

**An Examination of Academic and Assistive Technology Skills and  
Employment Outcomes**

by

Tabitha Brecke

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Approved by

Maria M. Witte, Chair, Professor of Educational Foundations Leadership and technology  
James Witte, Professor of Educational Foundations Leadership and Technology  
Leslie Cordie, Assistant Professor of Educational Foundations Leadership and Technology  
Joni Lakin, Assistant Professor of Educational Foundations Leadership and Technology

## **Abstract**

This study examined the relationship between skill attainment by individuals with visual impairments who participated in vocational rehabilitation and the relationship to employment. The skills included the use of an aid for orientation and mobility, reading format, assistive technology, education, and other demographics and the relationship to employment outcomes. The data were gathered from case closure information collected by a state vocational rehabilitation agency in a Southern state. Correlations, chi-squares, and logistic regression were used to analyze the data. The results demonstrated a positive relationship between a higher level of education and employment. The use of assistive technology was also positively linked to employment.

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## **Chapter 1 Introduction**

### **Introduction**

Unemployment rates among people who are visually impaired are far greater than what are found in the general population. Kirchner, Schmeidler, and Todorov (1999) reported that approximately one-third of working age individuals who are blind are employed. The Bureau of Labor Statistics (BLS) (AFB, 2013) reiterated the continuation of this trend. Beginning in June 2008, the BLS has conducted a monthly Current Population Survey (CPS) to analyze the labor force. The American Foundation for the Blind (AFB), a nonprofit agency dedicated to research and education about visual impairment, provided additional information explaining how the BLS calculates unemployment statistics (AFB, 2013). The AFB used BLS data (from September 2010) to explain the employment statistics. The AFB cautioned that these data would be different from other surveys asking questions regarding disability to determine information about individuals residing in American households, because the BLS conducts its monthly survey in order to determine current information about employment patterns in the United States. However, other surveys have different goals when asking for data pertaining to disabilities. Also, the AFB explained that the criteria used to determine whether a person has a disability is inconsistent between survey instruments.

Unemployment statistics measure the percentage of the population who are not currently employed, but who are actively seeking a job and are available for work. People who are not looking for work are not counted in the unemployment statistic reported by the BLS in its data

(AFB, 2013). The BLS counted far fewer people in the labor force than the total population who reported a visual impairment in September 2010. Four million Americans reported having vision problems, although not necessarily legally blind. Approximately three million of these individuals were not considered to be in the labor force and were not counted in BLS employment statistics. Only 875,000, approximately 22%, were counted in the BLS employment statistics. Thirteen percent of the 875,000 individuals with visual impairments who were considered in employment statistics were found to be unemployed. Similar trends were found in the population of all Americans with disabilities. Further, the civilian labor force consisted of 212 million people without disabilities. Twenty-six million individuals reported having a disability. Fifteen percent of individuals with a disability were reported as unemployed in the BLS statistics, although 79% of people over age sixteen with a disability were not in the workforce. By contrast, Thirty percent of those without a disability were not in the labor force. These statistics are alarming, and they reinforce the need for rehabilitation professionals and policy makers to not be complacent about striving for greater work force participation in this population (AFB, 2013).

Professionals in the field of rehabilitation have conducted research with the objective of providing information to assist in creating programs to narrow the unemployment gap. The research presents a fairly consistent picture of employment patterns among the population of people with visual impairments. Individuals who are visually impaired are more likely to be unemployed than those who are sighted. Additionally, visually impaired transition age youth work fewer hours during and after high school (McDonnall, 2011). Further, workers who experience a vision loss adventitiously experience interruption or termination of employment (Boerner & Wang, 2012). Researchers have studied several barriers that contribute to this

situation to include: (1) reliance on financial benefits provided by the Social Security Administration (Giesen & Cavanaugh 2012); (2) negative attitudes of employers (Crudden, Butler, & Sansing, 2005); (3) inadequate support systems (Sanders, 2013); and (4) lack of skills and preparation (Crudden, 2012).

Few studies discuss specific skills and their relation to employment outcomes. Ryles (1996) studied the use of braille as a predictor of employment. She found that individuals who read braille were more likely to be employed than those with visual impairments who read print. Her work did not probe other academic skill areas, or the use of assistive technology as predictors of employment success. Boerner and Wang (2012) conducted qualitative research among individuals who lost vision adventitiously. They were first-time applicants for rehabilitation services. Among participants who were employed, some mentioned the use of assistive technology as a reason for their continued employment. However, the specific skill levels and the types of technology utilized were not investigated.

