the most significant disabilities while other applicants are put on a waitlist. Individuals who receive services from agencies in OSS status may take up to 48 months to fully exit VR (Honeycutt & Stapleton, 2013). It has been speculated that states that do not have a status of OOS may be able to accept and serve more applicants with less significant disabilities and therefore have higher

levels of successful placements (Chan et al., 2016). Overall, longer wait times between application and when services have been received negatively impact the likelihood of employment. Research has shown that these wait times vary greatly among VR agencies. Honeycutt and Stapleton (2013) found the longest wait time to be 30 months while the majority of agencies had wait times ranging from 3 to 9 months. For each month, an individual is waiting to receive services, his or her chances of obtaining employment decreases by 1.2%, thus indicating the importance of providing services in a timely manner (Honeycutt & Stapleton, 2013).

Environmental characteristics

Individual characteristics and agency-level variables are only a piece that contributes to VR closure rates. The larger system in which the agencies operate also needs to be investigated. State variables may contribute to some of the differences among VR agency closure rates. Specifically, state environmental characteristics, such as population density, personal income per capita, Social Security beneficiary rate, average cost of services and administration cost rate, have accounted for 7% of variation when predicting quality employment for individuals who have used VR services (Chan et al., 2016). Of these variables, the effect of unemployment rate on outcomes of VR agencies has been heavily researched. Nord, Hewitt and Nye-Lengerman (2013) investigated economic and programmatic variables that help explain the variation of closure rates among individuals with cognitive disabilities. Overall, the authors found that the VR agency was impacted by the national employment rate. As the national employment-population ratio increased from 2004 to 2007, the VR agency success rate increased from 58.9% to 62% (Nord et al., 2013). Not only does the national unemployment rate impact VR outcome, but the labor market and unemployment rates in a specific community also influence VR

outcomes. Other research has supported this finding that unemployment rates of the community in which the VR agency is located influence the services received and overall employment rates for persons with psychiatric disabilities (Cook et al., 2006). Regardless of personal characteristics, the local unemployment rate has been found to be a significant predictor of VR agency outcomes. When unemployment rates are high, successful closure rates of VR agencies tend to fare poorly and typical treatments or services-as-usual are less effective (Cook et al., 2006). The percentage of individuals within a state who receive government assistance such as SSI/SSDI has accounted for 38% of variation in quality employment when investigating state environmental factors. Further, states with a larger Social Security beneficiary rate have lower levels employment quality outcomes (Chan et al., 2016). This finding is not surprising; receiving government assistance, especially SSDI, as a personal characteristic has been found to impact a consumers' ability to obtain and maintain gainful employment (Bond, Campbell, & Drake, 2013; Honeycutt & Stapleton, 2013). Overall, many of these specific state environmental factors seem to moderate the impact of personal and agency-level characteristics on employment outcome. This creates an opportunity to further investigate the effect of this multidimensional relationship between personal characteristics and environmental factors may have on the larger VR system and how it impacts agencies' performance rates.

Theoretical Framework

The International Classification of Functioning, Disability and Health (ICF) is a comprehensive that was designed to address categories that came from multiple stakeholders such as individuals with disabilities, professionals in the health care service delivery fields, insurance companies, social security, education, economics, social policy developers and other

allied corporate entities (Peterson, 2005). The ICF provides a framework that conceptualizes disability from a systematic approach to promote interdisciplinary and cross-cultural treatments (Chan, Gelman, Ditchman, Kim & Chiu, 2009). Importantly, the ICF uses classifications of health versus disease to better focus on the intersection between body functions, activity (related to tasks and actions of an individual), participation, severity of a disability and environmental and contextual factors (Chan, Tarvydas, Blalock, Strauser, & Atkins, 2009; World Health Organization [WHO], 2001).

The ICF theorizes that when an individual experiences a disability, the experience can be categorized into four separate, but related constructs: (a) body functions and structures, (b) activities and participation, (c) environmental factors, and (d) personal factors. Body functions and structures and activities and participation form Part 1. These constructs are considered components directly related to a health condition, whereas environmental factors and personal factors compose Part 2, which is classified as health-related factors or contextual factors (Chan, Gelman, et al., 2009). Figure 1 depicts the constructs of the ICF.

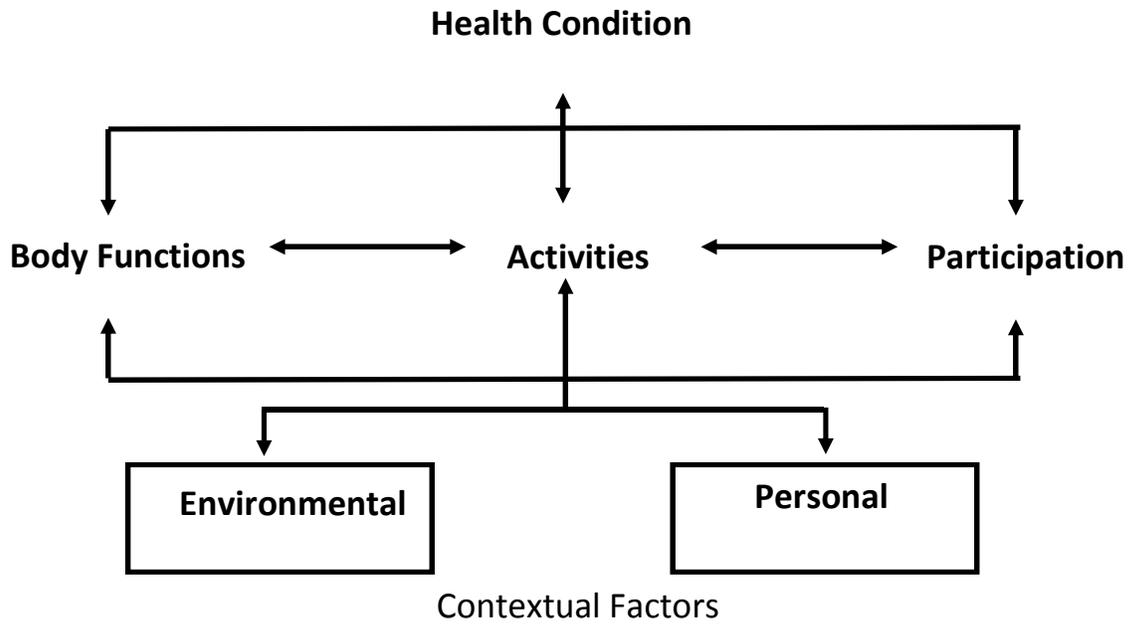


Figure 1: The WHO (2001) conceptualization of the ICF model

The ICF integrated components of the medical and social models of disability while also focusing on the enablement of an individual (Chan, Gelman, et al., 2009; Peterson, 2005). It addressed the biological, individual, and societal perspectives of health through a biopsychosocial lens. Importantly, the ICF can be used to describe how environmental factors are key to understanding disability and rehabilitation (Peterson, 2005).

The field of rehabilitation counseling has recognized the role of contextual factors in outcomes for individuals with disabilities, especially the way in which those factors may impact their ability to obtain and maintain employment (Chan, Tarvydas, et al., 2009). Further, research within the field has been exploring the interactions between the person and the environment on overall quality of life of individuals with disabilities (Chan, Gelman, et al., 2009). Recent research has begun incorporating the ICF model among specific populations to explore both the personal characteristics and the environmental factors of individuals who receive VR services and how these factors may impact their overall quality of life (Fleming, Fairweather, & Leahy, 2013; Sanchez, Frain, Bezyak, Rosenthal, & Tansey 2016). To date, only two studies have

explored the person and environment relationship through a multilinear analysis lens (Chan et al., 2016). Both of these studies warrant further investigation of the effect of the relationship between contextual factors and personal characteristics on VR outcomes.

Statement of Purpose

In this study, the ICF model was used as a framework to investigate the employment rates of individuals who utilize VR through a multidimensional lens. Specifically, this study investigates how personal characteristics, VR agency-level factors, and state economic variables influence a specific agency's ability to successfully close a case. By understanding the variables that influence variation among VR agencies, the Rehabilitation Services Administration along with VR agency administrations can identify practices and services that may lead to better employment outcomes for VR consumers.

The current research proposes to examine the effect of personal characteristics, agency-level factors, and state-economic variables across all general/combined VR agencies. This current research is needed not only to aid in possible policy reform, but also to add to new ways to study outcomes of individuals who utilize VR services. By gaining an in-depth and richer understanding of all the possible variables and the interactions of these variables within this system, researchers can work towards changing the conceptualization of the VR system. In turn, this may allow counselors to factor in personal characteristics, agency-level and the economic factors that impact the employment outcomes. Further, the goal of this research is to identify and better understand the differences that exist between low- and high-performing agencies, and particularly how these contextual factors may contribute to these differences. Figure 2 applies this current research inquiry to the ICF framework.

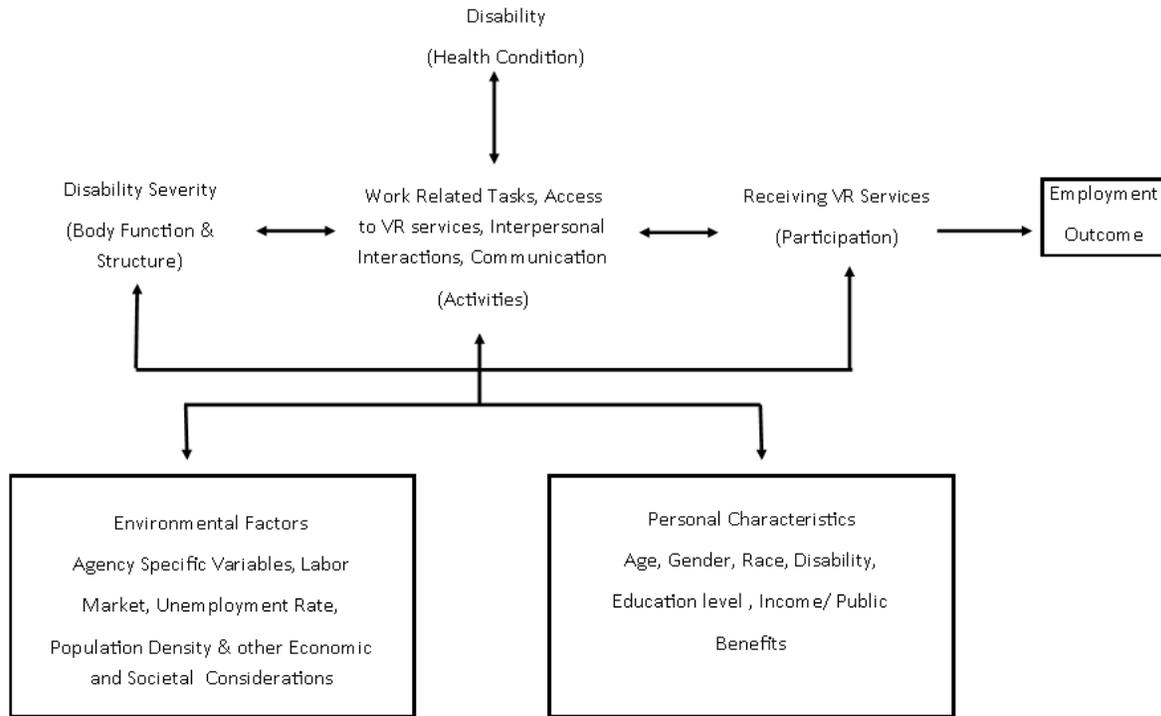


Figure 2: Conceptualization of ICF for this study

It is important to highlight the contextual factors that may directly impact an individual's activities; however, for this study it is important to further explore through advance statistical analysis that these factors are indirectly related to participation in state-federal VR services.

RSA-911 Dataset

The RSA-911 data set is collected through the United State's Department of Education. This is a case service reported collected by vocational rehabilitation counselors annually. The data that compromises the 911 database is generated from information recorded by counselors at various stages in the VR system. Even though the Rehabilitation Service Administration (RSA) has developed over 18 crosschecks to ensure that the data is accurate, some errors may still exist. It is assumed that these errors that do exist are random, and thus presumed to result in no systematic bias in the data (Wilson, 2000). Overall, the data used within the RSA-911 intends to

explore what may or may not be working for individuals with disabilities who utilize state-federal VR.

Research Questions

The aim of the current study is to investigate how personal characteristics, VR agency-level factors, and state-economic variables impact the placement rates of VR agencies. The specific research questions are specified below.

Research Question 1: How do personal characteristics, VR agency-level factors, and state economic variables predict the employment rates of VR agencies?

Hypothesis: Personal characteristics will have higher odds of predicting successful placement rates.

Research Question 2: How are personal characteristics, VR agency-level factors, and state economic variables different across states regarding the performance of VR agency?

Hypothesis: It is predicted that the VR agency-level factors and state economic variables will show differences across various states depending on VR agency performances. It is predicted that personal characteristics will not show as much variation across states.

Research Question 3: What is the impact of the relationship among personal characteristics, VR agency-level factors, and state economic variables on the employment rates of VR agencies based on their performance group?

Hypothesis: It is predicted that personal characteristics, VR agency-level factors, and state economic variables will all have main effects on the employment rates of VR agencies across all performances.

Hypothesis 2: It is predicted that all personal characteristics except for gender, VR agency-level factors and state economic variables will have significant effects of on the

employment rates of VR agencies. It is predicted that these variables will differ depending on performance.

Definition of Terms

Employment Status: Refers to an individual's participation in the labor market at a paying job in an integrated work setting. This can be represented as full-time or part-time work and does not include self-employment or sheltered work (Kaufman, 1986; Kuehn, 2004).

Successful VR Outcomes: A case is closed as successful when an individual has completed an Individualized Plan for Employment (IPE) and has been engaged in employment for 90 days or more (RSA, 2016a).

Age: An individual's birthdate at time of application

Gender: Refers to an "individual's subjective sense of what it means to be either male or female" (Cartwright & D'Andrea, 2004, p. 176) and the individual choice to identify as male or female (Cartwright & D'Andrea, 2004).

Race/Ethnicity: The Office of Management and Budget (OMB), specify that race and ethnicity are two separate and distinct concepts. Ethnicity refers to individuals of Hispanic origin. These individuals can be of any race. According the U.S. Census Bureau (2016), race refers to a person's self-identification with one or more social groups.

Disability: Refers to any physical or mental impairment that limits one or more major life activities or participation of an individual. This impairment impacts an individual's ability to achieve, prepare for, or maintain work. Disability is a complex phenomenon, reflecting the interactions between physical aspects of an individual and the features of the society in which the individuals operates in (Americans with Disabilities Act, 1990; RSA, 2016a; WHO, 2001).

Disability Significance: Refers to the severity of the disability. A significant disability is defined as one or more severe physical or mental impairments that seriously limit one or more functional capacities especially in terms of employment and whose vocational rehabilitation trajectory will include multiple services and last over an extended period of time (Wisconsin Division of Vocational Rehabilitation, 1994).

Education Level: Refers to the highest amount of schooling completed (RSA, 2016a).

Labor Force Participation Rate: Refers to the percentage of non-institutional population that is employed or looking for work (Kaufman, 1986).

Unemployment Rate of the State: Refers to the percentage of the labor force within the state that does not have employment (Kaufman, 1986).

Vocational Rehabilitation Services: Refer to any goods or services provided to a client of a VR system (RSA, 2016a).

Urban Population Rating: Refers to the overall population of the county where an agency is located. A county can be classified into four different categories: urban, large rural, small rural and isolated rural (Ipsen & Swicegood, 2015).

Average Annual Income: Refers to the aggregated money received on a yearly basis before payments for personal income taxes, social security, union dues or Medicare deductions are made. Income consists the household disposable income (U.S. Census Bureau, 2016).

Poverty Rate: Refers to the percentage of the number of people who do not make enough income to insure the minimum standard of living (Kaufman, 1986).

Social Security Beneficiary Rate: Refers to an aggregated dollar amount of total SSA benefits received within a state. Benefits include retirement, disability, family, survivors, and Medicare (SSA, 2016)

Agency Type: Distinguishes between an agency that provides specialized services to individuals with visual impairments or an integrated agency that serves all impairments (Cavanaugh et al., 2000)

Status of OOS: Refers to an order of selection for services status that a state-federal VR agency enters when it does not have sufficient funds to serve all eligible individuals (RSA, 2016a).

Summary

This chapter provided an overview of research evaluating vocational rehabilitation client outcomes and presented the need of further exploring agency performance through a framework such as the ICF. An overview of ICF was provided. This chapter concluded with the purpose statement, definition of terms, and statement of the research questions (research hypothesis relevant to this study). Chapter Two will provide a review of the literature upon which the study is going to be based.

CHAPTER TWO

LITERATURE REVIEW

Chapter two provides a review of the literature regarding current statistics of VR agency placements, general VR agency information, the personal characteristics that may influence an individual's success within VR, and agency-level factors and state-economic considerations for the placement rates of an agency. In addition, Chapter Two provides an in-depth presentation of the history, components, and current research trends of the ICF model.

