

Age at Application for Vocational Rehabilitation Services as a Predictor of Employment

Outcomes for Transition-Age Youth

by

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Abstract

Vocational Rehabilitation (VR) outcome data from the Rehabilitation Services Administration were used to examine age as a predictor of employment outcomes for transition-age youth with significant disabilities. Employment outcomes were examined with regard to type of VR case closure achieved and wages earned. Age at application for VR services was examined as a predictor to determine if youth who applied for VR services during their early secondary education years had better employment outcomes than those who applied later. Confounding variables were controlled (i.e., gender, race, education, SES, and primary disability type). Youth with significant disabilities who were aged 14 to 24 when they applied for VR services comprised the population for this study. Logistic and linear regression were used to analyze these data. Results indicated that age was a predictor for wages earned. Gender, SES, and primary disability type were also predictors of employment outcomes. Findings from this study suggest that VR's earlier involvement could lead to more positive employment outcomes.

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CHAPTER I: INTRODUCTION

Adolescents face a host of influences and developmental tasks that impact their growth and development (Flexer, Baer, Luft, & Simmons, 2008). Lichtenstein (1998) developed an ecological model of transition that identified 10 domains impacting youth as they move through this period of time: relations with peers, mass media, role of work, extra-curricular pursuits, pursuit of independence, risk taking, post-secondary education, poverty, relationships with parents, and high school. Navigating these multiple influences can create significant challenges for any young person moving through this period of life. For adolescents with disabilities, this period of transition can present even greater challenges (Oertle & Trach, 2007). This movement from adolescence to adulthood is a time of transition that extends into the mid-20s (Levesque, Lauen, Teitelbaum, Alt, & Librera, 2000).

Adolescents with disabilities age 14 to 24 are referred to as transition-age youth. Their transition involves a movement from school to post-school activities. Special education and vocational rehabilitation (VR) are two primary fields of service providers involved in this transition. Students with disabilities are entitled to special education services and may have been established with these services for many years prior to VR's involvement. VR services are introduced during the secondary education years and are based on eligibility. Special education services end when students exit secondary education and VR services ideally continue until the student achieves their employment goal.

The partnership between special education and VR provides a fluid delivery of services helping to ensure the success of students with disabilities that these entities jointly serve.

Interagency collaboration is an evidence-based predictor for post school success in employment (Test & Cease-Cook, 2012). Interagency collaboration between special education and VR occurs when information is shared, resources are combined, and there is a team approach to serving students (Oertle & Trach, 2007). VR counselors must develop relationships with special educators early on in the transition process so services they are providing can link students to the community prior to graduation (Agran, Cain, & Cavin, 2002). VR's involvement can lead to positive post-school outcomes in employment. Findings from Wave 2 of the National Longitudinal Transition Study indicated that 63% of students in special education who received VR services achieved an employment outcome. This was equivalent to the percent of employment for their peers without disabilities (Cameto, Levine, & Wagner, 2004). If VR's involvement in transition has led to positive outcomes for transition-age youth with disabilities, examining what is meant by involvement "early on" may provide valuable information.

In 2008, the National Council on Disability (NCD) published *The Rehabilitation Act: Outcomes for Transition Age Youth*, a comprehensive report to the President. Several recommendations were made to both the U.S. Congress and the U.S. Department of Education. Recommendations to the U.S. Department of Education extended to the Rehabilitation Services Administration (RSA), the National Institute on Disability and Rehabilitation Research (NIDRR), the Office of Special Education Programs, and state VR agencies. All recommendations were based on a review of existing agency data as well as structured qualitative information gained from key stakeholders. The first recommendation stated that "Congress should change existing VR transition legislation and policy to require that VR services be made available to eligible youth no later than three years before an adolescent or young adult exits from secondary education" (p. 16). For transition-age youth who will complete

secondary education by age 17 or 18, such a change would require VR's involvement as early as age 14. According to the NCD (2008), early intervention by VR is an element of many promising transition practices. The impact of earlier intervention was shown to prevent early school exit. Also, if VR becomes involved three years prior to school exit, the services provided are more intensive and last long enough to have a significant impact on students' positive employment outcomes (NCD, 2008).

Because employment is a goal for a majority of youth in this population (Blackorby & Wagner, 1996), employment outcomes and the services provided to support those outcomes are an essential measure of success for programs that serve transition-age students with significant disabilities. Program administrators, researchers, and other stakeholders are interested in identifying the predictors of positive employment outcomes (Test & Cease-Cook, 2012; Test & Grossi, 2011; Wooderson, 2012). Identifying the predictors of employment outcomes can create more efficient and effective service delivery models while also meeting the increased expectations for government accountability.

Despite students' desire to obtain employment, many youth with disabilities are not experiencing a successful transition into their adult roles after graduation. Many students with disabilities complete secondary school without gaining the necessary skills and supports needed for adult life (Hughes & Carter, 2011). Typical post-school goals such as a career, a college degree, and community integration are not realized for many youth with disabilities (Hughes & Avoke, 2010). Employment rates for people with disabilities lag behind their peers. More specifically, results from the most recent American Community Survey indicate that only 22% of individuals with disabilities age 16 and over are employed compared to 59% of those without disabilities (U.S. Census Bureau, 2010). Youth with significant disabilities are also not achieving

high rates of employment. Results from the National Longitudinal Transition Study showed that only 13% of these students who aged out of the school system (i.e., students with significant disabilities) were competitively employed two years after exiting school (Blackorby & Wagner, 1996). Results were slightly higher in a study conducted by the NCD (2000). Survey results indicated that 25% of students who aged out of school systems were competitively employed.

In addition, for persons with disabilities who are employed, their earnings are lower than those without disabilities. The American Community Survey reports average annual earnings using seven earnings categories. A majority (58%) of persons with disabilities age 16 and over have annual earnings in the bottom three categories (i.e., \$1 to \$4,999; \$5,000 to \$14,999; and \$15,000 to \$24,999) compared to 43% of those without disabilities. Over 20% of individuals with disabilities who were working had annual earnings between \$5,000 and \$14,999 (U.S. Census Bureau, 2010).

Based on these earnings, people with disabilities age 16 and over are more likely to live in poverty. Almost 22% of individuals with disabilities live below 100 percent of the poverty level compared to 13% without disabilities. Even more alarming, 36% of individuals with disabilities live at or below 149 percent of the poverty level compared to 21% of those without disabilities. In addition, those with severe (i.e., significant) disabilities live in poverty more so than persons with non-severe disabilities. Almost 11% of people with severe disabilities were in poverty compared to less than 5% of those with non-severe disabilities (Brault, 2012).

These poor outcomes may reflect the barriers that transition-age youth with significant disabilities face as they pursue goals beyond high school. Often, youth with disabilities do not receive the same educational preparation as their peers. In addition, many students who receive special education services do not earn a high school diploma (U.S. Department of Education,

2010). Other barriers include lack of workplace accommodations and supports, health, and lack of networking opportunities to identify jobs (Rangarajan et al., 2009; Shandra & Hogan, 2008). Some research has indicated this lack of service integration between VR and special education has led to the disappointing employment outcomes this population experiences (Certo & Luecking, 2006).

Services for youth with significant disabilities have been provided in a sequential rather than an integrated fashion. This has caused a disjointed, uncoordinated, and an often interrupted set of services as students make the transition from school to adulthood (Certo & Luecking, 2006). VR services for youth with disabilities are not consistent across the country. Mathematica Policy Research (2013) examined data for transition-age youth who applied for VR services in fiscal years 2004, 2005, and 2006. In addition, these researchers examined VR agency characteristics regarding transition services. Results from this study showed the considerable variation that exists in how different state VR agencies serve this population.

For example, some states (e.g., Maine) had an overwhelming majority of VR applicants who were still in high school while other states (e.g., Utah) had a majority of youth applying for VR services after they completed high school (Mathematica Policy Research, 2013). An assessment of VR state agency plans showed that 13 states had a focus on transition populations, 43 had dedicated state transition leadership, and 37 states had VR counselors who had dedicated transition caseloads (Mathematica Policy Research, 2013). Wide variation existed regarding the percentage of counselors who had dedicated transition caseloads. Transition-age youth comprise about one-third of VR's total cases. However, a majority (86%) of the state agencies had 20% or less of their counselors with dedicated transition caseloads. Only 7 states (i.e., Alabama,

Georgia, Maine, Maryland, North Carolina, Vermont, and West Virginia) had 21% or more VR counselors with dedicated transition caseloads (Mathematica Policy Research, 2013).

With such wide variability across state VR agencies, it is difficult to determine what factors influence positive employment outcomes. Previous research has identified several variables that predict positive employment outcomes for the larger population of persons with disabilities. These predictor variables include gender, having a work history, disability type, durations of VR services, and age (see Table 1 below).

Table 1

Post-School Outcome Studies by Variable Name and Type

Name	Type		Studies
	Predictor	Demographic	
Gender	X	X	<ul style="list-style-type: none"> • Benz, Doren & Yovanoff, 1998 Blackorby & Wagner, 1996 • Capella, 2002; Doren & Benz, 1998 Doren, Gau, & Lindstrom, 2011 • Fulton & Sabornie, 1994 • Heal & Rusch, 1995 • Wagner, 1992 • Rabren, Hall, & Brown, 2003 • Rabren, Dunn, & Chambers, 2002 • Wagner, Newman, Cameto, Levine, Garza, 2006
Having a work history	X		<ul style="list-style-type: none"> • Benz, Yovanoff, & Doren, 1997 • Benz, Lindstrom, & Yovanoff, 2000 • Colley & Jamison, 1998 • Certo & Luecking, 2011 • Certo, Luecking, Murphy, Brown, Courey, & Belanger, 2009 • Inge & Dymond, 1994 • Inge, Wehman, & Dymond, 2005; Luecking & Fabian, 2000 • Rabren et al., 2002 • Timmons, Hall, Bose, Wolfe, & Winsor, 2011

Disability type	X	X	<ul style="list-style-type: none"> • Baer, Daviso, Flexer, McMahan, & Meindl, 2011 • Grigal, Hart, Migliore, 2011 • Luecking & Fabian, 2000 • Rabren et al., 2003
Durations of VR services	X		<ul style="list-style-type: none"> • Butterworth et al., 2012 • Migliore & Butterworth, 2008 • Migliore & Smith, 2007
Age	X	X	<ul style="list-style-type: none"> • Berry & Caplan, 2010 • Gonzalez, Rosenthal, & Kim, 2011 • Rabren et al., 2003
Level of education	X		<ul style="list-style-type: none"> • Beveridge & Fabian, 2007 • Bolton, Bellini, & Brookings, 2000 • Moore, 2002 • Research Triangle Institute & Rehabilitation Services Administration, 2002 • Wilson, 1999 • Hayward, 1998
Race	X	X	<ul style="list-style-type: none"> • Beveridge & Fabian, 2007 • Research Triangle Institute & Rehabilitation Services Administration, 2002 • Moore, Price, & Alston, 2002 • Olney & Kennedy, 2002 • Wilson, 1999 • Wise, 1988
SES	X	X	<ul style="list-style-type: none"> • Dutta et al., 2008 • Gonzalez et al., 2011 • Martin, 2010 • Newman et al., 2009 • Rabren et al., 2014

Other research has identified additional demographic variables that are associated with positive employment outcomes (see Table 1 above). These variables include level of education, race, and socioeconomic status (SES). Level of education has been linked to increased weekly wages at the time of VR case closure (Beveridge & Fabian, 2007; Bolton, Bellini, & Brookings, 2000; Hayward, 1998; Moore, 2002; Research Triangle Institute & Rehabilitation Services Administration, 2002; Wilson, 1999). In a study of consumers whose VR cases were successfully

closed in Maryland, level of education was a statistically significant variable for participants' weekly wages at the time their case was closed. More education increased participants' weekly wages (Beveridge & Fabian, 2007). In Moore's (2002) study of VR participants who were deaf, education and training beyond high school were linked to higher weekly earnings at the time of VR case closure.

The impact of race on employment outcomes within VR has also been examined (Beveridge & Fabian, 2007; Moore, Price, & Alston, 2002; Olney & Kennedy, 2002; Research Triangle Institute & Rehabilitation Services Administration, 2002; Wilson, 1999; Wise, 1988). Using linear regression, a study of VR case closures in Maryland, found that race did impact VR participants' weekly wages at the time of case closure (Beveridge & Fabian, 2007). Specifically, Caucasians mean weekly earnings were \$471 a week, compared to \$394 for African Americans. In a study of VR case closures from fiscal year 1995 in a Mid-western state, logistic regression analysis revealed that race was a significant predictor of successful employment. Specifically, Caucasians were more likely to achieve a successful case closure than African Americans (Moore et al., 2002). Using data from the *Disability Supplement to the National Health Interview Survey* from 1994 and 1995, researchers found that Caucasians who used VR services were much more likely to achieve a competitive employment outcome than all other racial groups (Olney & Kennedy, 2002). Additionally, African Americans were the least likely to achieve a competitive employment outcome and the most likely to be closed in a nonintegrated work setting (i.e., sheltered workshop) (Olney & Kennedy, 2002).

SES has also been examined as a predictor of employment outcomes (Dutta et al., 2008; Gonzalez et al., 2011; Martin, 2010; Newman et al., 2009; Rabren et al., 2014). Low SES can be associated with receiving public support (e.g., Temporary Assistance for Needy Families,

Supplemental Security Income, or Social Security Disability Insurance). Dutta et al. (2008) found that youth who received government benefits were less likely to achieve a successful outcome with VR than those who did not receive benefits. Receipt of public support is recorded in VR case service data. In a study of all VR case closures from fiscal year 2007, the most influential predictor of successful employment was public support (Gonzalez et al., 2011). In a study of VR closures in a southwestern state for fiscal year 2006, receipt of public support was found to have a negative effect on quality employment outcomes across all racial/ethnic groups (i.e., earnings and medical insurance) (Martin, 2010).

In a study of successful VR case closures in Arkansas between 1992 and 1997 (Bolton et al., 2000), several demographic variables were examined. Personal history was a created variable that combined nine other demographic variables including education, family income, age, employment status, marital status, financial assistance, and three disability categories. Using a regression analysis, this variable attributed to some of the variance in employment outcomes and wages. However, it is uncertain how much each demographic variable within personal history attributed to employment outcomes.

A number of variables have been used to examine employment outcomes within the VR system. Additionally, there are a host of factors that can influence an individual's success in obtaining a job. Transition-age youth with significant disabilities are impacted by the variables that have been examined in previous research. Identifying one variable that may contribute significantly to this population's employment outcomes may be instrumental in improving VR's service provision to this group of young people. Specifically, the age when students initiate services with VR may be a significant predictor for future employment. VR's involvement

earlier in students' high school (i.e., age 14) experience may improve their ability to obtain a job and achieve a successful case closure with VR.

Purpose of the Study

The purpose of this study is to examine how the age when students apply for VR services impacts and predicts employment outcomes. This study will control for other variables that have been shown to influence employment outcomes (i.e., gender, race, education, disability type, and SES). This study will focus on transition-age students (i.e., age 14 to 24) with significant disabilities who are served under an IEP within special education and have received VR services.

Research Questions

1. Using logistic regression, does the age at application for VR services predict successful VR case closure for transition-age youth with significant disabilities after controlling for gender, race, education, disability type, and socioeconomic status?
2. Using a backward elimination logistic regression, which predictors (i.e., age at application, gender, race, education, disability type and socioeconomic status) contribute significantly to the type of VR case closure achieved for transition-age youth?
3. Using bivariate linear regression, how well does age at application for VR services predict wages at VR case closure for transition-age youth with significant disabilities?
4. Using multiple linear regression, how well does age at application for VR services predict wages at VR case closure for transition-age youth with significant disabilities when controlling for gender, race, education, disability type, and socioeconomic status?

Significance

The results of this study will help identify the impact that earlier involvement with VR services may have on employment outcomes for transition-age youth with disabilities. These

findings may help identify practices that VR and special education can implement to ensure that students apply for VR services at least three years prior to exiting high school. With the emphasis on evidence-based practices and improving overall outcomes for any agency receiving federal funding, identifying a factor that leads to positive outcomes can increase the efficiency of an agency. Rehabilitation and special education research seeks to identify such evidence-based practices and these entities are poised to collaborate as they serve transition-age students with disabilities. Both fields are concerned with employment outcomes. Considering the large population of transition-age students that these entities jointly serve, identifying a practice that leads to positive employment outcomes would be valuable information for both transition service provider agencies.

Limitations of the Study

This study examined the employment outcomes of transition-age youth with significant disabilities who were closed from VR services in fiscal year 2011. There were limitations in the current study with regard to the population selected, the employment outcomes measured, definitions of the predictor variables for primary disability type, and the accuracy of the data within the RSA-911. First, the sample was derived from a national data set that included data from all state VR agencies. Some state agencies are currently under an Order of Selection in which all eligible persons with disabilities are not served due to a lack of funding. As such, the cases within the sample from states under an Order of Selection may have been impacted by factors beyond the scope of this study. Additionally, there is wide variability in how states serve youth with disabilities. Some states have dedicated VR counselors to serve transition caseloads. Therefore, the employment outcomes for cases within the sample may have been impacted by the availability of a VR counselor who specializes in serving transition-age youth. Also,

outcomes for this study are limited to cases closed in fiscal year 2011. Cases closed during this year may have been affected by the economic recession in recent years. The quality of other service systems in a state may be highly influential to employment outcomes (e.g., mental health and education).

Limitations also existed due to the outcomes measured. Consumers whose cases were closed unsuccessfully do not have data recorded for wages earned. Even though their cases were closed without an employment outcome, it is still possible that they may have obtained employment. Measuring future wages for consumers who were unsuccessful with VR could be an important finding not included in this study.

The definition of primary disability type within the data set used in this study presented another limitation. It was difficult to disaggregate findings to specific disability types due to the broad categories used within the Rehabilitation Services Administration (i.e., sensory/communicative, physical, and mental). Specific disabilities such as autism and learning disability can be identified within each of these categories.

Finally, limitations existed due to the sample used. A large sample size increases the likelihood of finding significance when a poor-fitting model may have been generated (Mertler & Vannatta, 2010). Also, the number of youth who were less than 16 years of age when they applied for VR services was quite small ($n = 45$). Therefore, application of the results of this study may be limited for youth who are under age 16.

Definition of Terms

Several terms, agency names, and acronyms are used throughout this study. The following is a list of definitions that will clarify these terms so that each is understood within the context of this study.

Administration on Intellectual and Developmental Disabilities (AIDD): AIDD provides financial and leadership support to organizations in every state and territory in the U.S. to ensure that persons with developmental disabilities (DD) and their families can fully participate in and contribute to all aspects of community life. AIDD oversees four grant programs established by the Developmental Disabilities Assistance and Bill of Rights Act of 2000, oversees the President’s Committee for People with Intellectual Disabilities, and administers the disability provisions of the Help America Vote Act (AIDD, n.d.).

Developmental disability (DD): “a severe, chronic disability that is attributable to a mental or physical impairment or combination of mental and physical impairments that manifests before age 22, is likely to continue indefinitely, and results in a substantial functional limitation in three or more major life activities” (The Developmental Disabilities Assistance and Bill of Rights Act of 2000, 42 U.S.C. Section 15002).

Disability: According to the Americans with Disabilities Act Amendments Act of 2008, an individual is considered to have a disability if he or she has “a physical or mental impairment that substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment” [42 U.S.C. Section 4(a)(1)(A)(B)(C)]. According to the Individuals with Disabilities Education Improvement Act of 2004, disability is defined categorically for children and includes mental retardation [sic], hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities.

Employment outcome: “Entering or retaining full time or part time competitive employment in the integrated labor market; satisfying the vocational outcome of supported

employment; or satisfying any other vocational outcome deemed appropriate (i.e., self employment, telecommuting, or business ownership), in a manner consistent with the Rehabilitation Act” [29 U.S.C. Section 705 11(A)(B)(C)].

Individualized Education Program (IEP): “a written statement for each child with a disability that includes: the child's present levels of academic achievement and functional performance; measurable annual goals, including academic and functional goals; how the child’s progress toward goals will be measured; a statement of the special education and related services and supplementary aids and services that are needed; an explanation of the extent, if any, to which the child will not participate with nondisabled children in the regular classroom; a statement of any individual appropriate accommodations that are necessary to measure the academic achievement and functional performance of the child on State and district wide assessments; and the projected date for the beginning of the services and modifications” [IDEA, 20 U. S. C. Section 300 (a)(1)(2)(3)(4)(5)(6)(7)].

Individualized Plan for Employment (IPE): According to the Rehabilitation Act of 1973, as amended, an IPE shall, at a minimum, contain: “a description of the specific employment outcome that is chosen by the eligible individual, consistent with the unique strengths, resources, priorities, concerns, abilities, capabilities, interests, and informed choice of the eligible individual; a description of the specific vocational rehabilitation services that are needed to achieve the employment outcome; timelines for the achievement of the employment outcome and for the initiation of the services; a description of the entity chosen by the eligible individual or, as appropriate, the individual’s representative, that will provide the vocational rehabilitation services, and the methods used to procure such services; a description of criteria to evaluate progress toward achievement of the employment outcome; the responsibilities of the

VR agency; and the responsibilities of the eligible individual” [29 U. S. C. Section 722 (A)(B)(C)(D)(E)].

Intellectual disability (ID): According to the American Association on Intellectual and Developmental Disabilities (2013), an intellectual disability is characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills. This disability originates before the age of 18.

National Longitudinal Transition Study (NLTS): The original NLTS was designed and conducted by SRI International for the United States Department of Education, Office of Special Education Programs from 1985 through 1993. The NLTS includes a nationally representative sample of more than 8,000 youth with disabilities, drawn from the rosters of special education students in more than 300 school districts nationwide. All sample members were special education students between the ages of 15 and 21 in the 1985–86 school year. Data were collected in 1987 and again in 1990. The NLTS reports percentages of youths with a particular status (for example, the percentage employed) (Wagner & Blackorby, 1996).

National Longitudinal Transition Study-2 (NLTS-2): a study commissioned by the U.S. Department of Education, Office of Special Education Programs and Institute of Education Sciences. The NLTS-2 began in 2001 and is a follow-up of the original National Longitudinal Transition Study. NLTS-2 includes 11,270 youth nationwide who were ages 13 through 16 at the start of the study. Information was collected over 10 years from parents, youth, and schools and provided a national picture of the experiences and achievements of young people as they transitioned into early adulthood. It measured the secondary school and post school outcomes of youth in the education, employment, social, and residential domains. The NLTS-2 also identified factors in youth's secondary school and post school experiences that contributed to more positive

outcomes. Data from the NLTS-2 described: the characteristics of secondary school youth in special education and their households; the secondary school experiences of youth in special education, including their schools, school programs, related services, and extracurricular activities; and the experiences of youth once they left secondary school, including adult programs and services, and social activities (NLTS-2, n.d.).

Post school outcomes: The Individuals with Disabilities Education Act defines post school outcomes within the performance indicators for special education programs. Indicator 14 relates to the outcomes that youth with disabilities achieve once they exit high school. Post school outcomes pertain to youth who are no longer in secondary school and had IEPs in effect at the time they left school. Post-school outcomes are categorized as follows: enrolled in higher education within one year of leaving high school; enrolled in higher education or competitively employed within one year of leaving high school; or enrolled in higher education or in some other postsecondary education or training program; or competitively employed or in some other employment within one year of leaving high school [20 U.S.C. 1416(a)(3)(B)].

Rehabilitation Services Administration (RSA): RSA oversees grant programs that help individuals with disabilities to obtain employment and live more independently through the provision of such supports as counseling, medical and psychological services, job training and other individualized services. RSA's major Title I formula grant program provides funds to state VR agencies to provide employment-related services for persons with disabilities, giving priority to those with significant disabilities (Office of Special Education and Rehabilitative Services, 2012).

Rehabilitation Services Administration 911 (RSA-911) Database: The RSA – 911 is the primary administrative record in the VR program. It is one of the oldest national data

collection efforts related to employment outcomes for people with disabilities (Gilmore, Schuster, Timmons, & Butterworth, 2000). The RSA-911 is a public record that includes many data points at the individual level (e.g., demographics, critical dates of service determination, services provided, public support received, and employment outcomes). All data in the RSA-911 are for consumers whose cases have been closed.

Related services: Within special education, related services are any services that are required to assist or support a student with a disability so that he or she can benefit from special education (e.g., VR, occupational therapy, physical therapy, and mental health services) (deFur & Patton, 1999).

Significant disability: According to the Rehabilitation Act of 1973, as amended, an individual with a significant disability “has a severe physical or mental impairment which 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 an employment outcome.” The individual’s “vocational rehabilitation can be expected to require multiple vocational rehabilitation services over an extended period of time;” and the individual “has one or more physical or mental disabilities resulting from amputation, arthritis, autism, blindness, brain injury, cancer, cerebral palsy, cystic fibrosis, deafness, head injury, heart disease, hemiplegia, hemophilia, respiratory or pulmonary dysfunction, mental retardation [sic], mental illness, multiple sclerosis, muscular dystrophy, musculo-skeletal disorders, neurological disorders (including stroke and epilepsy), paraplegia, quadriplegia, and other spinal cord conditions, sickle cell anemia, specific learning disability, end stage renal disease, or another disability or combination of disabilities determined on the basis of an assessment for determining eligibility and vocational rehabilitation to cause comparable substantial functional limitation” [29

U.S.C. Section 705 (21)(A)(i)(ii)(iii)]. For the purposes of this study, persons with significant disabilities will be defined as those whom VR has determined have a significant disability and who also received Supplemental Security Income from the Social Security Administration. Individuals will be identified using these variables within the Rehabilitation Services Administration closed case database.

Special education: “specially designed instruction, at no cost to parents, to meet the unique needs of a child with a disability, including (a) instruction conducted in the classroom, in home, in hospitals and institutions, and in other settings and (b) instruction in physical education” [(20 U.S.C. Section 1401 (29)(A)(B)].

Successful case closure: exiting the VR program with an employment outcome, after having developed an IPE and receiving VR services (RSA, 2004). The provision of VR services was instrumental in obtaining employment (Gonzalez et al., 2011).