There is need for preparation among transition age students. Crudden (2012) completed a qualitative study with service professionals. The study stressed the need for self-advocacy skills among this population. McDonnall (2011) found work experience in high school to be a predictor of future employment. Also, McDonnall noted that relatively few students traveled to work independently. Giesen and Cavanaugh (2012) found that higher levels of education, work experience in high school, and greater visual acuity were associated with positive employment outcomes. Additionally, receiving Supplemental Security Income (SSI) from the Social Security Administration, lack of work experience and lower visual acuity were predictors of unemployment (McDonall, 2011; McDonall, Lee, & Crudden, 2013; Sanders, 2013).

## **Research Problem**

There is a lack of research regarding attainment of skill levels and the employment experiences of people who are blind or visually impaired. Specifically, limited information exists about the relationship between reading format, use of assistive technology, and the use of mobility aids, and employment among people who are blind or visually impaired. Educators and rehabilitation professionals might utilize this type of information to assist students and clients to obtain skills that have evidence of positive outcomes in the future.

## **Purpose of the Study**

The purpose of this study was to examine the relationships between demographic data such as gender and ethnicity, age of onset of visual impairment, visual acuity, attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired and who participated in vocational rehabilitation training in a southern state in the United States. The data was provided by a state vocational rehabilitation agency for cases closed in fiscal year 2013.

## **Significance of the Study**

Results of the study will enable rehabilitation professionals to facilitate acquisition of the necessary level of competence to provide the greatest opportunity for successful employment. Reducing the level of unemployment in this population should also lessen the dependence on benefits such as Social Security Disability Insurance (SSDI), Supplemental Security Income (SSI), and other benefits. These programs cost Americans significant amounts of money every year (Mamun, OLeary, Wittenburg, & Gregory 2011; Sulewski, Kugler, & Kramer 2010).

## **Research Questions**

The following research questions were used in this study:

1. To what extent is there a relationship between the age of onset of vision loss and employment outcome?
2. To what extent is there a relationship between gender and employment outcome?
3. To what extent is there a relationship between ethnicity and employment outcome?
4. To what extent is there a relationship between educational attainment and employment outcome?
5. To what extent is there a relationship between visual acuity and employment outcome?
6. What is the relationship between the use of assistive technology and employment outcome?
7. To what extent is there a relationship between reading format and employment outcome?
8. To what extent is there a relationship between the use of a mobility aid and employment outcome?
9. How do the independent variables work together to predict employment outcomes when correlated together in a multivariate analysis?

## **Assumptions**

Some assumptions were made when conducting this study. The information provided in the data set was accurate. The results may be generalizable by rehabilitation professionals in states in the Southeast region of the United States since data was provided about participants in vocational rehabilitation services from a state in this area.

## **Limitations**

There are limitations in this study: the results may not be generalized to other visually impaired individuals because on-the-job training programs change, as do the requirements of employers in specific work situations. These data may have errors due to omissions in case documentation.

## **Definitions**

The following terms are used in this study:

*Adventitiously blind* - one who has lost vision later in life, not at birth or in childhood.

Assistive technology- the Assistive Technology Act of 2004 defines it as, "...any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities: (29 U.S.C. Sec 2202(2)).

*Braille display*-a device that tactually represents the printed text on the screen in braille via moveable pins known as refreshable braille.

*Closed cases* - Each individual who applies for rehabilitation services has a case with the agency. The vocational rehabilitation system uses a system of various statuses to track a client's progress through the program, which are denoted by an administrative code. These codes are used throughout the state/federal vocational rehabilitation program in the United States. A case can be closed in a variety of ways: before services, during service provision, employed, or unemployed after service provision. A 26 is the desired closure, because of means that the person is employed and the case is closed successfully. Each agency is required by law to track data about closed cases.

*Congenitally blind or visually impaired*-a person who was born with a visual impairment, or lost vision very early in childhood.

*Individualized Plan for Employment (IPE)*-A document used in the state/federal vocational rehabilitation system. It details the services that will be provided by the agency to assist the individual client to become employed. Each IPE must be agreed upon by the client and his/her rehabilitation counselor in order for the provision of services to occur.