Vocational Rehabilitation

State VR agencies are joint federal-state programs that assist individuals with disabilities to obtain and maintain employment. VR services and agencies were created and maintained through the Rehabilitation Act of 1973 and the Workforce Innovation and Opportunity Act of 2014 (WIOA). These programs are funded through the Rehabilitation Services Administration (RSA) and are designed to assess, plan develop and provide appropriate VR services to individuals with disabilities that address an individual's strengths, resources, priorities, concerns, abilities, capabilities, interests, informed choices and economic self-sufficiency (Berkowitz & Dean, 1988; Bruyere & Reiter, 2012; Stapleton et al., 2010). A primary goal of VR is to maximize the vocational potential of an individual with a disability (Berkowitz & Dean, 1988).

As defined by the Rehabilitation Act of 1973, eligibly for VR services includes having a physical or mental impairment that results in interference in one's ability to work and being an individual who could benefit from VR services and who requires VR services to obtain employment (Riggar & Maki, 2004). In addition to determining eligibility, disability information is used to determine category of severity and what services would be appropriate for an individual to achieve a vocational goal (Riggar & Maki, 2004). Approximately two-thirds of

individuals who utilize VR services meet the criteria for a severe disability (Berkowitz & Dean, 1988).

The VR services provided range greatly depending on the individual's needs. Counseling, guidance, and job placement services are typical for most individuals and are provided by an in-house staff of rehabilitation counselors. Services such as medical and psychological assessments, education and training, and assistive technology and devices are also available for purchase from other out-of-house agencies (Berkowitz & Dean, 1988).

An individual can exit VR either as "successfully rehabilitated" or as "not rehabilitated". Successfully rehabilitated indicates that an individual achieved competitive, gainful employment in the labor market, obtained self-employment, was placed in sheltered work or was placed as a homemaker. "Not rehabilitated" indicates that an individual was unable to meet gainful activity while receiving state VR services (Berkowitz & Dean, 1998).

Personal Characteristics Impacting Vocational Rehabilitation

The ICF model's focus is that personal characteristics may mediate or moderate the relationship between disability and participation in various activities (Chan, Tarvydas et al., 2009). This relationship between personal characteristics and a person's ability to obtain and maintain employment and VR services has been researched at great length (Chan et al., 2016; Dutta et al., 2008; Sevak et al., 2015). Personal characteristics such as gender, age, disability type, and educational attainment are strong predictors of employment outcomes within the VR literatures (Dutta et al., 2008). Other personal characteristics such as race and disability severity have been less distinct variables in predicting employment outcomes.

Age

Age is a popular personal characteristic that has been studied extensively with regard to employment outcomes. There have been mixed results in studies of the relationship of age to employment outcomes. When individuals with disabilities are compared to individuals without disabilities, age has a very different population spread. Sevak and colleagues (2015), found that individuals with disabilities are more likely to exit the workforce at a younger age when compared to individuals without disabilities. The age-employment decline for individuals with disabilities typically occurs after age 30 versus after age 50 individuals without disabilities. This study also found that the employment gap is largest during middle age, which is a critical period for accumulating retirement savings and securing finances for exiting the workforce (Sevak et al., 2015).

Dutta and others (2008) found age to be a significant predictor for employment of individuals with sensory impairments; however, age was not a significant predictor for individuals with physical and mental impairments. This same study found that individuals who were 65 years or older were three times more likely to be employed compared to those between the ages of 16 and 34 (Dutta et al., 2008). Further, middle-aged individuals (35-54 years) were 1.39 times more likely to be employed (Dutta et al., 2008). Interestingly, the results of this study contradict previous studies suggesting that older age in other sub-populations, such as physical disabilities, chronic health conditions, and those who utilized VR services, has resulted in lower employment rates (Ipsen, 2006; Mwachofi et al., 2009).

The trend of older individuals with disabilities having lower rates of obtaining and maintaining employment has been supported in other studies. Particularly, Mwachofi and

colleagues (2009), found that not only were older individuals are less likely to secure competitive employment, they also tended to have fewer weekly hours of work, if they were able to obtain employment when compared to individuals who received services at a younger age. However, other research has indicated that older individuals (65 years or older) who received services from state-federal VR agencies had a significant increase in their average weekly earnings after successfully exiting VR. The average income gain was \$94 per week (Wadsworth et al., 2008). Of the total sample of older individuals, 66.5% exited state-federal VR agencies successfully, with 44.3% achieving competitive employment (Wadsworth et al., 2008).

A recent study conducted by O'Neill, Kaczetow, Pfaller and Verkuilen (2017), found that age had a significant interaction effect with impairment type. Of the disability types, deafness had almost a fourfold increase in risk for obtaining employment with increased age while mental impairments had the lowest risk (O'Neill et al., 2017). Further interactions between age and impairments were significant for the following interactions: deafness with visual communication; communicative, mobility and orthopedic, mobility and manipulation, other orthopedic, general physical, other physical; and cognitive, psychosocial, and other mental health impairments. Overall, the likelihood of competitive employment decreased among these impairment types as age increased (O'Neill et al., 2017).

Gender

Similar to age, the personal characteristic of gender has also shown inconsistent results when predicting employment outcomes of individuals who received VR services. The inequities in gender have been one of the longest studied personal characteristics within the state-federal VR program. A study completed by Menz and colleagues (1989) utilized an analysis of variance to investigate the gender equity among different agencies between 1972 and 1984. This study

found that the gap between successful outcomes narrowed over time, but women had a higher likelihood of exiting with being successfully rehabilitated. Even though women were more likely to have a successful outcome, they were less likely to exit with competitive employment by 9.4%. Women were more likely to exit into low-paying or non-paying occupations such as homemaker (15% of women versus 3% of males) or into sheltered employment (6.5% versus 4.9%). In another study Danek and Lawrence (1985) also found that in addition that women were more likely to exit as homemakers than men, and over half of these females did not identify homemaker as their vocational objective. In this study, females were also underrepresented in professional, technical, and managerial positions (Danek & Lawrence, 1985).

Capella (2002) conducted three separate logistical regressions to investigate differences in successful rehabilitation outcomes by gender while controlling for other variables such as race, education, and severity. Interestingly, this study found that gender was not a significant predictor of successful outcomes; however, the interactional relationship between gender and age was significant. Specifically, as a female's age increased, her odds of obtaining quality employment decreased when compared to a male (Capella, 2002).

More recent studies conducted by Chan and others (2016) and Mwachofi and colleagues (2009) found that males were more likely to secure competitive employment and to obtain more stable jobs (Chan et al., 2016). Males were also more likely to earn a higher hourly wage when compared to females who were receiving VR services (Mwachofi et al., 2009).

Even though males with disabilities may have a higher likelihood of obtaining employment through VR services, recent research suggests that females with disabilities may have a smaller employment gap when compared to their counterparts of females without disabilities (Sevak et al, 2015). Dutta and colleagues (2008) researched the effect of gender on

employment outcomes across disability types and found this variable to be nonsignificant. These inconsistent results suggest the need for further investigation of gender impact on employment outcomes of individuals who utilize VR services.

Race

Race was not studied as a variable in the vocational rehabilitation literature until the 1980s. A seminal study conducted by Atkins and Wright (1980) found that there were disparities in patterns of services delivery and overall employment outcomes for African Americans. However, the interpretation of the findings of the Atkins and Wright study created much controversy and other researchers such as Bolton and Cooper (1980) disagreed with the initial findings. Studying race and ethnicity within the VR system has been complex due to the variations in results of these previous studies. In general, initial and more recent studies have found that minorities and culturally diverse populations have been underrepresented and underserved within VR agencies (Capella, 2002; Feist-Price, 1995; Olney & Kennedy, 2002).

A number of previous studies have reported significant differences between Caucasian Americans and other minority groups, especially African Americans, on a variety of measures within the VR system. For example, Capella (2002) conducted a logistical regression and found that acceptance rates into VR were 1.5 times greater for Caucasian Americans than for African Americans. Further, Caucasian Americans were more likely to exit VR as rehabilitated than either African Americans and Native Americans. This study also found that Caucasian Americans were more likely to obtain higher quality employment than Hispanic Americans.

More recent studies have continued to support and elaborate on these findings. For example, in a study conducted by Mwachofi and colleagues (2009), studied the likelihood of minority individuals utilizing VR to exit with competitive employment, the hourly rate of

compensation, and the number of hours worked within the labor market. Further, this study investigated the effects of interventions on various ethnic groups. Similar to previous studies, the authors found that the majority of those receiving services were Caucasian (72.3%) while African Americans made up 23.9% of the sample, 1.9% were American Indians, 9.5% identified as Hispanic, 1.2% were Asian American, and 0.5% were Hawaiians or Pacific Islanders. This study also found that there were significant differences between pre-and post-interventions provided to minorities when compared to Caucasians (Mwachofi et al., 2009).

The work of Dutta and colleagues (2008) further supported that there were significant differences between minority groups. Particularly, African Americans had a 20% lower chance and Native Americans had a 50% lower chance of successfully exiting with employment after receiving VR services. Also, Native Americans had about a 50% lower chance of exiting VR with successful employment (Dutta et al., 2008).

Other research has investigated how race may be interacting with other personal characteristics, such as disability type. Overall, Hispanics were more likely to be competitively employed when compared to Caucasians. However, Hispanics with a cognitive impairment were three times less likely to obtain competitive employment (O'Neill et al., 2017).

Education

Educational attainment prior to receiving VR services is also a factor that needs to be considered when investigating the personal characteristics impacting an individual's ability to achieve employment. When comparing non-fixed personal characteristics such as education, it is important to take into account that differences between individuals with disabilities and their able-bodied counterparts may be attributed to differences in disability prevalence and differences in opportunities or choices. Overall, individuals with disabilities tend to have lower levels of

educational attainment. Sevak and colleagues (2015) noted that 4% of their sample of individuals with disabilities had a graduate or professional degree compared to 12% of the sample of individuals without disabilities; 9% of individuals with disabilities obtained a bachelor's degree versus 21% of the individuals without disabilities. Further, individuals with disabilities had a higher percentage of not graduating from high school (23%) compared to 11% of individuals without disabilities. This gap consistently declined with greater educational attainment (Sevak et al., 2015).

Other studies have investigated the relationship among educational attainment and employment outcomes when compared to disability types. Education is a significant predictor for individuals with sensory and physical impairments but not for those with mental impairments. Education has a positive relationship with employment outcome. Individuals with more education had a higher rate of exiting VR with employment (Dutta et al., 2008). Individuals who obtained some postsecondary education or AA degrees were 32% less likely to exit VR with employment when compared to those with a college degree. Further, individuals who completed high school had a 36% lower chance and those who did not complete high school had a 50% lower chance of exiting VR with employment compared to individuals with a college degree (Dutta et al., 2008).

Further research has found that education has an interaction effect on other personal characteristics. In general, the more education an individual receives seems to increase his or her rate of competitive employment (O'Neill et al., 2017). For example, for individuals with visual impairments, an increase in education from a high school degree to completing some college increases the odds of competitive employment by 19%. The odds of being competitively employed among individuals with visual impairments increases to 37% with college completion

(O'Neill et al., 2017). Less drastic changes can be seen among different education levels and impairment types. For example, individuals with a mobility/orthopedic impairment have an increase of 3% if they graduated from college versus only having some postsecondary education. Overall, regardless of impairment type, an increase in education seems to result in higher rates of obtaining competitive employment (O'Neill et al., 2017).

Disability Type

Previous studies have shown the benefits of employment for the psychological well-being of people with disabilities (Dutta et al., 2008). Disability type has been well studied in previous literature and was found to be a significant predictor of employment among individuals with disabilities (Dutta et al., 2008; O'Neill et al., 2017; Sevak et al., 2015). Initial studies that investigated disability type have grouped individuals into three different categories: sensory/communicative (e.g., visual impairments/blindness and hearing impairments/deafness), physical (arthritis, spinal cord injuries), and mental impairments (depression, schizophrenia, and learning disabilities; Dutta et al., 2008). More recent studies have expanded these categories, as has the RSA-911 dataset, to be more representative of disability types. O'Neill and colleagues (2017) studied 17 different impairments and the employment outcomes of these impairments.

These initial studies indicated significant differences in employment outcomes among disability types. Dutta and colleagues (2008) found that individuals with a sensory/communicative impairment had significantly higher rates of employment followed by individuals with physical disabilities and finally individuals with mental impairments. More recent and complex research has reported similar results. O'Neill and colleagues (2017) found that the main effects of a series of interactions resulted in disability type being a significant predictor of employment. Specifically, the comparisons of the non-interacted variables resulted

in blindness showing the highest rate of competitive employment. Following blindness, overall visual impairments resulted in the second highest rate of obtaining competitive employment. Mobility/orthopedic impairments resulted in the third highest rate of competitive employment, which was then followed by cognitive and other mental impairments. Lastly, other physical and psychosocial impairments resulted in significant rates for competitive employment.

The previous studies support the importance of personal characteristics when investigating the variations among VR employment rates, weekly hours, hourly wage, and job quality. Importantly, including these individual-level characteristics within regression models decreases the within-state variation, but also decreases the between-state and environmental differences when predicting quality of employment (Chan et al., 2016).

External Characteristics Impacting Vocational Rehabilitation

As outlined in the ICF, environmental characteristics influence the level of activity that may be impacted by an individual's disability and his or her participation within society. Importantly, the external characteristics contribute to the participation and overall handicap by reflecting the sociocultural, economic, and environmental consequences of the disability (Chan, Gelman et al., 2009). Sociocultural, economic and environmental factors may all contribute to an individual's access to services, participation in VR, and overall outcome within the VR system. It is important to further research and understand how these contextual factors may be influencing the VR system.

State-Level Variation among VR agencies

Few studies have investigated the differences that exist among VR systems at the state level. Stapleton and colleagues (2010) investigated how closure rates differ among personal characteristics, but also by state agencies. The authors found that state closure ratios varied

vastly. Interestingly, the authors found that nine of the 15 states that had the highest closure ratios, were clustered in the northern Great Plains and northern Rocky Mountains (Stapleton et al., 2010). Further, four states located in the Pacific Coast and Southwest region of the United States had the lowest closure ratios. Other geographic patterns among closure rates were unclear. The authors hypothesized that some of these variations across individual state closures were related to the individual characteristics that may make up the state population of consumers of VR services. For example, Stapleton et al. (2010) suggested that variation in the personal characteristic of age between states and closure rates may reflect special programs targeting transition-aged youth (Stapleton et al., 2010; Honeycutt et al., 2015).

Beneficiary Rate

The SSA provides essential services to individuals with disabilities through its Social Security Disability Insurance (SSDI) and Social Security Income (SSI) programs. Both of these programs include policies that are designed to expand access to employment services and encourage beneficiaries to return to work. In 2015, 65.1 million individuals received benefits from the SSA and 5.4 million people received newly awarded benefits. These programs serve a large majority of the population including those with disabilities and those who also utilize state-federal VR services (Social Security Administration, 2016; Stapleton & Martin, 2017).

Much of the research that investigates SSA beneficiaries comes from a policy perspective that focuses on the likelihood or percentages of beneficiaries receiving VR or other employment services. Previous studies have found that about 7 to 10% of DI/SSDI beneficiaries enroll in employment services (Ben-Shalom & Stapleton, 2015; Liu & Stapleton, 2011). Approximately, 2% of all DI/SSDI recipients who utilize employment services and obtain employment will have a reduction in benefits (Stapleton & Martin, 2017). Interestingly, about 80% of beneficiaries who

forgo benefits because of earnings do not enroll in SSA-financed employment services (Ben-Shalom & Stapleton, 2015; Lui & Stapleton, 2011; Stapleton & Martin, 2017).

Previous research has investigated the role of state-federal VR agencies in contributing to employment of consumers who receive DI/SSDI benefits. About 40% of beneficiaries who used state-federal VR services, increased their earnings; however, 88% were unable to earn above substantial gainful activity (SGA; U.S. Government Accountability Office [GOA], 2007). Other findings that support that state-federal VR services have produced significantly higher employment rates for DI beneficiaries when compared with a comparison group (O'Neill, Mamun, Potamites, Chan & da Silva Cordoso, 2015). Both the comparison group and the state-federal VR group were matched on personal characteristics. However, the extent to which the differences in employment outcomes in this study were the result of state-federal VR services is unknown. Overall, the amount of benefits that DI/SSDI beneficiaries forgo benefits seems to vary considerably by the state (Schimmel Hyde & O'Leary, 2015).

Further, Chan and colleagues (2016) investigated how Social Security beneficiaries may impact the personal-level and state-level among quality employment outcomes for state-federal VR consumers. The authors calculated a beneficiary rate that was aggregated from all selected participants in each state to determine the percentage of VR consumers who were beneficiaries. While controlling for both personal and VR services, the beneficiary rate was found to be the best environmental factor for employment quality. The Social Security beneficiary rate accounted for 38% of the variance between states in FY 2007, 19% in FY 2008, and 30% in FY 2009. The authors also found that beneficiaries who were living in a state with overall better economic conditions were more likely to have better employment quality than those who lived in poorer states (Chan et al., 2016). This finding suggests that there is still a need to continue to

research how the state-level economics may impact state-federal VR outcomes and personal characteristics.