Supplemental Security Income (SSI): SSI is administered by the Social Security Administration and provides monthly payments to people with low income and limited resources who are 65 or older, or blind, or who have a disability. Children younger than age 18 can qualify if they meet Social Security’s definition of disability for children, and if the child’s income and resources fall within the eligibility limits. Social Security considers the child’s income and resources as well as the income and resources of family members living in the child’s household. Social Security’s criteria for 2014 include: “the child must not be working and earning more than \$1,070 a month in 2013; the child must have a physical or mental condition, or a combination of conditions, that very seriously limit the child’s activities; and the child’s condition(s) must have been disabling, or be expected to be disabling, for at least 12 months; or must be expected to result in death” (Social Security Administration, 2014, p. 6).

Supported employment: “Competitive work in integrated work settings for individuals with the most significant disabilities for whom competitive employment has not traditionally occurred, for whom competitive employment has been interrupted or intermittent as a result of a significant disability, and who, because of the nature and severity of their disability, need intensive supported employment services” [29 U.S.C. Section 705 (35)(A)(i)(I)(II)(ii)]. These services are “typically provided for no longer than 18 months, unless there are special circumstances” [29 U.S.C. Section 705 (36)(C)].

Transition: a coordinated set of activities that assist students with disabilities as they move from school to independent, productive, and satisfying post-school activities (Trach, 2012).

Transition services: according to the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), transition services are included no later than the first IEP to be in effect when the child turns 16, or younger if determined appropriate by the IEP team, and updated annually. Within the IEP, these services include: “appropriate measurable postsecondary goals based upon age appropriate transition assessments related to training, education, employment, and, where appropriate, independent living skills; and the transition services (including courses of study) needed to assist the child in reaching those goals” [20 U. S. C. Section 300 (b)(1)(2)].

Unsuccessful case closure: exiting the VR program without an employment outcome, after having developed an IPE and receiving VR services (RSA, 2004).

Vocational rehabilitation (VR): Vocational rehabilitation agencies assist eligible persons with disabilities to prepare for, obtain, keep, or regain employment. Every state has a VR

agency that is designed to help individuals with disabilities meet their employment goals (Institute for Community Inclusion, 2004).

Summary

Transition-age youth with significant disabilities are not achieving high rates of employment. This population of students has the opportunity to benefit from both special education and VR services while they are in high school. Although these young people face many barriers to employment, previous research has demonstrated that some variables can predict more positive employment outcomes for persons with disabilities. For transition-age youth, future research needs to examine the variables that predict positive outcomes specific to their population. This study seeks to examine age at application for VR services as a predictor of employment outcomes for transition-age youth with significant disabilities. Findings from this study have implications for VR policy changes regarding the age when VR begins to work with students in secondary education. According to the results of this study, beginning VR services prior to age 16 and possibly by age 14 may lead to more positive outcomes for students. These findings have implications for both special education and VR because both fields are concerned about students' long-term success.

CHAPTER II. REVIEW OF RELATED LITERATURE

Employment outcomes for youth with disabilities lag behind youth without disabilities (Mathematica Policy Research, 2013). As these youth complete their secondary education years, they are involved in a period of transition as they prepare to take on adult roles after high school. Obtaining a job is goal for a majority of youth with disabilities (Cameto et al., 2004; Kiernan & Hart, 2011; Luecking, 2009) and becoming an employee is an aspiration for most adults. However, many young adults with disabilities are struggling to achieve this goal. Information from the Current Population Survey indicated that young adults with disabilities have an employment rate that is 20 to 30 percentage points behind that of their peers without disabilities (Horvath-Rose, Stapleton, & O'Day, 2004). A report to Congress on the implementation of the Individuals with Disabilities Education Act also showed a gap in employment for this group. Focusing on youth who were no longer in school, 57% of youth with disabilities aged 17 to 21 were employed while 66% of their peers without disabilities were employed (U.S. Department of Education, 2010). Young adults with significant disabilities who are transitioning from school to adult life face an even greater challenge in achieving employment. A study of youth who received Supplemental Security Income (SSI) from Social Security revealed that youth who continued to receive SSI after age 18 were much less likely to obtain employment than youth whose SSI benefits ended at age 18. When compared to youth whose SSI benefits ended, youth who remained on SSI were over one and a half times less likely to be employed and over two and a half times less likely to achieve full time employment (Wittenburg & Loprest, 2007).

Youth and young adults with disabilities often seek services from Vocational Rehabilitation (VR) as a way to address the employment barriers they experience (Mathematica Policy Research, 2013). VR is a federally mandated agency governed by the Rehabilitation Services Administration (RSA) that is housed within the U.S. Department of Education's Office of Special Education and Rehabilitative Services. VR is a jointly funded federal-state program that assists eligible individuals with the services they need to reach their employment goal. Youth with disabilities between the ages of 14 to 24 are often referred to as transition-age. The lower age limit is 14 because this is the typical age of a freshman (i.e., ninth grade student) in secondary education. The upper age limit is 24 because this aligns with the definition of the working-age population (i.e., 25 to 64) (Mathematica Policy Research, 2013). VR serves a large population of youth with disabilities. In a study examining all VR outcomes from 2004 to 2006, 2.3% of all transition-age youth in the United States applied for VR services, completed their service plans, and obtained employment (Mathematica Policy Research, 2013). As VR provides services to youth and young adults with disabilities who are still in secondary education, VR counselors are required to collaborate with state education agencies as they plan and implement rehabilitation services (Mathematica Policy Research, 2013).

Although VR is governed by federal legislation, state VR agencies still have leeway to determine the services that are provided. Therefore, there is variation across VR programs including the services, staffing, and expertise available for transition-age youth with disabilities (Mathematica Policy Research, 2013). In addition to the variation in service provision, there is not enough information available regarding the best practices for improving employment outcomes for VR's population of youth with disabilities (The Study Group, Inc., 2007). The Study Group, Inc. (2007) identified several areas of need as VR serves this population.

Specifically, VR needs to have a process to identify youth who could benefit from VR services, build stronger interagency collaboration with local education agencies, and strengthen data collection for this population (The Study Group, Inc., 2007). While these were important findings, none were supported with conclusive evidence showing that these practices lead to better employment outcomes (Mathematica Policy Research, 2013).

Rehabilitation methodologies must be “justified by empirical evidence and rigorous analysis; in other words, it calls for evidence-based practice” (Chan, Rosenthal, & Pruett, 2008, p. 3). The need to identify and use evidenced-based practices has gained a significant amount of attention in VR’s professional community. Researchers have also addressed the need for VR to provide evidence that clearly documents the link between consumer outcomes and specific rehabilitation interventions (Chan et al., 2008; Pruett, Swett, Chan, Rosenthal, & Lee, 2008; Rubin, Chan, & Thomas, 2003; Test & Cease-Cook, 2012). Rubin et al. (2003) examined how rehabilitation service provision improved life skills and overall quality of life for individuals within VR. These researchers emphasized the importance of using these measures as part of VR program evaluation in addition to the employment outcome measures.

Researchers within VR have also noted increased government accountability and its impact on rehabilitation research (Chan et al., 2008; Pruett et al., 2008). Currently, there is a paucity of research within rehabilitation literature regarding comprehensive outcomes (Pruett et al., 2008). Researchers have speculated that the lack of evidence for VR’s efficacy may have led to several states removing mandatory VR from worker’s compensation statutes (Pruett et al., 2008). Objective evidence must be obtained so that continued support for VR services is justified. The rehabilitation profession can no longer rely on team consensus, their own authority,

or experiences as the primary means of communicating the efficiency or efficacy of services (Chan et al., 2008).

While evidence-based practices are essential for accountability and the continued funding of VR services, such practices are also vital for practitioners (Chan et al., 2008; Test & Cease-Cook, 2012). Professionals within VR should be familiar with current research, methods used, research design, and the importance of measures reported within the results (i.e., effect size and power) (Chan et al., 2008). Such knowledge would give VR counselors the tools necessary to think critically about selecting and implementing services with consumers (Chan et al., 2008). VR counselors who are serving youth and young adults in secondary education need to be knowledgeable of evidence-based practices (Test & Cease-Cook, 2012). Specifically, VR counselors serving these students need to know which practices have been proven to be effective in teaching vocational skills and which services (i.e., predictors) have been linked to improved post-school outcomes (Test & Cease-Cook, 2012).

Identifying evidence-based practices has also been recognized at one of the highest administrative offices within VR. Steve Wooderson, the Chief Executive Officer of the Council of State Administrators of Vocational Rehabilitation, in a keynote address at the Fifth Annual Summit on Vocational Rehabilitation Program Evaluation and Quality Assurance (2012) emphasized the importance of conducting research to identify evidence-based practices within VR for youth with disabilities and those with the most significant disabilities. In identifying evidence-based practices, he stressed that practitioners and researchers need to identify interventions (i.e., predicting variables) that predict positive employment outcomes.

Regarding students in transition, Wooderson (2012) asked the Summit participants how services could be maximized due to the increased responsibility that VR has with this population.

He explained that maximizing services for this population is essential because in the original staff discussion regarding the draft of Title IV of The Rehabilitation Act, VR was responsible for all pre-vocational services to students in transition. Providing services to such a large number of students in transition would not be possible considering VR's current four billion dollar budget. However, the current discussions in Washington, DC revolve around increasing VR's role with this population of students. Mr. Wooderson asked the conference attendees to identify the data and information that shows how VR can maximize their limited dollars to provide services, collaborate, and be a resource in the bigger picture of transition.

With regard to consumers with the most significant disabilities, Wooderson (2012) stated that there is a groundswell of opportunity to increase service delivery to this population, specifically for those individuals with intellectual disabilities (ID), developmental disabilities, and chronic and persistent mental illness. He stated that there are promising practices and initiatives across the country for persons with the most significant disabilities that are having positive results. Research using the National Longitudinal Transition Survey 2 (NLTS-2) examined predictors for a variety of outcomes for students with ID (Grigal et al., 2011). Results indicated that setting a goal of attending post-secondary education was a predictor of employment for students with ID (Grigal et al., 2011). Additionally, there was insufficient data to determine if VR counselors' participation in transition planning had an impact on employment outcomes (Grigal et al., 2011). Wooderson (2012) contended that researchers should examine the data closely to determine what is really happening with rehabilitation services for consumers with the most significant disabilities so that resources are maximized and leveraged within VR to continue supporting these practices.

In closing, he stated that there are many priorities within the VR system. However, the current legislative and policy discussions regarding VR within Washington, D.C. revolve largely around transition-age youth with disabilities and persons with the most significant disabilities. Future research could combine these areas of emphasis by examining the population of students in transition with significant and most significant disabilities. This review of literature will examine the body of research for transition-age youth with significant and most significant disabilities. The topics discussed will include the prevalence of this population; legislative history; services provided by special education, VR, and other agencies; outcomes; predicting employment outcomes; and gaps in the literature that can guide future research.

Prevalence

This review will focus on transition-age youth with significant disabilities. Youth with the most significant disabilities are a smaller subset of the population of youth with disabilities; therefore, the focus on significant disability will include those with the most significant disabilities by default. To define the population of transition-age youth, researchers often specify an age range beginning in secondary school and extending to the initial years of young adulthood. The age range that defines transition-age youth with disabilities varies depending on the program, agency, or entity that supports or provides services to this group. The Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 set the minimum age for transition services to begin at 16. However, the IDEIA also allows states to begin services earlier if the Individualized Education Program (IEP) team supports the decision. VR programs also vary in defining this age range as some states begin services as early as 14, while others begin later. For example, the North Carolina Division of Vocational Rehabilitation Services (NCDVRS), places a priority on serving secondary students who are at least 16 years of age

(NCDVRS, 2014). According to Wehman (as cited in Wittenburg & Loprest, 2007, p. 183), most state VR agency policies do not allow rehabilitation placement services until students are in the latter part of their final year of high school. Defining the end of the age range for this population also varies. Much of the literature on this population uses ages that range from 14 to 24 (Ankeny, Wilkins & Spain, 2009; Flexer et al., 2008; Kohler & Field, 2003; Powers, Geenen, & Powers, 2009).

Prevalence of Transition-Age Youth with Disabilities

Similar to the variation in defining the age range for this population, estimates of the prevalence of transition-age youth with disabilities also vary widely across the surveys used with this population. These surveys include longitudinal surveys [i.e., the *Medical Expenditure Panel Survey*, the *National Longitudinal Survey of Youth 1997* (NLSY97), the *Panel Survey of Income Dynamics*, and the *Survey of Income and Program Participation* (SIPP)], cross sectional surveys [i.e., the *American Community Survey* (ACS), the *Current Population Survey* (CPS), the *National Health and Nutrition Examination Survey*, the *National Health Interview Survey*, and the *National Survey of Children's Health*], and special population surveys [i.e., the *National Longitudinal Transition Study-2* (NLTS-2), the *National Survey of SSI Children and Families*, and the *National Survey of Children with Special Health Care Needs*].

Prevalence estimates from these surveys vary widely due to the variation in context, the number and types of questions, and the variation in youth-specific questions (Wittenburg, 2012). Prevalence results for transition-age youth with disabilities within the entire U.S. population using the CPS, 2009-2010, the SIPP 2005, and the NLSY97 2002 are 5.3%, 13.8% and 24%, respectively. The advantage to these surveys is that the age range reported for prevalence includes ages 16 to 24 with the exception of the NLSY97, which starts with age 17. This is

advantageous because many surveys and agencies (e.g., the ACS, the IDEIA Data Tables, and the Rehabilitation Services Administration) report statistics and outcomes using age ranges that place transition-age youth into larger groups (e.g., ages 18 to 64, three to 21, or five to 17) that make it impossible to identify their prevalence.

The U.S. Census Bureau administers the ACS every year to gather demographic information that assists communities as they plan investments and services using state and federal funds. Disability is one of eleven areas examined. These statistics are representative of the entire U.S. population and provide a broad perspective on the prevalence of disability without tying statistics to specific services or programs. The ACS reports disability by type using the following categories: hearing, vision, cognitive, ambulatory, and self-care and/or independent living. The ACS (2011) reported that 5.2% of children between ages 5 and 17 have a disability and 10.2% of adults age 18 to 64 have a disability. Narrowing the age range further to identify the population age 14 to 24 is not possible using this data source.

Identifying the population of transition-age youth with disabilities who are served by special education and VR requires looking at each entity's statistics separately. Within special education, it may be useful to examine the prevalence of transition-age youth within statistics reported by the Office of Special Education Programs' Data Accountability Center as described in the most recent *Annual Disability Statistics Compendium* (Houtenville & Ruiz, 2012). However, results will not include the prevalence of transition-age youth between the ages of 22 and 24 who are no longer served by the Individuals with Disabilities Education Improvement Act (IDEIA). According to the IDEIA 618 Data Tables for fall 2010, there were 6,419,405 youth ages three to 21 who received special education services under IDEIA, Part B. Within this population, 2,724,538 (or 42.4%) were ages 12 to 17 and 363,279 (or 5.7%) were ages 18 to 21.

These numbers yield a total of 3,087,817 (or 48.1%) youth age 12 to 21 with disabilities served under IDEIA, Part B.

The prevalence of transition-age youth within the VR program can be obtained from Rehabilitation Services Administration (RSA) data. The RSA-911 database documents a host of information on all consumers whose cases were closed from the VR program each fiscal year. Reasons for VR case closure include: achieving an employment outcome, unable to locate or contact client, disability is too severe to benefit from VR services, client refused further services, death, individual entered an institution, transferred to another agency, failure to cooperate, no disabling condition, no impediment to employment, transportation not feasible or available, the individual does not require VR services, extended services were not available, extended employment, and all other reasons (U.S. Department of Education, 2004). Researchers often use this database to analyze a variety of characteristics and outcomes of VR consumers.

The population of transition-age youth within VR seems to be growing. Results from the Longitudinal Study of the VR Service Program (2000), revealed that transition-age youth comprised 13.6% of the population of individuals who receive VR services. In a study that examined the 10-year span of data using the RSA-911 from 1995 to 2005, 48% of all VR case closures were for youth age 16 to 21. The percentage of closures for the entire group of transition-age consumers is likely much higher, but was not determined because young adults age 22 to 24 were included within the broad category of adults with disabilities (i.e., ages 22 to 64). Across the 10 years examined, the percentage of VR consumers who were age 21 or younger when they applied for VR services increased from 40% in 1995 to 48% in 2005 (Migliore & Butterworth, 2008). In a study of all VR outcomes from 2004 to 2006, transition-age youth represented nearly one-third of all persons served (Mathematica Policy Research, 2013). In

a more recent study conducted by the Institute for Community Inclusion (ICI), the majority of VR closures for fiscal year 2009 were youth age 16 to 26. Among all the closures in 2009, 64% were transition-age youth between 16 and 26 years of age (Butterworth et al. 2011). Within this report, ages 25 and 26 exceed the age range of transition-age youth defined for this review of literature. In summary, the prevalence of transition-age youth with disabilities seems to comprise about half of the populations of youth served within special education and VR.

Prevalence of Transition-Age Youth with Significant Disabilities

Narrowing the population to focus on persons with significant disabilities who are transition-age is more challenging. Within the VR program, one study examined the impact of three years of rehabilitation legislation that addressed service provision to clients with severe (i.e., significant) disabilities. The results indicated that VR administrators' and counselors' perceptions of increased services to this population matched the RSA-911 data that showed an overall increase of clients categorized as having severe disabilities (Whitney-Thomas, Timmons, Gilmore, & Thomas, 1999). These data reflect the legislative time period of the amendments to the Rehabilitation Act (1992 and 1998) when the VR program placed a priority on serving individuals with severe and most severe disabilities. In more recent VR data from the RSA-911, the Institute for Community Inclusion has reported that the prevalence of individuals with significant disabilities has been fairly consistent during the past 15 years while the percentage of persons in this category who achieve a competitive employment outcome has decreased (Butterworth, Smith, Hall, Migliore, & Winsor, 2010).

The U.S. Census Bureau has attempted to identify persons with disabilities based on the severity of disability through conducting the SIPP. In use since 1984, the SIPP uses a multistage-stratified survey design that identifies panels of households for multiple monthly interviews. The

SIPP identifies individuals with severe (or significant) disabilities based on survey responses to the need for assistance with activities of daily living (e.g., getting around inside the home, getting in or out of bed or a chair, bathing, dressing, eating, or toileting) and instrumental activities of daily living (e.g., going outside the home, managing money and bills, preparing meals, doing light housework, taking prescription medicines, or using the telephone) (Brault, 2012). In addition, 11 of 23 measures indicate a severe disability relative to a respondent's age group (Brault, 2012). Based on respondents who indicated needing assistance with one or more activities of daily living or instrumental activities of daily living, an estimated 12.3 million (4.4%) of persons age 6 and older had a severe disability.

In summary, transition-age youth with disabilities comprise somewhere between 5% and 24% of the U.S. population of transition-age youth. Within this population, it is difficult to identify the prevalence of youth with significant disabilities due to the variations in how significance is defined. Special education programs under Part B of IDEIA and VR are two primary federal programs that serve millions of young people with disabilities each year. These two programs' populations overlap to create the group of youth with disabilities who are transitioning from school to post-school activities. This large group of transition-age youth with disabilities represents almost one half of all persons served within each program.

Such a high percentage may be reasonable given that Part B of IDEIA serves a 19-year span of ages and the secondary transition years cover about half of that time. However, within VR, the prevalence of transition-age youth far outweighs the prevalence of all other age groups considering the sixty or more years of the lifespan that VR serves. As a result, services for transition-age youth and young adults are a significant demand within VR. Understanding how

VR collaborates with special education to serve this population requires significant attention. The impetus for this collaboration rests heavily in the legislative history of both programs.

Legislation

The foundation for serving transition-age youth with disabilities rests in the historical context of the disability rights movement and the legislation that developed as a result. Developments that effect this population stem from education, rehabilitation, employment, and intellectual and developmental disabilities (IDD) legislation. Prior to the passage of key legislation, there were landmark Supreme Court decisions that spurred the entire disability rights movement. Case law and legislation across the decades since the 1950s provides the historical context for services provided to individuals with disabilities, including transition-age youth with significant disabilities.

The Civil Rights Movement, and some of the events around it in the 1950s and 1960s, laid considerable groundwork for disability rights. The Supreme Court's ruling in *Brown v. the Board of Education of Topeka Kansas* (1954) set the stage for educational reform for youth with disabilities by ruling that separate but equal educational facilities and programs for children of different races was inherently unequal. While this was viewed as civil rights legislation, it also provided the basis for objections to excluding or segregating students with disabilities. A few legislative events in the 1960s improved access to educational services for children with disabilities. The Elementary and Secondary Education Act (ESEA) of 1965 established federal aid to states for special instruction of economically disadvantaged students. This funding impacted students with disabilities because, unfortunately, many of these students live in impoverished conditions (Hughes & Avoke, 2010). Individuals with disabilities are more than twice as likely to have a household income that is below the federal poverty level than those

without disabilities (Harris Interactive, 2010). Amendments to Title I of the ESEA (1965) established funds for state operated programs for the handicapped [sic]. The 1968 amendments to the ESEA established a discretionary grant program to serve handicapped [sic] children.

Some of the most significant reforms occurred in the 1970s across education, rehabilitation, and developmental disabilities. To begin with, the Education of the Handicapped Act was passed in 1970. This act consolidated Title VI of the ESEA within the discretionary grant programs of the new legislation, expanded state grant programs for handicapped [sic] children, and also established grants to colleges to train special education teachers. The Developmental Disabilities Services and Construction Act of 1970 also impacted transition-age youth because it created a federal program and funding stream targeted to persons with developmental disabilities (DD). Though this Act created services for anyone with DD, regardless of age, part of the definition of DD was a requirement that the onset of DD occurred at birth or prior to age 18. Not long after the passage of the Education of the Handicapped Act, the Supreme Court ruled on the two most significant court cases that laid the foundation for equal access in education: *The Pennsylvania Association for Retarded Children v. The Commonwealth of Pennsylvania* (1971) (PARC) and *Mills v. The Board of Education of the District of Columbia* (1972).

In PARC, the Court ruled that students with mental retardation [sic] in Pennsylvania had been denied their 14th amendment right to a free public education. The Court ruled that students with disabilities had a right to free public education in the least restrictive setting. In the Mills case, another class action suit, the Court ruled that students with disabilities (i.e., mental retardation [sic], hyperactivity, epilepsy, and physical impairments) had also been denied public education in violation of the 14th amendment. Additionally, the Court's ruling created due

process safeguards for this population of children (Yell, 2006). Immediately, these two cases recognized the Constitutional rights of school age children with disabilities and initiated a watershed of other significant legislation beyond education.

Section 504 of the Rehabilitation Act of 1973 was the first nondiscrimination legislation passed for people with disabilities, though its scope was limited to the public sector. Section 504 had implications for transition-age youth with disabilities because it prohibited discrimination in public programs and services that received federal funding (e.g., public schools). Students who did not require special education services under an IEP could still receive accommodations under the requirements of Section 504.

In 1974, the basic rights that were established from PARC and Mills were incorporated into The Education for All Handicapped Children Act (EAHCA), which was passed in 1975. This legislation established the right of all children with disabilities to receive free appropriate public education in the least restrictive environment. Students with disabilities were required to have an IEP. Also, special education programming had to follow six principles: zero rejection, protection in evaluation, free appropriate public education, a continuum of services provided in the least restrictive environment to the maximum extent possible, procedural safeguards, and parental participation (EAHCA, 1975). With the foundation for equal access established, subsequent amendments and legislation could address more targeted areas of special education such as transition.

Also, in 1975 the Developmental Disabilities Assistance and Bill of Rights Act (i.e., The DD Act) was passed. This act addressed transition-age youth because it established five essential services that were basic rights for anyone with DD (i.e., including young adults). These basic rights were: residential services, employment, treatment, transportation, and leisure. These rights

as they applied to high school students and young adults with DD, emphasized the importance of services that went beyond education and continued into adult life.

In 1978, the DD Act was amended and renamed the Rehabilitation, Comprehensive Services, and Developmental Disabilities Act. This DD legislation impacted young adults with disabilities because it extended the timeframe of establishing a DD diagnosis to age 22. The extension to age 22 highlighted the importance of looking beyond the typical age range of secondary school to include the early years of young adulthood. This development was highly relevant for young adults with disabilities who were in their early 20s, particularly those with significant and most significant disabilities because it addressed the importance of services during these early adult years. The 1978 amendments to the DD Act also created protection and advocacy agencies in each state. Protection and advocacy agencies could advocate for the legal rights of individuals with DD, including advocacy within public school systems.

With the rights of persons with disabilities established by events in the 1970s, the 1980s represented a time of capacity building and targeted services. The 1983 amendments to the EAHCA created optional model transition programs to help transition-age youth with disabilities prepare for employment, independent living, and postsecondary education. These amendments also addressed services for youth with significant disabilities because it established independent living as a component of students' transition programs. In 1984, the Carl D. Perkins Vocational Education Act mandated equal access to recruitment, enrollment, and placement in vocational education. In addition, 10% of funds under this act were set-aside for students with disabilities. In 1986, the amendments to the Rehabilitation Act established supported employment as a competitive employment outcome. These amendments further demonstrated Congress' recognition of the importance of serving people with significant disabilities because supported

employment services could only be provided to eligible individuals with the most significant disabilities. With these amendments, youth and young adults with disabilities could receive comprehensive employment services that addressed their need for long-term support.

The 1990s brought significant changes for secondary education students with disabilities. First, the Individuals with Disabilities Education Act (IDEA) of 1990, formerly called the EAHCA, changed the name of the legislation to show that special education was also focused on older students by eliminating “children” and using “individuals” in the title. Additionally, the IDEA mandated that transition services be added to students’ IEPs and added VR as a related service within students’ special education programs. These additions to the legislation emphasized the importance of serving young adults with disabilities as they prepared for life beyond high school. Also in 1990, the Americans with Disabilities Act (ADA) was enacted. This law impacted youth and young adults with disabilities because it extended non-discrimination to the private sector. Through the provisions in Title I of the ADA regarding employment, young adults with disabilities could plan for and request reasonable accommodations at their job (PL 101-336, 104 Stat. 327). Though the accommodations that a student received during secondary school were not guaranteed in private sector employment, the passage of the ADA created the opportunity for students and IEP teams to discuss, plan, and work toward implementing reasonable workplace accommodations. Suddenly, students had an opportunity for access and equal access beyond what they experienced in secondary education.