*Legally blind*-“Legal blindness is a level of vision loss that has been legally defined to determine eligibility for benefits. The clinical diagnosis refers to a central visual acuity of 20/200 or less in the better eye with the best possible correction, and/or a visual field of 20 degrees or less. Often, people who are diagnosed with legal blindness still have some useable vision” (American Foundation of the Blind, 2015).

*Magnifier*-Device that enlarges print. There are various types of magnifiers: screen magnification software, hand-held magnifiers, and closed circuit televisions that can be either desktop or portable.

*Rehabilitation Services Administration (RSA)*-The federal agency that oversees and collects data about each state and territory, each of which has a vocational rehabilitation program. It also provides funding to those agencies in an 80/20 proportion, with 80% of the funding from the federal government and 20% from the state.

*Speech output*- technology that reads aloud print material. It can be in the form of scanners that use optical character recognition programs, or software that speaks aloud the text on the computer screen.

*Substantial gainful activity (SGA)*-A term used by the social security Administration that refers to working, or earning money.

*Supplemental Security Income (SSI)*-A program of the Social Security Administration which provides monetary benefits to individuals with limited resources who have a disability or who are over age 65.

*Social Security Disability Insurance (SSDI)*-A program of the SSA that provides monetary benefits based on the amount an individual paid into the social security system.

*Unemployed*-persons between the ages of 16-64 who are actively seeking work.

*Visually impaired*-having substantial functional limitations in the ability to see.

*World Blind Union (WBU)* - An international organization of agencies and professionals serving those who are blind or visually impaired. They estimate there are 285,000,000 individuals worldwide with visual impairments. The WBU convenes conferences and publishes literature relevant to the field (World Blind Union 2015).

## **Summary**

The purpose of this study was to investigate relationships between employment outcomes of individuals with visual impairments and several barriers which include: demographic data such as gender, ethnicity, visual acuity and the age of onset of the loss of vision, level of education, the use of assistive technology, the use of a mobility aid, and reading format. These data were gathered from case closure data of a Southern state vocational rehabilitation agency for fiscal year 2013. Definitions of terms have been clarified to assist readers who may be less familiar with the field of rehabilitation.

Subsequent chapters of this dissertation will address the following topics: Chapter 2 will present a review of the literature that is relevant to the topic and situate the study within the field of adult education. The methods used in this investigation will be detailed in Chapter 3. Chapter 4 will contain a thorough analysis of the results obtained in this study. Finally, summary, conclusions, implications, limitations, and future recommendations for research will be discussed in Chapter 5.

## **Chapter 2 Review of Literature**

### **Introduction**

This chapter will provide a review of the literature pertaining to this study. First, the motivations of adults to seek further education will be discussed. Then, a description of the research concerning the employment situation of individuals with visual impairments internationally follows. The chapter will then describe studies that focused on the effects of receiving financial benefits from the Social Security Administration (SSA). Research about the effects of federal legislation on employment of individuals with visual impairments will be discussed. Research concerning methods that rehabilitation professionals and educators can use to reduce the reluctance of employers to hire individuals with visual impairments is included. The importance of adequate skill preparation and support systems will follow.

### **Purpose of the Study**

The purpose of this study was to examine the relationships between demographic data such as gender and ethnicity, age of onset of visual impairment, visual acuity, attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired and who participated in vocational rehabilitation training in a southern state in the United States. The data was provided by a state vocational rehabilitation agency for cases closed in fiscal year 2013.

## **Research Questions**

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6. What is the relationship between the use of assistive technology and employment outcome?
7. To what extent is there a relationship between reading format and employment outcome?
8. To what extent is there a relationship between the use of a mobility aid and employment outcome?
9. How do the independent variables work together to predict employment outcomes when correlated together in a multivariate analysis?