Labor Market

The labor market condition is an important contextual factor that needs to be considered especially when investigating the employment outcomes and opportunities for individuals with disabilities. An early study conducted by Mirsa and Tseng (1986) investigated the relationship between the unemployment rate and competitive employment rates. Utilizing correlational analysis and time series regression analysis, the authors found significant negative correlations between the unemployment rate and VR outcomes from 1944 to 1981. More recent studies have found that unemployment rates may impact the relationship between personal characteristics and other employment factors (Chan et al., 2016; Cook et al., 2006). In the study conducted by Cook and colleagues (2006), unemployment rate was a significant predictor of employment. This study found that the unemployment rate was significantly associated with the likelihood of entering the labor force.

The study conducted by Chan et al. (2016) also supported the previous findings. The authors further investigated the relationship of unemployment rates have on VR outcomes by conducting a hierarchical linear model. This study investigated how unemployment rates may impact the relationship of individual factors as well by investigating the unemployment rate in 2005 and again in 2009. In 2005, when the authors reported that the economy was relatively stable, the unemployment rate significantly moderated the relationship between personal characteristics and employment outcomes. During 2005, as the state unemployment rates increased, disparities in successful placement decreased between European Americans and Native Americans, and between those with cognitive impairments and physical disabilities.

European Americans and those with cognitive impairments were favored within these disparities. Non-significant disabilities were also favored over significant disabilities. In 2009, the authors found that the unemployment rate impacted the relationship with personal characteristics differently. Similarly, in 2005, as the unemployment rate increased, the disparities among the individual factors decreased (Chan et al., 2016).

Further research supports the claim that the overall influence of the employment rate is impacted at both agency and personal levels (Nord et al., 2013). Nord and colleagues (2013) found that when the overall employment rate was high employment outcomes of individuals utilizing VR services also increased. For example, initial employment rates at VR agencies before the Great Recession were about 61.4% for individuals with cognitive disabilities however these rates declined steadily to 59.3% in 2010 (Nord et al., 2013). Further, the employment population-ratio explained about 11.2% of the variation in VR employment rates for people with cognitive disabilities (Nord et al., 2013).

Population Rating

The relationship between VR outcomes and the population density is an important factor to consider, particularly when investigating employment outcomes in rural areas when compared to metropolitan areas (Johnstone et al., 2003; Lustig, Strauser, & Weems, 2004). For example, various economic factors are influenced by the population density. Unemployment rates and rate of job growth tend to be lower in rural communities than in metropolitan areas (Arnold & Seekins, 1995; Parker, 1991). Further, the overall slower economic growth, higher unemployment rate, number and type of jobs available, lower wages, limited access to mental and vocational services, and limited access to transportation present unique challenges for rural

VR agencies compared to metropolitan VR agencies (Arnold & Seekins, 1995; Johnstone et al., 2003; Lustig et al., 2004).

Status of Order of Selection for Services

One factor that may impact an agency's overall competitive employment rate is its status of order of selection for services (OOS). An agency enters OOS when it does not have enough funding or other resources to serve all those who are eligible for services (Honeycutt & Stapleton, 2013; RSA, 2016a). When an agency is under OOS, it must restrict services to those with the most significant disabilities first and put others on wait lists for services. As funds become available, the individuals on the wait lists may receive services; however, those individuals assessed with less significant disabilities may not receive any services or may be referred to other vocational resources located in the community. Being under OOS may be a measure of an agency's financial distress; however, some agencies perpetually remain in OOS, even though the agency may have all the resources to serve eligible applicants (Honeycutt & Stapleton, 2013). Overall, research shows that outcomes were more favorable for applicants who applied for services at an agency that was not on OOS. Honeycutt and Stapleton (2013), found that when an agency was under OOS, the agency typically had longer wait times for services. More importantly, these longer wait times seemed to negatively impact the individuals on wait lists. Agencies that had about 50% or more of applicants being placed on a wait list had overall lower numbers of cases exiting with an employment outcome and a higher number of cases exiting before an individualized plan of employment (IPE) was signed.

Additionally, Chan and colleagues (2016) suggested that the status of OOS may partially explain the effect of personal characteristics accounting for a large portion of between-state differences. For example, states without a status of OOS may be more likely to accept applicants

who have less significant disabilities. This may increase the likelihood of exiting VR with competitive employment and high-quality employment.

History of the ICF Model

The overall model in which a rehabilitation professional chooses to conceptualize disability plays a critical role in the services and allocation of resources provided to an individual with a disability (Chan et al., 2009). Prior to the ICF model, other models of disability existed such as the medical model and the social model. The ICF provides a framework that incorporates components of both of these models (Chan et al., 2009).

The influence and consideration of environment has on the conceptualization of disability has been recognized for many years. For example, Lewin's field theory of 1935 hypothesized that behavior was a function of both the person and the environment (Chan, Gelman, et al., 2009; Wright, 1983). Stated algebraically:

$$B = f(P,E)$$

However, even though the person-environment relationship was presented in early works, many of the original models of disability primarily focused on the individual and frequently ignored the situation that may have contributed to the behavior. According to Wright (1983), this tendency to overlook the environment is due to a proximity effect. It can be conceptualized that a behavior belongs to a person thus a person is seen as causing the behavior (Wright, 1983). Saliency of environmental factors also contributes to the tendency to underrate the role of environment when investigating behavior. Since the environment contributes to a background medium for the person's behavior, it is typically vaguer, less active, and less visible to those conceptualizing the behavior. Therefore, making it a less apprehensible as a prominent factor (Wright, 1983).

The Medical Model.

The medical model of disability is one disability model that is the most well-known to the general public and professionals in other settings. The primary tenets of the medical model are rooted in the scientific model and primarily focus on an individual's physical or mental deficits (Nosek, 2012; Smart & Smart, 2006). This attention to the individual leads to conceptualizations that internalize a person's disability. Specifically, the disability and the treatment for the disability are solely to lie within the individual. Another primary concept of the medical model is the disability or problem must be eliminated, or at the very least concealed from others. Further, this model tends to rely heavily on diagnosis and labeling the disability in terms of inability and dysfunction, thus primarily focusing on the cure or normalization of the disability. This underlying concept places a heavy emphasis on pathology and objectifying the individual solely due to this pathology (Nosek, 2012; Smart & Smart, 2006). Furthermore, the combination of the emphasis on the individual and the pathology leads to segregation and stigmatization of these individuals (Nosek, 2012; Smart & Smart, 2006).

Overall, the medical model lacks social integration or societal implications that may impact a person's disability. Further, the medical model lacks personal interaction and integration. Due to the individualization of a disability, it is the person and his or her aspirations that need to be modified, not the environment or society (Smart, 2004). Essentially, the medical model also heavily emphasizes that all individuals with the same diagnosis will receive the same treatment ignoring personal differences in needs, resources or assets (Chan, Gelman, et al., 2009; Smart, 2004). Having a "diagnosis-driven" model leads to a dichotomized outcome; total cure or the death of individual (Smart & Smart, 2006). This model struggles to conceptualize the needs

of individuals with chronic disabilities and psychiatric disabilities (Smart, 2009; Smart & Smart, 2006).

The Functional Model.

Unlike the medical model of disability which is based upon biology and the individualization of a disability, the functional model incorporates both the individual and the individual's environment (Smart & Smart, 2006). Overall, the functional model conceptualizes disability as the inability to complete or perform one's role due to disability (Smart, 2009; Smart & Smart, 2006). The focus is deflected from treatment or rehabilitation to adaptation. It focuses on the functions within the environment that can be changed rather than the individual who needs to make changes (Smart, 2009). Further, it suggests that lack of adaptations that are the source of a disability, not the individual (Smart, 2009).

The functional model considers the interactions that exist between the individual, the disability and the functions of the individual. The definition of disability, the causal attribution, and the solution are not solely placed on the individual or the individual's disability. Instead, the functional model suggests that the environment can cause, contribute to, or worsen one's disability (Smart & Smart, 2006). Importantly, the relationship between the context of the disability and functioning are taken into consideration when conceptualizing disability from the functional model perspective (Chan, Gelman, et al., 2009). Even though this model is more inclusive than the medical model, the focus still remains on dysfunction, thus making it a disablement process (Chan, Gelman, et al., 2009).

The functional model of disability plays an integral role among rehabilitation counselors especially those who work within a state-federal VR agency setting. Many times, VR agencies are required to use an order of selection in regard to serving individuals with the most severe

disabilities or significant disability first. Many times, this determination process is guided by functional limitations in order to define a severe or significant disability (Chan, Gelman, et al., 2009).

The Social Model.

The social model of disability is unique to the models prior because of the inclusion of a person's social environment impacting his or her pathologies, functioning, and the physical environment (Chan, Gelman, et al., 2009). Similar to the functional and medical models of disability, the social model views that an impairment and disability are distinctly different, and that the impairment is a functional limitation due to physical, sensory, or emotional limitations. However, the conceptualization of disability is due to a social construct. Disability is not a form a pathology but created from the social environment of an individual (Anastasiou & Kauffman, 2013). It is society that creates disabilities by not providing the proper services, and the needs of individuals with disabilities not being met and taken into consideration within the social organization (Anastasiou & Kauffman, 2013).

The social model of disability not only addresses the physical barriers that are produced by the environment, but also includes the attitudinal obstacles that individuals with disabilities face (Goering, 2015). Importantly, other's perceptions and expectations about quality of life, ability to work, and gainful employment impact the way the environment is created structurally but can create additional barriers when individuals with disabilities are unable to meet these expectations (Goering, 2015). These opinions of others are a mediating factor in determining specific outcomes for individuals with disabilities (Tate & Pledger, 2003). The overall disability experience is unique and multifaceted. The social model of disability tries to capture this unique and individualized experience by incorporating individual characteristics and specific behaviors,

cultural influences, social stigmas, and the attitudes of others that have the power to enable or disable an individual with a disability (Tate & Pledger, 2003).

Another important distinction of the social model when compared to the medical and functional models is that the focus is one enabling an individual. Including the person's social environment in the conceptualization of disability is a key factor in ensuring that the correct supports and services such as access to health care, assistive technology and universal design, are considered in the definition of disability (Chan, Gelman, et al., 2009). Another key factor that the social model contributes to the conceptualization of disability is the addition of secondary conditions. Secondary conditions can impact the enablement or disablement of a disability. Although secondary conditions have the ability to increase the severity of a disability, they are typically preventable from both an individual and an environmental perspective (Chan, Gelman, et al., 2009).

The ICF Model

The ICF model integrates key components from the medical, functional, and social models and provides a comprehensive framework for conceptualizing disability (Chan, Gelman, et al., 2009; Chan, Tarvydas et al., 2009; WHO, 2001). The current ICF model is an improved version of the International Classification of Impairments, Disabilities and Handicaps (ICIDH) created by the World Health Organization (WHO; Nosek, 2012). This initial model classified disabilities from a less restrictive form of the medical model and still conceptualized disability as a linear process. This process started with an underlying cause that led to an impairment and then to led to a disability. However, eventually there was a need to include a framework that was more holistic and addressed contextual concerns, and the community of individuals (Nosek,

2012). Importantly the ICIDH provided a definition for the terms: impairment, disability, and handicap that clarify disability.

Impairment is defined as abnormalities of structural, appearance, or overall system functioning (WHO, 1980, p. 47). This definition is primarily concerned with dysfunctions occurring at the organ level and limitations regarding physical, cognitive or emotional functioning (Chan, Gelman, et al., 2009).

Disability is defined as the functional consequences of an impairment (WHO, 2001, p. 47). This definition primarily focuses on how the impairment may impact a person's ability to function, perform, or behave. The definition of disability conceptualizes this term from a personal perspective (Chan, Gelman, et al., 2009).

Handicap is defined as the disadvantages that impede an individual with a disability from fulfilling a normal role (WHO, 2001, p. 47). This definition of handicap reflects that an individual's disability interacts with the society, culture, economy and the environment of the individual. It represents that a person's disability may impact the ability to fulfill his or her social role (Chan, Gelman, et al., 2009).

The current model of ICF attempts to unify and integrate the previous models of disability to a global and holistic level across various professions that will foster interdisciplinary and multi-disciplinary treatments (Chan, Gelman, et al., 2009; WHO, 2001).

One of the major limitations that the ICF presents is lack of clear measurements and definition of constructs. For example, there is a lack of clarity between the constructs of activity and participation. There is even more of a concern in developing an appropriate measure for these constructs (Chan, Gelman et al., 2009; Chan, Tarvydas, et al., 2009). Part of this problem is due to the lack of operationalized definitions for the constructs: Activity, Environment, Personal

Factors, Participation, and Quality of Life (Alvarez, 2012; Chan, Tarvydas, et al., 2009; Tate & Pledge, 2003). Not having operationalized definitions and accurate measures complicates the integration of the ICF into rehabilitation research.

Underlying Principles of the ICF

There are four underlying principle that encompass the ICF. These include universality, parity and etiological neutrality, neutrality, and environmental influence. Universality promotes the inclusion of individuals with a variety of health conditions in all physical, social, and cultural contexts. Parity and etiological neutrality focuses on the person's functioning instead of the health condition itself. Within the ICF, there is no distinction between mental or physical health conditions; therefore, the goal is to compare disabilities using a common metric. Neutrality refers to the language used within the ICF. Definitions are worded using person-first language (Chan, Tarvydas, et al., 2009) and can be used to identify both the positive and the negative aspects of disability (WHO, 2001). Environmental influence highlights the importance of the person-environment interaction as an essential understanding of an individual's functioning and overall health condition (Chan, Gelman, et al., 2009; Chan, Tarvydas, et al., 2009; WHO, 2001).

Theoretical Framework of the ICF

As mentioned previously, the ICF is an enablement model that focuses on the interaction between personal and environmental characteristics, functioning, and activity, which affect participation within society and overall quality of life. The ICF theorizes that disablement can be categorized into four constructs: body functions and structures, activities and participation, environmental factors and personal characteristics (Chan, Gelman, et al., 2009; WHO, 2001). The ICF is organized into two parts. Part 1 includes body functions and structures and activities and participation. These are directly related to a person's health condition. Part 2 includes

contextual factors, which are environmental and personal factors. The components of Part 2 are considered health-related factors since they affect Part 1. Part 2 components provide specific context for the components included in Part 1 (Chan, Gelman, et al., 2009; Scherer & Glueckauf, 2005; WHO, 2001).

The body functions and structures component is organized according to body systems. Body functions refer to both physical and psychological roles and include eight components: (1) mental functions; (2) sensory functions and pain; (3) voice and speech functions; (4) functions of the cardiovascular, hematological, immunological, and respiratory systems; (5) functions of the digestive, metabolic, and endocrine systems; (6) genitourinary and reproductive functions; (7) neuromusculoskeletal and movement-related functions; and (8) functions of the skin and related structures. Body structures are similar to body functions but focus on the anatomical parts of the body. Body structures include (1) structures of the nervous system; (2) the eye, ear, and related structures; (3) structures involved in voice and speech; (4) structure of the cardiovascular, immunological, respiratory systems; (5) structures related to the digestive, metabolic, and endocrine systems; (6) structures related to the genitourinary and reproductive systems; (7) structures related to movement; and (8) skin-related structures.

Activities and participation refer to an individual's abilities and performances within the environment. Activity refers to an individual's ability and the potential for an individual to carry out a task or action. Participation refers to the performance of a task and is referred to as what tasks and actions an individual actually participates in (Chan, Gelman, et al., 2009; WHO, 2001). The ICF incorporates nine activity and participation domains: (1) learning and applying knowledge; (2) general tasks and demands; (3) communication; (4) movement; (5) self-care; (6)

domestic life areas; (7) interpersonal interactions; (8) major life areas; (9) community, social, and civic life.

Environmental factors include the physical, social, and altitudinal environment where people live their lives. These factors are separate and external from the individual but may still influence the overall capacity, performance, and body function or structure of an individual. These environmental factors play an important role in facilitating or creating barriers for acceptance and inclusion of individuals with disabilities into society. Some environmental factors include natural and/or man-made changes to the environment, products and technology, support and relationships, attitudes and services, systems and policies.

Personal factors are defined as individual features and characteristics that impact any area of the ICF (Chan, Gelman, et al., 2009; WHO, 2001). They include gender, age, other health conditions, coping style, social background, education, profession, past experiences, and character style (Chan, Gelman, et al., 2009; WHO, 2001).

The ICF's focus on personal and external factors as mediating and moderating variables can be useful for researchers especially in VR. The ICF model suggests that both external and personal factors mediate and moderate the relationship between functional disability, participation, and overall outcome, thus, allowing researchers and clinicians to better understand the dynamic between disability and work (Chan, Tarvydas, et al., 2009).

Overall, there are a number of benefits from using the ICF model when conceptualizing a disability. First, the ICF provides theoretical foundations of functioning and disability as a multifaceted concept (WHO, 2001). These agreed-upon meanings of terms allow for communication about a specific individual or a population regarding function and overall participation in society. Importantly, The ICF views disability within a biopsychosocial model

that incorporates medical aspects, individual characteristics and environmental factors when determining a person's functioning and participation in society (Chan, Gelman, et al., 2009).