The remainder of the 1990s was characterized by key amendments to existing legislation in both rehabilitation and special education. The 1992 amendments to the Rehabilitation Act impacted VR’s young adult population through the introduction and emphasis on a career perspective for consumers’ employment goals. Such a perspective created the opportunity for

more post-secondary education services as part of a consumer's Individualized Plan for Employment (IPE). The 1992 amendments also impacted young adults with significant disabilities because a priority was placed on serving consumers who had severe disabilities and created a new category within VR to serve consumers with the most severe disabilities. Prior to this, persons with severe disabilities, including young persons, were frequently determined ineligible because counselors had to assess the feasibility of employment. With these amendments, counselors were to consider any individual who met the eligibility criteria as being feasible in their ability to achieve an employment outcome (Callahan, Griffin, & Hammis, 2011). Subsequently, VR services for youth with disabilities were expanded through the emphasis on and inclusion of individuals with significant (or severe) disabilities.

In 1997, the IDEA was amended so that students' IEPs included Individualized Transition Plans. This ensured that all secondary age students with IEPs were entitled to transition services and were moving toward an adult outcome of some kind. Additionally, these amendments to the IDEA recognized the importance of beginning transition services early and required transition to begin no later than age 14. For many transition-age youth in secondary education, this would mean beginning transition planning in late middle school or early high school, depending on their matriculation through their school system.

Young adults with significant disabilities who received benefits from Social Security were impacted positively with legislation in the 1990s. The 1998 amendments to the Rehabilitation Act (i.e., the Workforce Investment Act) emphasized high quality employment outcomes, and established presumed eligibility for persons who received Supplemental Security Income (SSI) and/or Social Security Disability Insurance (SSDI). Such changes greatly increased this population's access to VR services as many VR applicants with significant disabilities were

determined ineligible prior to the 1992 and 1998 amendments. Additionally, the Ticket to Work and Work Incentive Improvement Act of 1999 also improved access to VR, and other employment networks for individuals receiving SSI and/or SSDI. This act affected youth in transition with significant disabilities because it removed the barrier that required young people and their parents/guardians to choose between healthcare coverage and work.

Special education reform continued into the 21st century. In 2001, Congress passed the No Child Left Behind Act (NCLB), with the goal of increasing the academic achievement of all public school students, including students with disabilities. In addition, schools were required to adopt scientifically based instructional practices in all aspects of education (e.g. assessment, instructional methods, classroom management techniques, and educator's professional development activities). Schools needed to base educational practices on scientifically proven research to improve academic performance (Yell, 2006). Also in 2001, the President's Commission on Excellence in Special Education recommended that special education services be results-oriented, embrace a model of prevention and not a model of failure, and consider children with disabilities as general education children first (U.S. Department of Education, 2002). After seven years of mandated transition planning by age 14, the Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 increased the minimum age to 16, though states could begin earlier if the IEP team agreed that it was necessary.

In an effort to align the IDEA with NCLB, the IDEIA required a results-oriented process for transition planning. NCLB required states to establish yearly standards (i.e., annual yearly progress) and assessments to determine if schools met annual yearly progress. Essentially, NCLB required schools to demonstrate results. Students with disabilities were included in the statewide assessments and their results were included in schools' data. Additionally, the IDEIA introduced

Performance Goals and Reporting (i.e., P-20 indicators) to increase accountability for results. Four of the 20 indicators relate to transition (i.e., Indicators 1, 2, 13, and 14). Indicator 1 requires states to report the graduation rate of students with IEPs compared to all other youth in the state. Indicator 2 addresses the dropout rate of students with IEPs compared to all other students. Indicator 13 requires school systems to report the percent of students aged 16 and older with an IEP that included coordinated, measurable, annual IEP goals and transition services that would reasonably enable the students to meet their post-secondary goals. Indicator 14 addresses students' post-school outcomes. School systems had to begin reporting the percent of students who had IEPs, were no longer in secondary education and who had been competitively employed, enrolled in some type of postsecondary school, or both, within one year of leaving high school. Finally, the IDEIA reiterated the importance of producing meaningful post-secondary education, employment, and independent living outcomes (PL 108-446, 118 Stat. 2647). The increased accountability for measurable outcomes was intended to improve outcomes for transition-age youth with disabilities.

The historical context of disability legislation for youth with disabilities provides the framework for discussing the services that are available to and provided for young adults with significant disabilities. As students within this group move from school to post-school activities, most will have employment as a goal (Luecking, 2009; Wehman, Inge, Revell, & Brooke, 2007). There are three main programs that support or provide services toward the employment of youth with significant disabilities: special education, VR, and intellectual/developmental disabilities (IDD). Each entity defines disability given the context of the population that is served. The services each group provides are also unique due to the goals of each program. However, all

three entities are charged with providing a coordinated set of services to assist transition-age youth with significant disabilities as they move from school to adult life.

Services Provided to Youth with Significant Disabilities

Special Education Services

The main purpose of the IDEIA (2004) is “to ensure that all children with disabilities have available to them a free appropriate public education that emphasizes special education and related services designed to meet their unique needs and prepare them for further education, employment, and independent living” [(Title 20, Chapter 33, 20 U.S.C. Section 1400 (d)(1)(a)]. Special education is defined as “specially designed instruction, at no cost to parents, to meet the unique needs of a child with a disability, including (a) instruction conducted in the classroom, in home, in hospitals and institutions, and in other settings and (b) instruction in physical education” [(Title 20, Chapter 33, Subchapter 1, 20 U.S.C. Section 1401 (29)(A)(B)]. Through special education services under Part B of IDEA, students with disabilities age three to 21 receive special education and related services as part of an IEP. Transition services are a required component of a student’s IEP by the time they reach age 16.

Transition services must be provided within a results-oriented process that is focused on both academic and functional achievement. The post-school activities that are targeted can include postsecondary education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation. Additionally, the services and outcomes that are listed must be based on the individual student’s needs, strengths, preferences, and interests (IDEIA, 2004). Within IDEIA, special education is defined for all children with disabilities. However, the term “related services” may shed more light on the types of services that are available to students with

significant disabilities. Additionally, VR services can be listed as a “related service” within a student’s IEP and transition plan.

Related services include transportation and the broad category of “developmental, corrective, and other supportive services.” Within this second category, services include speech-language pathology and audiology services, interpreting services, psychological services, physical and occupational therapy, recreation (including therapeutic recreation), social work services, school nurse services (to enable free appropriate public education within an IEP), counseling services (including rehabilitation counseling), orientation and mobility services, and certain medical services (IDEIA, 2004). There is no requirement of a severity or significance level of disability to receive any of the developmental, corrective, or other support services that are categorized as related services. However, the students who receive these services may likely have significant disabilities and subsequently require related services to benefit from special education. The legislation’s recognition of these services seems to acknowledge the importance of serving students with more significant needs.

In addition, the IDEIA acknowledged students with significant disabilities through regulations that permitted states to develop alternate academic achievement standards. An alternative academic achievement standard was defined as “an expectation of performance that differs in complexity from grade-level achievement standard” [Title I-Improving the Academic Achievement of the Disadvantaged, Final Rule 34 C.F.R. Section 200 (2003)].

A variety of special education services are provided to support students’ goals of employment. One primary service that is supported by research is community-based vocational instruction (CBVI) (Agran, Snow, & Swaner, 1999; Clark, Field, Patton, Brolin, & Sitlington, 1994; Cook, 2002; Inge & Dymond, 1994; White & Weiner, 2004). CBVI trains students in real

work environments in integrated community settings (Kim & Dymond, 2010). With CBVI, students with disabilities receive repeated instruction on vocational and other job related skills in community settings (Kim & Dymond, 2010). CBVI begins with job sampling in a variety of areas that increases students' career awareness, develops employment skills, and helps them identify the types of work they might like to pursue in the latter years of their secondary experience (Banks & Renzaglia, 1993; Test, Aspel, & Everson, 2006; Wehman, 2006). CBVI can include paid and non-paid work (e.g., volunteering), job shadowing, or internship programs (Test et al., 2006). As students experience a variety of real work situations, they learn essential job skills as well as socially appropriate work behaviors (Luecking & Fabian, 2000). Services provided through CBVI allow students with disabilities to apply the knowledge and skills they may have gained through other special education services delivered in accordance with their IEP (Agran et al., 1999; Benz, Lindstrom, Unruh, & Waintrup, 2004; Test et al., 2006; Wehman, 2006). CBVI provides a logical opportunity for VR counselors to work together with special educators and collaborate for a common goal.

Vocational Rehabilitation Services

Until the passage of the IDEIA in 2004, the definitions of transition within special education and VR were aligned. Previously, the IDEA amendments of 1997 defined transition as it is still defined within the Rehabilitation Act:

a coordinated set of activities for a student, designed within an outcome-oriented process, that promotes movement from school to post school activities, including postsecondary education, vocational training, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation. The coordinated set of activities shall be based upon the individual student's needs, taking into account the student's preferences and interests, and shall include instruction, community experiences, the development of employment and other post school adult living objectives, and, when appropriate, acquisition of daily living skills and functional vocational evaluation.

Within the definition of transition in the IDEA amendments of 1997, “related services” are included within the list of services provided to students. Rehabilitation counseling from VR is an example of a related service.

The IDEIA also changed the age for implementing transition services within a student’s IEP. The IDEA of 1997 mandated that IEPs should contain a statement of transition service needs beginning at age 14. The IDEIA of 2004 requires transition services to be in effect before students turn age 16 and be a part of their IEP. Almost half the states kept the initial transition planning age at 14 (Test & Grossi, 2011). Regardless of these changes within special education legislation, the Rehabilitation Act does not mandate a minimum age to begin working with transition-age youth. Such policies vary by state and across VR’s 80 agencies. Instead of providing services that add-on to a student’s existing IEP transition goals, VR counselors can be involved early in the planning process so that they play an active role in developing post-school goals (Lamb, 2003). This way, the VR counselor may be able to identify and provide the services necessary to support such goals in a more timely and integrated manner.

Other changes to the IDEIA of 2004 related to increased accountability and improved student performance. These changes were implemented so that the IDEIA more closely aligned with the No Child Left Behind Act of 2002. The IDEIA requires special education programs to use scientifically based practices and employ highly qualified teachers (Yell, 2006). The shift in focus on results, achievement, and accountability is also evident within the new definition of transition services under the IDEIA. The latter part of the definition is still consistent with the IDEA of 1997 and the Rehabilitation Act. However, the beginning was altered to:

a coordinated set of activities for a child with a disability that is designed to be within a results oriented process, that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child’s movement from school to post-school activities... [IDEIA, 2004; 20 U.S.C. 1401(34)].

Accountability and the need for evidence-based practice also exist within VR. Title II of the Rehabilitation Act amendments of 1998 addressed scientifically based practices within the provisions for research and training. This title of the act ensured that research within VR would be conducted to “identify effective strategies that enhance the opportunities of individuals with disabilities to engage in employment” [Title II, Section 200(5)]. In fact, the National Institute on Disability and Rehabilitation Research (NIDRR) is mandated to “conduct research to examine the relationship between the provision of specific services and successful, sustained employment outcomes” [Title II, Section 202(b)].

In addition to the legislation governing VR services, the Commission on Rehabilitation Counselor Certification (CRCC) addresses how rehabilitation counselors should utilize scientifically based practices. The CRCC is the organization charged with establishing professional standards in the field of rehabilitation counseling. Section D of the CRCC *Code of Professional Ethics for Rehabilitation Counselors* (2010) contains six subsections regarding professional responsibility. The final subsection is devoted to scientific bases for interventions and states “rehabilitation counselors use techniques/procedures/modalities that are grounded in theory and/or have an empirical or scientific foundation” (p. 13).

VR services for persons with significant and most significant disabilities are guided by the legislative priority placed on serving these consumers. Specifically, when states do not have sufficient funds to serve all eligible individuals, they must implement an order of selection and place priority on serving those with the most significant disabilities [Rehabilitation Act, Section 101(a)(5)(A)]. Though consumers with significant disabilities may receive any VR service, the services within the Rehabilitation Act that are provided specifically to persons with the most significant disabilities are supported employment and extended services. Results from a national

survey of state VR agencies indicated that there is wide variability across VR's 80 agencies regarding the emphasis on supported employment as well as how each state defines this service (Haines et al., 2012). This finding may be surprising given the clear definition of supported employment that is provided within the Rehabilitation Act.

Supported employment is defined as:

competitive work in integrated work settings, or employment in integrated work settings in which individuals are working toward competitive work, consistent with the strengths, resources, priorities, concerns, abilities, capabilities, interests, and informed choice of the individuals, for individuals with the most significant disabilities--

for whom competitive employment has not traditionally occurred; or

for whom competitive employment has been interrupted or intermittent as a result of a significant disability; and

who, because of the nature and severity of their disability, need intensive supported employment services for the period, and any extension, described in paragraph (36)(C) and extended services after the transition described in paragraph (13)(C) in order to perform such work [Rehabilitation Act, Section 7 (35)(A)(i)(I)(II)(ii)].

Extended services are provided as the component of supported employment that allows support to be continued beyond VR's time limited service. VR can provide funding for supported employment for up to 18 months: though in some circumstances this time can be extended. Job stability is the goal of supported employment and is provided to persons with the most significant disabilities. Even though a person is considered stable on his or her job, supported employment requires on-going support beyond the point of stability so that he or she can maintain their job. With very few exceptions, VR state agencies do not provide funding for these on-going supports (also called extended services or extended supports). Once job stability is achieved, other state agencies must provide the funding (Haines et al., 2012). Within the legislation, extended services are formally defined as:

on-going support services and other appropriate services, needed to support and maintain an individual with a most significant disability in supported employment, that a) are provided singly or in combination and are organized and made available in such a way as to assist an eligible individual in maintaining supported employment; b) are based on a determination of the needs of an eligible individual, as specified in an individualized plan for employment; and c) are provided by a State agency, a nonprofit private organization, employer, or any other appropriate resource, after an individual has made the transition from support provided by the designated State unit [Rehabilitation Act, Section 7 (13)(A)(B)(C)].

The last statement regarding the “transition from support” addresses the change to extended services funding after VR consumers achieve job stability. Funding for the extended services that are needed to maintain their job can come from a variety of state sources. In a national survey of supported employment providers, the most frequently reported funding sources for extended services (in order) were: Medicaid Home and Community Based Waivers, Social Security work incentives, DD general revenue, and mental health general revenue (Haines et al., 2012).

Federal legislation requires VR to provide supported employment services as part of a collaborative effort with other agencies and service providers (34 CFR 363.50).

After the 1986 amendments to the Rehabilitation Act, federal funding for supported employment programs increased states’ capacity to serve persons with the most significant disabilities. These individuals had previously been un-served and underserved. Through supported employment, more people gained access to integrated employment (Callahan, Griffin, & Hammis, 2011).

Often, VR provides supported employment services through partnerships with community rehabilitation programs (CRPs) (Haines et al., 2012). There are approximately 12,000 CRPs across the U.S. providing a variety of services to individuals with disabilities (Haines et al., 2012). The Institute for Community Inclusion surveyed a representative sample of these CRPs ($n = 3,551$) and 83% reported providing individualized supported employment services. Other employment services reported included group models of supported employment

(i.e., an enclave model), transitional employment for persons with mental illness, competitive employment with time-limited supports (i.e., for those with less significant disabilities who do not require extended services), and facility-based (i.e., non-integrated employment) (Haines et al., 2012).

Though research has shown that supported employment services are stagnating or declining (Callahan et al., 2011; Haines et al., 2012), research has also found a statistically significant association between CRPs that have experienced a growth in supported employment and their partnership with VR. “The proportion of CRPs serving VR-funded customers increases as individual employment services increase” (Haines et al., 2012, p. 24). Among the primary state agencies that provide public employment services (i.e., VR, IDD, mental health, and welfare) and provide funding for supported employment, VR supports the highest percentage of integrated employment outcomes. Likewise, VR supports the smallest percentage of facility-based work (Haines et al., 2012). These findings suggest that VR is a critical agency involved in supporting integrated and competitive employment outcomes for persons with the most significant disabilities.

In addition VR’s partnerships with IDD agencies provide further opportunities for improving employment outcomes for persons with significant and most significant disabilities. However, collaboration between these agencies is often difficult due to disagreements about the population served, varying levels of commitment to employment as the primary goal, differences in agency culture, and differences in funding mechanisms (Timmons, Cohen, & Fesko, 2004). However, in states with IDD agencies that have high rates of participation in integrated employment as well as high rates of growth in integrated employment, collaboration between VR

and IDD agencies has proven to be an important variable that supports positive employment outcomes (Boeltzig, Timmons, & Marrone, 2008).

Intellectual and Developmental Disabilities Services

The Administration on Intellectual and Developmental Disabilities (AIDD) is the guiding federal agency for policy and service provision for individuals with IDD. Due to the functional limitations imposed by disabilities that would meet the criteria for IDD, those who receive services through IDD agencies could be regarded as having significant or most significant disabilities. Transition-age youth with disabilities may receive services as part of the federal IDD program, funded by the AIDD. Developmental disability is defined as

a severe, chronic disability that is attributable to a mental or physical impairment or combination of mental and physical impairments that manifests before age 22, is likely to continue indefinitely, and results in a substantial functional limitation in three or more major life activities (42 U. S. C. Section 15002).

This functional definition of DD has implications for the population of transition-age youth with disabilities as many, regardless of their diagnosis, may have disabilities that meet these criteria.

In addition, the identification of DD would occur during a student's educational years, including the years encompassing secondary transition.

Funding from AIDD supports organizations in every state so that persons with DD have access to inclusive community living. The DD Act establishes the funding stream for AIDD and in the most recent reauthorization (2000) the DD Act clarifies its purpose to:

assure that individuals with developmental disabilities and their families participate in the design of and have access to needed community services, individualized supports, and other forms of assistance that promote self-determination, independence, productivity, and integration and inclusion in all facets of community life, through culturally competent programs (42 U.S.C. Section 15001).

This purpose clearly impacts transition-age youth with DD and has implications for both school and post-school activities. The promotion of self-determination, independence, productivity,

integration, and inclusion are consistent with the policies and goals of both special education and VR as they also serve this population.

AIDD oversees four grant programs: State Councils on Developmental Disabilities; State Protection and Advocacy Systems; University Center for Excellence in Developmental Disabilities Education, Research and Service (UCEDDs); and Projects of National Significance (AIDD, 2013). State Councils provide a planning body for each state regarding IDD policy and work to advocate for IDD services, including special education and VR. The Councils coordinate activities in partnership with their respective Protection & Advocacy System and UCEDD.

AIDD's Protection & Advocacy Systems impact transition-age youth as they provide significant advocacy and legal aid for students and families facing educational issues. Their advocacy supports the rights of students to receive an appropriate education in an inclusive setting. In 2011, the Protection & Advocacy Systems served 6,580 students with disabilities, advocating for their right to receive education and support in reaching their goals (AIDD, 2012b). These advocacy efforts may pave the way for younger students with disabilities as they begin to move into their secondary transition years and initiate their plans for adulthood.

The state UCEDDs conduct research on a variety of topics relative to persons with DD and are often housed within state universities that have a medical college. Their findings have implications for service delivery and often have implications for transition-age youth. Each state has at least one UCEDD and a few states have two.

AIDD funds are awarded to state IDD agencies using a formula grant based on each state's population, prevalence and need for IDD services. State IDD agencies then issue requests for proposals (RFPs) that ask potential grantees to propose initiatives and activities that are

consistent with AIDD's purpose. The grants that are awarded vary widely, but recent awards have heavily focused on transition-age youth (AIDD, 2012a).

In October 2012, AIDD awarded \$930,000 in grant funding to support competitive integrated employment outcomes, focusing on youth with significant IDD. In 2011, AIDD provided \$3 million in funding for employment initiatives that targeted youth with IDD (AIDD, 2012a). These initiatives, across all states, may have significant implications for improving the employment outcomes of transition-age youth with disabilities, including those with significant and most significant disabilities.

Funding from AIDD can benefit transition-age youth with significant disabilities who are using supported employment services that are often initiated by VR agencies. VR funds are time limited and do not continue after a consumer's case is closed (Haines et al., 2012). However, continued funding is needed for individuals who require extended services within the context of supported employment. As previously mentioned, VR provides supported employment in collaboration with other agencies through formal cooperative agreements (Haines et al., 2012). State IDD agencies are often involved in these cooperative agreements with VR and can provide funding for extended services through state IDD funds, including their administration of the Medicaid Home and Community Based Services (HCBS) Waiver program (Butterworth et al., 2012). In a national survey of state IDD agencies, 93% use the HCBS waiver to provide ongoing employment support for workers with IDD (Haines et al., 2012). However, many states have a waiting list for the HCBS waivers, resulting in limited access to integrated employment because guaranteed funding for extended services can preclude VR's support and funding for the beginning stages of supported employment (Haines et al., 2012). In addition to employment

services, states can provide a variety of other services to individuals with significant and most significant disabilities using the Medicaid system.

Medicaid

Medicaid is a significant source of funding for services to persons with significant and most significant disabilities. Medicaid provides health coverage and long-term services and supports through a variety of delivery systems. Coverage primarily relates to health care, but the Social Security Act authorizes states to apply for waivers so that there is flexibility in how funds can be used, including Medicaid funding for people with significant disabilities. Eligibility criteria vary by state. However, most states recognize any individual who receives SSI as eligible to receive Medicaid. The Medicaid waivers vary greatly by state with regard to the populations served (i.e., the disability diagnosis criteria) as well as the services approved for each waiver.

For transition-age youth with significant disabilities who have employment as a goal, most states have a Medicaid waiver that can provide funding for services that support integrated employment. Such services could include case management, service coordination, and integrated community employment (e.g., supported employment). A majority of states have waivers that include one or more of these services for persons with a diagnosis of MR [sic], ID, DD and/or autism. A majority of states' waivers for those with IDD serve all ages. Arizona, Tennessee, and Vermont are the only states that do not currently have a home or community-based waiver such as these described (Centers for Medicare and Medicaid Services, 2013).

Medicaid also uses funds for waivers (i.e., HCBS waiver) to support integrated employment that is often associated with supported employment. Other services separate from integrated employment can also be funded through Medicaid waivers. Individuals with significant and most significant disabilities may also receive services such as community-based

non-work, facility-based work, and facility-based non-work. Community-based non-work can include recreation, skills training, or volunteer activities that assist persons with community integration and participation (ICI, 2001). Facility-based work is employment in a facility where persons with disabilities require on-going support and supervision. The majority of people who work in these settings have a disability. Therefore, this does not constitute an integrated setting (ICI, 2001). Finally, facility-based non-work includes skills training, activities of daily living, recreation and/or professional therapies in a facility where a majority of individuals have disabilities (i.e., not an integrated setting). Facility-based non-work is often referred to as day activity or day habilitation (ICI, 2001). Types of Medicaid waivers and the funding available for each vary widely across the nation because Medicaid is a state program.

Transition-age youth with significant disabilities have a wide array of services available through special education, VR, IDD agencies, and Medicaid. These services and systems often overlap. Their collaboration has demonstrated improved employment outcomes for youth with significant ID. The Transition Services Integration Model (TSIM) was first implemented in 1994 as a model demonstration project to build a seamless transition model (Certo et al., 2009). The TSIM integrated school and adult service systems prior to students' graduation (Certo et al., 2009). Five years of employment outcome data from the TSIM showed that students who received integrated services from special education and adult service agencies (i.e., IDD agencies, VR, and/or Medicaid) maintained integrated employment after high school. Additionally, their employment rates were consistently higher than the national average for students with ID (Certo et al., 2009). The TSIM is just one example of a service model that has been implemented to serve youth with significant disabilities.

Service Models for Youth with Significant Disabilities

Services for transition-age youth with significant disabilities have been provided in a sequential rather than an integrated fashion. The lack of a cohesive service delivery system has caused a disjointed, uncoordinated, and an often interrupted set of services as students work towards their transition from school to adulthood. In addition, this lack of coordination may result in disappointing employment outcomes (Certo & Luecking, 2006). Most students with disabilities set their primary goal as employment within a competitive setting as opposed to working in a segregated day program (Luecking, 2009; Wehman et al., 2007). Service delivery for students with significant ID has shifted from academic to functional skills education or community-based instruction to teach life skills (Certo & Luecking, 2011). Additionally, person-centered planning is also a focus of service delivery. Such planning requires professionals to focus on students' unique interests, preferences, strengths and weaknesses (Certo & Luecking, 2011). Service providers must work together to provide services that integrate employment goals within the context of a student's overall goals for their adult life after graduation. This kind of collaboration is consistent with the definition of transition in the Rehabilitation Act as well as the IDEIA.

The definitions of transition services are similar between rehabilitation and special education legislation. Over the years, there has been an attempt to align legislation with each field that affects transition-age youth. According to Kohler (1998), one possible goal for this realignment was to increase collaboration and remove barriers between the two entities so that students with disabilities could access coordinated transition services. Transition-age youth with significant disabilities receive special education and can apply for VR services. The partnership

between special education and VR represents interagency collaboration, which is an evidence-based predictor for positive post-school outcomes (Test & Cease-Cook, 2012).

Further opportunity for interagency collaboration for this population exists with state IDD agencies through the services and funding these agencies can provide. Certo & Luecking (2011) have gone so far as to suggest that the IDEIA, DD Bill of Rights Act, and the Rehabilitation Act should be amended so that service integration is mandated. Such amendments would improve employment outcomes and ensure that the long-term support needs are met in adulthood (Certo & Luecking, 2011). In order for service integration to be successful, it seems all three systems should begin working together early in a student's secondary school experience. However, funding issues may present a barrier to this collaboration.

Some states have addressed the potential barriers to this kind of interagency collaboration. Minnesota has established a collaborative planning process for transition-age youth with mental health disabilities. Partnerships exist between VR, the department of education, the IDD agency, the mental health agency, and individual schools (Haines et al., 2012). Vermont's VR program has strong collaboration with its CRPs as well as a highly effective statewide program for youth called Jump on Board for Success (Haines et al., 2012). Some local education authorities even provide the funding required for extended services for transition-age youth who exited the VR system using supported employment (Haines et al., 2012). As part of an integrated service delivery model, Maryland, California, Tennessee, Virginia, and Florida have also participated in collaborative transition practices involving special education, VR, CRPs, and state IDD agencies (Certo & Luecking, 2006). All of these collaborative efforts represent an emphasis on employment as a goal for transition-age youth with significant and most significant disabilities.