## **Skill Attainment and Its Relation To Employment in Adult Education**

The idea that adults seek education to fulfill specific goals was introduced by Knowles (1973) and expanded on by other adult educators (Merriam & Brockett, 2007). Knowles's theory of andragogy proposed that adults learn differently than children. Two of his ideas that have special relevance for vocational education is his idea that adults are ready to learn due to their life experiences and that their readiness and orientation to learning is uniquely formed by

motivations due to the social roles they play in life. Spouse, employee, parent and student are all examples of social roles. Pursuing further education occurs within the context of satisfying obligations within these roles. Adults are motivated by goals such as advancing in a career or changing careers. It is especially important that the material being taught is relevant and has practical application for life (Long, 2004). Obtaining vocational training has relevance and practical application. Individuals who participate in rehabilitation have expressed a very specific employment goal. The Individualized Plan for Employment (IPE) is a document that the client and the vocational rehabilitation counselor complete together. It states the employment goal and the steps to be completed to reach it; including provision of training and other services. The IPE is a requirement of all agencies within the state/federal vocational rehabilitation system.

Darensbourg (2013) analyzed Rehabilitation Services Administration (RSA) case closure data from 2006 and found that 47% of those with blindness or visual impairments were between the ages of 51-65. This information about the ages of these individuals supported the idea that adults continue to pursue goals related to employment throughout the lifespan.

Recent reports highlighted the importance of education in obtaining a job. Asin and Willis (2012) indicated that those with at least a bachelor's degree experienced more gains in the job market during the economic recovery than did those with less education. This reflects a demand for a more highly educated workforce. A report published indicated that earnings increased with education (Alssid et al., 2002). These reports do not focus on individuals with disabilities. However, no evidence was given that would preclude generalizing the findings to individuals with visual impairments.

## Overview

Literature concerning the employment of individuals with visual impairments has focused on similar issues since the early twentieth century (Moore, 2007). Articles have become more scholarly and research based with time. Early professionals described efforts to locate employment for individuals with visual impairments. Statistical analyses concerning the success of early programs did not occur. The goal of better employment opportunities expressed by early professionals has not changed significantly; though language has changed.

In an attempt to determine the worldwide concerns about employment issues of people with visual impairments, the World Blind Union (WBU) conducted research among its international constituency (Wolffe & Spungin, 2002). The WBU survey reported that 95% of participants noted poverty as a barrier to employment, 59% cited discrimination, and 48% mentioned lack of education and resources. Forty-four percent cited the lack of awareness of employers of the capabilities of people with visual impairments, and 53% cited lack of technology.

LaGrow (2004) found that people with visual impairments were under-employed or unemployed at higher rates than the general population in New Zealand. The study included 150 working age adults of whom 59 were employed for pay with 22 of them being underemployed, 36 were seeking work, and 56 were not interested in employment. Thirty-nine percent of the population with visual impairments were employed. However, only 26% of people with no vision, 35% who reported having a small amount of useable vision, and 65% who viewed themselves as having fairly good vision were employed. Several factors were associated with unemployment in New Zealand including gender, age of onset, other disabilities, type of disability and its severity. Education was a positive predictor, but was confounded by other

variables. Early onset, being female, and other disabilities were negative predictors. The research divided the types of disabilities that were present into five categories: physical, sensory, psychiatric, intellectual, and other. People with sensory disabilities were the most likely of the five categories of conditions to be employed, but individuals with deafness occurred two to one in the population. The number of individuals with hearing and visual impairments in the study population were not provided. Therefore, these statistics can't be properly generalized to the population with visual impairments.

LaGrow (2004) revealed that younger people and people with earlier age of onset of their disability were found to be more likely to be employed. Specifically, 44% experienced a congenital loss of vision, 27% at ages 6-39, and 25% of those after forty. About 63% of those with a lot of vision were employed, 35% of those with some, and 25% of those with none. Approximately 43% of men compared to 32% of women with visual impairments were employed. Having no additional disabilities was also related to greater likelihood of employment; about 47% with no additional disabilities, compared to 28% with other disabilities, were employed. Twenty-seven percent had no educational certificate, 30% had a high school diploma, and 43% had post-secondary education. The most frequently employed were those secondary certificates at about 70%. Post-secondary certificate holders were employed at about 63% and 46% of those with no qualifications were employed (LaGrow, 2004).

Roy, Storrow, and Spinks (2002) studied trends in the European Union (EU). Seventy-five percent of people of working age with visual impairments were unemployed. Traditional jobs in Europe are manufacturing, or customer service based such as answering telephones. These opportunities are shrinking due to technology. Programs in Europe vary in part due to differing cultural views about disability. A group of rehabilitation professionals from several

European countries created manuals to guide vocational workers attempting to assist people with visual impairments to become employed.