However, there are some shortcomings to using the ICF model. Even though, the ICF has encouraged rehabilitation professionals to consider how aspects of the environment may influence functioning and participation, the ICF is unable to provide measurements of environmental factors to help aid in developing evidence-based practices. This is partially due to the size and complexity of translating the ICF into assessments. Further, utilizing ICF concepts to describe individual differences across economic and cultural divides also presents challenges (Chan, Gelman, et al., 2009).

Summary

The current study intends to further investigate the relationships that exist between personal characteristics, agency-level factors, and state-economic variables across VR agency performances. By utilizing the ICF model, this study is able to include and further research the contextual factors and how they may influence agency performance especially as it relates to employment outcomes. As prior research has indicated, these contextual factors play an important role in an individual's VR services and overall success within VR.

Much of the previous research has focused on the relationships that exist between personal characteristics and state level factors that influence service outcomes. For example, Stapleton and colleagues (2010) found variations among VR agencies services based upon demographic, disability and educational characteristics of VR applicants. Further, Honeycutt and others (2015) found that overall agency resources as associated with a status of OOS may contribute to differences in employment outcomes among state VR agencies. Other research has

confirmed that state-level economic factors such as the unemployment rate influence VR services and employment outcomes (Nord et al., 2013). By building off of these works, the aim of this study is to seek how state VR agency differ across personal characteristics, agency level and state-economic factors. Investigating these relationships will hopefully provide answers to better understanding the mechanisms that promote successful rehabilitation closures and can be used across agencies.

CHAPTER THREE

METHODOLOGY

This study intends to explore the differences that exist between low-performing and high-performing VR agencies along with the relationships between the contextual factors that contribute to employment outcomes among individuals with disabilities. This chapter presents information about the secondary datasets, relevant research questions, and hypotheses along with the statistical analysis performed to answer the questions posed in the present study. The goal of the current study is to examine the differences between VR placement outcomes among low-performing and high-performing VR agencies and the impact of personal characteristics, agency-level factors, and state economic variables have on employment outcome. This research will utilize the RSA-911 data set paired with the American Community Survey (ACS).

Research Questions and Hypothesis

Research Question 1: How do personal characteristics, VR agency-level factors, and state economic variables predict the placement rates of VR agencies?

Hypothesis: Personal characteristics will have higher odds of predicting successful placement rates than agency-level factors and state-economic variables.

Research Question 2: How are personal characteristics, VR agency-level factors, and state economic variables different across states regarding the performance of VR agency?

Hypothesis: It is predicted that the VR agency-level factors and state economic variables will show differences across various states depending on VR agency performances. It is predicted that personal characteristics will not show as much variation across states.

Research Question 3: What is the impact of the relationship among personal characteristics, VR agency-level factors, and state economic variables on the employment rates of VR agencies based on their performance groups?

Hypothesis: It is predicted that personal characteristics, VR agency-level factors and state economic variables will all have main effects on the employment rates of VR agencies.

Hypothesis2: It is predicted that personal characteristics will moderate the effects of VR agency-level factors and state-economic variables on the employment rates of VR agencies, regardless of performance.

Research Design

The present study employed a descriptive, secondary data, quantitative design. Quantitative research designs use numerical data and deductive reasoning in order to identify key areas of a theory, identify the characteristics of an observed phenomenon or explore possible correlations among two or more phenomena (Bryman, 2012; Leedy & Ormrod, 2001). This design examines relation to and the effects of the independent variables on the dependent variables (Cohen, Manion, & Morrison, 2000). Using secondary data allows one to explore the hypotheses about causes and relationships between the independent and dependent variables. There is no manipulation or random assignment with this type of research (Cohen et al., 2000).

The following paragraphs will provide information on data collection and analyses process. First, the data sources will be identified and defined. Next, a definition of each variable used will be provided and explained how it was used within the analyses. The procedures section outlines a sequence of steps that was used to run the analyses. Finally, the data analysis section defines and provides a rationale as to why an analysis of variance (ANOVA), multiple regressions and a hierarchical linear model (HLM) were used.

Data Collection and Analysis

In addition to investigating differences among personal characteristics, a goal of this study was also to explore any differences among state-federal VR agencies and discover what state and federal characteristics were more related than others. To do this, a sample of macro-level characteristics was also needed. The RSA-911 dataset was used to measure one of the agency-level variables. Further, the percentage of cases closed with an employment status was used to calculate the performance group of the state agencies. In order to be included in this study a state-federal VR agency had to be a general/combined agency. The agency had to be within the United States, District of Columbia, or Puerto Rico; all other American territories and islands were not included in the analysis due to small sample sizes and lack of availability of data across the macro-level variables.

Data Sources

In order to examine the relationships between the different variables and the employment outcomes in the state-federal VR program, individual characteristics along with state and national information was collected and analyzed. All of the individual and state agency information was obtained from the fiscal year (FY) 2013 RSA-911 dataset. The state level data were collected through the U.S. Census Bureau's American Community Survey (ACS).

RSA-911 Data

The population of interest within this study was individuals with disabilities. Secondary data was used to access a sample of this population. Information from the RSA-911 dataset was used to analyze the individual characteristics and agency-level factors within this study. The RSA-911 dataset is an administrative case service report sponsored by the Rehabilitation Services Administration housed within the Department of Education (DOE). It is an annual

collection of data from VR offices in each state on clients with closed cases. RSA-911 data include information regarding demographics, primary and secondary disability, services provided, reason for case closure, employment status, sources of financial support, income, and hours worked per week. The RSA-911 provides an opportunity to assess the effectiveness of employment services provided by the state-federal VR program and the overall context within which individuals utilize VR services. This study focused on a number of demographic and personal characteristics utilizing this database. Since the nature of the study focused on the differences in agency performance among various variables, the researcher chose not to research a specific disability. Selecting a specific disability may have made the findings of the study less generalizable and may have provided information and insights on the differences between agencies for that specific disability however it may not have provided a holistic view of the agencies and the differences that exist between them.

For the micro-level investigation, the sample was gathered from the fiscal year (FY) 2013 RSA-911 dataset. Inclusion criteria for the individuals include: exiting a state-federal VR program with employment, developed an individual plan of employment (IPE), received at least one VR service from a general/combined agency, and be of working age, 16 to 64 years. Further, there are two different types of VR agencies: agencies for the blind or vision impairments and general or combined agencies. VR agencies for the blind and vision impairments provided specialized services and only work with individuals who have visual impairments while general and combined agencies serve individuals with all disabilities. For this study, only general or combined agencies were selected.

In addition to investigating differences among personal characteristics, a goal of this study is also to explore any differences among state-federal VR agencies and discover what state

and federal characteristics are more related than others. In order to do this, a sample of macro-level characteristics was also needed. The RSA-911 dataset was also used to measure some of the agency-level variables.

American Community Survey (ACS)

The ACS was used to analyze the state economic variables within this study. The ACS is an annual survey conducted by the U.S. Census Bureau that collects information on a sample drawn for the United States' population. Information collected includes a variety of topics such as age, sex, family and relationships, income and benefits, health insurance, education, veteran status, disability status and housing characteristics (Census Bureau, 2017). For this study, the data from the ACS will be used to measure level-2 data such as the labor force participation, average annual income, and poverty rating. Information from the ACS was obtained and downloaded using the FactFinder option within the Census's website.

Each of these data sets contributed specific information about both individual characteristics and environmental factors influencing agency performance. Data from the ACS primarily contributes to measures of environmental variables while the RSA-911 dataset provides information primarily about personal characteristics. The data from the ACS was matched with the RSA-911 based on the state code of the agency. This allowed the researcher to compare state agencies to one another.

Measures

Outcome Variable

The outcome variable was employment rate. Employment was measured under the variable 'Type of Closure' where the counselor had indicated 'exited with an employment outcome'. This variable allows counselors to select from seven different options: 'exited as

applicant’, ‘exited during or after a trial work experience/extended evaluation’, ‘exited with employment outcome’, ‘exited without an employment outcome, after receiving services’, ‘exited without an employment outcome, after a signed IPE, but before receiving services,’ ‘exited from an order of selection waiting list’, and ‘exited without an employment outcome, after eligibility, but before an IPE was signed’. Competitive employment in the RSA-911 is defined as employment for at least 90 days in an integrated setting, or self-employment. The individual is compensated at a rate that is required under the applicable state or local minimum wage. The employment rate was calculated by dividing the total number of cases per state by the number of cases within the state that had exited with the code ‘exited with an employment outcome’. The employment rate was used as the outcome variable. Further, this was used to separate states into performance groups.

State Groups

States were placed in a high, medium, or low performing group based upon the employment ratings. States that had an employment rate that was one standard deviation or more above the mean were included the high performing group, while states that had an employment rate that was one standard deviation or less below the mean consisted of the low performing group. The remaining states were placed in the medium performing group. The employment rates were calculated for each state by dividing the number of cases closed with an employment status over the total number of cases for that state.

Predictor Variables

When studying employment outcomes framed within the ICF model, the predictor variables are grouped into two different levels: a micro-level that consists of personal variables and a macro-level that consists of environmental factors.

Level-1: Personal Characteristics:

Level-1 is the micro level that includes the personal characteristics. Individual characteristics included gender, age, race, disability type, disability severity, and education level. These variables were gathered from the RSA-911 dataset.

Gender

Within the RSA-911 dataset, gender is a dichotomous variable and was measured using a dummy code. 1 indicates that the individual identifies as male. 2 indicates that the individual identifies as female. 9 indicates that the individual chooses not to identify his or her gender.

Race/Ethnicity

The RSA-911 dataset allows seven variables for race and ethnicity. These include American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, and Hispanic or Latino. Clients are able to report multiple races/ethnicities. Each race variable is coded as an individual category. For each race, 1 indicates that an individual identifies with that race, 0 indicates that the client does not identify with that race and 9 indicates that the individual chooses not to self-identify with his or her race. In the RSA-911, race is also coded continuously, allowing individuals to identify with more than one race or ethnicity. The remaining categories have codes of 0 while the categories that the individual identified as his or her race are coded as 1. For this study, five groups of races or ethnicity were created. Individuals who identified as Caucasian were coded as 1. Individuals who identified as Black or African American were coded as 2. 3 represented individuals who identify as Asian American. Individuals who identify as Hispanic or Latino/a were coded as 4. Lastly,

individuals who identified with as Pacific Islander, Native Hawaiian, American Indian, Alaska Native, or identified with multiple races were coded as 5.

Disability Type

Disability type is represented by a combination of the type of impairment and the source of impairment. Type of impairment is categorized into sensory, physical, or mental while the source of impairment has 37 different variables ranging from alcohol abuse/dependency to traumatic brain injury. For this study, disability type was categorized based on the type of impairment. A new variable was created that was coded as: 1 indicating a sensory/communicative impairment, 2 represented a physical impairment, and 3 represented individuals with mental impairments.

Disability Significance

The RSA-911 defines a person with a significant disability as “an individual who has a physical or mental impairment that seriously limits one or more functional capacities (such as mobility, communication, self-care, self-direction, interpersonal skills, work tolerance, or work skills) in terms of employment outcome and whose VR can be expected to require multiple VR services over an extended period of time and who has one or more physical or mental disabilities” (RSA, 2016a). Disability significance has three different variables: individual has a significant disability, individual is most significantly disabled, or individual has no significant disability. Disability significance was also coded. 1 indicating that the individual does not have a significant disability, 2 indicating that the individual does have a significant disability.

Education Level

Education level is measured using the RSA-911 and includes nine different categories: individual attained a secondary school diploma; individual attained a secondary school

equivalency; individual has a disability and attained a certificate of attendance/completion as a result of successfully completing an Individualized Education Program (IEP); Individual completed one or more years of postsecondary education; Individual attained a postsecondary certification, license, or educational certificate (non-degree), 'Individual attained an associates' degree; individual attained a bachelor's degree; individual attained a degree beyond a bachelor's degree; or no educational level was completed. For this study, level of education was combined into four different categories, all of which were coded. 1 represented less than high school training, 2 represented a high school graduated or equivalency certificate (GED), 3 represented individuals that had some post-secondary training however did not obtain a bachelor's degree, and 4 represented a bachelor's degree or higher levels of education.

Level-2: State and Agency-Level Factors

Level 2 factors are macro-level variables that are related to state, community, and agency variables as well as macro-economic variables. These variables include the labor force participation rate, unemployment rate, urban population rating, average annual income, poverty rating, social security beneficiary rating, and OOS status. These variables will be obtained from the ACS and RSA-911 datasets.

Labor Force Participation Rate

The labor force participation rate is the percentage of the population that is employed or unemployed. The labor force participation rate does not include individuals who may not be working due to being institutionalized (Bureau of Labor Statistics [BLS], 2017). In this study, labor force participation rate was a continuous variable.

Unemployment Rate of the State

Individuals are considered unemployed if they are ages 16 to 64 years or older, do not have a job, have been actively seeking employment in the previous 4 weeks, and are available for work. Individuals who are waiting to return to work due to being temporarily laid off are also considered unemployed. Unemployment is not impacted by whether an individual may be receiving benefits from the Department of Labor's Unemployment Insurance (UI) program. The unemployment rate represents the number of people unemployed as a percentage of the labor force (BLS, 2017).

Average Annual Income

Average annual income consists of hourly and weekly earnings of wage and salary workers that is received on a regular basis before deductions for personal income taxes, Social Security, union dues, and Medicare deductions. Income does not reflect if families received part of their incomes in the form of noncash benefits such as food stamps, health benefits or subsidized housing. Year-to-year changes in average annual wages can result from changes in the overall proportion of employment in high and low-paying jobs (BLS, 2017).

Poverty Rating

Poverty rating is determined by family or household, indicating that everyone within the family or household falls below the poverty threshold or no one within the family falls below the poverty threshold. These poverty thresholds are determined by family size, number of children under the age of 18, and if the age of the primary householder is over age 65. The poverty threshold is primarily determined by a set income (Census Bureau, 2017). Within the current study, the poverty rating was represented as a percentage of individuals within a particular state that lived under the poverty threshold.

Social Security Disability Insurance

Social Security Disability Insurance pays month benefits to workers who are no longer able to work due to a significant illness or impairment that is expected to last at least a year or result in death within a year. Benefits are based on the disabled worker's past earnings (SSA, 2016). The current study, used the ACS to measure the average amount paid to a beneficiary per the state.

Status of OOS

A state-federal VR agency under OOS status lacks the funding or resources to serve all individuals who are eligible for services, thus reserving services for those whose disabilities are more severe. The status of OOS may be an indication that the agency variable status of OOS is reported in the RSA-911 dataset available through the RSA website. In this study, status of OOS was a dichotomous variable. States that were under an OOS were coded as 1, while states that were not under an OOS were coded as 0.

Table 1: Summary of Variables and Measures

Variable Assessed	Level of Variable	Data Source	Type of Variable
Type of Closure	Dependent Variable	RSA-911	Continuous/Ratio
Gender	Level-1 Independent Variable	RSA-911	Categorical
Age at Application	Level-1 Independent Variable	RSA-911	Continuous
Race/Ethnicity	Level-1 Independent Variable	RSA-911	Categorical
Disability Type	Level-1 Independent Variable	RSA-911	Categorical
Disability Significance	Level-1 Independent Variable	RSA-911	Categorical
Education Level	Level-1 Independent Variable	RSA-911	Categorical
Labor Force Participation Rate	Level-2 Independent Variable	ACS	Continuous
Unemployment Rate of the State	Level-2 Independent Variable	ACS	Continuous
Urban Population Rating	Level-2 Independent Variable	ACS	Continuous
Average Annual Income	Level-2 Independent Variable	ACS	Continuous
Poverty Rating	Level-2 Independent Variable	ACS	Continuous
Social Security Beneficiary Rating	Level-2 Independent Variable	ACS	Continuous

Table 1- Continued

Status of OOS	Level-2 Independent Variable	RSA-911	Categorical
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Procedures

After obtaining approval from the University of Iowa Institutional Review Board (IRB), data was screened for any missing data and the following steps were taken:

1. The RSA-911 dataset was obtained from the public file available on the Rehabilitation Service Administration’s website: <http://rsa.ed.gov>; the ACS is also available for public use. The specific state level variables were downloaded using FactFinder on the Census Bureau’s website: <https://factfinder.census.gov>
2. The employment outcome rates were calculated, and new variables were formed using data from the RSA-911.
3. Data from the ACS were paired with the RSA-911 based on the agency code.
4. The RSA-911 dataset was used to measure each state’s employment outcome rate. States were, then, grouped into a low, medium, or high group based on this employment outcome rate. States that were grouped in the low group fell below one standard deviation below the mean. State that consisted of the high performing group had employment outcome rates were one standard deviation above the mean. States that had an employment outcome rate that was within the range of one standard deviation above or below the mean were placed into the medium group.
5. An analysis of variance (ANOVA) was completed to determine if significant differences among the group of agencies based upon employment outcome rate existed.