Interagency collaboration has been discussed as a best practice for transition services for many years (Furney, Haszai, & Destefano, 1997; Kohler, 1996; Oertle & Trach, 2007; Test & Cease-Cook, 2012). Within this context, collaborative models for serving transition-age youth with significant and most significant disabilities have been developed to improve employment outcomes for this population (e.g., the TSIM, the Bridges Program, and the Youth in Transition Program). Research supports the effectiveness of these models (Benz et al., 2000; Certo & Luecking, 2006; Certo & Luecking, 2011; Luecking & Fabian, 2000). Additionally, Employment First is a national movement and policy initiative that originated to address the discrepancy in integrated as opposed to facility-based services and outcomes for persons with the most significant disabilities.

Some models of transition programs have recognized the importance of developing adult skills and real work experiences while students are still in secondary education: The Bridges Program, the Youth Transition Program (YTP), and the TSIM. According to Luecking & Fabian (2000), the “Bridges... from school to work program” (p. 205) started in Montgomery County, Maryland in 1989. The Marriott Foundation for People with Disabilities operates the project to provide high quality employment experiences and opportunities for transition-age youth in special education. The Bridges Program focuses on developing paid internship experiences for students with disabilities during their last year of high school. Students receive intensive support throughout the three phases of the program: pre-vocational orientation, pre-vocational preparation, and internship (Luecking & Fabian, 2000).

Findings from a study of Bridges participants revealed promising results (Luecking & Fabian, 2000). Among 1,586 participants representing seven urban cities across the U. S., an overwhelming majority (i.e., 75%) of the participants who completed internships were offered

positions with their host company. Likewise, this study found that the strongest predictor for maintained employment at 6 and 12 months post internship was completing the internship through the Bridges Program (Luecking & Fabian, 2000). The researchers who conducted the study recommended that schools include organized paid work throughout students' secondary education years so that competent work behaviors are strengthened (Luecking & Fabian, 2000). VR services could be utilized to coordinate high school internships. Such findings suggest that coordinating VR services within students' special education experience throughout high school may benefit students' employment outcomes.

The YTP is another promising program for youth and young adults with disabilities. YTP originated in Oregon in the early 1990s and represents collaboration between the Oregon Department of Education, the Oregon Office of Vocational Rehabilitation Services, the University of Oregon, and statewide school districts in Oregon. YTP serves transition-age youth with a variety of disabilities to achieve employment or post-secondary training to obtain employment. The students served require additional support, beyond what is available through their local school system. YTP services are provided during the last two years of secondary education and continue into the initial years of transition beyond high school. YTP services are comprehensive and can include: individualized planning, coordination with community agencies, independent living, social skills instruction, career development services, job assessment and training, individualized mentoring, and one year employment follow-up (University of Oregon, 2012).

Finally, the TSIM focuses on transition-age youth with significant support needs. It combines the resources and personnel of special education, VR and IDD agencies. These entities work together during students' last year of secondary education to provide a seamless transition

from school to adult life that includes employment. School systems have formal agreements with adult service providers (e.g., CRPs) to provide job search and placement services (i.e., supported employment). Typically, students are hired during their last year of high school. After graduation, VR and the IDD agency coordinate continued funding to support the individual as they maintain the job, with the IDD agency providing on-going support as part of the extended services component of supported employment. Service continuity before and after high school graduation is one of the primary goals (Certo et al., 2003).

The TSIM uses the discovery process for person-centered planning because this is a more appropriate method to assess vocational interests for youth with significant disabilities (Certo & Luecking, 2006). Discovery as a vocational evaluation process requires extensive planning and collaboration with an individual, their family and other professional support personnel who know the individual well. Often, the individual also engages in work sample assessments in real employment settings to determine their skills, abilities, and interests. This process can require many months to complete. All of the information gathered from students' person centered evaluation as well as students' existing supports are integrated and used to tailor the professionals' job search efforts for students (Certo & Luecking, 2011).

After students' job interests are identified, the TSIM encourages job placement occurring as early as possible during students' last year of school (Luecking & Certo, 2003). VR is typically involved with consumers during vocational assessments like those discussed in the TSIM. In the TSIM, these assessments must occur before students enter their final year. In order for VR to be involved at that point, a student would need to apply for VR services during their sophomore year of high school. In a discussion of the TSIM, Certo & Luecking (2006) stated that VR typically opens a case with a student by the start of the student's senior year. The VR

counselor then authorizes services that include post school employment supports. This model is for students with significant disabilities, therefore many, if not most of these students will be aging out of the school system.

The TSIM is labor intensive because career development for youth with the most significant disabilities is inherently a labor-intensive process (Luecking & Certo, 2003). The time required to complete this process may be increased as school systems and VR programs serve many youth with significant disabilities, simultaneously. With this in mind, it would seem beneficial for school systems to begin their collaboration with VR earlier than the last year of school. Service models like the Bridges Program, YTP, and the TSIM have had success in states where they have been implemented and may continue to spread to other states as research continues.

From a national perspective, Employment First is a policy movement that is aimed at addressing the discrepancy in integrated as opposed to facility-based services and outcomes for individuals with the most significant disabilities. Employment First policies seek to facilitate the full inclusion of people with the most significant disabilities in the workplace and community by making community-based, integrated employment the first option for youth and adults with significant disabilities [Office of Disability and Employment Policy (ODEP), 2011]. These policies direct all or most of the funding for day services (e.g., day habilitation) toward integrated community employment (Haines et al., 2012). ODEP created the Employment First State Leadership Mentor Program to assist states as they amend or develop policies that place a funding priority on integrated employment for persons with significant and most significant disabilities.

Washington State was a leader in establishing the Employment First initiative and continues to lead regarding policies and practices that positively impact persons with the most significant disabilities (Haines et al., 2012). Their Working Age Adult Policy states, “supports to pursue and maintain gainful employment in integrated settings in the community shall be the primary service option for working age adults” (Washington State Division of Developmental Disabilities, 2004). Washington’s policy strongly influenced services for individuals with significant disabilities across the country. By early 2011, at least 21 states had a policy, or were developing a policy similar to Washington’s where competitive integrated employment would be the funding priority for services delivered to persons with developmental disabilities (Kiernan, Hoff, Freeze, & Mank, 2011). In 2011, The National Association of Councils on Developmental Disabilities officially endorsed Employment First, stating that it was critical in advancing opportunities for individuals with developmental disabilities. National policy efforts such as this may be essential in improving the outcomes of people with significant and most significant disabilities.

Outcomes

Preparation for employment is a primary focus of many transition services for secondary-school-age youth with disabilities, and achieving employment is the primary transition goal of the majority of secondary students with disabilities served under IDEA (Cameto et al., 2004). Therefore, employment outcomes for transition-age youth with significant disabilities should be measured in order to determine if their goals are being met. Employment outcomes also include outcomes in supported employment. Wages are also an important employment outcome measure.

There is not a single definitive data source that examines all of the employment outcomes for this population. As such, employment outcomes, for this population must be examined from a

host of sources including national population surveys (i.e., the ACS), special education (i.e., the NLTS-2), RSA data, and IDD data. Outcomes from some of the collaborative service models discussed in the previous section will also be included.

The ACS reports average annual earnings using seven earnings categories. A majority (58.3%) of persons with disabilities (age 16 and over) have annual earnings in the bottom three categories (i.e., \$1 to \$4,999; \$5,000 to \$14,999; and \$15,000 to \$24,999) compared to 43.1% of those without disabilities. The annual earnings category for individuals with disabilities with the highest percentage was \$5,000 to \$14,999 (23.3%). For many persons and their families, annual earnings within this range would be at or below the poverty level. Between 2009 and 2010, people with cognitive disabilities who received SSI had the lowest employment rate among all persons with disabilities and were the most likely to live below the poverty level (U.S. Census Bureau, 2010).

From this perspective, individuals with disabilities seem to be at a financial disadvantage. This may be due to differences in employment for this segment of the population. Only 21.5% of persons with disabilities age 16 and over are employed, compared to 58.5% of the total civilian noninstitutionalized population (U.S. Census Bureau, 2010). Persons with significant or severe disabilities have even lower rates of employment.

Results from the U.S. Census Bureau's SIPP revealed there was a significant decrease in the number of adults aged 21 to 64 with severe disabilities who were employed. When comparing employment status by disability, adults with severe disabilities were much less likely to be employed than all other persons with disabilities. Only 27.5% of adults aged 21 to 64 with severe disabilities were employed compared to 41.1% of all individuals with disabilities (Brault, 2012).

Results from the most recent SIPP also reveal alarming numbers regarding long-term unemployment for people with severe disabilities. During the 24 months prior to the survey interview, 49.9% of persons with severe disabilities were unemployed during the entire 24-month period compared to 14.1% of those with nonsevere disabilities and 9.2% of those without disabilities (Brault, 2012). One section of the SIPP examines individuals' economic well-being during the 24 months prior to the survey interview. Results from this section of the SIPP revealed that almost 11% of persons with severe disabilities were in poverty during the entire 24-month period compared to less than 5% of those with nonsevere disabilities (Brault, 2012).

Data examining the population of persons with IDD also reveal lower employment outcomes for those with significant disabilities. People with IDD may likely have functional limitations that result in having a significant or severe disability. Individuals with IDD who work tend to earn low wages and work very few hours a week (Boeltzig, Timmons, & Butterworth, 2008; Mank, Cioffi, & Yovanoff, 2003; Migliore & Butterworth, 2008; Moseley & Bradley, 2011). This is highlighted in the significant income gap that exists for adults with severe ID compared to their peers without disabilities. Adults with severe ID are three times more likely to live in poverty with household incomes of \$15,000 or less (Butterworth & Gilmore, 2000; Harris & Associates, Inc., 2000).

Likewise, there is a significant employment gap for this population. According to the 2010 Harris Survey, there was a 51-point employment gap between working age people with severe ID and their peers without disabilities. Only 8% of individuals with severe ID were employed. This was much larger than the 38-point gap that the broader category of persons with disabilities experienced (NOD, 2010). The gap does not seem to be closing significantly. Persons with a cognitive disability who also receive SSI may likely have the most significant cognitive

disabilities (Butterworth et al., 2012). This group has the lowest employment rate (only 8.3%) of all disability subgroups examined within the ACS data from 2009 to 2010 (Butterworth et al., 2012).

Within the population of people with IDD, the adult services provided reveal a focus on services not related to employment. The ICI, a UCEDD, recently published a report with comprehensive results and trends from 20 years of statistics derived from several national data sets. Results from all data sources showed that more adults with IDD are supported in facility-based (i.e., non-integrated) employment with earnings below minimum wage (Butterworth et al., 2012). Furthermore, growth in supported employment has subsided since the mid-1990s while community-based non-work services have continued to expand (Butterworth et al., 2012). Community-based non-work services are loosely defined and results do not indicate that individuals' outcomes meet the criteria of community integration (Sulewski, Butterworth, & Gilmore, 2008; Sulewski, 2010). A national survey of community rehabilitation providers revealed that only 19% of persons with IDD who were being served received support (i.e., funding) for integrated employment. Simultaneously, services for sheltered employment and non-work services grew steadily (Domin & Butterworth, 2012).

Examining 20 years' worth of data, the ICI determined that the total number of persons with IDD grew 97% between 1988 and 2010. Though integrated employment services increased 240% during this time, most of the growth occurred between 1988 and 1999. Since 1999, integrated employment services have only increased by 5% while the number of persons served has increased 24% (Butterworth et al., 2012). These data suggest that there is a need for more services for individuals with IDD (i.e., significant and most significant disabilities) in the area of competitive and integrated employment. Outcome data from VR highlights findings from the ICI

that growth in services and outcomes for this population has not increased in the 21st century.

According to RSA-911 data from fiscal years 2002 to 2010, the rehabilitation rate for individuals with ID has declined from 58% in 2002 to 49% in 2010 (Butterworth et al., 2012).

Employment outcomes for some categories of persons with significant or most significant disabilities are promising. In 2010, SSI recipients with IDD were more likely to be working compared to SSI recipients in all other disability categories (Butterworth et al., 2012). In more recent data from the SSA, results were similarly positive and revealed that persons with IDD had the highest percentage of employment compared to all other primary disabling conditions (Mamun, O’Leary, Wittenburg, & Gregory, 2011).

Considering the variation in culture, focus of service delivery, funding mechanisms, and tracking systems, it is difficult to identify the outcomes and evidence of successful collaboration that may exist between the agencies that provide services to people with significant and most significant disabilities. This was highlighted in the ICI’s national survey of agencies that are involved with supported employment. A majority of mental health and IDD agencies could not report any data for the number of persons who transition to their agencies’ extended services for supported employment after they exited VR services (Haines et al., 2012). Without these data, it may be difficult to determine the effectiveness of these agencies’ collaborative efforts.

The majority of adults with IDD (71%) receive services in non-inclusive settings such as facility-based programs or non-facility community programs (Braddock, Hemphand, & Rizzolo, 2008). In light of the 1992 and 1998 amendments to the Rehabilitation Act, this statistic is surprising because these adults have significant and most significant disabilities and would be eligible to receive VR services. As such, the Rehabilitation Act mandates that VR services be provided in the most integrated settings [Section 102 (b)(3)(B)(i)(II)]. In addition, employment

outcomes, including supported employment for individuals with the most significant disabilities, should be achieved in a competitive integrated labor market [Section 7 (11)(A)]. The findings of Braddock et al. (2008) as well as the findings from the ICI are not consistent with these legislative mandates.

Supported employment services continued to increase in the late 1980s and 1990s, but by the mid-1990s individuals with IDD who were using these services were less competitive compared to those who accessed the same services in the initial years of supported employment (Callahan et al., 2011). A national survey of organizations that provide supported employment services had similar findings. A majority of the respondents (59%) indicated that over the previous three years the number of people receiving individualized supported employment has stayed the same or decreased (Haines et al., 2012).

Employment outcomes for transition-age youth with disabilities also reveal discrepancies as compared to the general population. Even though legislation and services exist to ensure equal access to promote high quality outcomes for transition-age youth with disabilities, many complete secondary schools without gaining the necessary skills and supports needed for adult life (Hughes & Carter, 2011). Typical post-school goals such as a career, a college degree, and community integration are not realized for many youth with disabilities (Hughes & Avoke, 2010). Results from the NLTS-2 Wave 5 interview (2009) showed that 60% of young adults with disabilities who had been out of high school for up to 8 years were employed for pay outside the home compared to 66% of their peers (21 to 25 years old) in the general population.

Narrowing the focus to transition-age youth with significant disabilities, results from the NLTS showed that students who aged out of the school system had poor employment outcomes (Blackorby & Wagner, 1996). Students who age out of special education have reached age 21

and most likely have significant disabilities because they have not been able to complete secondary education with their age level peers in a course of study. Only 13% of students who aged out of the school system were competitively employed two years after exiting school (Blackorby & Wagner, 1996). Results were slightly higher in a later study conducted by the National Council on Disability (NCD) (2000). Survey results from the NCD indicated that 25% of students with significant disabilities who aged out of school systems were competitively employed.

More recent results from Wave 5 (2009) of the NLTS-2 indicated that youth in some primary disability categories were less likely to be currently employed. The following categories had percentages of employment that were well below the average of 59% across all categories: MR [sic] (37.2%), emotional disturbance (48.2%), visual impairment (41.5%), orthopedic impairment (33.1%), autism (32.5%), multiple disabilities (34.7%), and deaf/blindness (29.5%). The functional limitations often imposed with these disabilities may indicate that youth with more significant disabilities were less likely to be currently employed as compared to youth with less significant disabilities.

For respondents to the NLTS-2 who were employed, results from the survey regarding access to adult employment services were low. Results showed that a majority of the participants, regardless of their age, found their jobs themselves. Only 3.6% of young adults age 21 to 22 received assistance from an employment agency (e.g., VR) for help with finding a job. Across all ages, an average of 8% of young people indicated that they received assistance from an employment agency. Though it is impossible to know if all of the youth who participated in the survey would have been eligible for VR services, it is reasonable to expect that many were. Therefore, these results may indicate that many transition-age youth with disabilities were not

accessing essential VR services, which they may have benefited from in terms of achieving positive employment outcomes.

Regarding the use of adult service agencies for assistance finding employment, results from Wave 5 (Newman, Wagner, Cameto, & Knokey, 2009) of the NLTS-2, indicated that a majority of the participants, regardless of their age (i.e., 21 to 25 years old), found their jobs themselves. When results of employment agencies' assistance (e.g., VR) were reported by primary disability category, some categories indicated a much higher percentage than the average of 8%. These categories included mental retardation [sic] (19.4%), hearing impairment (12%), visual impairment (14.3%), orthopedic impairment (21%), autism (27.6%), and multiple disabilities (22.2%). Considering the significant functional limitations often imposed by these disabilities, these results could point out that youth with significant or the most significant disabilities are more likely to use employment agencies such as VR for assistance finding a job.

Furthermore, responses to this question by primary disability category were examined more broadly by grouping responses into two categories: found job him/herself or had help finding a job. Most disability categories for the response of "had help finding a job" had results ranging from 43 to 50%. However, some categories had notably higher results for this response and included MR [sic] (72.3%), orthopedic impairment (59.9%), autism (79.3%), multiple disabilities (79.1%), and deaf/blindness (71.7%). Again, these disability categories suggest that youth with more significant disabilities are more likely to need assistance finding a job. Supporting these findings, other results from the NLTS-2 showed that youth within these same categories had much higher percentages than the mean for receiving vocational services (e.g., VR) during the previous year, indicating that some disability groups may be more likely to use or

receive VR services. These groups included: MR [sic] (27.1%), autism (33.1%), multiple disabilities (33.2%), and deaf/blindness (35.6%) (Newman et al., 2009).

Additionally, results from Wave 5 of the NLTS-2 regarding the number of months that unemployed youth looked for a job indicated that certain disability categories were more likely to search for a job longer. The mean number of months across all disability categories was 8.2. Youth in the following primary disability categories searched for a job for 12 months or longer: speech impairment (32.4%), MR [sic] (29.7%), emotional disturbance (36.4%), hearing impairment (25.1%), visual impairment (25.3%), orthopedic impairment (45.7%), autism (42.2%), traumatic brain injury (41.8%), and multiple disabilities (44.1%) (Newman et al., 2009). The reasons why youth within certain disability categories may have searched for employment longer are not examined within the NLTS-2. However, it may be reasonable to speculate that these youth need assistance with their job search efforts from adult service agencies such as VR.

Little is known regarding the specific vocational services that students receive after they exit secondary school settings. Potential responses to the question in the NLTS-2 regarding the types of services received by youth who were out of school a year or more include: testing to find out interests, training in specific job skills, training in basic skills, vocational services, help in learning to look for a job, job shadowing opportunities, help in finding a job, and other services. A majority of the results had too few responses to reliably report a percentage (i.e., there were fewer than 10 responses in a cell or 20 in an entire column). Any of the services listed could be provided by VR as part of a consumer's Individualized Plan for Employment (IPE). Such services can be provided directly by VR or by a third party vendor that VR pays for such services. If survey respondents received services from a third party vendor, there is a chance that

the respondents did not realize that VR was funding the service. As such, the NLTS-2 does not provide clear information regarding students' receipt of VR services beyond secondary education. Similarly, transition-age youth with disabilities may also not be accessing VR services while they are still in school. Only 20.7% of youth in secondary settings received services from VR during the most recent school year (Newman et al., 2009). This may also be a result of students not realizing that the services they receive are coming from VR.

For transition-age youth with significant disabilities who access VR services, the outcomes may not be positive. An examination of employment outcomes for individuals with ID (i.e., a disability cause code indicating MR [sic]) who exited the VR program between the years 2002 and 2010 revealed that a majority of persons within this group were transition-age youth. Additionally, results showed that the rehabilitation rate for this group have declined and weekly wages have not increased with inflation, even though the duration of VR services have increased for consumers closed successfully into employment (Butterworth et al., 2012).

Promising outcomes exist for some transition-age youth with significant disabilities. The Transition Services Integration Model (TSIM) combines the resources of special education, VR, and IDD agencies to assist youth with significant support needs as they move into adult life (Certo et al., 2003). Results from the TSIM examined outcome data for 293 youth who had exited school systems in California and Maryland. Results showed that 89% of participants exited school with the same services in place. In addition, 71% of participants were still employed, though it was unclear when these data were collected regarding employment (Certo & Luecking, 2006). Using the TSIM, 60% of students with severe ID across three states were employed at the time they exited high school (Certo & Luecking, 2006). Within this model, VR is viewed mainly as a funding source for post-school services.

Other promising results for transition-age youth with significant disabilities have emerged within a study of Social Security benefit recipients. In a study of the Social Security disability program beneficiaries (SSI and SSDI recipients) from 1996 to 2007, persons in the youngest age category (i.e., age 18 to 39) had the highest percentage of employment compared to all other age categories. When controlling for multiple factors, SS beneficiaries who received disability insurance only, or were age 18 to 39 were 12 percentage points more likely to be employed than individuals in comparisons groups (Mamun et al., 2011).

The most promising results for transition-age youth with significant disabilities may come from data related to states that have implemented Employment First policies. Employment First is an initiative to change state statutes, regulations, and procedures so that funding supports competitive, integrated employment as a first option for persons with significant disabilities (Martinez, 2013; U.S. Department of Labor, n.d.). Among the states that have established an Employment First policy, the average percentage of integrated employment is 32% while the average for states without a policy is 20%. The range across all states goes from 4% to 88% with six states at 10% or less in integrated employment. Washington State has the highest percentage (88%) of individuals with DD employed in integrated settings (Butterworth et al., 2010). According to Callahan et al. (2011), these data indicate that states' decisions regarding the importance of employment for persons with significant disabilities have an influence on the employment outcomes within a state.

In summary, the outcomes for transition-age youth with significant disabilities are mixed. The broad outcomes from large data sets within special education, VR, and IDD seem to suggest that employment outcomes for this population lag behind other transition-age youth, including those with less significant disabilities. Alternatively, employment outcomes from collaborative

service models are positive and suggest that promising practices exist for this population. To this end, it is important to identify practices that can predict positive employment outcomes for transition-age youth with significant disabilities.

Predicting Outcomes

Little research has targeted predictors of employment outcomes for the specific population of transition-age youth with significant disabilities. Employment outcomes have been examined using descriptive data and predictors have been examined more closely for the larger population of individuals with disabilities. Variables and predictors that will be discussed include gender, disability, having a work history, duration of services, and age. This review will lay the foundation for discussing the need for further research to identify predictors of positive employment outcomes for transition-age youth with significant disabilities.

Gender is a strong predictor of employment outcomes for transition-age youth with disabilities and many studies have examined this variable (Benz et al., 1998; Blackorby & Wagner, 1996; Capella, 2002; Doren & Benz, 1998; Doren et al., 2011; Fulton & Sabornie, 1994; Heal & Rusch, 1995; Rabren et al., 2002; Rabren et al., 2003; Wagner, 1992; Wagner et al., 2006). Much research has examined employment outcomes for female youth with disabilities and found that they had lower employment rates after finishing school, earned lower wages, received fewer benefits, and had more limited advancement opportunities as compared to males (Benz et al., 1998; Blackorby & Wagner, 1996; Capella, 2002; Doren & Benz, 1998; Fulton & Sabornie, 1994; Heal & Rusch, 1995; Wagner, 1992; Wagner et al., 2006).

In a study of over 1,000 transition-age youth in a southeastern state, gender was a strong predictor of employment one year after high school. Males were much more likely to report employment than females. Only 25% of the respondents who reported employment were female

(Rabren et al., 2002). In a larger study of 3,024 transition-age youth, females were five times less likely to be employed than males (Benz et al., 1997). A national study examined specific aspects of employment and revealed males were more likely to work full time and have jobs in within skilled labor (Newman et al., 2009).

Results from a study of participants in Oregon's YTP program revealed that males had more positive employment outcomes than females. In addition, gender was a predictor of wages earned. Wage differentials between males and females involved in the YTP revealed that receipt of a high school diploma and having a successful employment outcome with VR were significant predictors for males' wages, but not for females (Doren et al., 2011). Finally, one study examined multiple employment predictors using combined outcome data from special education and VR. When all nine predictors were simultaneously analyzed, gender was strongest predictor of employment for transition-age VR consumers. Overall, males were more likely than females to be competitively employed (Rabren et al., 2003).

Disability type has also been examined as a predictor of employment outcomes (Baer et al., 2011; Grigal et al., 2011; Luecking & Fabian, 2000; Rabren et al., 2003). Some studies have demonstrated that youth with significant disabilities have less favorable employment outcomes (Baer et al., 2011; Grigal et al., 2011; Rabren et al., 2003). Other studies that have examined outcomes using specific transition models have reported positive outcomes for youth in this population (Certo & Luecking, 2006; Luecking & Fabian, 2000).

Regarding less favorable outcomes, Rabren et al. (2003), examined the employment outcomes of transition-age youth in a southeastern state that used VR services. Students who spent a high number of hours outside the general education classroom (i.e., students with more severe or significant disabilities) were less likely to achieve an employment outcome than

students who spent fewer hours outside the general education classroom (Rabren et al., 2003). Another study showed that one year after graduation, transition-age youth with ID had a 10% lower full time employment rate when compared to their peers with learning disabilities, emotional disabilities, and other health impairments (Baer et al., 2011). Another study examining outcomes for transition-age youth based on disability type used data from NLTS-2 to compare youth with ID to youth with all other disability types. The findings revealed that only 46% of youth with ID had ever worked for pay after leaving high school compared to 74% of youth in all other disability categories. Of the students with ID who had worked, 77% earned more than minimum wage (Grigal et al., 2011). This seems like a high percentage until it is compared to the 96% that earned more than minimum wage in all other disability categories.

Despite the abundance of research showing less favorable outcomes for students with significant disabilities, some studies have identified positive outcomes for this population (Certo & Luecking, 2006; Luecking & Fabian, 2000; Migliore & Butterworth, 2008). Using the TSIM, 60% of students with severe ID across three states were employed at the time they exited high school (Certo & Luecking, 2006). Researchers who examined the employment outcomes of students who participated in the Bridges Program found that youth with ID had more positive long-term outcomes (i.e., at 12-month and 18-month follow-up) than students with learning disabilities or emotional disabilities (Luecking & Fabian, 2000). Previous research has also shown that youth with ID who have completed post-secondary training were much more likely to achieve a successful employment outcome with VR than youth with ID who had not participated in post-secondary training (Migliore & Butterworth, 2008).