Lee and Park (2008) completed a survey in South Korea to ascertain predictive factors for employment. They found that gender, education, amount of vision, and practical supports were all statistically significant. Men were 3 times more likely to be employed than were women. Those with more vision had higher rates of employment than those with less vision. Individuals with higher education experienced greater levels of employment. The more practical support that a person received, the less likely he/she was to be employed. Historically legislation in South Korea mandated that employers with more than fifty employees comprise two percent of their work force with people with disabilities. The authors noted that public entities do a better job of meeting this requirement than do private companies.

A quantitative study of working age people in Turkey who were blind further examined factors related to employment (Bengisu, Izbirak, & Mackieh, 2008). People were contacted telephonically who were unemployed, in addition to people who were employed. Both multiple choice and open ended questions were asked. The dependent variable was employment, and it was related to the independent variables of age, marital status, education, and braille literacy. In addition, beliefs of the participants concerning discrimination and other barriers were analyzed. The researchers used logistic regression to analyze the closed ended questions and reported the common themes of the open ended items. They found that men were three times more likely to find employment than women. Married individuals were also more likely to be employed, as were those with higher education levels, and braille literacy. Among the barriers, discrimination and other barriers to travel were mentioned frequently.

Goertz et al. (2010) conducted a meta-analysis of the literature to determine factors that predicted employment. They found that various researchers measured certain variables, such as visual acuity in different ways; therefore, making it difficult to generalize. Two specific demographics, type of community where the study participants resided, and whether the person was married or had a partner, were found to have a positive relationship to employment in their analysis. In the area of skill attainment, braille was mentioned to have been found significant by Ryles (1996) and Bengisu, Izbirak, and Mackieh (2008). Level of education was another positive predictor. Goertz et al. (2010) stressed that drawing conclusions can be difficult due to the limited sample size used in some of the literature.

Also, Darensbourgh (2013) found that people under 36 years of age had greater success obtaining competitive employment than did those in other age categories. She noted that over 80% of the individuals in the sample studied identified as white. Negative predictors of employment were receipt of Medicaid and lower visual acuity.

Giesen and Cavanaugh (2012) analyzed data provided by the Rehabilitation Services Administration (RSA) concerning transition age students whose cases were closed. The population consisted of 2282 individuals under the age of 22. The data were obtained from the RSA-911 database. The authors used logistic regression to conduct a thorough multi-variant analysis. They found that 41.3 percent were employed in competitive employment at the time of case closure. The analysis focused on the predictors that were present at the time the young individuals applied for services, and not whether the predictors were present when their cases were closed. The authors found that African-Americans were more likely to have cases closed as unsuccessful rather than other groups. Latinos were more likely to be closed in either the competitive or noncompetitive employment categories. Higher education levels were positively

linked to competitive employment, as were higher levels of visual acuity. Youths with cognitive impairments in addition to a visual impairment were less likely to be competitively employed. Work experience was a positive predictor of a successful outcome, as was job placement assistance. Receipt of Supplemental Security Income (SSI) was a negative factor, as were remedial services.

McDonnall (2005) found four predictors of employment through studying RSA data. These were: (1) education that resulted in the receipt of a certificate during the rehabilitation program; (2) employment since the onset of disability; (3) a good relationship with the rehabilitation counselor; and (4) a work-related reason for applying for assistance through vocational rehabilitation programs. Those who were employed since the onset of their disability were 3.5 times more likely to be employed than those who had not worked. Those who received education as a service that resulted in a certificate were 9 times more likely to become employed. The odds of employment were 3.5 times greater for those who applied for rehabilitation services for work-related reasons, than for those who had not had this motivation. If the consumer perceived the relationship with the counselor as positive, the odds were 2.5 times more likely to become employed than if the relationship was a negative one.

The Social Security Administration (SSA) provides two types of benefits to individuals with disabilities, Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI). Beneficiaries may be enrolled in both programs. Mamun et al. (2011) evaluated SSA statistics and found that approximately ten million Americans received SS benefits. Approximately thirteen percent were employed. They defined employment as earning over one-thousand dollars in a calendar year. Their analysis highlighted the fact that the employment rate varies depending on region. Southern and Appalachian states had lower rates of employment

than did upper mid-Western states. The reasons for this difference were not certain; however, variation in state policies in administering such programs as Medicaid were cited. Also, the economic condition in each region may have a different effect on employment generally; however, this was not examined by Mamun et al. (2011). In 2010, the SSA paid recipients of SSDI and SSI 160 billion dollars (Kregel, 2012). Kregel noted in his testimony before congress that the employment rate of people with disabilities has fallen, while the rate of those applying for and being granted SS benefits is rising.