6. A multiple regression using a general linear model was utilized to determine which personal variables are significant predictors of employment outcome rate. Individual regressions were conducted for each performance group. The general linear model was conducted using SAS version 9.4.
7. A multiple regression was conducted to explore which environmental factors were significant in predicting employment rate. Individual regressions were conducted for each performance group.
8. The level 1 sampling model of the HLM was conducted. Information from this model was used to calculate the interclass correlation (ICC).
9. The overall level-structural model from step 5 was used to complete the one-way ANOVA with random effects. Further, tests that contributed to the HLM included a Random Intercept model, Random Coefficient Model, and Full Random Coefficient Model.
10. All data cleansing, bivariate analyses, and the multiple regression of the environmental factors were completed using the statistical software program, SPSS version 25. The multiple regressions ran as a general linear model and the HLM were conducted using SAS version 9.4

Data Analysis

The present study investigated the relationship and differences among state-federal VR agencies at two different levels: the individual and the state. As mentioned above a number of statistical analyses were conducted. First, an ANOVA investigating the differences among employment outcome rates between state performance groups was completed. Next, several multiple regressions were used to determine the significance of personal characteristics and

environmental factors have on the relationship between employment outcome rates. These multiple regressions were also used to explore differences that may exist between state performance groups. Finally, a hierarchical linear model (HLM) was conducted to further research the impact the individual and state-level factors have on employment outcome rates.

Analysis of Variance (ANOVA)

Using an ANOVA allows a researcher to assess for potential differences in the dependent variables (Hays, 1994). Since there was only one independent variable (employment rate) a one-way ANOVA was used to determine if there are significant differences among the performance groups of agencies based upon the employment rate.

Multiple Regression

Multiple linear regression attempts to predict or explain variation between two or more independent variables and the predictor variable when the dependent variable is continuous (Kleinbaum, Kupper, Nizam, & Rosenberg, 2014). This study used a multiple regression to answer research questions 1 and 2. Each variable from both level-1 and level-2 characteristics was entered into the model to determine which has the highest raw coefficient.

A multiple linear regression consists of a weighted sum of two or more variables that contribute to the multiple regression equation. It is these raw coefficients of the predictors variables that represent a unit change in the dependent variable. A positive raw coefficient results in an increase in the units of the dependent variable; while a negative raw coefficient represents a decrease in units of the dependent variable (Grimm & Yarnold, 1995). Furthermore, a multiple regression provides estimates of the accuracy of the prediction and the degree of relationship between this linear combination of predictors and the dependent variable (Grimm & Yarnold, 1995).

Multiple linear regression requires four assumptions to be met. These include a linear relationship between the dependent variables and independent variables, multivariate normality meaning that the residuals are normally distributed, there is no multicollinearity between independent variables, and homoscedasticity (Grimm & Yarnold, 1995). A scatter plot between the independent and dependent variables was completed and found a linear relationship. The errors between observed and predicted values was investigated using a histogram. The assumption of multicollinearity was investigated by computing a correlation matrix among the independent variables. None of the magnitude of the variables were above .80, indicating that multicollinearity is not a problem.

Hierarchical Linear Model (HLM)

One independent variable (individual level characteristics) is nested within the others (state-level factors). This nesting of variables leads to using a hierarchical linear model for data analysis. Many times, in social sciences, variables are nested, for example, students within a class, employees working in a firm, and suspects trialed by judges in courts (Raudenbush & Bryk, 2002; Snijders & Bosker, 2012). Multilevel analysis attempts to take into account the distinct variability within each level (Snijders & Bosker, 2012). A hierarchical linear model presents two main assumptions: (a) the expected outcome at each level may be represented as a linear function of a regression coefficient, and (b) the random effects at each level can reasonably be assumed to be normally distributed (Peugh, 2010; Raudenbush & Bryk, 2002).

HLM is based on the tendency for data to be grouped at various levels that create complex patterns of variability (Snijders & Bosker, 2012; Woltman, Feldstain, MacKay, & Rocci, 2012). The analysis of nested data takes into account that each level of nesting is associated with variability that has a distinct interpretation. Further, the HLM analysis differs

from a regression model in that it contains more than one error term. Overall, the goal of an HLM is to construct a model that expresses how the dependent variable depends on the independent variable. An HLM suggests that the outcome variable has both an individual and group aspect. This idea also applies to the dependent variables, suggesting that a dependent variable may occur at the individual level and may also contain a group aspect (Snijders & Bosker, 2012; Wong & Mason, 1985).

Multilevel data analysis allows for analysis of variance across levels of data, while controlling for the variances explained by level 2 variables (Snijders & Bosker, 2012; Woltman et al., 2012). Separate predictive equations are created for each of the multiple levels.

In order to answer research questions two and three of this study and investigate the variation between the state performance groups, this study used the sub-model one-way ANOVA model with random effects. This is the first model ran in an HLM and typically determines if multilevel modeling is needed. The first model, the unconditional model or also known as a “random effects ANOVA”, determines if the dependent variable varies notably across the level-2 variables (Peugh, 2010). Further, this model shows whether adding a level-2 variable accounts for the variances among the level-2 groups.

$$\text{Level-1: } \eta_{ij} = \beta_{0j} + e_{ij}$$

$$\text{Level-2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\text{Combined: } \eta_{ij} = \gamma_{00} + u_{0j} + e_{ij}$$

To test the personal and demographic variables, each independent variable was examined in a one-Way ANCOVA model with random effects, also known as the random intercept model. This model tests a single level 1 predictor as a covariate but assumes the covariate effect is identical for every group. An example model for age is:

$$\text{Level-1: } \eta_{ij} = \beta_{0j} + \beta_1(\text{Age}_{ij}) + e_{ij}$$

$$\text{Level-2: } \beta_{0j} = \Upsilon_{00} + u_{0j}$$

$$\text{Level-2: } \beta_{1j} = \gamma_{10}$$

$$\text{Combined: } \eta_{ij} = \beta_{0j} + \beta_1(\text{Age}_{ij}) + u_{0j} + e_{ij}$$

An important difference in this model and a standard ANCOVA model is that u_{0j} is conceived as random rather than fixed. Υ_{10} represents the pooled within-group regression coefficient of η_{ij} on X_{ij} . Further, each β_{0j} represents the mean outcome for each level-2 unit.

In order to answer research question three, the intercepts- and slopes as outcomes' model, which is also considered to be the full model, will be used. The individual characteristics that were used in the level-1 model were added at each level-2 state-economic variable at a time. The testing of the labor market indicators is the following:

$$\text{Level-1: } \eta_{ij} = \beta_{0j} + \beta_{1j} (\text{Gender})_{ij} + \beta_{2j} (\text{Age})_{ij} + \beta_{3j} (\text{Race})_{ij} + \beta_{4j} (\text{Disability})_{ij} + \beta_{5j} (\text{Sig Disability})_{ij} + \beta_{6j} (\text{Edu})_{ij} + e_{ij}$$

$$\text{Level-2: } \beta_{0j} = \Upsilon_{00} + \Upsilon_{10} (\% \text{LaborForcePart}) + u_{0j}$$

(Unemployment Rate, Mean Income, %Poverty, %SSDI, OOS)

Ethical Considerations

This study employed secondary data; therefore, many of the typical ethical considerations regarding recruitment, informed consent, and data collection are not directly applicable.

However, it is still important to highlight the ethical considerations employed to strengthen the validity of the present study. First, the researcher evaluated the datasets and identified criteria such as the accuracy, period of data collection, purpose for which it was collected, and the content of the data that made the selected data files the best fit for this study. Second, once

obtained, the researcher will scan the data sets to ensure the data files were properly coded and did not have any pieces of information that could lead to personal identification. Third, the researcher will store data using the University of Iowa OneDrive System which provides password protected access to authorized individuals only. Last, both codes of ethics from the American Counseling Association and the Commission on Rehabilitation Counselor Certification caution against making inferences from research results. While the dataset included in the present study are national sets, the fact that data included in these files represent only the experiences and services received by those individuals who voluntarily acceded to such program interventions is a limited threat to participants.

Potential Limitations

One potential limitation that needs to be addressed is simply by the nature of an ex post facto design. Being a retrospective descriptive study that utilizes large data sets suggests that casual inferences cannot be determined (Cohen et al., 2000).

Another limitation that presents itself is the use of a large administrative dataset, the RSA-911. Even though administrative data provides a plethora of information regarding client information, geographic region, and other important subgroup patterns, it at times complete clinical information is lacking (Sarrazin & Rosenthal, 2012). This is present with RSA-911, especially when considering the disability significance variable. Further, because all information is entered by rehabilitation professionals who are trained and provided with a manualized codebook, human errors and individual differences are inevitable.

Summary

Previous studies have investigated the effect of the relationship between individual factors and environmental factors on employment outcomes, and both factors were shown have

to be significant when predicting outcomes for individuals receiving state-federal VR services. However, this study aimed to further explore these relationships among VR agency performances to determine how individual characteristics and contextual factors may influence the employment rates while also investigating how these variables differ between agency performance categories. The ICF model supports that both contextual factors and individual factors influence a person's participation and employment outcome in a state-federal VR setting (Chan et al., 2016; Chan, Gelman, et al., 2009). However, little is known about the interactions between individual characteristics and contextual factors has on overall employment. The results of this study provided further insight into the way in which VR outcomes and overall VR processes are researched and implemented. Investigating how macro-economics and agency-level characteristics influence employment rates between other VR agencies will hopefully provide richer and deeper knowledge of the interactions and facilitate changes in policy and overall implementation of services to individuals with disabilities. The discussion section reported and further discussed how individual factors influence employment rates, the impact of macro-economics, and the agency-level, on the employment rates, the relationships that may exist between these variables. Chapter III provided an overview of the data collection and analysis procedures. Chapter IV presented the results of the proposed study. Finally, Chapter V provided a discussion and application of the results.

CHAPTER FOUR

RESULTS

This chapter presents the findings of the data analyses used to investigate the effects of the personal (micro) and the state (macro) level factors on the employment outcome rates of VR agencies. The chapter begins with a brief summary of the data collection and cleansing processes and the descriptive statistics for all variables used within this study. Next, the chapter provides a summary of the ANOVA, correlations of the micro-level and macro-level independent variables, results of the multiple regressions, and the HLM analyses.

The multivariate analysis consisted of two parts. The first part was a multiple regression designed to examine the relationships between employment outcome rates, personal characteristics, and environmental factors. The second part explored the multilevel impacts on employment outcome rates by using the hierarchical linear modeling (HLM) method. Exploring whether there were significant variations among states in terms of their employment outcome rates revealed which personal characteristic variables were related to VR outcomes and which state-level variables accounted for the variations in employment rates across the state groups.

Descriptive Statistics

A total of 575,462 clients exited from general/combined state-federal VR agencies within the United States and Puerto Rico during the fiscal year 2013 according to the RSA 911 data file. Of those clients, 399,016 cases were deleted due to missing information regarding the 'Type of Closure' variable that was used to measure the dependent variable, employment rate and other independent variables. Of the total cases, 176,446 (30.7%) cases exited with an employment outcome, 154,765 (26.9%) cases exited without an employment outcome but with services received, 12,727 (2.2%) cases exited without employment after signing an individual plan of

employment but before receiving services, 8,060 (1.4%) cases exited from an OOS waiting list, 135,392 (23.5%) cases exited without employment after determining eligibility for services but before signing an individual plan of employment, and 82,986 (14.4%) cases exited as an applicant. The total number of cases used in the current analyses were only those that exited with an employment outcome ($n=176,446$).

Micro-Level Variables

Table 2 presents the descriptive statistics for the micro-level characteristics. Approximately 43% of the sample were female, 61% were Caucasian with no Hispanic origin, and the average age at application was 35.27 years. Further, about 52% of individuals who received services were between the ages of 14 and 34 years old. 35% of the sample were 35-54 years old. Approximately, 10% of individuals were between the ages of 55 and 64. 3% of the sample were above the age of 65. About 43% of the sample reported having a high school diploma or equivalency certificate, including special education certificate of completion, at the time of application. The majority of the sample (81%) had significant disabilities and about 48% had mental impairments.

Table 2: Descriptive Statistics for Micro-Level Variables

Variable	Mean/ Frequency	SD	Min	Max
Dependent Variable				
Employment Rate	.3282	.07895	.16	.51
Independent Variables				
Gender (Female)	43.2%		0	1
Age at Application (years)	35.27	15.605	13	99
Race/Ethnicity				
Caucasian	60.5%			
African American	19.8%			
Asian	.4%			
Hispanic	17.7%			
Other	1.7%			
Level of Education				
No High School	26.8%			
High School Diploma	43.4%			
Some College or Associate's Degree	20.5%			
Bachelor's or Advanced Degree	9%			
Disability Type				
Sensory/Communicative	25.3%			
Physical Impairment	26.3%			
Mental Impairment	48.4%			
Significance of Disability				
Significant Disability	81.4%			
No Significant Disability	18.6%			

Macro-Level Variables

The macro-level descriptive statistics were also explored prior to completion of the analyses. Table 3 presents the means, standard deviations, and minimum and maximum values for the state-level variables. Labor force, poverty, and unemployment rate are presented as percentages of the total population. As shown in the table, about 73% of the total population was contributing to the labor force. Additionally, about 16% of the population was living at or below the poverty line. The mean unemployment rate for all 50 states plus the District of Columbia and Puerto Rico was about 8%. The mean average annual income was about \$71,265. Further, about 63% of state federal VR agencies were operating under OOS status.

Table 3: Descriptive Statistics for Macro-Level Variables (N=52)

Variable	Mean	SD	Minimum	Maximum
Labor Force	73.20	4.01	54.7	81.1
Poverty	16.41	4.76	8.7	45.4
Unemployment Rate	8.46	1.97	2.6	18.1
SSDI	1,194,656.8	911,391.8	48,822.0	3,319,186.0
Mean Annual Income	71,264.93	12,392.31	30,247	102,882
OOS	.6340	.4817	0	1

State Groups

As described in Chapter 3, states were placed in categories depending on the state's overall employment outcome rate. Table 4 shows that the mean employment rate was 32.82%, and rates ranged from 16% to 51%. Figure 3 shows the distribution of the employment rates among the different states. The employment outcome rates for the high performing group ranged from 41.92% to 50.69%, for the medium performing group ranged from 24.91% to 39.96%, and

for the low performing group ranged from 15.69% to 24.10%. Table 4 shows the states that were included in each group and each state's employment outcome rate.

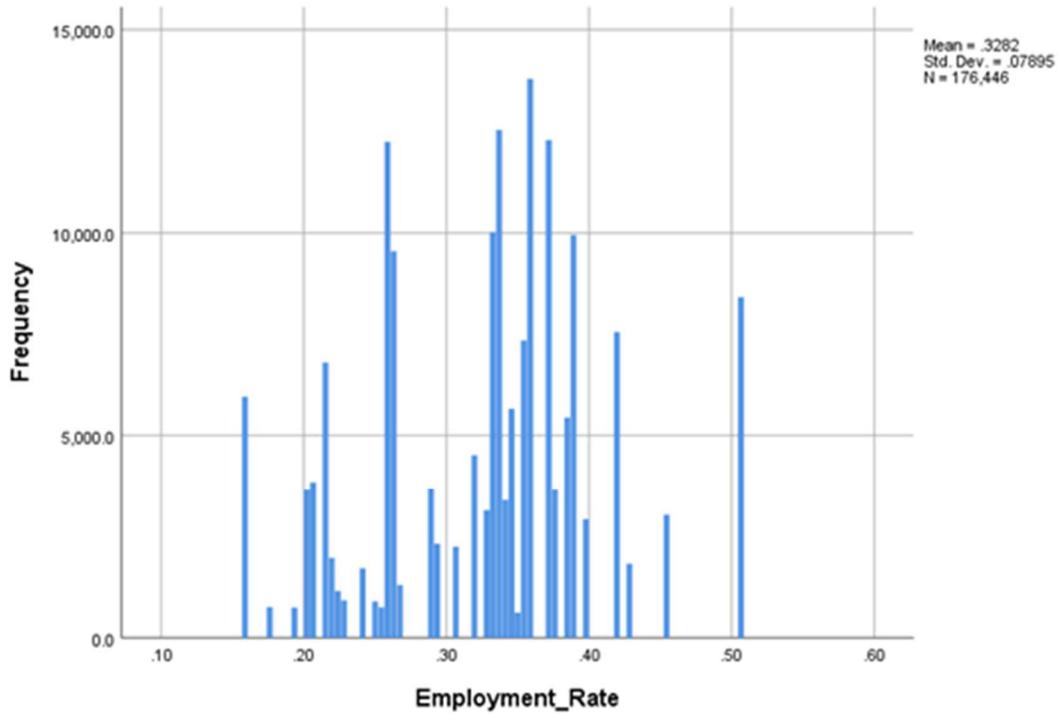


Figure 3: Distribution of the employment outcome rates among the different states

Table 4: State Groups and Employment Outcome Rates

Performance Group	State	Employment Outcome Rate (%)
Low	LA	15.688
Low	OH	15.728
Low	HI	17.637
Low	ND	17.795
Low	NM	19.610
Low	GA	20.368
Low	WI	20.566

Table 3- Continued

Low	FL	21.617
Low	TN	22.018
Low	AZ	22.602
Low	ME	22.640
Low	KS	24.090
Medium	MT	24.910
Medium	NV	25.253
Medium	CA	25.845
Medium	NC	26.156
Medium	WA	26.422
Medium	RI	26.752
Medium	WY	26.929
Medium	KY	29.030
Medium	OR	29.529
Medium	OK	30.523
Medium	MO	31.835
Medium	VA	32.914
Medium	IN	33.125
Medium	CT	33.193
Medium	NJ	33.460
Medium	IA	33.803
Medium	UT	33.816
Medium	MI	33.866
Medium	MD	34.285
Medium	SD	34.290
Medium	MN	34.553
Medium	NE	34.624
Medium	DE	34.704

Table 3- Continued

Medium	DC	35.028
Medium	IL	35.320
Medium	ID	35.445
Medium	NY	35.835
Medium	NH	36.020
Medium	AK	36.031
Medium	TX	37.120
Medium	MA	37.455
Medium	SC	38.409
Medium	PA	38.702
Medium	AR	39.964
High	AL	41.920
High	CO	41.970
High	VT	42.918
High	PR	45.490
High	MS	50.447
High	WV	50.688

Bivariate Analysis

Prior to exploring multi-level relationships between the independent and dependent variables, a number of bivariate analyses were conducted to explore any differences between the state performance groups. Table 5 shows the number of cases, means, standard deviations, and minimum and maximum employment outcome rates for each group.