Previous work history has been examined extensively as a post-school employment predictor (Benz et al., 1997, 2004; Benz et al., 2000; Colley & Jamison, 1998; Certo &

Luecking, 2011; Certo et al., 2009; Inge & Dymond, 1994; Inge et al., 2005; Luecking & Fabian, 2000; Rabren et al., 2002; Timmons et al., 2011; Wagner & Shaver, 1989). Students should be developing a history of work while they are still in secondary settings (Certo & Luecking, 2011). Developing a history of work and developing a resume are all things that VR can and does provide for individuals with disabilities, so it stands to reason that it can offer these same services to students who are in transition. Developing a history of work is not something that can be accomplished in a short period of time. The word “history” suggests a longer span of time and suggests starting early, perhaps as soon as a student is able to legally work. This age depends on the labor laws in a student’s state. For example, the legal working age (i.e., with restrictions to hours and type of employment) is 14 in Alabama, California, Georgia, Iowa, North Carolina, and Oregon. All of these states require a work permit for youth ages 14 and 15 and place restrictions on hours they can work on a school day as well as the total number of hours worked in a week. The Fair Labor Standards Act of 1938 restricts the hours that children under age 16 can work and forbids the employment of children under age 18 in certain jobs deemed too dangerous. For agricultural operations, it prohibits the employment of children under age 16 during school hours and in jobs with duties that could result in significant harm. Based on the laws that allow students to access some work opportunities prior to age 16, VR could be involved earlier in establishing students’ work history.

Having an early employment experience is a predictor of employment after high school graduation (Benz et al., 2000; Rabren et al., 2002). In one study, having two or more paid jobs while in high school was a predictor for employment after graduation (Benz et al., 2000). In a study of transition-age youth in a southeastern state, having a paid employment experience during high school was a predictor of employment one year after high school. Specifically, there

was an 87% probability that students with paid work during high school would be employed one year after graduation (Rabren et al., 2002). Research with the general population (i.e., persons with and without disabilities) has also shown that early work experience contributes to wage differentials (Blau & Kahn, 2000; Bobbit-Zeher, 2007). With the emphasis on early employment experiences, it would seem that transition services aimed at securing employment should also be provided early on in students' high school experiences.

Even though work prior to graduation has been demonstrated to be a strong predictor of post-school employment, many transition-age youth are not achieving this goal. Results from Wave 5 (Newman et al., 2009) of the NLTS-2 indicate that majorities of youth across all disability categories were not employed in the last year of their secondary school experience. Only 29.8% of the NLTS-2 Wave 5 (Newman et al., 2009) respondents reported employment during their last year of high school. The economic downturn during the time these data were collected may have contributed to this low employment percentage.

The importance of early work experience also extends to transition-age youth with significant and most significant disabilities. Empirical research has found that early employment experiences influence the employment decisions of young people with IDD (Timmons et al., 2011). Youth with severe ID must develop an employment record during their secondary school experience that can be supported and maintained by post-school service providers (e.g., VR) after they leave school (Certo et al., 2009). However, a closer examination of the NLTS-2 Wave 5 (Newman et al., 2009) results show that transition-age youth in some disability categories were far below the already low mean of 29.8%. These groups included: MR [sic] (12.3%), orthopedic impairment (11.8%), autism (6.4%), and multiple disabilities (9.4%). These results may suggest that youth with more significant disabilities are less likely to develop a work history prior to

leaving high school. Results for this question regarding age indicated that youth who were 18 during their last year of high school (i.e., youth who did not age out) were the most likely to have a paid job outside of their home at 39.6%. Youth who were 19 during their last year of high school fell slightly below the mean at 28.9%.

Findings from a study of students who participated in the Bridges Program in the mid to late 1990s revealed that students who had completed the paid internship component of the program were more likely to be working at six months and 12 months after the program's completion. Descriptive data from this same study revealed that 75% of the students who completed the paid internship component of the program received job offers with the companies who hosted their internship experience (Luecking & Fabian, 2000).

Duration of services has also been examined as a predictor of employment outcomes. Within the broad population of VR consumers (i.e., all ages, including transition-age youth), Migliore & Smith (2007) found that it is important that VR consumers be placed into employment as quickly as possible to build consumers' confidence and retention of job skills. They also contend that employers may prefer consumers who have limited gaps in their employment history. The authors did not suggest that the timeframe from application to case closure was a predictor or measure of success due to the wide variability in consumers as well as VR services. As an example, they reported that consumers who were secondary students at the time of application might delay their search for employment until after they completed secondary or postsecondary education. While this may be true, delaying a job search for students in secondary settings who do not go on to postsecondary education until after high school is in direct opposition to suggested best practices in transition as well as a number of transition models.

Using the VR program's RSA-911 database, Migliore & Smith (2007), examined service duration for individuals with DD. Specifically, they analyzed the timeframe from VR application to case closure for consumers with MR [sic], cerebral palsy, epilepsy, and autism) using FY2006 data from the RSA-911 with a total sample of 27,579. The timeframe categories used from the data of VR application were: closed in one year or less, closed between one and three years, and closed after more than 3 years. Only 9 states (almost 18%) had their highest percentage of closures as "closed in one year or less." An overwhelming majority had their highest percentage of closures between one and three years from the date of VR application. In addition, when the highest two categories were combined, 90% of states closed a majority of these consumers' cases after more than a year since the date consumers applied for services. Individuals with these types of DD could be regarded as having functional limitations that result in a significant or most significant disability. With this in mind, these findings from VR's national data set suggest that consumers with these DD will be in the VR system for more than a year from the date of application for services.

Over the course of the past 20 years, VR consumers' duration of services has increased (Butterworth et al., 2012). More specifically, the duration of services for consumers with MR [sic] who were successfully closed into employment had increased during the time between fiscal years 2002 and 2010. For fiscal year 2002, the average number of days between VR application and successful case closure for individuals with ID was 733 (i.e., a little over 24 months). This number increased across all subsequent years leading to the high in fiscal year 2010 of 842 days (i.e., almost 28 months) (Butterworth et al., 2012). The authors who examined these RSA-911 data contend that longer duration of services present a threat to consumers' hopes as well as VR counselors' commitment to a successful job search (Butterworth et al., 2012).

Examining VR service duration for transition-age youth revealed that the average duration of services (i.e., from application date to closure date) was substantially greater for consumers who were students at the time they applied for VR services compared to all other age groups across a 10-year period (Migliore & Butterworth, 2008). The longer duration of services could be attributed to a variety of factors. One reason may be that services are provided across several years of students' secondary education, suggesting VR's early involvement in the transition process. Another reason for longer duration could be the provision of post-secondary education or training.

Finally, age of transition-age youth has been examined with regard to employment outcomes. Coordinated services between special education and VR should allow transition-age youth to have VR's involvement early in their secondary education experience (Lamb, 2003). Research supports that VR is a needed collaborator within transition services (Doren et al., 2011) as well as services to youth with significant and most significant disabilities (Boeltzig et al., 2008). Related to the legislative changes, when IDEA 2004 changed the minimum age for the initiation of transition planning from 14 back to 16, half of the states chose to keep the age at 14 (Test & Grossi, 2011). This demonstrates that some states recognized the importance of beginning transition services earlier.

Rabren et al. (2003) used two independent variables related to age in examining the VR employment outcomes of transition age youth who had received special education and VR services from transition demonstration sites in a southern state. These two variables (i.e., age at VR application date, and grade level at VR application date) were not statistically significant with regard to students' employment outcomes. Another study using the RSA-911 data set for fiscal year 2007 examined age at VR application as a predictor of employment outcomes for

youth with specific learning disabilities (Gonzalez et al., 2011). The descriptive results by age category for this study are worth noting. This study examined a large segment of the fiscal year 2007 RSA-911 case service report data. A total of 30,265 students with learning disabilities age 16 to 24 comprised the sample. All of these were closed cases. The majority of consumers whose cases were closed were age 16 to 19 at the time they applied for VR services. Additionally, students age 16 to 19 comprised 84% of all successful case closures in the sample. Only 16% of individuals who were closed successfully applied for services between the ages of 20 to 24.

Using special education data from Wave 5 (Newman et al., 2009) of the NLTS-2, youth who were 15 to 16 were less likely to receive vocational services than youth who were 17, 18 and 19 years old. Only 16.8% of youth who were 15 to 16 received vocational services while 22 to 23% of youth in all three other categories received the same services (Newman et al., 2009). Other results from Wave 5 (Newman et al., 2009) of the NLTS-2 indicated that unemployed young adults in the oldest age category (i.e., 25-year-olds) were the most likely to search for employment for 12 months or longer. This finding could suggest that older transition-age youth have more difficulty finding employment. In turn, this finding could suggest that earlier job placement and earlier service coordination with VR is needed for this population.

According to Certo & Luecking (2011) services for students with severe ID should progress from school-based full inclusion to community-based full inclusion across students' years in secondary settings. They contend that this shift should begin at age 16 and become increasingly community-based to the point of total immersion by age 19. Such a shift is necessary in "establishing a quality adult life" for graduates (p. 160). Considering this kind of service delivery model, it seems that VR should be involved well before students' last year of

high school. A shift in services at age 16, suggests a definite transition. As such VR should be involved in the transition planning from that initial shift.

Predicting Employment Outcomes for Youth with Significant Disabilities

Future research within special education and rehabilitation should continue to identify evidence-based practices in accordance with each field's legislation (Test & Cease-Cook, 2012). To promote better outcomes for all students, No Child Left Behind (2001) requires educators to use scientifically based educational practices. Additionally, the 2004 amendments to IDEA require special education programs to use scientific, research-based interventions. There is no mandate for VR counselors to use evidence-based or research-based practices, however, the importance of such practices is highlighted in the act's regulations regarding the National Institute on Disability and Rehabilitation Research (NIDRR). NIDRR is required to conduct research and identify effective strategies to enhance a variety of employment opportunities for persons with disabilities. Using evidence-based practices for transition-age youth with disabilities may be one way to close the gaps that exist between these youth and their peers without disabilities (Test et al., 2009a). Examining the age that VR services begin may lead to identifying an evidence-based practice for transition planning that begins earlier in student's secondary school experience. Such a finding could lead to better interagency collaboration between special education and VR.

Future research should also examine ways to enhance interagency collaboration or what leads to improved collaboration. Even though there are legal mandates and recommended practices for interagency collaboration, there is currently no vehicle to enhance collaboration (Oertle & Trach, 2007). Special educators never or rarely coordinate referrals to adult service providers (e.g., VR) (Oertle & Trach, 2007). However, as part of students' IEPs, they are still

providing services toward adult outcomes. Therefore, these services are likely provided without the input of professionals who specialize in adult services (Carlson, Brauen, Klein, Schroll, & Willig, 2002). VR counselors understand the adult services that are available to transition-age youth within their communities as well as ways to identify and/or establish new services when a need exists. Instead of special educators depending on their own resources to provide transition-related activities and services, their collaboration with VR could facilitate the “coordinated set of activities” that are mandated in each field’s legislation (Trach, 2012).

Test et al. (2009a) conducted a comprehensive literature review of experimental research studies to identify evidence-based instructional practices for transition-age youth with disabilities. The articles that were reviewed had to include an outcome variable that matched one of the five areas within Kohler’s (1996) Taxonomy for Transition Programming: (a) student-focused planning, (b) student development, (c) interagency collaboration, (d) family involvement, and (e) program structures. While this literature review revealed 63 evidence-based practices, none of the practices identified fell within Kohler’s area of interagency collaboration. However, interagency collaboration was identified as an evidence-based predictor in another article published during the same time period that examined correlational research on interventions and post-school outcomes for transition-age youth with disabilities (Test et al., 2009b). These findings suggest that specific practices or interventions within the broad context of interagency collaboration need to be examined further. One such practice could be the age at which transition-age youth apply for and begin receiving services from VR as a related service within special education.

Within the list of 63 evidence-based practices identified in Test et al. (2009a), some practices may also work well within the context of VR services for transition-age youth. For

example, four strategies address self-advocacy and/or self-determination (i.e., *Whose Future is it Anyway*, the *Self-Advocacy Strategy*, the *Self-Directed IEP*, and the *Self Determined Learning Model of Instruction*). These strategies or similar practices could be used as VR counselors work with transition-age youth to develop their IPE using informed choice; a practice that is emphasized and mandated throughout the policies and procedures for VR within the Rehabilitation Act.

Researchers who examined findings from the NLTS-2 recognized differences in the age at which VR becomes involved during secondary education (Cameto et al., 2004). Within the executive summary, they noted there is more emphasis on vocational goals and services for older students. As such VR's involvement is more common among 17 and 18-year-olds. One in four students age 17 and 18 have a VR counselor involved in transition planning while only one in ten 14-year-olds have a VR counselor's involvement (Cameto et al., 2004). While this was a notable finding, there have been no follow up studies to examine the impact of VR counselors' earlier involvement in students' transition planning process.

Similarly, the active participation of representatives from a variety of other outside organizations increases as early adulthood approaches; that is, from one in ten 15-year-olds to one in five 17 and 18-year-old students (Cameto et al., 2004). Future research could also examine the impact that early involvement from other outside agencies. Many of these agencies may be service providers that VR would collaborate with to provide employment services to transition-age youth with significant disabilities (e.g., IDD agencies). Some transition-age youth with significant and most significant disabilities will require extended services that continue well past time limited services from VR. An example would be Medicaid funded long-term support

for supported employment or personal assistance. Integrating such services into a student's transition plan early on may lead to a more seamless transition and better overall outcomes.

Research should expand in both special education and VR outcomes to examine the impact of VR transition services on secondary students with disabilities (Rabren et al., 2003). Collecting, analyzing, and using employment outcome data has become more prevalent and necessary with government accountability (Butterworth et al., 2012). Special education, VR, and other agencies/organizations collect a host of outcome data. Employment data regarding individuals with disabilities are available from multiple sources including: the National Longitudinal Transition Studies, the Rehabilitation Services Administration Case Service Reports, the Administration on Developmental Disabilities, the National Organization on Disability, the Social Security Administration, and the American Community Survey. The ICI also operates an interactive data source (i.e., StateData.info) that reports and integrates survey results and outcome data from many of these sources. Even though data are available from multiple sources, it can be difficult to identify youth in transition from the results due to the different age ranges that each program uses. In addition, it can also be difficult to identify outcomes for persons with significant or most significant disabilities given the functional and often varying definitions. A clear and accessible data collection system that provides outcome data for specific groups of individuals is critical (Hall, Butterworth, Winsor, Gilmore, & Metzler, 2007).

Examining large data sets may be an effective way to examine outcomes within VR. There are many variables to consider within VR. As such, designing and implementing experimental research is difficult and has been scarce (Bolton, 2004; Pruett et al., 2008). Johnston et al. (2009) suggested that researchers within VR should look to research in similar

fields to identify alternatives to empirical research and randomized controlled trial designs. Using a large national data set such as the RSA-911 may be one way to examine an effective practice, at least with regard to the age that services are implemented.

In 2008, the NCD published *The Rehabilitation Act: Outcomes for Transition Age Youth*, a comprehensive report to the President. Eleven recommendations were made: five to the U.S. Congress and seven to the U.S. Department of Education, RSA, NIDRR, Office of Special Education Programs, and state VR agencies. The first recommendation stated that “Congress should change existing VR transition legislation and policy to require that VR services be made available to eligible youth no later than three years before an adolescent or young adult exits from secondary education” (p. 16). All recommendations were based on a review of existing agency data (i.e., RSA-911) as well as structured qualitative data with key stakeholders. For transition-age youth who will complete secondary education by age 17 or 18, such a change would require VR’s involvement as early as age 14. According to the NCD (2008), early intervention by VR is an element of many promising transition practices. The impact of earlier intervention was shown to prevent early school exit. Also, if VR becomes involved three years prior to school exit, the services provided are more intensive and last long enough to have a significant impact on students’ positive employment outcomes (NCD, 2008).

The information presented in this review highlights the importance of identifying practices that promote positive employment outcomes for transition-age youth with significant disabilities. The legislative history shows a progression of providing more comprehensive and integrated services within special education and VR so that youth with disabilities achieve quality outcomes. The services provided to this population of transition-age youth also target collaborative services between special education and VR. Examining the outcomes of the

services provided is critically important for both entities as seen in the NLTS, the RSA-911, and all of the research that has been generated from these large data sets. Examining the impact of beginning VR services earlier in secondary education is a gap in the current body of literature. VR's earlier involvement could lead to more positive employment outcomes for transition-age youth with disabilities and might be most critical to those with significant disabilities.

CHAPTER III. METHODOLOGY

Statement of the Problem

There is a lack of knowledge regarding how age when vocational rehabilitation (VR) services begin affects employment outcomes for transition-age youth. Additionally, there is limited research that has examined the impact of VR services on the employment outcomes for youth and young adults with significant disabilities. Research can examine characteristics of this population and their outcomes within VR to identify variables that may lead to successful employment.

State VR programs are held to evaluation standards and subsequent performance indicators that include outcome and related measures that accomplish the purpose of the Rehabilitation Act [29 U.S.C. Section 106 (a)(2)]. There are two evaluation standards for state VR programs. Evaluation Standard 1 requires state VR programs to assist any eligible individual, including an individual with a significant disability, to obtain, maintain, or regain high-quality employment (34 C.F.R. Section 361, 2006). The performance indicators for Evaluation Standard 1 measure employment outcomes based on type of case closure, significant disability status, and consumers' earnings at case closure (U.S. Department of Education, 2014). Evaluation Standard 2 requires state VR programs to ensure that individuals from minority backgrounds have equal access to VR services (34 C.F.R. Section 361, 2006). All public VR programs are required to report outcomes for all consumers whose cases are closed each fiscal year. These data are compiled for all public VR programs across the U.S. and its territories into the Rehabilitation Services Administration (RSA)-911 data set. The measures used to calculate that each program

meets the performance indicators for the two evaluation standards are derived from the RSA-911. As such, this data set is the primary source of information on VR consumers (Bruyere & Houtenville, 2006). The RSA-911 has historical significance in rehabilitation research and program evaluation (Gilmore et al., 2000; Moore, Alston, Donnell, & Hollis, 2003; Paugh, 2003; Wheaton & Hertzfeld, 2002; Whitney-Thomas et al., 1999; Wilson, 2002, 2004) and will continue to have a significant role in future research (Bruyere & Houtenville, 2006).

In addition to legislative requirements, recent discussions in Washington, DC regarding the VR program emphasize the importance of identifying evidence-based practices for transition-age youth as well as individuals with significant disabilities (Wooderson, 2012). Analyzing statistics from administrative records like the RSA-911 can have a valuable impact on VR's program evaluation (Bruyere & Houtenville, 2006). Finally, in the current climate of government accountability and budget scrutiny, programs that receive federal funds, such as VR, must demonstrate their efficiency and effectiveness (Bruyere & Houtenville, 2006). This study will examine two primary employment outcome measures from the RSA-911 data set: successful case closure into employment and wages earned at the time of case closure.

Additionally, this study will examine the characteristics of transition-age youth with significant disabilities that may predict successful case closure and higher wages at the time of closure. The RSA-911 contains a host of demographic information for each individual that is closed each fiscal year. Identifying the characteristics (i.e., independent variables or predictors) that predict positive employment outcomes would be valuable information for the VR program. The variables that will be examined include gender, race, primary disability type, level of education at the time of application for VR services, socioeconomic status, and age at the time of

application for VR services. These characteristics will serve as the independent (i.e., predictors) variables for the study.

The age when students apply for VR services (i.e., initiate the process of establishing services with VR) may be a variable that predicts employment outcomes. Many youth with disabilities in secondary education receive special education services through the provision of an IEP. These young people can also apply for VR services while they are still in the public school system.

Special education and VR overlap to form a partnership of services during these secondary education years as students make their transition from school to adult life. The Rehabilitation Act governs the VR program, while the IDEIA governs special education programs. The Rehabilitation Act does not identify an age when secondary students should apply for VR services. However, IDEIA indicates that transition services should be identified on a student's Individualized Education Program (IEP) by the time the student reaches 16 years of age. Transition services can be identified prior to age 16 if necessary. If beginning VR services prior to age 16 is a predictor of positive employment outcomes, the partnership between special education and VR could be strengthened during students' early secondary education years. The following research questions guided this study:

1. Using logistic regression, does the age at application for VR services predict successful VR case closure for transition-age youth with significant disabilities after controlling for gender, race, education, disability type, and socioeconomic status?

2. Using backward elimination logistic regression, which predictors (i.e., age at application, gender, race, education, disability type and socioeconomic status) contribute significantly to the type of VR case closure achieved for transition-age youth?

3. Using bivariate linear regression, how well does age at application for VR services predict wages at VR case closure for transition-age youth with significant disabilities?

4. Using multiple linear regression, how well does age at application for VR services predict wages at VR case closure for transition-age youth with significant disabilities when controlling for gender, race, education, disability type, and socioeconomic status?

Methods and Procedures

Data Source

This study used data obtained from the RSA-911 data set for fiscal year 2011. The RSA is housed within the U.S Department of Education's Office of Special Education and Rehabilitative Services. The RSA-911 is a national database that is collected annually and contains individual consumer closure reports from all VR agencies across the U.S. and its territories. The RSA-911 data file is publicly available from RSA with all personal identifications deleted to protect confidentiality (Bruyere & Houtenville, 2006). Individual level data within the RSA-911 are collected at the time consumers apply for services, during service provision, and at case closure. Therefore, the RSA-911 is a comprehensive and standardized system of statistical reporting on the entire VR process (Moore, 2002). This data set is comprised entirely of closed case data (i.e., persons who are no longer receiving VR services).

Population and Sample

The population for this study was derived from the RSA-911 fiscal year 2011 database. There are 589,773 total cases within this database. The population of transition-age youth with significant disabilities who received special education and VR services were identified using several data points within the RSA-911. The data points used to identify the population included age at the time of application for VR services, having an IEP, type of case closure, significant

disability status, receipt of Supplemental Security Income (SSI) and/or Social Security Disability Insurance (SSDI), and previous case closure. The criteria for inclusion in the population are described below.

Age at application for VR services was obtained from a variable that the RSA computes for the publically available version of the RSA-911. The RSA-911 data that are reported from each state VR program includes each consumer's date of birth and the date of application for VR services (U.S. Department of Education, 2004). The RSA computes age at application based on the data reported from these two data points. Consumers who were between 14 and 24 years of age when they applied for VR services were included in the population.

VR consumers who received special education services were identified using the RSA-911 variable for having an IEP. The possible values for this variable within the RSA-911 are did not have an IEP, had an IEP, or information is not available (U.S. Department of Education, 2004). Consumers who had an IEP were included in the population.

Consumers' cases can be closed at various stages within the VR process. The RSA-911 defines seven types of closures. Within the data set the closures are coded as follows:

1. Exited as an applicant.
2. Exited during or after a trial work experience/extended evaluation.
3. Exited with an employment outcome (i.e., an individual's case was closed successfully into employment due to the provision of VR services).
4. Exited without an employment outcome, after receiving services (i.e., an individual did not successfully obtain employment after receiving VR services).
5. Exited without an employment outcome, after having a signed Individualized Plan for Employment (IPE), but before VR services were provided.

6. Exited from an order of selection waiting list.
7. Exited without an employment outcome after being determined eligible, but prior to having an IPE (U.S. Department of Education, 2004).

For this study, closure types 3 and 4 were used as criteria for inclusion in the population because both types indicate that a consumer was determined eligible for VR services and VR services were implemented as part of an individual's IPE.

Significant disability status was identified within the RSA-911 using two data points to ensure the fidelity of this criterion. The first data point was significant disability status, which is coded in the RSA-911 as no significant disability, significant disability, or information not available. To be included in the population, consumers had to be coded as having a significant disability. This status determination is a decision made by consumers' VR counselors as they review consumers' medical documentation and other pertinent case documents to apply the Rehabilitation Act's definition of significant disability. Even though this federal definition governs all state VR programs, it is still a subjective counselor decision. Therefore, a second data point within the RSA-911 was used to ensure the fidelity of this criterion.

The second data point used to define significant disability was the type of public support received at the time of application for VR services. The RSA-911 indicates receipt of seven types of public support at application: SSI, Temporary Assistance for Needy Families (TANF), general assistance (i.e., state or local government), SSDI, veterans' disability benefits, workers' compensation, and other public support. Each type of public support is coded as not received, received, or information not available (U.S. Department of Education, 2004). To be included in the population for this study, consumers had to receive SSI and/or SSDI at the time of application for VR services.

Using these additional data points ensured that only consumers with significant disabilities were included because the Social Security Administration (SSA) applies a more stringent definition of disability. For individuals age 18 and over to qualify for SSI and/or SSDI, they “must not be able to engage in any substantial gainful activity because of a medically-determinable physical or mental impairment(s): that is expected to result in death, or that has lasted or is expected to last for a continuous period of at least 12 months” (SSA, 2014a, p. 5). To qualify for SSI, youth who are under 18 years of age must have “a medically determinable physical or mental impairment, (including an emotional or learning problem) that: results in marked and severe functional limitations; and can be expected to result in death; or has lasted or can be expected to last for a continuous period of not less than 12 months” (SSA, 2014b).

The final criteria for inclusion related to consumers’ previous case closure status. This data point is coded in the RSA-911 has eight possible codes: no previous case closure within 36 months and seven other codes that indicate a consumer had a previous service record closed by the state VR program within a 36-month period prior to the most recent application for VR services (U.S. Department of Education, 2004). Consumers who did not have a previous case closure with VR within the previous 36 months were included in the population for this study. Consumers who had previous cases with VR were not included in the population because the focus of this study was on individuals who were applying for services for the first time.

There were 13,967 cases within the RSA-911 for fiscal year 2011 that met all of the criteria listed above and comprised the total population of transition-age youth with significant disabilities that were used for this study. Using the entire population for analyses may have yielded statistically significant results that were not meaningful. A large number of cases might have produced such a large effect size that even the slightest, most trivial difference could have

been interpreted as statistically significant (Harris, 1998). Instead, a random sample of approximately 15% of cases was taken from the total population using the “Select Cases” tool within the Statistical Package for the Social Sciences (SPSS) software program. This yielded a total sample size of 2,141 cases. It should be noted that 15% of 13,967 is 2,095. However, selecting an approximate 15% sample using the function within SPSS continually yielded a slightly larger sample size of 2,141 cases. This is an appropriate sample size because it involved a balanced combination of α , effect size, and power. Table 2 shows the characteristics for the population and the sample.