As shown in Table 6, the correlations show that gender was the variable that was least associated with employment rate while significant disability had the highest relation to

employment rate. Age and gender were positively associated with employment rate. Individuals who had a high school education resulted in a positive relationship with the employment rate. While, those that had only some college, post-secondary training or an associate’s degree indicated a negative correlation. Further, there was a positive correlation between the employment rate and individuals who were Caucasian or Hispanic. A negative relationship was found between the employment rate and individuals who were African American, Asian, or reported multiple races. Further of the disability types, mental impairments resulted in a negative relationship with the employment rate. Additionally, those with a significant disability, also had a negative correlation with the employment rate.

Table 5: Means, SDs, and Range of Employment Outcome Rates for State Performance Groups

Group	N	Mean	SD	Min	Max
Low Performing States	27,409	.2012	.02583	.16	.24
Medium Performing States	127,953	.3341	.04326	.25	.40
High Performing States	20,744	.4602	.03906	.42	.51

Table 6: Bivariate Correlations

Variable	Correlation Coefficient
Age	.051
Gender	.009
Race& Ethnicity: White	.013
Race & Ethnicity: African American	-.012
Race & Ethnicity: Asian	-.037
Race & Ethnicity: Hispanic	.026
Race & Ethnicity: Mixed	-.038
Level of Education: No High School	-.027
Level of Education: High School	.017
Level of Education: Post-Secondary/AA degree	-.002
Level of Education: College Degree or Higher	.015
Disability Type: Sensory/Communicative	.090
Disability Type: Physical	.040
Disability Type: Mental	-.104
Disability Significance	-.128

A one-way analysis of variance was conducted to evaluate the relationship between the state performance groups and the employment outcome rates. The independent variable, state groups, included the three levels of performance based on the average employment outcome rate: low, medium, and high. The dependent variable was the employment rate. The ANOVA was significant, $F(2, 176,443) = 246428.753, p < .000$. The strength of the relationship between the state groups and the employment outcome rates as assessed by R^2 was strong, which indicates 73.6% of the variance in employment outcome rate was accounted for by the state performance groups.

Multivariate Analysis

Multiple Regression of all State Performance Groups

Micro-Level. To explore the relationship between personal characteristics and employment outcome rates, a multiple regression was used. Since many of the personal characteristic variables were coded categorically, a general linear model was used to run the multiple regressions. The results of this analysis are shown in Table 7 and address Research Questions 1 and 2.

All personal characteristics were entered into the model. Overall, the model was found to be significant, $F(12, 176,092) = 433.45, p = .0001$. Gender and age were found to be insignificant whereas the remaining personal characteristics of race and ethnicity, disability type, disability significance, and level of education were significant predictors of employment rate. Overall, 2.87% of the variance of employment rate could be accounted for by the linear combination of race and ethnicity, disability type, disability significance, and level of education. As shown in Table 7, individuals who identified as Asian had a negative beta estimate.

Table 7: Results of General Linear Model for Variables Predicting Employment Rate

Variable	β	SE	<i>t</i>
Intercept*	.301	.001	226.22
Age	-.000004	.000014	-0.27
Gender (Female)	.0002	.0004	.54
Race & Ethnicity: Caucasian***	.0174	.0012	18.14
Race & Ethnicity: African American***	.0163	.0012	13.24
Race & Ethnicity: Asian***	-.0085	.0020	-4.17
Race & Ethnicity: Hispanic***	.0234	.0013	18.14
Race & Ethnicity: Other	0.000	.	.
Disability Type: Sensory/Communicative***	.0188	.0005	33.39
Disability Type: Physical Impairments***	.0120	.0005	22.31
Disability Type: Mental Impairments	0.000	.	.
Significant Disability***	.0353	.0007	47.87
Education: No High School Degree**	.001	.0006	1.89
Education: High School Degree***	.004	.0005	8.55
Education: Post-Secondary/AA	0.000	.	.
Education: College Degree or Higher*	.0018	.0007	2.46

***p=<.0001, **p=.01, *p=.05

A general linear model was conducted for each state performance group to explore the relationships between personal characteristics and employment rates of each specific performance group. The results of all the general linear models are shown in Tables 8 - 10.

For the low performing states, personal characteristics were found to be significant in predicting the employment rate, $F(12, 27,407) = 60.97, p < .0001$. The sample multiple correlation coefficient was .026, indicating that about 2.6% of the variance of employment rate in the sample could be accounted for by the linear combination of personal characteristics. All personal characteristics were found to be significant. There were inconsistencies regarding the directionality of the relationship between race and employment rate. Among the low performing states, African Americans, Asians, and Caucasians all had a negative association with the employment rate. However, there was a positive association with employment rate among those who identified as Hispanic, indicating that those who identified as Hispanic tended to have higher employment rates. Furthermore, having a college degree or higher was not significant in predicting employment rate.

Table 8: Results of General Linear Model for Low Performing States

Variable	β	SE	<i>t</i>
Intercept***	.2008	.001	199.55
Age***	.00007	.000012	6.13
Gender (Female)***	.0002	.0003	4.87
Race & Ethnicity: Caucasian***	-.0044	.0009	-5.02
Race & Ethnicity: African American***	-.0080	.0009	-8.90
Race & Ethnicity: Asian***	-.0085	.0016	-5.19
Race & Ethnicity: Hispanic***	.0053	.0010	5.31
Race & Ethnicity: Other	0.000	.	.
Disability Type: Sensory/Communicative***	-.0027	.0005	-5.63
Disability Type: Physical Impairments**	.0009	.0003	2.33
Disability Type: Mental Impairments	0.000	.	.
Significant Disability***	.0098	.0008	11.19
Education: No High School Degree***	.0030	.0005	6.53
Education: High School Degree*	.0008	.0004	2.00
Education: Post-Secondary/AA	0.000	.	.
Education: College Degree or Higher	.0004	.0006	.55

***p<.0001, **p<.01, *p<.05

For states grouped in the medium performing group, five of the six personal characteristics were found to be significant in predicting employment rates, $F(12, 127,952) = 187.29, p < .0001$. Within this model, approximately, 1.7% of the variance of the employment rate in the sample could be accounted for by the linear combination of personal characteristics.

The personal characteristics that were found to be significant included gender, race and ethnicity, disability type, disability significance, and level of education. Table 9 presents the results of the general linear model in more detail. Within the medium performing states, the role of significant disability seemed to be more reserved than in the previous findings. Those with more significant disability had lower employment rates. Furthermore, identification as Hispanic was not a significant predictor of employment rate; however, this association was negative, meaning that a higher presence of individuals who identified as Hispanic resulted in lower rates of employment.

Table 9: Results of General Linear Model for Medium Performing States

Variable	β	SE	<i>t</i>
Intercept***	.3207	.0009	371.93
Age*	-.00001	.000009	-1.38
Gender (Female)	.0005	.0002	2.09
Race & Ethnicity: Caucasian***	.0012	.0008	15.11
Race & Ethnicity: African American***	.0124	.0008	15.48
Race & Ethnicity: Asian***	-.0085	.0013	-6.67
Race & Ethnicity: Hispanic	-.0057	.0008	-0.68
Race & Ethnicity: Other	0.000	.	.
Disability Type: Sensory/Communicative***	.0080	.0004	21.69
Disability Type: Physical Impairments***	.0062	.0003	19.12
Disability Type: Mental Impairments	0.000	.	.
Significant Disability***	-.0035	.0005	-6.78
Education: No High School Degree***	.0020	.0004	5.45

Table 9- Continued

Education: High School Degree***	.0015	.0003	4.77
Education: Post-Secondary/AA	0.000	.	.
Education: College Degree or Higher*	.0011	.0005	2.30

***p<.0001, **p<.01, *p<.05

The high performing group included four personal characteristics that were significant in predicting employment outcome rate, $F(12, 20,731) = 286.30, p < .0001$. Approximately 14.2% of the variance in employment rates could be accounted for by the linear combination of personal characteristics. The personal characteristics that were found to be significant in predicting employment rate were age, race and ethnicity, disability type, and level of education. As seen within the other general linear models, race and ethnicity were variable. Caucasian and African American were not significant predictors of employment rate; however, Asian and Hispanic were significant but had negative associations with employment outcome rate. Furthermore, level of education presented an interesting finding that having more advanced degrees was associated with lower employment rates.

Table 10: Results of General Linear Model for High Performing States

Variable	β	SE	<i>t</i>
Intercept***	.4408	.0022	203.42
Age***	.0002	.00002	9.73
Gender (Female)	-.0006	.0005	-1.19
Race & Ethnicity: Caucasian	.0014	.0020	0.72
Race & Ethnicity: African American	.0002	.0020	0.12
Race & Ethnicity: Asian**	-.0123	.0046	-2.67
Race & Ethnicity: Hispanic**	-.0057	.0020	-2.78
Race & Ethnicity: Other	0.000	.	.
Disability Type: Sensory/Communicative***	.0233	.0008	30.65
Disability Type: Physical Impairments***	.0253	.0007	38.07
Disability Type: Mental Impairments	0.000	.	.
Significant Disability	-.00002	.0007	-0.03
Education: No High School Degree	-.0006	.0008	-0.71
Education: High School Degree**	.0020	.0007	2.87
Education: Post-Secondary/AA	0.000	.	.
Education: College Degree or Higher**	-.0025	.0010	-2.48

***p<.0001, **p<.01, *p<.05

Macro-Level. To further explore the relationships between employment rate and state- and agency-level characteristics, multiple regression analyses were completed. This analysis did not take into account the various state performance groups. Stepwise entry was used with the state-level characteristics.

As shown in Table 11, state-level characteristics were found to be significant in predicting employment rate, $F(4, 176,441) = 10837.26, p < .000$. The multiple correlation coefficient was .444, indicating that approximately 19.7% of the variation in employment rate could be accounted for by the linear combination of state-level characteristics. The only state-level variable that was not significant was unemployment rate.

Table 11: Results of Multiple Regression for State-Level Characteristics

Variable	Beta	β	SE B	<i>t</i>
OOS*	-.047	-.288	.000	-130.420
SSDI*	-2.64E-8	-.305	.000	-121.874
Poverty*	.004	.267	.000	81.184
Mean Income*	1.17E-6	.183	.000	52.896

* $p < .000$

Individual multiple regressions were conducted for each state performance group to explore how the state-level characteristics may have influenced the employment rate for each of these performance categories. These analyses provide further information for answering Research Questions 1 and 2. The results of each regression for each performance group are displayed in Tables 12-14.

For the low performing group, the state-level characteristics that were found to be significant in predicting employment outcome rate included poverty, unemployment rate, SSDI beneficiary, and mean income, $F(4, 27,467) = 1299.989, p < .000$. The multiple correlation coefficient was .399 and $R^2 = .159$. This indicates that about 16% of the variation in the employment rate could be accounted for by the linear combination of state-level characteristics. The only variable that was not included in this model was the OOS status of an agency.

For the medium performing states, five of the six state-level variables were significant in predicting employment outcome rate, $F(5, 128,176) = 3643.835, p < .000$. The variables were

unemployment rate, status of OOS, poverty, mean income, and SSDI. The multiple correlation coefficient was .353, indicating that approximately 12.4% of the variation in employment rate among medium performing states could be accounted for by the combination of state-level characteristics.

Similar to the low and medium performing state groups, the state-level variables were significant in predicting employment rate, $F(4, 20,787) = 10048.791$, $p < .000$, for the high performing group. The multiple correlation coefficient was .812 and $R^2 = .659$, meaning that approximately 65.9% of the variation in employment rate of high performing states could be accounted for by the linear combination of SSDI, mean income, unemployment rate, and OOS status. Interestingly, OOS status was positively associated with employment outcome rate, indicating that as OOS status increased, so did employment rate.

Table 12: Results of Multiple Regression for State-Level Characteristics for Low Performing States

Variable	Beta	β	SE B	<i>t</i>
Poverty*	-.009	-.802	.000	-64.582
Unemployment Rate*	.013	.810	.000	58.605
SSDI*	-7.68E-9	-.255	.000	-28.106
Mean Income*	-8.77E-7	-.107	.000	-15.537

* $p < .000$

Table 13: Results of Multiple Regression for State-Level Characteristics for Medium Performing States

Variable	Beta	β	SE B	<i>t</i>
Unemployment Rate*	-.005	-.179	.000	-52.005
OOS*	-.018	-.204	.000	-69.804
Poverty*	-.004	-.227	.000	-41.618
Mean Income*	-5.6E-7	-.144	.000	-29.314
SSDI*	-1.14E-9	.025	.000	6.233

* $p < .000$

Table 14: Results of Multiple Regression for State-Level Characteristics for High Performing States

Variable	Beta	β	SE B	<i>t</i>
SSDI*	-2.90E-9	-.012	.000	-1.715
Mean Income*	-6.01E-6	-.215	.000	-128.007
Unemployment Rate*	-.018	-.165	.000	-100.478
OOS*	.036	.459	.000	73.247

* $p < .000$

Hierarchical Generalized Linear Model

The Unconditional Model. As a preliminary step, the unconditional model was used to gauge the magnitude of variation in the employment outcome rates across the three performance groups. The unconditional model is represented by the following equation:

$$\eta = \beta_{0j} + e_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

There were no predictors included in this model. The unconditional model, also called the intercept only model, provided important information. The results of the unconditional model were used to calculate the intra-class correlation (ICC). The ICC was computed as $\tau_{00} / (\tau_{00} + \sigma^2)$. In this equation, τ_{00} represents the level-2 variance and σ^2 is the level-1 variance. In this case, the variance of the state-level variables (τ_{00}) equaled .0157, and the variance of the personal characteristic variables equaled .0016. Therefore, the ICC was $.0157 / (.0157 + .0016) = .9075$. This indicates that approximately 91% of the variance in employment rate was accounted for by personal-level characteristics, suggesting that 9% of the variability in employment rate was accounted for by state-level variables. Another important piece of information provided in the unconditional model was the significance in differences of employment rates between groups. As shown previously in the results of the ANOVA, significant differences were present between

state performance groups based on employment outcome rates, which warranted further investigation of the group effects. These are shown in Table 15.

Table 15: Results of Unconditional Model

Fixed Effects	Coefficient	St. Error	P-Value
Intercept (γ_{00})*	.3318	.0724	.0444

Random Effects	Coefficient	Variance
Intercept (u_{0j})*	.01572	.01475
Residual (e_{ij})	.00164	5.533E-6

* $p < .05$

Random Intercept Model. The random intercept model indicated the relationship between personal characteristics (micro-level predictors) and employment outcome rates. This model did not take into account how the micro-level predictor variables varied across the macro-level predictor variables. The equation that was tested for this model with age as an example is shown below:

$$\eta_{ij} = \beta_{0j} + \beta_{1j}Age_{ij} + e_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

Table 16 presents the results of the random intercept model with each of the six personal characteristic variables. As shown in the table, all six micro-level variables were statistically significant in predicting employment rate. Age, gender, and significant disability were all positively related to employment rate whereas race, disability type, and level of education were negatively associated with employment rate. Interestingly, the results of the random intercept

model did not mimic the results of the overall multiple regression. In the multiple regression, only significant disability, level of education, and disability type were found to be significant predictors. Further, the relationship between significant disability and employment rate was negative, unlike in the random intercept model.

Table 16: Results of Random Intercept Micro-Level Variables

Fixed Effects	Coefficient	St Error	p-value
Intercept (γ_{00})*	.3445	.07208	.0411
Age (γ_{10})*	.00006	7.304E-6	<.0001
Gender (γ_{20})*	.00070	.00020	.0004
Race (γ_{30})*	-.0027	.000089	<.0001
Disability Type (γ_{40})*	-.00432	.000141	<.0001
Level of Education (γ_{50})*	-.0074	.000116	<.0001
Significant Disability (γ_{60})*	.00083	.000386	.03
Random Effects	Coefficient	Variance	
Intercept (u_{0j})	.01559	.01457	
Residual (e_{ij})	.00162	5.46E-6	

Random Coefficient Model. The following model was similar to the random intercept model in that it provided the fixed results for the personal characteristic variables; however, it examined whether the micro-level slopes varied over states. The random coefficient model examined whether both the micro-level intercepts and slopes varied randomly among states, but no attempt was made to predict this variation. The random coefficient model is depicted below in an equation with age as an example.

$$\eta_{ij} = \beta_{0j} + \beta_{1j}Age_{ij} + e_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

The random coefficient model resulted in differences between the coefficients of the random intercept model. Many of the differences among coefficients seem to be small however the directionality of disability significance changed between models, going from a positive relationship in the random intercept model to negative in the random coefficient model. The results are presented in Table 17. In this model, the only personal characteristics that were found to be significant were gender, disability type, level of education, and significant disability. Of these variables, only gender was positively associated with employment rate, indicating that female gender was associated with higher employment rates. Similar to the random intercept model, disability type, level of education, and significant disability were negatively associated with employment rate. What may be most interesting in the random coefficient model was the insignificant results of the random effects. Surprisingly, none of the personal characteristics were significant. This indicates that neither the intercepts nor the slopes varied significantly across states.

Table 17: Results of Random Coefficient Model with Micro-Level Variables

Fixed Effects	Coefficient	St Error	p-value
Intercept (γ_{00})*	.3449	.0789	.0485
Age (γ_{10})	.000095	.000061	.1153
Gender (γ_{20})*	.000823	.000292	.0049
Race (γ_{30})	-.00116	.001572	.4603
Disability Type (γ_{40})*	-.00525	.003951	.1835
Level of Education (γ_{50})*	-.00064	.000203	.0017
Significant Disability (γ_{60})*	-.00252	.003681	.4937
Random Effects	Coefficients	Variance	
Intercept (u_{0j})	.01867	.01750	
Residual (e_{ij})*	.0016	5.40E-6	
Age (u_{1j})	1.07E-8	0	
Gender (u_{2j})	1.033E-7	0	
Race (u_{3j})	7.372E-6	7.406E-6	
Disability Type (u_{4j})	.000047	.000047	
Level of Education (u_{5j})	6.47E-6	0	
Significant Disability (u_{6j})	.00004	.000041	

Full Random Coefficient Model. The final model conducted explored how the state-agency characteristics interacted with the relationship between the macro-level variables and the employment rate. Importantly, this model included the state-agency characteristics as fixed effects while building on the previous model. An example equation, using age and OOS status as example variables, is shown below:

$$\eta_{ij} = \beta_{0j} + \beta_{1j}Age_{ij} + e_{ij}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}OOS_{ij} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

As shown in Table 18, when state-agency characteristics were added as fixed effects to the full model, all of the personal characteristics variables showed insignificant results. Further, all state-agency level predictors were significant in this model except poverty. OOS status,

amount of SSDI expenditure in a state, percentage of the state engaged in the labor force, unemployment rate, and mean annual income were negatively associated with employment rate. The results of the full random coefficient model suggested that state and agency variables moderated the relationships between personal characteristics and employment rates in a negative way. This suggested that the resources of the states played an important role, potentially even more of a role in further understanding the employment outcomes of individuals who utilized VR services. As in the random coefficient model, none of the personal characteristics variables were significant when exploring the random effects.

Table 18: Results of Full Random Coefficient Model with Micro- and Macro-Level Variables

Fixed Effects	Coefficients	St Error	p-value
Intercept (β_{00})*	.4839	.07536	.0234
Age (γ_{10})	.0001	.000063	.1123
Gender (γ_{20})	.00074	.000428	.0824
Race (γ_{30})	.000557	.000557	.7396
Disability Type (γ_{40})	-.00493	-.00493	.1918
Level of Education (γ_{50})	-.00060	.000627	.3399
Significant Disability (γ_{60})	-.00086	.004618	.8530
OOS Status (γ_{01})*	-.01029	.000226	<.0001
SSDI (γ_{02})*	-3.87E-9	0	<.0001
Labor Force (γ_{03})*	-.00124	.000064	<.0001
Unemployment Rate (γ_{04})*	-.00449	.000093	<.0001
Poverty (γ_{05})	.000086	.000064	.1803
Mean Income (γ_{06})*	-9.76E-8	0	<.0001
Random Effects	Coefficients	Variance	
Intercept (u_0)	.4839	.07536	
Residual*	.001513	5.1E-6	
Age (u_{1j})	1.59E-8	0	
Gender (u_{2j})	.000043	0	
Race (u_{3j})	8.38E-6	8.41E-6	
Disability Type (u_{4j})	.000043	.000042	
Level of Education (u_{5j})	1.13E-6	1.207E-6	
Significant Disability (u_{6j})	.000063	.000064	

Summary

The results of the present analyses provided data about the relationships between personal characteristics, environmental factors, and employment outcome rates of VR agencies. Initial findings of the general linear model investigating personal characteristics and employment rates regardless of state performance group found that race and ethnicity, disability type, disability significance, and level of education were significant predictors. However, other multiple regressions conducted on specific state performance groups found other personal characteristics to be predictive of employment rate. Furthermore, the directionality of the relationship with specific personal characteristics differed across the state performance groups. Environmental characteristics were also investigated to help identify contributing factors that impacted performance differences among the states. Without investigating specific state performances, OOS status, SSDI beneficiary expenditures, the poverty rating, and the mean annual income were found to be significant predictors of employment. Once again, these variables varied across state performance groups. The HLM further investigated the relationships among personal characteristics and state and agency factors. Overall, the findings of these analyses suggest that state-level factors moderated the relationship between personal-level characteristics and employment outcome rates.

CHAPTER FIVE

SUMMARY AND DISCUSSION

The main goal of this study was to explore the relationships of both personal characteristics and state-level factors across state-federal VR agencies based upon their overall employment outcome performance, extending previous VR outcome studies that primarily focused on personal characteristics. Based on the results presented in Chapter 4, this chapter will further discuss how the findings can be applied to practice and policy and inform future research. A summary of the findings is first presented.

Summary of the Results

The sampling frame of this study consisted of 176,466 clients who had exited VR with a successful employment outcome after receiving services and having a signed IPE. The clients had received VR services in the United States, District of Columbia, or Puerto Rico during the fiscal year 2013. Below are summaries of the findings that reveal the impact of personal characteristics on employment outcome rates across the different state groups and identify which state-level factors were associated with employment outcome rates across the different state performance groups. The findings further summarize the relationships between micro-level characteristics and macro-level factors and their impact on employment outcome rates.

Research Question 1: How do personal characteristics, VR agency-level factors, and state economic variables predict the employment outcome rates of VR agencies?

Age, gender, race and ethnicity, level of education, type of disability, and disability significance were the personal-level characteristics entered into both the general linear model and the HLM. The outcome of these analyses revealed inconsistent results. The general linear model did not control for personal characteristics and was used only to explore the relationships

between personal characteristics and employment outcome rates among the performance groups. The results of the general linear model, which included all performance groups, found that all races and ethnicities except “other,” all disability types except mental impairments, disability significance, and the level of education except some post-secondary degrees were significant predictors of employment outcome rate. The only negative associations found within this analysis were for age and Asian race/ethnicity. Interestingly, the findings of the HLM seemed to contradict these initial findings. This analysis showed that when not controlling for any other effects, all of the personal characteristics were found to be significant including which contradicts previous research (Capella, 2002; Danek & Lawrence, 1985).

OOS status was the only agency-level factor included in this study. The average state-level SSDI benefits paid, poverty rate, annual mean income, unemployment rate, and percentage of individuals participating in the labor force were used as state-economic factors that contributed to the macro-level variables. When investigating how these factors predicted VR employment outcome rates regardless of state performance group, OOS status, average state-level SSDI benefits paid, poverty rate, and annual mean income were found to be significant predictors. Of these variables, the amount of SSDI benefits paid had a strong relationship with employment rate ($\beta = -.305$); however, OOS status was found to be the highest predictor. With a one unit increase in OOS status, the employment rate decreased by .047. Another interesting relationship was between the average state-level poverty rate and the employment rate. These two factors were positively associated, indicating that a higher poverty rate resulted in a higher employment outcome rate. Unlike the macro-level multiple regression, the HLM analysis revealed that when state- and agency-level variables were added to the equation, all variables were found to be significant except poverty rate. Even though race/ethnicity did not reveal a

significant relationship with employment rate when the state economic factors were added to the final model, the directionality did change from negative to positive. This finding suggests that when investigating VR employment rates, state economic factors interact with personal characteristics. In the current study, the state economic factors diminished the effect of the personal characteristics on employment rates. A possible reason for this finding could be due to the way in which VR agencies and policies are designed. These findings may suggest that current VR agencies and policies are not designed to account for the differences that occur at both environmental and personal levels.

Research Question 2: How are personal characteristics, VR agency-level factors, and state economic variables different across states regarding the performance of VR agency?

The HLM results revealed that no personal characteristics variables were significantly associated with employment outcome rates in the final model, however all were significant when agency-level or state-economic variables were not included. However, the results of the HLM indicated that OOS status, an agency-level factor, and average state-level SSDI benefits paid, average percentage of the state population participating in the labor force, average state unemployment rate, and the state's annual mean income were all significantly associated with employment rates across the three levels of state performance. Furthermore, regardless of the state employment rate, the state economic and agency-level factors moderated the relationship of all personal characteristics with employment rates. These results highlight the importance of agency-level and state economic factors in the employment rate, suggesting that these may be more predictive than personal characteristics alone.

Research Question 3: What is the impact of the relationship among personal characteristics, VR agency-level factors, and state economic variables on the employment rates of VR agencies based on their performance group?

The results of the general linear models and the multiple regressions conducted on both micro-level and macro-level variables differed based on the state performance groups. However, conclusions about significant differences among these analyses cannot be drawn. For example, different personal characteristics predicted employment rates among the state groups; however, conclusions cannot be made regarding the significance of these differences.

In low performing states, gender, age, race and ethnicity, disability type, significant disability, and level of education were the personal characteristics predictive of employment rate. Race and ethnicity presented interesting findings for this group. In low performing states, identification as Caucasian, African American, and/or Asian was negatively associated with employment rate. However, identification as Hispanic had a positive relationship with employment rate. Sensory and communicative impairments were also negatively associated with employment rate whereas age, gender, significant disability, and level of education all showed a positive relationship with the employment rate of the low performing states. The positive association between disability significance and employment rate was surprising. This indicates that a higher presence of individuals with a significant disability resulted in a higher employment rate. However, a potential explanation for this finding could be that low performing states may have had a higher population of clients with more severe disabilities and that more agencies were under OOS status thus needing to provide services to the most significant disabilities first. This is overall explained by VR's focus on serving individuals with the most significant disabilities first, as mandated by the Rehabilitation Act.

Further, state economic variables were found to be significantly associated with the employment rate in low performing states. The average state-level poverty rate, the average state unemployment rate, the average state-level SSDI benefits paid, and the state annual mean income were predictive of employment rate. Of these variables, all were negatively associated with employment outcome except the unemployment rate, which had the strongest relationship with employment rate ($\beta = .810$). Additionally, all state economic variables resulted in stronger relationships with the employment rate than did the personal characteristics.

Medium performing states showed some similarities but also some differences in results for both personal characteristics and environmental factor variables. The personal characteristics that were predictive of employment outcome rate included age, race and ethnicity, disability type, disability significance, and level of education. Identification as Asian and/or Hispanic resulted in a negative association with employment rate. Disability significance also showed a negative association with employment rate. This finding could be due to the overall OOS status of agencies within medium performing states, in which individuals with the most severe disabilities were served first and required more time or services to find employment for these individuals. The average state-level unemployment rate, OOS status, average state-level poverty rate, average annual mean income of a state, and the average state-level SSDI benefits paid were significant agency-level and state economic predictors for the employment rate of medium performing states. All environmental factors were negatively associated with employment rate, indicating that a higher level of these variables resulted in a lower employment rate.

High performing states differed from both medium and low performing states in the personal characteristics and environmental factors that were predictive of employment rate. Age, race and ethnicity, disability type, and level of education were found to be significant in

predicting employment rate. Interestingly, identification as Caucasian or African American was not a significant predictor of employment rate; however, identification as Asian or Hispanic showed a significant negative relationship. Another surprising finding was the negative relationship between employment rate and post-secondary education, indicating that higher levels of education resulted in a lower employment rate. The state-level average SSDI benefits paid, the annual mean income of a state, the average state-level unemployment rate, and OOS status were significant state-agency and state economic predictors of employment rate for high performing states. The only environmental factor that was positively associated with employment rate was OOS status. This is an interesting finding, indicating that a unit increase in OOS resulted in a unit increase in employment rate. This finding could potentially be explained by the overall number of agencies implementing OOS status in the high performing states. Since, there are fewer agencies grouped in the high performing category, this may inflate the significance. All other state economic variables were negatively associated with employment rate.

Overall, the summary of these results shows support for the ICF model. The ICF model suggests that body functions and structure, activities, participation, the severity of the disability, and contextual factors such as personal characteristics and environmental factors are key components in understanding and conceptualizing disabilities (Chan, Gelman, et al., 2009). The ICF model integrates all key concepts of the medical, functional, and social models of disability while also integrating a conceptual framework (Chan, Gelman, et al., 2009). Consistent with the ICF model, this study investigated the influence of disability, severity of disability, other personal characteristics, and environmental factors on individuals' participation and employment

outcomes within the state-federal VR system. This study revealed the overall impact of environmental factors on individuals' participation and employment outcomes in the VR system.

Discussion

Compared with previous studies (Chan, Wang, Fitzgerald, Muller, Ditchman, & Menz, 2016), this study confirmed the claim that the determinants of persistent underemployment and unemployment among individuals with disabilities cannot be reduced to a single factor and that these outcomes are the result of a set of adverse personal and environmental factors that interact in a complex manner. The results of this study support the tenants of the ICF.

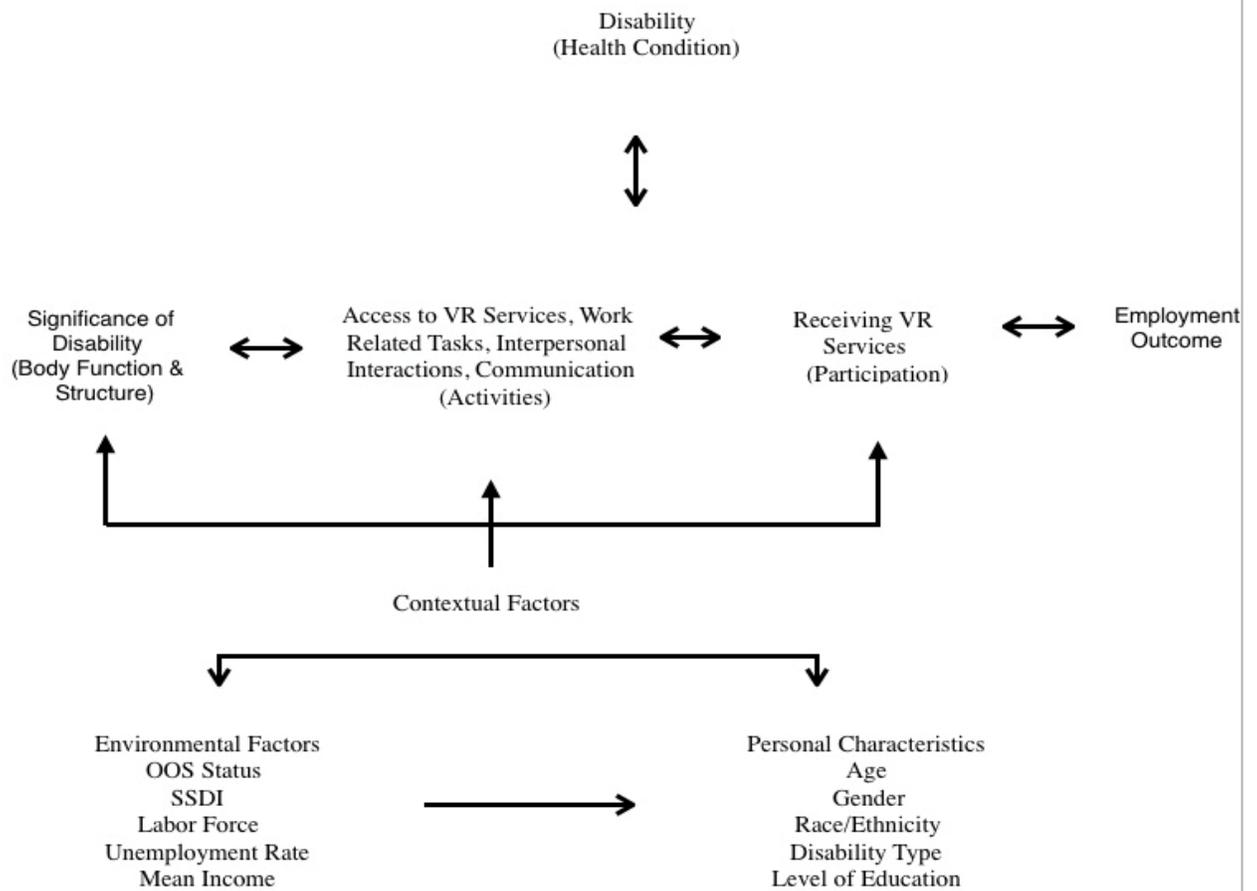


Figure 4: Results depicted with ICF Model

As shown in Figure 4, the role of contextual factors is important when investigating employment outcomes. In this figure, the arrow from environmental factors to personal characteristics represents the moderating relationship between the two. This finding has also been supported in previous research in which Chan and others (2016) found that other state economic factors, such as per capita income and state social security beneficiary rate, moderated the relationship between personal and VR service-related factors and employment quality. The findings of this research indicates that the economic factors of state play an important role in

predicting employment, so much so that the magnitude of personal characteristics are not significant. When a state is has a healthy and strong economic climate, the personal characteristics are not as important in predicting the employment outcome of individuals with disabilities. As suggested by the ICF, the results of this study indicate the importance and complexity of studying the outcomes of individuals with disabilities. Multidimensional measurements of employment outcomes and a further focus on research that refines the relationship between personal and environmental factors and employment outcomes for individuals with disabilities are also supported (Bond et al., 2012; Chan et al., 2016).