Table 2

Population and Sample Characteristics

Characteristic	Population		Sample	
	Frequency	Percent <i>N</i> = 13,967	Frequency	Percent <i>n</i> = 2,141
Age				
14	72	0.5	12	0.6
15	245	1.8	33	1.5
16	1,020	7.3	154	7.2
17	2,575	18.4	391	18.3
18	3,567	25.5	526	24.6
19	2,023	14.5	314	14.7
20	1,474	10.6	238	11.1
21	1,224	8.8	197	9.2
22	722	5.2	113	5.3
23	536	3.8	77	3.6
24	509	3.6	86	4.0
Gender				
Male	8,578	61.4	1,336	62.4
Female	5,389	38.6	805	37.6
Race and Ethnicity ^a				
White	9,171	65.7	1,408	65.8
Black or African American	4,475	32.0	690	32.2
American Indian or Alaska Native	262	1.9	35	1.6
Asian	201	1.4	29	1.4
Native Hawaiian or Other Pacific Islander	69	0.5	10	0.5
Hispanic or Latino	1,314	9.4	215	10.0
Education Level at Application				
Less than High School	7,260	52.0	1,087	50.8
Special Education Certificate	4,310	30.9	672	31.4
High School or Higher	2,397	17.2	382	17.8
Low Socioeconomic Status (SES)				
Yes	8,440	60.4	1,287	60.1
No	5,527	39.6	854	39.9
Primary Disability Type				
Sensory/Communicative	1,356	9.7	190	8.9
Physical	1,362	9.8	207	9.7
Mental/Cognitive	8,667	62.1	1,335	62.4
Mental/Psychosocial	1,924	13.8	298	13.9
Mental/Other	658	4.7	111	5.2
VR Case Closure Type				
Successful	5,618	40.2	852	39.8
Unsuccessful	8,349	59.8	1,289	60.2

^aThe RSA-911 data set has 5 racial categories: White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander. These categories are not exclusive. VR consumers may self-identify with one or more of these categories. The RSA uses Hispanic or Latino as an ethnic category and does not identify it as a separate race. If VR consumers self-identify as having Hispanic or Latino ethnicity, a racial category of White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander must also be selected. If VR consumers refuse to self-identify their race or Hispanic ethnicity, the VR counselor or interviewer provides the best assessment of the consumer's race and Hispanic ethnicity (U.S. Department of Education, 2004).

Variables

Predictors.

There are six predictors for this study: gender, race, education level at the time of application for VR services, SES, primary disability type, and age at the time of application for VR services. Each predictor is defined within the RSA-911 and some required recoding within SPSS due to the type of analysis that was used (i.e., logistic and linear regression). Each predictor, its reason for inclusion, and any subsequent recoding are described below.

Gender was included as a predictor due to findings from previous research (Benz et al., 1998; Blackorby & Wagner, 1996; Capella, 2002; Doren & Benz, 1998; Doren et al., 2011; Fulton & Sabornie, 1994; Heal & Rusch, 1995; Rabren et al., 2002; Rabren et al., 2003; Wagner, 1992; Wagner et al., 2006) that have found it is a predictor of employment outcomes for persons with disabilities. Within the RSA-911, gender is dichotomously coded as male or female. This variable did not require recoding.

Race was included as a predictor due to findings from previous research (Beveridge & Fabian, 2007; Moore et al., 2002; Olney & Kennedy, 2002; Research Triangle Institute & RSA, 2002; Wilson, 1999; Wise, 1988) that have found it is a predictor of employment outcomes for individuals with disabilities. The RSA-911 data set has five racial categories defined as follows: White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander. These categories are not exclusive. VR consumers may self-

identify with one or more of these categories. The RSA uses Hispanic or Latino as an ethnic category and does not identify it as a separate race. If VR consumers self-identify as having Hispanic or Latino ethnicity, a racial category of White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander must also be selected. If VR consumers refuse to self-identify their race or Hispanic ethnicity, the VR counselor or interviewer provides the best assessment of the consumer's race and Hispanic ethnicity (U.S. Department of Education, 2004). Each racial and ethnic category within the RSA-911 is dichotomously coded as "is not of that race/ethnicity" and "is of that race/ethnicity" (U.S. Department of Education, 2004, p. 10). Cases with a racial category of White were transformed into the variable *race 1_White* with values of 1 (i.e., yes), while all other cases being transformed with a value of 0 (i.e., no) for this variable. Cases with a racial category of Black or African American were transformed into the variable *race 2_Black_AA* with values of 1 (i.e., yes), while all other cases were transformed with a value of 0 (i.e., no) for this variable. Cases with a racial categories of American Indian or Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; and Hispanic or Latino were collapsed and transformed into the variable *race 3_Other* with values of 1 (i.e., yes), while all other cases were transformed with a value of 0 (i.e., no) for this variable.

Level of education at the time of application for VR services was included as a predictor due to previous research (Beveridge & Fabian, 2007; Bolton et al., 2000; Hayward, 1998; Moore, 2002; Research Triangle Institute & RSA, 2002; Wilson, 1999) that has revealed that increased educational attainment is linked to higher wages at the time of VR case closure. Within the RSA-911 data set, level of education is one variable with 10 possible codes:

- no formal schooling;

- elementary education (i.e., grades 1 through 8);
- secondary education, no high school diploma (i.e., grades 9 through 12);
- special education certificate of completion/diploma or in attendance;
- high school graduate or equivalency certificate (i.e., regular education students);
- post-secondary education, no degree;
- associate degree or vocational/technical certificate;
- bachelor's degree;
- master's degree or higher; or
- information not available (U.S. Department of Education, 2004).

This predictor was transformed into three new dichotomous predictors: *education 1_less than high school*, *education 2_special education certificate*, and *education 3_high school or higher*. Values assigned to all three variables were 0 = no and 1 = yes. All cases coded within the RSA-911 as no formal schooling; elementary education (i.e., grades 1 through 8); or secondary education, no high school diploma (i.e., grades 9 through 12) were transformed with values of 1 for the variable *education 1_less than high school*. All cases coded within the RSA-911 that were categorized as having a special education certificate of completion/diploma or in attendance were transformed to have values of 1 for the variable *education 2_special education certificate*. All cases within the RSA-911 that were categorized as having high school graduate or equivalency certificate (i.e., regular education students); post-secondary education, no degree; associate degree or vocational/technical certificate; bachelor's degree; or master's degree or were transformed with values of 1 for the variable *education 3_high school or higher*.

SES status was included as a predictor due to previous research that has shown it can be a strong predictor of successful employment outcomes (Gonzalez et al., 2011) as well as other

research showing that it can be associated with poor employment outcomes (Martin, 2010). For this study, SES status was derived from the RSA-911 variable that contains five possible categories for consumers' primary source of support at application: personal income (e.g., earnings, interest, dividends, rent); family and friends; public support (e.g., SSI, SSDI, TANF, etc.); and all other sources (e.g., private disability insurance and private charities) (U.S. Department of Education, 2004). To create the variable *SES_Low*, categories in the RSA-911 primary source of support variable were collapsed. Cases that had public support (e.g., SSI, SSDI, TANF, etc.) for this variable were transformed into the *SES_Low* variable with a value of 1 (i.e., yes). All other cases were transformed into the *SES_Low* variable with a value of 0 (i.e., no).

Primary disability type was also included as a predictor because previous research has demonstrated that it can predict employment outcomes (Baer et al., 2011; Grigal et al., 2011; Luecking & Fabian, 2000; Rabren et al., 2003). Primary disability is reported in the RSA-911 as a "four-digit code that best describes the individual's primary physical or mental impairment that causes or results in a substantial impediment to employment" (U.S. Department of Education, 2004, p. 14). The four-digit code is a combination of a two-digit impairment code and a two-digit source/cause of impairment code. The primary impairment code (i.e., the first two digits) was used to identify consumers' primary disability type in this study.

Within the RSA-911 there are 19 impairment codes that are grouped into three categories: sensory/communicative, physical, and mental. The sensory/communicative impairment codes are as follows:

- 01 blindness;
- 02 other visual impairment;

- 03 deafness, primary communication visual;
- 04 deafness, primary communication auditory;
- 05 hearing loss, primary communication visual;
- 06 hearing loss, primary communication auditory;
- 07 other hearing impairments (tinnitus, Meniere’s disease, hyperacusis, etc.);
- 08 deaf-blindness; and
- 09 communicative impairments (expressive/receptive) (U.S. Department of Education, 2004).

All consumers in the data set who had a sensory/communicative impairment code of 01 through 09 were collapsed into one variable for sensory/communicative impairment as a primary disability. All cases in the data set were transformed to create the dichotomous variable *primary disability_sensory/communicative* with the following values assigned: 0 = no, 1 = yes.

The physical impairment codes in the RSA-911 are as follows:

- 10 mobility orthopedic/neurological impairments;
- 11 manipulation/dexterity orthopedic/neurological impairments;
- 12 both mobility and manipulation/dexterity orthopedic/neurological impairments;
- 13 other orthopedic impairments (e.g., limited range of motion);
- 14 respiratory impairments;
- 15 general physical debilitation (fatigue, weakness, pain, etc.); and
- 16 other physical impairments (not listed above) (U.S. Department of Education, 2004).

All consumers in the data set with a physical impairment code of 10 through 16 were collapsed into one variable for physical impairment as a primary disability (i.e., *primary*

disability_physical). All cases in the data set were transformed to create the dichotomous variable *primary disability_physical* with the following values assigned: 0 = no, 1 = yes.

The mental impairment codes in the RSA-911 are:

- 17 cognitive impairments (impairments involving learning, thinking, processing information and concentration);
- 18 psychological impairments (interpersonal and behavioral impairments, difficulty coping); and
- 19 other mental impairments (U.S. Department of Education, 2004).

These primary impairment codes were not collapsed into one variable because a large majority (i.e., 80%) of consumers in the population and the sample had a mental impairment code. Instead all cases were transformed to indicate values for three new variables: *primary disability_mental/cognitive*, *primary disability_psychological*, and *primary disability_mental/other*. All three variables had the following values assigned: 0 = no, 1 = yes.

Age was included as a predictor due to previous research that has found that it was a significant predictor for employment outcomes for a large sample of students with specific learning disabilities (Gonzalez et al., 2011) and other research that showed that age was not statistically significant with regard to students' employment outcomes (Rabren et al., 2003). Consumers' date of birth is a demographic variable that is deleted from the RSA-911 that is available for public use due to confidentiality. Therefore, the RSA computes the variable for age at application to be included in the RSA-911 that is publicly available. Age at application is computed based on consumers' date of birth and the date of application for VR services. This variable was not recoded.

Criteria.

The criteria for this study were employment outcomes at the time of VR case closure: type of case closure and average weekly wages at case closure. Type of case closure is the main employment outcome measure from the RSA-911. This study focused on two types of case closure: exited with an employment outcome (i.e., an individual's case was closed successfully into employment due to the provision of VR services); and exited without an employment outcome, after receiving services (i.e., an individual did not successfully obtain employment after receiving VR services). Values for the case closure type variable were transformed so that the variable *final case closure type* would be quantitative. A value of 0 indicated an exit from VR without an employment outcome (i.e., closed unsuccessfully) and a value of 1 indicated an exit from VR with an employment outcome (i.e., closed successfully).

Average weekly wage at the time of case closure was another important employment outcome that was used as a dependent variable (i.e., criterion) in this study. Within the RSA-911, weekly wage is recorded for all consumers whose cases are closed successfully. This is not a variable that is recorded for unsuccessful case closures. Wages are recorded to the nearest dollar and include "all income from wages, salaries, tips, and commissions before payroll deductions of federal, state and local income taxes and Social Security payroll tax" (U.S. Department of Education, 2004, p. 37).

The current study measured the impact of all potential predictors on both criteria (i.e., employment outcomes). Five of the predictors were controlled, in an attempt to isolate the effect of age on the employment outcome variables. In addition, the effects of possible confounding variables were controlled (i.e., gender, race, education, SES, and primary disability type).

Design and Analyses

This was an ex post facto study based on historical data from the RSA-911. It was a non-experimental design. Data were analyzed using SPSS version 22. Correlation and regression analyses were used to answer the research questions. These two types of analyses were used because the study sought to examine the relationship (i.e., correlation) between the age of VR applicants (i.e., the independent variable or predictor) and their employment outcomes (i.e., the dependent variables or criteria).

To answer research questions one and two, logistic regression was used to analyze the effect that several variables had on predicting the type of VR case closure that transition-age youth achieved. Logistic regression was an appropriate analysis because the question sought to predict VR consumers' employment outcome, which was a dichotomous categorical variable (Byrne, 2006). Logistic regression also had an advantage in that no assumptions about the distributions of the predictor variables had to be made (Mertler & Vannatta, 2010). Also, logistic regression could analyze predictor variables of all types (Mertler & Vannatta, 2010). This analysis attempted to specify the probability of the employment outcomes for each VR consumer represented in the sample. An index of model fit utilizing a chi-square statistic was computed to show how accurately the model predicted outcomes for consumers in the sample. This index was displayed within the classification table that was generated. This table showed the percentage of subjects in the sample that were correctly classified using the model. Due to the sensitivity of chi-square statistics used with a large sample size, the Nagelkerke *R* Square value was reported to examine the amount of variance in the criterion accounted for by the model (i.e., combination of predictors). Finally, the calculated odds ratio for each predictor was reported to show the effect of each predictor on the type of VR case closure achieved (i.e., the dichotomous outcome

or criterion) (Mertler & Vannatta, 2010).

To answer research questions three and four, linear regression was used to analyze how well the age of transition-age youth at the time they applied for services predicted the wages they achieved at the time their VR case was closed. Linear regression was an appropriate analysis for a non-experimental design and was also appropriate because both the independent and dependent variables were quantitative (Green & Salkind, 2008). Effect sizes or strength-of-relationship statistics were reported. Chan et al. (2008) emphasized the importance of rehabilitation researchers using, understanding, and reporting statistics such as effect size so that field can move toward identifying evidence-based practices.

There is considerable redundancy in the correlational indices reported in the SPSS output for linear regression (Green & Salkind, 2008). The effect size statistics reported for research question three were the zero order correlation (i.e., bivariate correlation) (r), its squared value (R^2), and the part (i.e., semi-partial) correlation. The correlation coefficient r reports a value ranging from -1 to +1. Positive values for this study would suggest that as age at the time of VR application increases (i.e., the predictor), wages earned at the time of VR case closure (i.e., the criterion) also increase. Negative values would suggest that as age at the time of VR application increases, wages earned at case closure decrease. Values of r that are closer to -1 or +1, suggest stronger linear relationships. Correlation coefficients of .10, .30, and .50, regardless of the sign, are interpreted as small, medium, and large respectively (Green & Salkind, 2008). The squared value of r is an index that explains how well the criterion (i.e., wages) can be predicted from the variable (i.e., age at the time of VR application). The value of R^2 was used to report the proportion of variance in wages at the time of VR case closure accounted for by the age at which consumers apply for VR services. The semi-partial correlation was reported because it can

account for more of the variance without ignoring overlaps from other predictors. It is more suitable for prediction when redundancy exists (Wendorf, 2004).

The focus of research question four was the predictive power of age at the time of VR application upon wages earned at the time of successful case closure. Possible confounding variables were controlled (i.e., gender, race, education, SES, and primary disability type). The analysis produced two models using multiple linear regression for analysis. The first model examined the predictive power of the demographic variables without age added. The second model examined the predictive power of the age at application after controlling for the other demographic variables. For each model, R^2 was reported to identify the amount of variance in wages earned at the time of VR case closure that could be accounted for by the overall model. The statistical significance of each model was examined using an F test statistic that corresponds to each model's value for R^2 . A change in R^2 was also reported to examine how the addition of age might have improved the final model. Finally, the analysis for research question four resulted in the standardized regression coefficient (i.e., beta or β) for each predictor that indicated the weight each predictor had upon the overall prediction equation for the model. Beta weights have a mean of 0 and a standard deviation of 1 and have a corresponding p -value that indicates the statistical significance of the coefficient in the model (Mertler & Vannatta, 2010).

Summary

This study examined predictors of employment outcomes for youth and young adults with significant disabilities who were transitioning from school to adult life using special education and VR services. Specifically, age at application for VR services was the key predictor that was examined in this study. The RSA-911 database for fiscal year 2011 was used to examine four research questions concerning this population of VR consumers. The population of

transition-age youth with significant disabilities was extracted from this database for analysis. SPSS was used to analyze the data for this non-experimental ex post facto study. Correlations and regression analyses were used to examine the strength of relationships between variables as well as the statistical significance of the predictors.

CHAPTER IV: RESULTS

Chapter four presents the results of the analyses for the four research questions of this study. These research questions sought to identify predictors of employment outcomes for transition-age youth with significant disabilities. Two types of employment outcomes were examined: the type of VR case closure achieved (i.e., successfully closed into employment or unsuccessfully closed) and wages earned at the time of successful case closure. Gender, race, education level, disability type, socioeconomic status, and age at the time of application for VR services were the predictors examined in this study.

Descriptive statistics for the population and sample were recorded in Table 2 in the previous chapter. Some descriptive statistics relative to the predictors and criterion examined were worth noting. The mean age at the time of application for VR services was 18.96 with a standard deviation of 2.14 years. A majority (72.4%, $n = 590$) of youth in the sample were 18 or over when they applied for VR services. Of the 27.6% that were under age 18 when they applied for services, only 2.1% ($n = 45$) of individuals were under 16 years of age. With regard to the demographic characteristics of the population, the majority of the sample were male (62.4%), White (65.8%), had a mental/cognitive disability (62.4%), and had less than a high school education at the time they applied for services (50.8%). Additionally, the majority of consumers in the sample had a low socioeconomic status (60.1%) and did not achieve a successful employment outcome with VR (60.2%). For the individuals in the sample who did achieve a successful employment outcome, the mean weekly earnings at the time of case closure were

\$204.23 with a standard deviation of \$146.86. The mean weekly earnings can be calculated as an average yearly income from work of \$10,620.

Logistic regression was used to answer research questions one and two. The type of VR case closure achieved was the focus of the analyses. To answer research questions three and four, linear regression was used to analyze the potential predictors of wages earned. The current study was a nonexperimental design that used existing data from the Rehabilitation Services Administration (RSA). The population of transition-age youth with significant disabilities used in this study was derived from the RSA-911 data set for fiscal year 2011. A 15% random sample ($n = 2,141$) was taken from the population and used for each research question. Within the sample, 852 consumers were closed successfully into employment. Research questions three and four focused on wages earned at the time of successful case closure. Therefore, only consumers' cases that were closed successfully were used in these analyses ($n = 852$).

Preliminary Analysis

A preliminary multiple regression was conducted to examine multicollinearity among the 13 predictors:

- *Gender*
- *Race 1_White,*
- *Race 2_Black_African American (Race 2_Black_AA),*
- *Race 3_Other,*
- *Education 1_Less than High School (Ed_1 Less than H.S.),*
- *Education 2_Special Education Certificate (Ed_2 Special Ed Cert),*
- *Education 3_High School or Higher (Ed_3 H.S. or Higher),*
- *SES_Low,*

- *Primary Disability_Sensory/Communicative (PD_Sensory/Communicative)*,
- *Primary Disability_Physical (PD_Physical)*,
- *Primary Disability_Mental/Cognitive (PD_Mental/Cognitive)*,
- *Primary Disability_Mental/Psychological (PD_Mental/Psychosocial)*, and
- *Primary Disability_Mental/Other (PD_Mental/Other)*.

Tolerance for 11 predictors was greater than .1, while tolerance for two predictors (i.e., *PD_Mental/Cognitive* and *Education 2_Special Ed Cert*) was below .1. The low tolerance level indicated there was a problem with multicollinearity with these two predictors. Researchers recommend that one or more of the redundant predictors be removed from the model in order to eliminate the multicollinear relationship (Mertler & Vannatta, 2010). Therefore, *Education 2_Special Ed Cert* was removed from the model. Standardized residuals were also examined in the preliminary analysis to identify potential outliers. Using this method, any case with an absolute standardized residual greater than 1.96 (i.e., 2 standard deviations away from the mean of 0) would have been eliminated (Agresti, 2002). None of the cases in the sample met this criterion; therefore all cases in the sample were retained.

Research Question One

Initial Analysis

To answer research question one, logistic regression was used to analyze how well the *Age at Application* for VR services predicted the type of case closure for transition-age youth with significant disabilities after controlling for *Gender*, *Race*, *Education*, *Primary Disability Type*, and *SES*. An initial logistic regression analysis was conducted with the 12 predictors that were retained after the preliminary analysis. Table 3 reports the results of the initial analysis of research question one.

Model 1 (i.e., the constant only model) correctly classified 60.4% of the consumers indicating that the model was fairly accurate in classifying consumers' case closure status (Mertler & Vannatta, 2010). The model fit index was statistically significant ($X^2 = 40.42$, $df = 11$, $p < .001$), which indicated a good model fit. Chi-square statistics are sensitive to large sample sizes (Green & Salkind, 2008; Mertler & Vannatta, 2010); therefore, the Nagelkerke R^2 (i.e., a pseudo R square value) was reported. The predictors in the equation for Model 1 only accounted for 3% ($R^2 = .03$) of the variance in the criterion (i.e., VR case closure type). Regression results for the initial analysis of research question one indicated that a majority of the predictors did not significantly predict the type of VR case closure achieved. Only three variables significantly predicted VR case closure type: *Gender* ($e^B = 0.77$, $df = 1$, $p < .01$), *PD_Sensory/Communicative* ($e^B = 1.96$, $df = 1$, $p < .01$), and *PD_Mental/Cognitive* ($e^B = 1.73$, $df = 1$, $p < .05$).

Model 2 (i.e., the model when *Age at Application* was added) correctly classified 60.1% of the consumers. This was a slight decrease compared to Model 1, indicating that the addition of *Age at Application* did not improve the model. The model fit index was statistically significant ($X^2 = 43.01$, $df = 11$, $p < .001$), which indicated a good model fit. However, the change in chi-square statistic at the step when age was added ($X^2 = 2.59$, $p > .05$) indicated that the addition of age did not improve or change the model with any statistical significance. Due to the sensitivity of the chi-square statistic when using a large sample size, Nagelkerke R^2 was used. The predictors in the equation for Model 2 only accounted for 3% ($R^2 = .03$) of the variance in the criterion (i.e., VR case closure type), which was similar to the variance for Model 1. Additionally, the majority of the predictors did not significantly predict type of VR case closure. As in Model 1, only three variables significantly predicted VR case closure type: *Gender* ($e^B =$

0.77, $df = 1$, $p < .01$), *PD_Sensory/Communicative* ($e^B = 2.01$, $df = 1$, $p < .01$), and *PD-Mental/Cognitive* ($e^B = 1.74$, $df = 1$, $p < .05$). There was little variability in the odds ratios for these three variables in Model 2.

A good-fitting model has a statistically significant model chi-square (Mertler & Vannatta, 2010). While the initial analysis did reveal a good model fit, only three predictors contributed to the model with statistical significance (i.e., *Gender*, *PD_Sensory/Communicative*, and *PD-Mental/Cognitive*). A follow-up logistic regression analysis was conducted using only the variables that had statistical significance to determine if the model fit could be improved. Results from the follow-up analysis are reported in Table 4.

Table 3

Research Question One Initial Analysis: Logistic Regression Overall Model Fit

Overall Model	Model 1			Model 2		
	X^2	Percent Classified Correctly	Nagelkerke R^2	X^2	Percent Classified Correctly	Nagelkerke R^2
	40.42**	60.4	.03	43.01**	60.1	.03
Predictors	B	Odds Ratio	B	Odds Ratio		
<i>Gender</i> (1 = Male)	-.26*	.77	-.26*	.77		
<i>Race 1_White</i>	-.20	.82	-.20	.82		
<i>Race 2_Black_AA</i>	-.19	.82	-.16	.85		
<i>Race 3_Other</i>	-.07	.93	-.06	.94		
<i>Ed 1_Less than H.S.</i>	-.10	.91	-.03	.97		
<i>Ed 3_H.S. or Higher</i>	.11	1.12	.09	1.10		
<i>SES_Low</i>	-.11	.89	-.15	.86		
<i>PD_Sensory/Communicative</i>	.67*	1.96	.70*	2.01		
<i>PD_Physical</i>	.21	1.23	.21	1.24		
<i>PD_Mental/Cognitive</i>	.55**	1.73	.56**	1.74		
<i>PD_Mental/Psychosocial</i>	-.07	.94	-.07	.94		
<i>Age at Application</i>	N/A	N/A	.04	1.04		

*p < .01

**p < .05

Follow-up Analysis

The follow-up analysis for research question one examined how the *Age at Application* for VR services predicted the type of case closure after controlling for the three predictors that showed statistical significance in the initial analysis: *Gender*, *PD_Sensory/Communicative*, and

PD_Mental/Cognitive. Results for both models are displayed in Table 4. Model 1 classified 60.2% of consumers' VR case closure type correctly, indicating that it was fairly accurate in classifying consumers' case closure type (Mertler & Vannatta, 2010). The overall model chi-square for Model 1 (i.e., the constant-only model) was statistically significant ($X^2 = 33.69$, $df = 3$, $p < .001$), indicating a good model fit. The predictors only accounted for 2% of the variance in the type of VR case closure achieved ($R^2 = .02$).

Model 2 (i.e., the model when *Age at Application* was added) correctly classified 60.2% of the consumers' type of VR case closure, which was consistent with the percent classified correctly in Model 1. The overall model fit was statistically reliable in distinguishing between unsuccessful and successfully closed VR cases ($X^2 = 36.94$, $df = 3$, $p < .001$). However, the predictors only accounted for 2% of the variance in the type of VR case closure that was achieved ($R^2 = .02$). At the step in Model 2 when *Age at Application* was added, the change in the chi-square statistic ($X^2 = 3.26$, $p > .05$) indicated that the addition of age did not improve or change the model with any statistical significance.