The ICF clearly identifies that personal characteristics are an important factor in the activities and participation within a community and society for individuals with disabilities. This study, further suggests that personal characteristics are important when not including other environmental factors in predicting the employment outcome of individuals with disabilities. Similar to previous research, personal characteristics such as type of disability, disability significance, race and ethnicity, and educational attainment are strong predictors of employment outcomes (Dutta et al., 2008; Wilson, 2000). This study found that regardless of a state's performance, disability significance, disability type, and level of education were strong predictors of employment rate. Consistent with previous literature (Dutta et al., 2008), higher rates of employment were associated with sensory or communicative impairments versus physical or mental impairments; however, in the current study, this finding was only supported among medium and high performing states. This relationship was reversed in low performing states. An interesting finding in the current study that was inconsistent across previous research was the relationship between educational attainment and employment rate. Across performance groups, educational attainment had a positive relationship with employment rate except in high

performing states where the directionality of the relationship was reversed for those who obtained a college degree or higher. This negative relationship indicated that higher levels of education were associated with lower employment rates. Previous research suggested that the more education an individual receives, the more likely he or she is to obtain competitive employment (O'Neill et al., 2017). It is unknown what contributed to the current relationship between high performing states and post-secondary educational attainment.

Depending on the state's performance group, significance of disability was either positively or negatively associated with employment rate. Medium performing states and high performing states showed a negative association with employment rate, meaning that a higher number of individuals with significant disabilities resulted in lower employment rates. This suggests that individuals with more complex and severe disabilities may require more VR services and have more difficulty obtaining competitive employment (Chan et al., 2016). However, in low performing states, disability significance was positively associated with the employment rate. This could potentially be due to the OOS status of agencies within low performing states. If more states in the low performing group were operating in OOS status, they were possibly serving more individuals with more severe disabilities.

Race and ethnicity have long been studied in relation to state-federal VR outcomes, with mixed conclusions regarding the relationship between race and employment outcome (Atkins & Wright, 1980; Bolton & Cooper, 1980; Dutta et al., 2008; Mwachofi et al., 2009). The results of this study are consistent with the findings of previous research. In all state groups, race/ethnicity was a significant predictor of employment rate; however, it was not significant in the fixed effects of the HLM. When controlling for state performance groups, race/ethnicity was not a significant predictor of employment rate. Many previous studies suggest that individuals who

report a minority status tend to have lower employment rates and are underserved in VR agencies (Dutta et al., 2008; Mwachofi et al., 2009). Overall, this assumption was supported in the current study and within the ICF. Across all performance groups, a negative relationship existed between employment rate and minority group status; however, there were differences in the relationship between specific races/ethnicities across the state performance groups. For example, in the high performing state group, identification as Asian and Hispanic was a significant predictor of employment rate. Further, this relationship was negative, whereas identification as Caucasian or African American resulted in a positive relationship. Another interesting finding that is incongruent with previous literature is the relationship between low performing states and identification as Hispanic race/ethnicity. In the current study, a positive relationship was found between Hispanic race/ethnicity and employment rate whereas all other races and ethnicities resulted in a negative relationship. Further, across all state performance groups, there was a negative relationship between identification as Asian and employment rate. These findings indicate that further research needs to be conducted to better understand how VR counselors address working with individuals who are minorities and how their needs may differ within the VR system.

At the macro-level, this study found much variation among environmental variables across states depending on the performance group. Further, it seems that the macro-level variables were influential factors when looking at state-federal VR outcomes based on the findings of the HLM. This study found that all environmental factors except poverty rate were significantly associated with employment rate. Furthermore, these variables moderated the relationship between personal characteristics and employment rate.

OOS status, average SSDI benefits paid, poverty rate, and annual mean income were significant predictors of employment rate, regardless of the state's performance group. The amount of SSDI benefits paid by states as a significant predictor was consistent with previous literature (Chan et al., 2016). Further, this particular variable was of great interest since it is one of the only variables that can be considered to be both an environmental factor and an individual variable. When researched at both levels, it was found to significantly impact the ability of individuals with disability to obtain employment. At both the micro and macro levels, the amount awarded for SSDI had a negative impact on employment rate (Bond et al., 2013; Chan et al., 2016; Honeycutt & Stapleton, 2013).

The amount of SSDI paid to beneficiaries was the only variable that measures government assistance within this study. There are a variety of other programs funded by the federal, state, and local governments such as Supplemental Security Income (SSI), Temporary Assistance for Needy Families (TANF), and general assistance programs. The funding and amount awarded to individuals with disabilities may also contribute to the employment rate or measures of the amount of government assistance a state spends on individuals with disabilities and can impact how an individual with disabilities is likely to progress through the VR system. Further, the relationship between both the timing of receiving government benefits and when an individual receives VR services could be a moderating relationship to the employment rate, and influence how one may receive services in a VR agency, especially if that agency is in a status of OOS. This particular relationship was not investigated, but presents a unique opportunity to further investigate the role government assistance plays and status of OOS in the overall employment rate of a specific state and for an individual.

A surprising finding in the overall multiple regression was the non-significant finding regarding unemployment rate. This particular environmental factor has been studied extensively and has been found to be a significant predictor of employment outcomes in previous studies (Cook et al., 2006; Mirsa & Tseng, 1986). Even though this variable did not contribute significant findings, in the overall multiple regression, it did result in a significant association in the HLM. This suggests that when controlling for state performance, the unemployment rate is significant. Further, this claim is supported when investigating the average state unemployment rate across state performance groups. The average state unemployment rate was a significant predictor of unemployment across all three performance groups; however, in low performing states, the average state unemployment rate had a positive association. This means that states in the low performing group with higher average state unemployment rates may have been more likely to hire individuals with disabilities.

Another interesting result was the significant finding regarding the poverty rate in the multiple regressions. This particular finding was inconsistent with the results of the HLM. Further, there is little literature to further expand on how poverty may impact the employment rate; however, as shown in this study and previous studies (Chan et al., 2016; Cook et al., 2006; Nord et al., 2013), the stronger overall economics of a state, the higher rates of employment. The findings of the multiple regressions support the claims made in previous research. In both low and medium performing state groups, a negative association between poverty and employment rate was found.

There were some common trends among the various state performance groups when exploring the relationship between employment rates and agency-level factors and state economic variables. Overall, unemployment rate, average SSDI benefits paid, annual mean

income, and OOS status were significant predictors for employment rates across low, medium, and high performing states. Poverty was a significant predictor of employment rates only for the low and medium performing states. This could potentially mean that states that tend to struggle more with poverty may also have lower employment rates. This finding is consistent with the literature that demonstrates that the unemployment rate of a state negatively impacts the employment rate of individuals with disabilities and the overall employment outcomes of state-federal VR agencies (Chan et al., 2014; Nord et al., 2013).

The OOS status variable showed variation across the state performance groups both as a predictor of employment rate and in the overall impact on employment rate. Although OOS status was not a significant predictor of employment rate in low performing states, it was found to be a significant predictor in medium and high performing states. However, in medium performing states, OOS status had a negative impact on employment rate, and in high performing states, OOS status was positively associated with employment rate. There could be a few potential explanations for this finding. First, the medium performing states may be serving individuals with more severe disabilities and overall more functional limitations, thus making it more difficult to achieve successful VR outcomes for these individuals. In addition, there could be a higher percentage of individuals with severe disabilities who are also receiving Social Security benefits that create a disincentive to work in these particular states (Lustig et al., 2003; Chan et al, 2016). A positive relationship between the employment rate and OOS status may suggest that these agencies are able to provide the services and supports that individuals with more severe disabilities need to obtain employment. However, it is unclear how long any of the agencies had been in OOS status and if the agencies were accurately in OOS status. There are agencies that remain in OOS status even though the agency may have all the resources needed to

serve eligible applicants. It may be that the agencies in the high performing states were solely remaining in OOS status (Honeycutt & Stapleton, 2013).

Limitations

This section of the chapter discusses several limitations of the current study. One limitation that needs to be addressed is the overall nature of working with a large data set. In the FY 2013 RSA-911 dataset, there was a large number of missing data or incomplete cases. Over 399,000 cases had to be deleted due to missing information that was pertinent to this study. This potentially does not provide the most accurate representation of the population and the landscape of VR agencies. For example, due to the many missing cases, the average employment rate was about 33%, whereas typically most agencies have an employment rate of 60% (Fleming et al., 2012). Furthermore, the overall sample of this data was over 175,000 cases, which is still considered large. Having such a large sample posits the potential limitation of statistical significance versus clinical significance. It is important to carefully review the literature and the current findings to determine how relevant a statistically significant finding may be.

In regard to further limitations of the RSA-911 dataset and the ACS data is the problem of overall limited information. For example, this study conducted an HLM investigating the differences between personal and environmental factors across state-federal VR agency performance groups. Other potential factors could impact the results of this study. Specific environmental factors such as urban or rural type of population served was not available within the RSA-911. Many states have both metropolitan and rural areas; however, different agencies work with these populations, and this information was not provided in the FY 2013 RSA-911 dataset. Investigating cities or counties for macro-level data could provide more accurate and more detailed information about these environmental factors.

The final limitation that needs to be addressed are the assumptions of the statistical analyses that were conducted. Several statistical methods such as correlations and regressions assume homoscedasticity, meaning that the variances around the regression line are the same for all values of the independent variables. The environmental factor, average SSDI benefits paid, showed some heteroscedasticity. However, the extent of this research did not further explore this trend, the possible reasons, or the impact this may have had on the analyses.

Implication of Findings

Implications for Future Research

This study was designed to explore the personal and environmental factors across various performance levels of the United States, District of Columbia, and Puerto Rico in terms of state-federal VR employment rates. This study found that agency-level and state economic factors were more prominently related to successful VR employment outcomes than personal characteristics. Further, the environmental factors moderated the relationships across all personal characteristics and employment rates. Based on these findings, the present study can be improved by investigating differences that may be occurring at the county or city level. This can be further studied with an additional level (individuals nested by county/city nested by state).

In addition, this study did not include any service-related variables. It could be of interest to include these in a future study to further understand how agencies may differ not only in regard to employment rates but also in how they serve individuals with disabilities. By including these specific state agency factors and service-related variables, more information can be provided to further expand the perspectives on program evaluation of state-federal VR agencies and overall rehabilitation research.

The current study investigated only how the agency-level and state economic impacted the employment rates within a single fiscal year. Future research could investigate these same characteristics longitudinally. Given the changes that occurred to the Workforce Innovation and Opportunity Act (WIOA) of 2014 and its accompanying Amendments of the Rehabilitation Act of 1973, a longitudinal study comparing personal characteristics, service-related factors, and the state economic variables of state-federal VR agencies prior to the WIOA changes with current state federal VR agencies would provide much needed information in understanding how WIOA has impacted the various levels associated with VR.

Another potential area of research that ought to be investigated could be exploring how the personal characteristics, agency-level factors and state-economic variables influence other outcomes besides employment. Approximately, 40% of individuals do not achieve an employment outcome when utilizing VR services (Fleming et al., 2012). By exploring what may be occurring at these different levels and across different states could provide valuable information of the barriers both individuals and agencies are experiencing in achieving an employment outcome. Further, these variables could be studied at the various breakdowns of closure outcomes across VR agencies. For example, exploring how personal characteristics, agency-level factors, and state-economic variables impact the outcome of those who had determined eligibility for services, but exited before signing an IPE could be useful in further understanding the overall process and success of VR agencies.

Implications for Practice and Policy

The employment outcomes of VR agencies have been studied at great length and for decades. Many of these studies have identified inequalities observed in the state-federal VR

program. Based on these findings, new policies and plans have to be implemented to improve VR outcomes.

Given the findings that suggest environmental factors may be more associated with employment outcomes than personal characteristics, possible policy initiatives may need to focus on providing individual low performing states more resources to better account for these differences. These policy initiatives need to focus on creating an equal economic environment for all states in order to reduce this source of variability among VR agencies while also support an environment that creates equal opportunities for individuals with disabilities to obtain and maintain employment. Further, at both the policy and the program levels, greater emphasis needs to be placed on efficient and effective economic development that is inclusive of people with disabilities. Given the large effect of Social Security benefits on employment rates across all states, policy initiatives should address the importance of bridging the gap between receiving benefits and finding and maintaining employment. Policies such as WIOA are attempting to do just that with initiatives such as implementing the transition-age youth program. This program supports an integrated service delivery system and provides a framework through which states and local areas can use other federal, state, local, and philanthropic resources to support in-school and out-of-school youth. Further, there is considerable emphasis on work experience. An increase in policies and programs, such as the transition-age youth programs, that focus on early intervention and prevention of initially receiving Social Security benefits may be helpful in aiding individuals with disabilities to utilize fewer funds from Social Security benefits and maintain quality employment.

Given the differences that were present in this study among VR agencies, it is clear that a “one size fits all” model may not be applicable to the VR program. It is evident that different

states have different needs regarding the individuals they serve and their economic climate. This means that these states may need different evaluation standards and different strategies to effectively and efficiently serve individuals with disabilities.

The current findings suggest the importance of further understanding and considering the impact of agency-level and state economic factors on employment rates. The implications of this study can influence the way in which vocational rehabilitation counselors and regional area managers work with individuals with disabilities. Both counselors and managers need to address the influence that the overall economic climate of their state and possibly even county may have on consumers and their ability to obtain and maintain employment. This creates a need for vocational rehabilitation counselors and regional area managers to be active in both state and federal policies in promoting advocacy for individuals with disabilities to better share how their specific state economic variables influence the employment rate of their state.

Implications for Rehabilitation Counselor Education

The findings of the current research can be used to further influence the training and educational needs of rehabilitation counselors. First and foremost, the results of this study further strengthen the ICF model, which can be used to train rehabilitation counselors on the conceptualization of disability and overall participation in state federal VR services and the more general community. Further, the results highlight the importance of the contextual factors that need to be considered when working with individuals with disabilities. More specifically, the interactions that occur between personal characteristics and state economic factors need to be brought into the discussion.

The results of this study can influence an overall change in the curriculum of rehabilitation counselors. The findings of the current research highlight the differences and discrepancies that occur among race and ethnicity within VR agencies. This may suggest incorporating more training opportunities and more rigorous courses in multicultural competencies. Currently, the Commission on Certified Rehabilitation Counselor Certification (CRCC) requires students to have training in multicultural issues; however, this is not identified as a stand-alone course and can be combined with other topics such as medical aspects of disability and psychosocial aspects of disability in the curriculum. The findings of this study suggest the importance of race and ethnicity, not only at the individual level but also at the level in which environmental factors such as poverty and unemployment rates may interact with race and ethnicity. The VR curriculum needs to incorporate these interactions and further train counselors to be better prepared to work with various races and ethnicities in various economic climates. This multicultural framework would include the idea of privilege and how that may be a considerable factor within the VR system for individuals of a minority race.

Summary

The current chapter incorporates the findings of the current study with the previous literature. Overall, many of the findings such as the significant predictive factors of race and ethnicity, disability type, and level of education have been supported in previous research. Further, macro-level variables were also found to be significant in predicting employment rates and have been supported throughout the literature. Importantly, this chapter highlights the result of the moderating effect of state-level characteristics on personal characteristics. This finding, overall, highlights the importance of the ICF model. Further, this supports the role contextual factors play when conceptualizing disability. These findings present implications for future

research that continues to explore how personal characteristics and state-level factors may be influenced at the community level. Lastly, this chapter addressed the importance of incorporating these results into policy and training for rehabilitation counselors, suggesting that more work needs to be done at the policy level to incorporate early interventions for individuals who are receiving SSDI and more training opportunities to address multicultural issues that occur with VR.

Conclusions

The present study attempted to identify and examine the relationships between personal characteristics and environmental factors and the impact these have on VR outcomes. Results identified the important contribution of personal characteristics and contextual factors and how these vary based on agency performance at the state level. Further, this study identified the important role that environmental factors play when investigating VR outcomes. Future studies need to continue to include person-environment factors to further understand this relationship and how it may differ across agencies.

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