The odds ratios for all three predictors were similar in the follow-up analysis as compared to the initial analysis that included all 12 predictors. The odds ratio for *Gender* ($e^B = .78$, $df = 1$, $p < .01$) was the same in the follow-up analysis, while *PD_Sensory/Communicative* ($e^B = 1.92$, $df = 1$, $p < .001$) and *PD_Mental/Cognitive* ($e^B = 1.67$, $df = 1$, $p < .001$) both increased slightly. Examination of the predictors indicated that the two primary disability types were the strongest predictors of VR case closure type. VR consumers who had a primary disability that was sensory/communicative were almost two times as likely to be closed from VR as successfully employed when all other predictors were held constant (i.e., *Gender*, *PD_Mental/Cognitive*, and *Age at Application*). Consumers who had a primary disability that was mental/cognitive were

over one and a half times as likely to be successfully employed at the time of VR case closure when the other predictors were held constant (i.e., *Gender*, *PD_Sensory/Communicative*, and *Age at Application*). For both models, *Gender* was also a strong predictor of VR case closure type. Males were more likely to be employed at the time of VR case closure than females. With an odds ratio of 0.78, the odds of a male VR client in this population achieving a successful employment outcome were 12% greater than the odds of a female VR client when other predictors were held constant (i.e., *PD_Sensory/Communicative*, *PD_Mental/Cognitive*, and *Age at Application*).

Table 4

Research Question One Follow-up Analysis: Logistic Regression Overall Model Fit

Overall Model	Model 1			Model 2		
	X^2	Percent Classified Correctly	Nagelkerke R^2	X^2	Percent Classified Correctly	Nagelkerke R^2
	33.69**	60.2	.02	36.95**	60.2	.02
Predictors	B	Odds Ratio	B	Odds Ratio		
<i>Gender</i> (1 = Male)	-.24*	.78	-.25*	.78		
<i>PD_Sensory/Communicative</i>	.62**	1.87	.65**	1.92		
<i>PD_Mental/Cognitive</i>	.50**	1.65	.51**	1.67		
<i>Age at Application</i>	NA	NA	.04	1.04		

*p < .01

**p < .001

In summary, results for research question one showed that some consumer characteristics were strong predictors of VR case closure type. However, *Age at Application* for VR services was not a significant predictor. The chi-square statistic for the step at which age was added to the

model was not statistically significant ($X^2 = 3.26$, $df = 1$, $p > .05$). Additionally, the percent classified correctly did not improve when age was added. Instead, the percent classified remained the same for both models.

Research Question Two

To answer research question two, backward elimination logistic regression was used to analyze which predictors (i.e., *Age at Application*, *Gender*, *Race*, *Education*, *Primary Disability Type*, and *SES*) contributed significantly to the type of VR case closure achieved for transition-age youth with significant disabilities. *Gender*, *PD_Sensory/Communicative*, and *PD_Mental/Cognitive* were the only three predictors used in research question two due to results from the initial analysis for research question one. These were the predictors that contributed to the model with statistical significance. Backward elimination required all variables to be entered into the equation initially. Then, the analysis examined the smallest change in Log-Likelihood when variables were successively removed from the model (Agresti, 2002). Results for research question two are displayed in Table 5.

Table 5

Research Question Two: Backward Elimination Logistic Regression Overall Model Fit

Overall Model	Model 1			Model 2		
	X^2	Percent Classified Correctly	Nagelkerke R^2	X^2	Percent Classified Correctly	Nagelkerke R^2
	36.95**	60.2	.02	36.95**	60.2	.02
Predictors	B	Odds Ratio	B	Odds Ratio		
<i>Gender</i> (1 = Male)	-.25*	.78	-.25*	.78		
<i>PD_Sensory/Communicative</i>	.65**	1.92	.65**	1.92		
<i>PD_Mental/Cognitive</i>	.51**	1.67	.51**	1.67		
<i>Age at Application</i>	.04	1.04	.04	1.04		

*p < .01

**p < .001

Model 1, the model that included all three predictors, was fairly accurate in classifying the type of VR case closure that youth achieved. After using backward elimination, all three variables were retained in the final model. Model 2 correctly classified 60.2% of consumers' type of VR case closure. The final model also had an overall fit that was statistically reliable in classifying the type of VR case closure that consumers achieved ($X^2 = 36.95$, $df = 4$, $p < .001$). However, the predictors only accounted for 2% of the variance in the outcome ($R^2 = .02$). The odds ratios for the predictors with statistical significance were the same as the results for research question one: *Gender* ($e^B = .78$, $df = 1$, $p < .01$), *PD_Sensory/Communicative* ($e^B = 1.92$, $df = 1$, $p < .001$), and *PD_Mental/Cognitive* ($e^B = 1.67$, $df = 1$, $p < .001$). Once again, the two primary disability types were the strongest predictors of VR case closure type.

Similar to research question one, results for research question two showed that some consumer characteristics were strong predictors of VR case closure type. However, *Age at*

Application for VR services was not a significant predictor. It may be worth noting that the p -value for *Age at Application* was less than .08.

Research Question Three

Bivariate linear regression was used to answer research question three. This question focused on how well *Age at Application* for VR services predicted wages at VR case closure for transition-age youth with significant disabilities. Wages at the time of VR case closure are reported for consumers' whose cases were closed successfully (i.e., employed), therefore, this question only examined part of the total sample ($n = 852$). RSA reports weekly gross wages.

Regression results indicated that *Age at Application* for VR services significantly predicted wages earned at the time of successful VR case closure [$F(1, 850) = 39.08, p < .001$]. *Age at Application* accounted for 4% of the variance ($R^2 = .04$) in the amount of weekly wages earned at the time of VR case closure. A linear relationship existed between *Age at Application* and weekly wages earned ($r = -.21$), indicating that as *Age at Application* increased, the wages earned at the time of successful VR case closure decreased. Even though the relationship was statistically significant, the strength of the relationship was low.

Research Question Four

Multiple linear regression was used to answer research question four. This question focused on how well *Age at Application* for VR services predicted wages at VR case closure when controlling for gender, race, education, disability type, and socioeconomic status. As in research question three, only consumers whose cases were closed successfully ($n = 852$) were used. The initial analysis for this question included all 12 predictors that were examined in research question one after *Education 2_Special Ed Cert* was removed due to multicollinearity. Results included the effect size (R^2), the Standard Error (S.E.) of the Estimate, the zero order

correlation (r), the part (i.e., semi-partial) correlation, and the standardized regression coefficient (β). An F test of significance was also reported to examine the difference between the models.

Results for the initial analysis are reported in Table 6.

Initial Analysis

Model 1 significantly predicted average weekly wages earned at the time of successful VR case closure. The predictors in the equation for Model 1 accounted for 10% ($R^2 = .10$) of the variance in the criterion (i.e., average weekly wages earned). Five predictors significantly contributed to Model 1: *Gender* [$\beta = -.10, t(840) = -3.07, p < .01$], *Race_2_Black_African American* [$\beta = .25, t(840) = 2.61, p < .01$], *Education_1_Less than High School* [$\beta = .12, t(840) = 3.04, p < .01$], *SES_Low* [$\beta = -.12, t(840) = -3.70, p < .001$], and *PD_Sensory/Communicative* [$\beta = .23, t(840) = 6.70, p < .001$].

Model 2 (i.e., the model when *Age at Application* was added) also significantly predicted average weekly wages earned. Model 2 accounted for 12% ($R^2 = .12$) of the variance in the average weekly wages earned. This was a slight increase compared to Model 1. In addition, the change in R^2 was statistically significant [$F(1, 839) = 16.51, p < .001$], indicating that the addition of *Age at Application* improved the model. Similarly to Model 1, the majority of the predictors did not significantly predict average wages at successful case closure. Four predictors significantly contributed to the model: *Gender* [$\beta = -.10, t(839) = -3.13, p < .01$], *Education_3_High School or Higher* [$\beta = .10, t(839) = 2.68, p < .01$], *PD_Sensory/Communicative* [$\beta = .21, t(839) = 6.29, p < .001$], and *Age at Application* [$\beta = -.16, t(839) = -4.06, p < .001$].

Table 6

Research Question Four Initial Analysis: Multiple Linear Regression Findings

Overall Model	Model 1			Model 2		
	R^2 .10 ^a	S.E. Estimate \$140.23		R^2 .12 ^{bc}	S.E. Estimate \$138.95	
Predictors	r	Semi-Partial r	β	r	Semi-Partial r	β
	<i>Gender</i> (1 = Male)	-.08	-.10	-.10*	-.08	-.10
<i>Race 1_White</i>	-.06	.06	.16	-.06	.05	.14
<i>Race 2_Black_AA</i>	.08	.09	.25*	.08	.07	.21
<i>Race 3_Other</i>	.01	.05	.06	.01	.04	.05
<i>Ed 1_Less than H.S.</i>	.09	.10	.12*	.09	.04	.06
<i>Ed 3_H.S. or Higher</i>	.03	.08	.09	.03	.09	.10*
<i>SES_Low</i>	-.13	-.12	-.12**	-.13	-.08	-.09
<i>PD_Sensory/Communicative</i>	.22	.22	.23**	.22	.20	.21**
<i>PD_Physical</i>	.01	.04	.04	.01	.05	.05
<i>PD_Mental/Psychosocial</i>	-.02	.00	.00	-.02	.01	.01
<i>PD_Mental/Other</i>	-.03	-.02	-.02	-.03	-.01	-.01
<i>Age at Application</i>	N/A	N/A	N/A	-.21	-.13	-.16**

* $p < .01$ ** $p < .001$ ^a $F_{(11, 840)}=8.49, p < .001$ ^b $F_{(12, 839)}=9.30, p < .001$ ^c $\Delta R^2 = .02 (F_{1, 839}=16.51, p < .001)$

Follow-up Analysis

A follow-up analysis was conducted to determine if the model could be improved using only the predictors from Model 2 in the initial analysis that had statistical significance. The predictors used in the follow-up analysis were *Gender*, *Education_3_High School or Higher*, *SES_Low*, and *PD_Sensory/Communicative*. Results from the follow-up analysis are reported in Table 7.

Model 1 of the follow-up analysis significantly predicted consumers' average weekly wages earned at the time of VR case closure. The predictors in Model 1 accounted for 8% ($R^2 = .08$) of the variance in the criterion. Three of the four predictors significantly contributed to Model 1: *Gender* [$\beta = -.10$, $t(847) = -2.92$, $p < .01$], *PD_Sensory/Communicative* [$\beta = .23$, $t(847) = 6.89$, $p < .001$], and *SES_Low* [$\beta = -.14$, $t(847) = -4.19$, $p < .001$].

Model 2 (i.e., the model when *Age at Application* was added) of the follow-up analysis also significantly predicted average weekly wages earned. The predictors in Model 2 accounted for 10% ($R^2 = .10$) of the variance in the average weekly wages individuals earned. Three of the five predictors significantly contributed to the model: *Gender* [$\beta = -.10$, $t(846) = -3.01$, $p < .01$], *PD_Sensory/Communicative* [$\beta = .21$, $t(846) = 6.25$, $p < .001$], and *Age at Application* [$\beta = -.19$, $t(846) = -5.28$, $p < .001$]. Finally, the change in R^2 was statistically significant [$F(1, 846) = 20.20$, $p < .001$], indicating that the addition of *Age at Application* improved the model.

Table 7

Research Question Four Follow-up Analysis: Multiple Linear Regression Findings

Overall Model	Model 1			Model 2		
	R^2	S.E. Estimate		R^2	S.E. Estimate	
	.08 ^a	\$141.41		.11 ^{bc}	\$139.22	
Predictors	Semi-Partial			Semi-Partial		
	r	r	β	r	r	β
<i>Gender</i> (1 = Male)	-.08	-.10	-.10*	-.08	-.10	-.10*
<i>Ed 3_ H.S. or Higher</i>	.03	.03	.03	.03	.08	.08
<i>SES_Low</i>	-.13	-.14	-.14**	-.13	-.08	-.09
<i>PD_Sensory/ Communicative</i>	.22	.23	.23**	.22	.20	.21**
<i>Age at Application</i>	N/A	N/A	N/A	-.21	-.17	-.19**

* $p < .01$ ** $p < .001$ ^a $F_{(4, 847)}=17.72, p < .001$ ^b $F_{(5, 846)}=20.20, p < .001$ ^c $\Delta R^2 = .03 (F_{1, 846}=27.85, p < .001)$

In summary, results for research question four demonstrated that some consumer characteristics predicted wages earned at the time of successful VR case closure. *Age at Application* for VR services was a statistically significant predictor of wages earned after controlling for other consumer characteristics. As consumers' age at application for VR services decreased (i.e., the younger a consumer was when he or she applied for VR services), the wages earned at the time of successful VR case closure increased. In addition, *Gender* and *PD_Sensory/Communicative* were also significant predictors for wages earned. Male VR consumers earned higher wages at case closure than females. Consumers who had a sensory/communicative primary disability earned higher weekly wages ($M = \$302$) than youth

with other disabilities: physical ($M = \$211$), mental/cognitive ($M = \191), mental/psychosocial ($M = \$196$), and mental/other ($M = \181).

Summary

This study examined potential predictors of employment outcomes for transition-age youth with significant disabilities who received VR services. Existing data from the RSA for fiscal year 2011 was used to derive a random sample of youth whose cases were closed successfully or unsuccessfully after receiving VR services. Two employment outcomes were examined: type of VR case closure achieved and wages earned at the time of successful case closure. Research questions one and two focused on predictors for the type of VR case closure achieved while research questions three and four focused on wages earned. Potential predictors were identified from existing literature and included six categories: age at the time youth applied for VR services, gender, race, education level at the time youth applied for VR services, socioeconomic status, and primary disability type. Some predictors emerged as significant predictors of employment outcomes for youth with significant disabilities. Table 8 summarizes the predictors that contributed significantly to the final models created by each research question.

Table 8

Summary of All Findings

Research Questions	Type of VR Case Closure Achieved		Wages Earned at the Time of Successful Case closure	
	Research Question 1 p-value	Research Question 2 p-value	Research Question 3 p-value	Research Question 4 p-value
Predictors				
<i>Gender</i> (1 = Male)	p < .01	p < .01	N/A	p < .01
<i>PD_Sensory/Communicative</i>	p < .001	p < .001	N/A	p < .001
<i>PD_Mental/Cognitive</i>	p < .001	p < .001	N/A	N/A
<i>SES_Low</i>	N/A	N/A	N/A	p < .05
<i>Age at Application</i>	p < .08	p < .08	p < .001	p < .001

*p < .01

**p < .001

Gender and *PD_Sensory/Communicative* were significant predictors for both types of employment outcomes examined. Males were more likely to achieve a successful case closure and earn higher weekly wages at the time of case closure than females. Results across three research questions revealed that gender was a predictor with statistical significance at the $p < .01$ level. This level of significance indicated that there was a less than 1% probability that the findings were a result of chance. Participants with a primary disability that was sensory/communicative were more likely to achieve a successful case closure than those who did not have this primary disability type when all other variables were held constant. Three of the four research questions revealed disability type as a predictor with statistical significance.

Specifically, *PD_Sensory/Communicative* contributed significantly to all three final models at the $p < .001$ level. This level of statistical significance indicated that it was highly unlikely that results were due to chance (i.e., less than one in one thousand).

Other predictors contributed significantly to one or more of the research questions. *PD_Mental/Cognitive* contributed significantly to the final models created in research questions one and two that used the type of VR case closure achieved as the criterion. Youth with a primary disability that was mental/cognitive were more likely to achieve a successful VR case closure than youth who did not have this primary disability type, when all other variables were held constant. *PD_Mental/Cognitive* contributed significantly at the $p < .001$ level for both questions, indicating that the probabilities of these findings being due to chance were less than one in one thousand.

Socio-economic status contributed significantly to the final research question that examined predictors of wages earned at the time of successful VR case closure. Participants who had public support (e.g., SSI, SSDI, TANF, etc.) as their primary source of support were identified as having a low SES in this study. Those who had a low SES were less likely to earn higher wages at the time of successful VR case closure. Alternatively, those who did not have a low SES (i.e., youth whose primary support was from personal income, family, and all other sources) were more likely to have higher wages at the time of successful VR case closure. The probability of these results being due to chance was less than 5%.

Finally, age at the time youth with significant disabilities applied for VR services was a significant predictor for wages earned at the time of successful case closure. For research questions three and four, participants who applied for VR services at a younger age were more likely to achieve higher wages when their cases were successfully closed. Results for both

research questions were significant at the $p < .001$ level, indicating that the probability of the findings being a result of mere chance was highly unlikely (i.e., less than one in one thousand). Age did not contribute with statistical significance to the models created in the research questions that used VR case closure type as the criterion. However, it is important to note that the p -level for *Age at Application* for both questions was .071. This probability level is not far from the level required for statistical significance (i.e., .05).

CHAPTER V: DISCUSSION

The previous chapter reported the results of the research questions posed in this study. Chapter five will offer a discussion of the results to include the significance and interpretation of the findings within the context of previous research. The performance across participants will highlight demographic data to provide further explanation. Limitations to this study will also be discussed. Finally, the chapter will close with implications for future research and conclusions.

This study examined the age at application for vocational rehabilitation (VR) services as it impacted employment outcomes for transition-age youth (i.e., age 14 to 24) with significant disabilities. Employment outcomes were defined as the type of VR case closure achieved and the wages earned at the time of case closure. Controls were set for predictors that had demonstrated influence on employment outcomes in previous research [(i.e., gender, race, education level, disability type and socioeconomic status (SES)]. The most comprehensive data set within the Rehabilitation Services Administration (RSA), the annual RSA-911, was used to obtain the population and sample used for the study. The RSA-911 for fiscal year 2011 was used, as it was the most current data set available at the time the study began. Results revealed that certain demographic characteristics, including the age at application for VR services did impact the employment outcomes measured. Future research with the RSA-911 data set may expound on the findings of this study to identify effective transition practices for this population of youth.

Significance

The findings of this study are significant to the fields of special education and rehabilitation. Identifying individual characteristics that can lead to improved employment

outcomes has importance for both fields, particularly as they overlap to provide services to transition-age youth with disabilities (Luecking & Fabian, 2000). As students progress through secondary education, VR can be a partner in the delivery of collaborative transition services because of its ability to help youth with disabilities “develop vocational skills, obtain employment, and advance the opportunity to live independently” (Benz, Lindstrom, & Latta, 1999, p. 55). In order for special educators and VR counselors to work together, the barriers that have prevented successful collaboration must be addressed (Benz et al., 1999). A potential barrier to successful collaboration may be VR professionals’ lack of involvement in the early years of secondary education. According to Oertle & Trach (2007), special educators never or rarely coordinate referrals to adult service providers (e.g., VR).

Interpretation

Results from this study must be applied within the context of previous research. Some findings confirmed and extended previous research (Baer et al., 2011; Benz et al., 1997; Berry & Caplan, 2010; Dutta, Gervey, Chan, Chou, & Ditchman, 2008; Flannery, Benz, Yovanoff, Kato, & Lindstrom, 2011; Gonzalez et al., 2011; Luecking & Fabian, 2000; Newman et al., 2009; Rabren et al., 2002; Rabren et al., 2003; Rabren, Carpenter, Dunn, & Carney, 2014; Wagner et al., 2012). Other findings differed from and extended previous research (Benz et al., 1997; Berry & Caplan, 2010; Gonzalez et al., 2011; Grigal et al., 2011; Luecking & Fabian, 2000; Rabren et al., 2003; Rabren et al., 2014; Wagner, Newman, & Javitz, 2014). The details of how this study confirmed, differed from, and extended previous research will be discussed.

Confirmation of Previous Research

Findings from the current study confirmed and extended previous research with regard to gender (Baer et al., 2011; Benz et al., 1997; Doren et al., 2011; Lindstrom & Benz, 2002; Rabren

et al., 2002; Rabren et al., 2003; Rabren et al., 2014; Wagner et al., 2014). Within this study, males were more likely to achieve a successful employment outcome and earned higher wages at the time of successful case closure. This finding extends previous research that examined employment outcomes for students after completing high school (Baer et al., 2011; Benz et al., 1997; Rabren et al., 2002; Rabren et al., 2003; Rabren et al., 2014; Wagner et al., 2014). Current findings revealed a smaller discrepancy in the odds ratios (OR) between genders as compared to Benz et al. (1997), Rabren et al. (2002), and Baer et al., (2011) that examined state level data. The current study revealed an odds ratio more similar to the Wagner et al. (2014) study that examined data from the National Longitudinal Transition Study-2 (NLTS-2). Even though the current study and Wagner et al. (2014) used two different national data sets, both found similar results.

Current results for the impact of gender on obtaining employment were the most similar to Rabren et al. (2003) and Rabren et al. (2014) that examined state level data. Rabren et al. (2003) examined a combined special education/VR data set while Rabren et al. (2014) examined a special education data set focusing on a sample of youth with disabilities who lived in high-relative poverty. All of the similarities noted above relate to obtaining employment. While this is an important outcome, wages earned from employment are another critical outcome measure.

The current study also confirmed previous studies' results for wages earned from competitive employment (Doren et al., 2011; Flannery et al., 2011). This study's findings showed that males were more likely to earn higher wages at the time of VR case closure. The Doren et al. (2011) study examined outcomes from the Youth Transition Program (YTP) in Oregon. YTP participants receive VR services as a program component. Female YTP participants earned significantly lower starting wages than males. Additionally, when predictors

that interacted with gender were examined, none of the predictors that influenced higher wages for males (i.e., completing high school, employment at exit from YTP, and successful VR case closure) predicted higher wages for females (Doren et al., 2011). Flannery et al. (2011) examined employment outcomes for students who completed a short-term community college training program. The odds ratio from Flannery et al. (2011) is very close to the odds ratio for the current study (-.13 and -.10 respectively). However, a notable difference is that a majority of participants in Flannery et al. (2011) were over age 25. Even though the majority of participants in Flannery et al. (2011) were older than participants in this study, current and previous research has demonstrated with statistical significance that females have lower earnings despite receiving services that have led to employment.

The current study also confirmed and extended previous research that examined the impact of SES on employment outcomes (Dutta et al., 2008; Newman et al., 2009; Rabren et al., 2014). The current study found that youth who primarily depended on public support (i.e., SSI, SSDI, TANF, or other sources) at the time they applied for VR services, were more likely to earn lower wages than youth who relied on other sources of income. This finding extends research from Dutta et al. (2008) that found receipt of government benefits was a negative predictor of achieving a successful outcome with VR. Specifically, youth in all three major disability categories (i.e., sensory/communicative, physical, and mental) had significantly lower chances (40%, 37%, and 39% respectively) of being closed successfully into employment if they received government benefits (Dutta et al., 2008). Findings from Rabren et al. (2014) demonstrated that youth with specific learning disabilities (SLD) or ID who lived in high-relative poverty areas were not achieving high rates of employment in the latter transition years. Specifically, only 33% of students with SLD or ID had a job at the time they left high school and only 41% had a job

during the year following high school (Rabren et al., 2014). Findings from the NLTS-2 showed that youth from high-income households were more likely to have had a job since leaving high school (Newman et al., 2009). Current and previous research has revealed that youth who depend on government benefits and/or live in poverty face significant barriers to achieving positive employment outcomes.

The current study also confirmed and extended previous research that examined age as a predictor of employment outcomes (Berry & Caplan, 2010; Gonzalez et al., 2011). The current study confirmed previous results from Berry & Caplan (2010) with regard to the impact of age on wages earned. Berry & Caplan (2010) examined a similar population of transition-age students age 16 to 25. All study participants in Berry & Caplan (2010) had significant disabilities based on receiving SSI benefits. Results of their research showed that youth who applied for VR services at age 16 had the highest median earnings two years after exiting the VR program (Berry & Caplan, 2010). The current study showed that age at the time of application for VR services was a significant predictor ($p < .001$) of wages earned at the time of successful VR case closure. As the age at application decreased, wages earned increased.

The impact of age on obtaining employment was also extended in the current study's findings. Berry and Caplan (2010) found that youth who applied for VR services in the latter transition years were less likely to be employed. Gonzalez et al. (2011) examined employment outcome predictors for youth with SLD using the RSA-911 for fiscal year 2007. Although they found that age at the time of VR application was not a predictor of employment, 84% of the total sample's successful closures came from students who applied for services between ages 16 and 19 (i.e., the lower end of the age range examined) (Gonzalez et al, 2011). The current study's descriptive data revealed that 61% of all successful closures in the sample were youth who

applied for services between ages 16 and 19. In Gonzalez et al. (2011), only 16% of consumers who were closed successfully applied for services between the ages of 20 to 24 (Gonzalez et al., 2011). The current study showed 36% of successful closures were from students who applied between ages 20 to 24. Looking more closely at age at application for VR services, the Gonzalez et al. (2011) study revealed that youth ages 16 to 17 comprised 38% of the total successful closures while the current study showed 24% for the same age range. The Gonzalez et al. (2011) study examined only youth with SLD while the current study examined youth with a variety of significant disabilities, including some with learning disabilities ($n = 347$ or 16% of the total sample). While findings from Gonzalez et al. (2011) and the current study did not show that age at the time of application for VR services significantly predicted employment outcomes, the descriptive results from both studies are worth noting and suggest that further research on the impact of age may be warranted.

Results from previous research on disability type as a predictor of employment outcomes were also confirmed and extended in the current study. Previous research has demonstrated that youth with significant ID have achieved positive employment outcomes (Certo & Luecking, 2006; Luecking & Fabian, 2000; Migliore & Butterworth, 2008; Wagner et al., 2014). Using the Transition Services Integration Model, 60% of participants with ID were employed by the time they exited high school (Certo & Luecking, 2006). Youth with ID who participated in the Bridges Program were more likely to maintain long term employment than students with learning or emotional disabilities (Luecking & Fabian, 2000). Youth with ID also achieved positive employment outcomes after completing post-secondary training (Migliore & Butterworth, 2008). In Wagner et al. (2014), having a greater number of functional domains affected by disability was associated with higher odds employment after high school.

The current study revealed that having a mental/cognitive disability was a significant positive predictor of successful employment outcomes with VR. Specifically, youth with a mental/cognitive disability were over one and a half times more likely to achieve a positive employment outcome than youth who did not have a mental/cognitive disability when all other variables were held constant. Within the large category of mental/cognitive disability in this study, 51% were youth with ID. Current findings, as well as previous findings demonstrate that youth with ID are achieving positive employment outcomes.

In summary, the current study confirmed and extended previous research on employment outcome predictors for transition-age youth. Gender, SES, age, and disability type demonstrated statistical significance in predicting employment and/or wages earned after high school. The following characteristics increase the likelihood of transition-age youth with significant disabilities achieving successful employment outcomes: being male, having a higher SES, applying for VR services during the early years of secondary education, and having a sensory/communicative or mental/cognitive disability.

Differences from Previous Research

Some of the results in this study differed from and extended previous research. Differences existed in terms of gender (Benz et al., 1997; Luecking & Fabian, 2000), disability type (Grigal et al., 2011; Luecking & Fabian, 2000), SES (Berry & Caplan 2010; Rabren et al., 2014; Wagner et al., 2014), and age (Rabren et al., 2003). With regard to the impact of gender on employment outcomes, the current study demonstrated that females were less likely to obtain employment as in Benz et al., (1997). However, there was a marked difference in the odds ratio in each study. In Benz et al. (1997), females were five times less likely (i.e., odds ratio with a value close to 5.00) to be employed while the current study revealed that females were only 12%

less likely (odds ratio = .78) to obtain employment. Findings also differed from Luecking & Fabian's (2000) study of outcomes from the Bridges Program because gender did not make a difference in the employment status of program participants. In addition, there was no variation in the job placement rate between genders (Luecking & Fabian, 2000).

Current results on the impact of disability type on employment outcomes also differed from previous research (Grigal et al., 2011; Luecking & Fabian, 2000). A secondary analysis of variables from the NLTS-2 revealed that students with ID were far less likely to be employed compared to students with other disabilities (i.e., 46% for ID and 74% for students with other disabilities). In the current study, having a mental/cognitive disability (a category with a majority having ID) was a positive predictor of obtaining employment. Additionally, current results showed that youth with ID had slightly better employment outcomes than youth with other disabilities. Specifically, 43% of youth with ID as a primary disability achieved a successful employment outcome with VR while 38% of youth with all other disabilities achieved a successful employment outcome. The sample pulled from the RSA-911 data set contained youth with significant disabilities. Sample selection included receipt of SSI and/or SSDI benefits. Considering the criteria used to determine eligibility for SSI and/or SSDI, the current sample could contain a high percentage of youth with ID.

Luecking & Fabian's (2000) study revealed that disability type had no impact on the initial job placement of youth who completed the Bridges training program. However, having an emotional disability negatively impacted long term employment outcomes for Bridges participants at 18-month follow-up (Luecking & Fabian, 2000). In the current study, the comparable disability type was categorized as mental/psychosocial. Current findings did not

reveal that having a mental/psychosocial disability was a predictor for either employment or wages earned.

Current findings related to the impact of SES on employment outcomes also differ from previous research. In the current study, having a low SES (i.e., primary support from public benefits such as SSI, SSDI, and/or TANF) was a negative predictor for wages earned at the time of VR case closure. The current study did not demonstrate that SES was a predictor of obtaining employment (i.e., achieving a successful VR outcome). This differed from previous research that examined data from the NLTS-2 (Wagner et al., 2014). Previously, SES was a significant negative predictor of obtaining employment after high school (Wagner et al., 2014).

Results for the effects of age on employment outcomes also differed in this study compared to previous studies (Berry & Caplan, 2010; Rabren et al., 2003). In Berry & Caplan (2010), transition-age youth who received SSI and completed services through VR were less likely to be employed and earned less if VR services were provided over longer periods of time. This finding could suggest that VR services began early in secondary education (i.e., an earlier age). However, Berry & Caplan (2010) also found that youth who applied for services at an older age had lower earnings and were less likely to be employed. In Rabren et al. (2003) age at the time of application for VR services was not a statistically significant predictor of employment outcomes for transition-age youth. The difference in findings between the current study and Rabren et al. (2003) could be attributed to the difference in data sets used (i.e., a state data set versus a national data set).

Performance across Participants

Descriptive statistics for the predictors that demonstrated statistical significance in the current study may provide more information for interpreting the findings. Predictors that

contributed significantly to the models created included gender, primary disability type, SES, and age and at the time of application for VR services. Descriptive data for each predictor will be discussed for the total sample examined.

Gender was a significant predictor for both employment outcomes measured in this study. Males had 12% greater odds of achieving a successful employment outcome than females in this study. There was a small negative correlation ($r = -.25$) between gender and earnings, indicating that being a male VR consumer was associated with having higher earnings at the time of successful VR case closure. At the time of successful case closure, the average weekly earnings for males were \$213 and \$188 for females. An independent-samples t-test revealed there was a statistically significant difference for earnings between genders ($t = 2.39$, $p < .05$).

A majority of the sample was male (i.e., 62%). A slightly higher percentage of males achieved a successful employment outcome (i.e., 42% of males compared to 36% of females). Within the ages represented in this study (i.e., 14 to 24), the prevalence of males and females within each age category was similar. For example, 7% of females and males were 16 years old at the time they applied for VR services. Also, 15% of each gender was 19 years old at the time they applied. SES status was also represented equally within each gender. Within each gender, 60% were considered to have a low SES. Primary disability type was relatively similar for each category within gender: sensory/communicative (8% of males and 11% of females), physical (12% of males and 9% of females), mental/cognitive (63% of males and 61% of females), mental/psychosocial (15% of males and 12% of females), and mental/other (6% of males and 4% of females). Considering that males and females showed similar prevalence across several categories (i.e., VR closure type, age, SES, and primary disability type), the reason for differences in employment outcomes achieved need to be examined further.

Previous research has examined the career development of young women with disabilities (Lindstrom & Benz, 2002; Lindstrom, Harwick, Poppen, & Doren, 2014). In case studies of six young women with learning disabilities, Lindstrom & Benz (2002) demonstrated that vocational goals and preferences developed over an extended period of time. Additionally, a wide array of factors influenced their career decisions (Lindstrom & Benz, 2002). Specifically, the researchers found five factors that influenced positive outcomes: “a high level of individual motivation and personal determination, family support and advocacy, opportunities for career exploration, vocational training, and supportive workplace environments” (Lindstrom & Benz, 2002, p. 76).

In a more recent study, researchers used focus groups (i.e., qualitative methods) to examine barriers and supports that influenced career development in women with disabilities (Lindstrom et al., 2014). Study participants included school administrators, special education teachers, employers, college women with disabilities, and high school girls with disabilities (Lindstrom et al., 2014). All five focus groups indicated that low self-esteem/self confidence, limited exposure to career opportunities, and a lack of female role models were barriers to career development (Lindstrom et al., 2014). Findings from previous research along with the findings from the current study suggest that VR and special educators can work together to address the identified barriers to improve employment outcomes for these young women. VR’s earlier involvement could allow more time to address career development needs that are unique to women (e.g., exposure to a variety of vocations and interventions to increase self-esteem).

Although primary disability type was a predictor of employment outcomes, *PD_Sensory/Communicative* and *PD_Mental/Cognitive* were the only two categories that showed statistical significance. Both disability categories were significant predictors for the type

of VR case closure that was achieved. Consumers in the *PD_Sensory/Communicative* category were over two times more likely to achieve a successful employment outcome compared to individuals who were not in that category when all other variables were held constant.

PD_Sensory/Communicative was also a statistically significant predictor of wages earned at the time of successful VR case closure. There was a small positive correlation ($r = .22$) between *PD_Sensory/Communicative* and wages earned. Within the *PD_Sensory/Communicative* category, a majority (52%) of youth had some type of hearing loss (i.e., deafness or hard of hearing) as the cause code for their disability. Consumers with blindness or some type of vision loss comprised 34% of the *PD_Sensory/Communicative* category.

Previous research has demonstrated that VR consumers with sensory/communicative disabilities have achieved successful outcomes with VR at a statistically significant higher rate than individuals with physical or mental disabilities (Dutta et al., 2008). Consumers with sensory/communicative disabilities have also had a higher percentage of profession/technical job placements (Dutta et al., 2008). Reasons for the higher success could be attributed to many factors. In some states (e.g., Arkansas, North Carolina, Florida, Oregon, and Washington) agencies that provide services for persons who are blind are provided outside of the general VR agency (i.e., there is a separate agency for blind services). A previous study of the population within the RSA-911 for fiscal year 2005 demonstrated there was a statistically significant difference in the age of persons with sensory disabilities when they applied for VR services as compared to other disability types (Dutta et al., 2008). Individuals with sensory disabilities were significantly older at the time they applied for VR services ($M = 43$ years, $SD = 17$ years). The current study does not demonstrate this finding as it focused on youth ages 14 to 24. The previous study showed that case expenditures were significantly higher for this population ($M =$

\$5,462). Additionally, providing rehabilitation technology to persons with sensory/communicative disabilities was found to uniquely contribute to successful employment outcomes within VR (Dutta et al., 2008). Youth in the current study may have received rehabilitation technology or other cost services that contributed to their successful outcomes with VR.

Youth in the *PD_Mental/Cognitive* category were over one and a half times more likely to achieve a successful employment outcome compared to consumers who were not in that category when all other variables were held constant. Within this category some disability cause codes were prevalent: 51% with ID, 25% with a specific learning disability, 8% with attention deficit hyperactivity disorder, and 6% with autism. Youth with ID have demonstrated success in obtaining employment in previous studies (Certo & Luecking, 2006; Luecking & Fabian, 2000; Migliore & Butterworth, 2008). Results from the previous studies examined youth with ID who participated in targeted comprehensive programs of service such as the Transition Services Integration Model (TSIM) (Certo & Luecking, 2006), Bridges Program (Luecking & Fabian, 2000) and postsecondary training (Migliore & Butterworth, 2008). Youth with ID who achieved positive employment outcomes in the current study may have received comparable programs of service as part of their plan with VR.

A major finding of this study is the impact of SES on wages earned from employment. Having a low SES negatively affected earnings at the time of successful VR case closure. Similarly, Dutta et al. (2008) found that receiving cash and/or medical benefits (e.g., SSI, SSDI, Medicaid, Medicare, and other government benefits) had an adverse effect on employment outcomes for VR consumers. Regardless of SES, findings from the current study demonstrated

that all youth with significant disabilities who achieved a successful outcome earned very low wages.

The average weekly wage earned from the current study was \$204.23 or \$10,620 per year. A majority of youth (57%) who were closed successfully into employment did not have public support as their primary financial support. Therefore, their earnings from work were considered their primary source of income. The federal poverty level for 2011 for a household size of one was \$10,890 (U.S. Department of Health and Human Services, 2011). Some youth (32%) who were closed successfully still had public support listed as their primary source of income at the time of successful case closure. The majority of youth obtaining public support received SSI. The average SSI benefit for youth closed successfully was \$378 per month. As an example of annual income for a young person closed successfully while also continuing to receive SSI, combining the average annual wages from work (i.e., \$10,620) with the average yearly SSI benefit (i.e., \$4,536) yielded an average annual income of \$15,156 (i.e., 39% above the federal poverty level for fiscal year 2011).

Findings from the current study and previous studies show that individuals with significant disabilities are at a disadvantage in terms of achieving successful employment at an adequate wage. Persons with disabilities who receive government benefits often face the difficult decision of weighing the benefits of paid work with the possibility of losing benefits such as SSI (Hennessey, 1997). While receipt of SSI and other government benefits may be perceived as a disincentive to paid work, there are work incentives within the guidelines for SSI and SSDI which can assist youth and their families with understanding how their benefits will be impacted and how to maximize the Social Security work incentives that are available. VR professionals need to be more familiar with Social Security benefits counseling that is available to VR

consumers as service within their individualized plans for employment (Dutta et al., 2008; Hennessey, 1997).

Another important finding of this study is that age at the time of application for VR services was a statistically significant predictor for wages earned at the time of successful case closure. Even though age was not a significant predictor for obtaining employment, the probability level was close to being significant ($p < .08$). Descriptive statistics for the 11 age categories (i.e., aged 14 through 24) did not reveal significant differences in the frequency of ages represented across gender, disability type, closure type achieved, or SES.

Interpretation of Findings

The current study used a national data set of employment outcomes for individuals with disabilities who received VR services and were closed from services in fiscal year 2011. A random sample of youth with significant disabilities was obtained from this data set and used to examine potential predictors of employment and wages. This was a representative sample and results can be generalized to the population of youth with significant disabilities who received VR services and special education services during fiscal year 2011. Results may also be generalized to the same population for other recent fiscal years.

With regard to wages earned, the current study demonstrated that youth who applied for VR services at an earlier age had higher wages at the time their cases were closed successfully than youth who applied in later transition years. While this finding seems to suggest that VR's early involvement may have a positive impact on outcomes, the average wages earned were still below the federal poverty level. Longitudinal research from the NLTS-2 revealed that youth with disabilities who were out of secondary school earned significantly less than their peers without disabilities (U.S. Department of Education, 2007). The mean hourly wage for youth with

disabilities was \$9.40, while the mean hourly wage for youth without disabilities was \$13.20. The difference demonstrated statistical significance ($p < .001$) (U.S. Department of Education, 2007). If these mean wages are computed for part time hours (i.e., 20 hours per week) and full time hours (i.e., 40 hours per week), annual wages for youth without disabilities were \$3,952 and \$7,904 higher than youth with disabilities. The current study's findings confirmed wage findings from the NLTS-2. Transition-age youth with significant disabilities in the current study earned average wages that were below the federal poverty level. While obtaining employment is certainly considered a successful closure, earning an inadequate living wage would seem to diminish the level of success achieved. Previous findings in combination with the current study's findings demonstrate that transition-age youth with disabilities require services that lead to high quality employment outcomes as they move into their adult life. VR may be uniquely positioned to provide services that lead to higher quality employment.

Recent research that examined employment outcomes of youth with disabilities living in impoverished areas found that participation in general education and career technical education were positive predictors of employment after high school (Rabren et al., 2014). In addition, having a job during high school was also a positive predictor for employment beyond secondary education (Rabren et al., 2014). Another recent study showed that youth with intellectual and developmental disabilities (IDD) were more than four and a half times likely to be employed in the community if they had paid work experiences during high school (Simonsen & Neubert, 2012).

These previous findings demonstrate that obtaining work during secondary education is essential for employment success beyond high school. Therefore, VR could be involved much earlier in secondary education to assist students with job placement services. VR's earlier

involvement was a positive predictor for wages earned in the current study. These findings suggest that VR's early collaboration with educators to provide paid work experiences could provide schools with the capacity building they need to make these experiences possible.

Findings from the current study regarding disability type demonstrate that youth with sensory/communicative and mental/cognitive disabilities (e.g., ID) were more likely to obtain positive employment outcomes. While it is uncertain what other factors led to the positive outcomes in this study, previous research has shown that rehabilitation technology and higher VR case expenditures were positive predictors of employment for consumers with sensory/communicative disabilities (Dutta et al., 2008). Provision of rehabilitation technology as well as providing more cost services could be beneficial to youth with other types of significant disabilities.

Previous research has also demonstrated that paid work experience during secondary education is a positive predictor of employment outcomes for youth with disabilities (Benz et al., 1997; Luecking & Fabian, 2000; Rabren et al., 2002) as well as youth without disabilities (Blau & Kahn, 2000; Bobbit-Zeher, 2007). Luecking & Fabian (2000) demonstrated that paid work is particularly beneficial for youth with ID. Coordinating paid work experiences for students with IDD often requires school systems to have targeted personnel such as job development specialists who have the training and expertise to establish and maintain relationships with local businesses (Simonsen & Neubert, 2013). These professionals can identify jobs and develop accommodations or on-the-job supports so that students with significant disabilities can work as independently as possible (Simonsen & Neubert, 2013).

Once again, VR is uniquely equipped to provide services such as job development and placement using their own employment specialists who can coordinate services with VR

counselors and school personnel. VR has been identified as an essential partner in collaborative transition services. However, the barriers that have prevented school systems and VR agencies from working together effectively must be addressed (Benz et al., 1999). Future research may reveal educational practices and rehabilitation services that can be integrated to improve employment outcomes for transition-age youth with significant disabilities.

Implications for Future Research

The current study has several implications for future research. There are alternative ways to approach the data set as well as ways to improve the methods used in the current study. This study used data from RSA to examine outcomes using VR's national data set (i.e., RSA-911). Much literature in the area of transition has examined post-school outcomes using special education data sets such as the NLTS and NLTS-2 (Benz et al., 1997; Baer et al., 2011; Cameto et al., 2004; Grigal et al., 2011; Hughes & Avoke, 2010). Although the NLTS data sets are comprehensive, a single data set may not be able to describe the extensive transition practices provided to and outcomes for transition-age youth with significant disabilities (Mazzotti, Rowe, Cameto, Test, & Morningstar, 2013).

Researchers have recommended that future studies in the area of transition use other equitable data sources that also contain comprehensive descriptive variables (Mazzotti et al., 2013). The Division of Career Development and Transition has recommended "researchers continue to mine extant data sets, particularly those that have been established to examine both in-school experiences and follow students into adulthood." (Mazzotti et al., 2013, p. 148). The RSA-911 is an extant data set that can identify some in-school experiences and follow students into adulthood. Therefore, future research should continue to examine the RSA-911 to identify individual characteristics and practices that may predict positive employment outcomes.

Identifying predictors of positive outcomes for youth with significant disabilities is essential to improving employment outcomes for this population. Transition-age youth have their entire working life ahead of them. Researchers who examined evaluation designs for the Social Security Administration's Youth Transition Demonstration Projects stated that youth inherently have a high economic advantage of pursuing gainful employment instead of relying on government benefits (Rangarajan et al., 2009). Secondary education cannot bear the responsibility of transition services alone. Youth with disabilities are more likely to be successful if they have coordinated services and support that continues beyond high school (Benz et al., 2000).

In a study of VR professionals' perceived role in transition activities, a majority of the participants self-reported that they needed more participation in transition activities while students were still in secondary school so that they could be effective. A majority of the respondents (62%) were VR counselors serving transition-age youth (Oertle, Trach, & Plotner, 2013). Another recent study examined the differences between VR counselors who solely serve transition-age youth and those who serve youth as part of a general VR adult caseload (Plotner, Trach, Oertle & Fleming, 2013). VR counselors devoted specifically to transition-age youth provided more frequent transition activities (e.g., career preparation experiences) than general VR counselors. Compared to general VR counselors, VR transition counselors considered the responsibility of developing and maintaining collaborative partnerships as a significantly important job responsibility (Plotner et al., 2013). Perhaps a reason for the positive outcomes for some of the current study's participants was due to VR counselors who have dedicated transition caseloads. Based on these findings, future research could use the RSA-911 data set to examine predictors and employment outcomes in states that have designated VR transition counselors.

A recent study of eight state VR agency transition practices revealed that the majority of agencies began serving youth during their junior year of high school (Mathematica Policy Research, 2014). Two agencies initiated contact during students' sophomore year, while one agency waited until the senior year to begin. While agencies differed in the target grade for planning, almost all agreed that early engagement was the best practice. Agencies reported that VR's early involvement allowed counselors to spend the maximum amount of time with youth providing services and preparing them for life beyond high school (Mathematica Policy Research, 2014). VR agencies reported that early involvement at the secondary level resulted in better outcomes (Mathematica Policy Research, 2014). Outcomes from the study seemed to support this contention. The five agencies with high transition ratios targeted youth earlier in high school than the agencies with low transition ratios (Mathematica Policy Research, 2014). Researchers stated that the push towards early engagement may be a recent development within VR (Mathematica Policy Research, 2014).

Limitations

There were limitations in the current study with regard to the population selected, the employment outcomes measured, definitions of the predictor variables for primary disability type, and the accuracy of the data within the RSA-911. The population and sample for this study were derived from the RSA-911 data set for fiscal year 2011. Using only one year of reported data may limit how much the result can be generalized to the population. There may have been policy changes within state VR agencies that impacted the data reported or the number of closures that occurred during fiscal year 2011. Additionally, the population examined reflects data across all VR agencies regardless of their order of selection status (OOS). During an OOS, state VR agencies must prioritize service delivery to consumers with significant disabilities. The

population available for examination will be different in states that are under an OOS. Finally, using one year of data provides only a snapshot of an agency's performance. It may be more beneficial to look at several fiscal years of RSA-911 data in order to have a more thorough understanding of employment outcomes and predictors.

Other limitations related to the employment outcomes measured. Two types of employment outcomes were measured: type of VR case closure achieved and wages earned at the time of successful closure. A number of variables likely impact the employment outcome that is achieved when a young person uses VR services. This study examined predictors that had demonstrated significance in previous research. Age at the time of application for VR services has not been examined extensively as a predictor for youth with significant disabilities. The effect of applying for VR services during the early secondary education years (i.e., prior to age 16) was of particular interest. The sample used did not afford a high number of youth who applied for VR services prior to age 16 ($n = 45$). Therefore, application of the results of this study may be limited for youth who are under age 16.

Wages earned were another important outcome measure. Within the RSA-911 this outcome is not recorded for individuals whose cases are closed unsuccessfully. Therefore, the application of results for research questions three and four are limited to youth who achieve a successful outcome with VR. Youth who are closed unsuccessfully from VR may have obtained employment and also benefited from the provision of VR services. Future research could examine outcomes for individuals closed unsuccessfully and find a way to obtain wages earned for this population.

Another limitation was the way primary disability type was defined broadly. In this study, primary disability type was based on the RSA four digit code: the first two digits are for

impairments and the second two digits define the cause. An individual's actual disability is more specifically defined in the cause code. There are three broad impairment categories (i.e., sensory/communicative, physical, and mental). Impairment categories can have multiple cause codes. For example, RSA still uses MR (sic) for ID. A person with MR can be coded as having any of the three types of mental disabilities (i.e., cognitive, psychosocial, or other). The same is true for learning disability. Learning disability has a cause code of 34 which can be attached to multiple impairment codes. In the sample for this study, LD was identified within four categories of impairment; physical, mental/cognitive, mental/psychosocial, and mental/other. For these reasons, descriptive statistics were reported and discussed to highlight the cause codes that were prevalent within each broad impairment code. However, this limitation did create difficulty in applying the results more specifically to disability type. Researchers have recommended that future studies employ "high quality correlations research that disaggregates data by disability category to identify predictors of post-school success for specific disability groups" (Mazzotti, 2013, p. 145).

Finally, the accuracy of the RSA-911 data set is another limitation. Data collected from each state VR agency comprises the RSA-911. VR staff gathers and enters data on consumers throughout the VR process that are recorded in each state's case management system. A majority of the RSA-911 data are recorded at the time an individual applies for and is closed from VR services. Therefore, the accuracy of the RSA-911 depends on the accuracy of the data entry process across all state VR agencies.

Conclusions

The current study examined potential predictors of employment outcomes for transition-age youth with significant disabilities. Predictors were selected based on results from previous

research. The current findings confirmed, differed from, and extended previous research. Two primary disability types demonstrated statistical significance in predicting the type of VR case closure achieved: sensory/communicative and mental/cognitive. Gender was also a significant predictor. Males were more likely than females to achieve a successful employment outcome. In one of the generated models, having a low SES was associated with earning lower wages at the time of successful case closure. Finally, age at application for VR services was a significant predictor for wages earned for youth who were closed successfully into employment. These results have significant implications for transition-age youth with significant disabilities and the professionals involved in their lives.

Youth with disabilities in secondary education have access to a partnership of service delivery: special education and vocational rehabilitation. Collaboration between these entities is needed in order to improve post-school outcomes of youth with disabilities. Interagency collaboration has been identified as an evidence-based predictor for employment (Test & Cease-Cook, 2012). Collaboration requires information sharing, combined resources, and a team approach (Oertle & Trach, 2007). Researchers have stated that this collaboration must begin earlier in the transition process so that students are linked to their community prior to graduation (Agran et al., 2002).

The National Council on Disability (2008) has indicated that VR's early involvement with transition-age youth is a promising practice. The impact of earlier intervention was shown to prevent early school exit. Providing VR services earlier allows students access to vocational support for a longer duration of time. This could have a significant impact on students' positive employment outcomes (NCD, 2008). The current study adds to the body of research in this area and has demonstrated that students who apply for VR services at an earlier age achieve higher

wages in employment. Additionally, the significance of age predicting successful employment was notable although not statistically significant. Mathematica Policy Research (2014) noted that VR's earlier involvement at the secondary level may be a recent trend. Therefore, research with more current data sets may reveal that age is a predictor for positive employment outcomes with VR.

Although applying for VR services at an earlier age was associated with higher weekly wages at the time of successful case closure, the overall wages earned were quite low. The mean weekly wage computed to an annual wage was below the federal poverty level for a family of one. Obtaining any job can lead to a successful closure with VR, but earnings that are below a livable wage can hardly be considered a "success." Persons with disabilities are already more than twice as likely to live in poverty than those without disabilities (Harris Interactive, 2010). Future research should attempt to identify VR services for transition-age youth that lead to wages that reach beyond the federal poverty level.

Finally, the current study was an attempt to add empirical evidence to the body of rehabilitation research. Within VR, researchers have called for studies that clearly document the link between outcomes and interventions (Chan et al., 2008; Pruett et al., 2008; Rubin et al., 2003; Test & Cease-Cook, 2012) so that the field moves toward evidence-based practice (Chan et al., 2008). The Commission on Rehabilitation Counselor Certification requires VR counselors to use procedures that are grounded in scientific research (2010). The Rehabilitation Act amendments of 1998 mandated that rehabilitation research identify scientifically based practices. In a study that examined VR counselors' knowledge and implementation of research based services, an overwhelming majority of participants (92%) were willing to try new research based

ideas. However, only 40% consistently used research to guide the development of individualized plans for employment (Graham, Inge, Wehman, Murphy, Revell, & West, 2013).

Equally important, government accountability requires agencies like VR to demonstrate their effectiveness so that future funding is justified (Chat et al., 2008; Pruett et al., 2008). Establishing a practice as “evidence-based” is a rigorous process. Currently, the only predictor that has established a moderate level of evidence across three main post-school outcome areas (i.e., employment, education, independent living) is inclusion in general education (Mazzotti et al., 2013). More research within VR needs to focus on identifying predictors of success. The current study demonstrated that earlier involvement with VR had a positive impact on employment outcomes for transition-age youth with significant disabilities who were closed in fiscal year 2011. The current findings barely scratch the surface of all that could be uncovered from data sets like the RSA-911.

In 2012, Steve Wooderson accurately stated that legislative discussion largely revolved around transition-age youth with disabilities and individuals with the most significant disabilities. On July 22, 2014, President Obama signed the Workforce Innovation and Opportunity Act (WIOA) into law. The WIOA replaced the Workforce Investment Act of 1998. The WIOA focuses heavily on transition services and requires VR agencies to set aside 15% of funding for transition-age youth. In addition, persons under age 24 can no longer be placed into sheltered workshop settings earning subminimum wage without first pursuing VR services (WIOA, 2014). This new legislation presents VR with an opportunity to explore the predictors of success for transition-age youth with significant disabilities. Beginning VR services during the early years of secondary transition may lead to more positive employment outcomes.

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