Loprest and Maag (2007) found that SSI benefits had a negative association with employment. In addition, their analysis of National Institutes of Health survey data indicated that individuals with early onset of disability were more likely to be unemployed. They were more likely to not have completed high school and not to have obtained higher education than those who had a later onset of disability. Researchers have studied the effect that receipt of benefits from the Social Security Administration (SSA) has on the participation of people with disabilities in the workforce (Livermore, Goodman & Wright 2007; Mamun et al. 2011; Tremblay, Smith, Porter & Weathers 2011) Receipt of SSI has been negatively correlated with working (Giesen & Cavanaugh 2012; McDonnall 2011).

Supplemental Security Income is a needs based program to assist the elderly and individuals with disabilities who have very limited resources. It strictly caps the amount of assets that a person can possess. The amount paid to an individual provides a minimal income. The rate changes based on cost of living. A person is allowed to earn 85 dollars per month. Any amount above that, the SSA takes away one dollar for every two dollars the person earns as wages (Tremblay, Smith, Porter, & Weathers, 2011). Individuals with visual impairments are allowed to document work expenses, such as transportation and assistive technology. The work expenses are

not counted against the person's earnings, so that they will not effect the SSA benefit check. The Social Security Disability Insurance (SSDI) program functions differently. Individuals are eligible based on the amount they have worked and paid into the Social Security system through taxes. Recipients of this program can earn up to a certain amount of money without endangering their benefits (Mamun et al., 2012).

Livermore, Goodman and Wright (2007) conducted a national beneficiary survey (NBS) in 2004, sponsored by the SSA. They interviewed participants by telephone or in person. They reported that over 53 percent of the research participants had received SSA benefits for a period of time longer than 10 years. Only 4 percent had received benefits for less than 2 years. They found that SSDI recipients differed from those receiving SSI. SSDI beneficiaries were more likely to be older, have worked for at least 10 years, and be married. SSI beneficiaries tended to have lower levels of education and work experience. They were also more likely to be from an ethnic or racial minority.

The purpose of the Livermore et al. (2007) study was to determine if and how beneficiaries use employment services, including the Ticket to Work Program (TTW). Also, it documented the beneficiaries' interest in obtaining and maintaining a job. Ninety-six percent of the participants stated that they were not employed due to the limitations imposed by their disability such as poor health, inaccessibility of work sites, discouragement due to failure of previous attempts to work, inability to find a job for which they were qualified, the belief of others that they could not work, and lack of transportation. However, during the year prior to the survey, 18 percent of the sample population engaged in activities related to employment, such as looking for work and/or working. Thirty percent of the survey respondents stated that they had work related goals even if they were not currently working; approximately 20 percent received

job assessments or help locating work. The authors found that many participants also used services that could indirectly increase their ability to enter the work force. For example, 70 percent of the population used services to ameliorate their health problems and 25 percent participated in programs to improve their ability to complete daily living tasks.

While a substantial part of the population expressed work-related goals, rehabilitation professionals and policy makers realize there are obstacles when lessening the dependence on benefits. The health problems of many recipients may preclude them from working. Also, over half of the people receiving SSDI or SSI have done so for at least 10 years; therefore, rehabilitation professionals will need to assist these clients with updating skills, as well as with work related activities to accustom them to regular work. Livermore et al. (2004) reported that 65 percent of Social Security recipients did not report any additional income. Therefore, they may be reluctant to jeopardize these benefits and other programs for which they may be eligible, such as food stamps, housing assistance, or health insurance. Only 11 percent of individuals stated that the fear of loss of benefits was the reason for their unemployment; however, individuals may not have self-reported this concern due to societal stigma attached to the dependence upon welfare benefits. While this study occurred almost a decade ago, these factors are still present today (Mamun et al., 2011).

Sanders (2013) conducted a study in Mississippi to learn about employment concerns among people who are visually impaired in his state. One of the major themes that participants discussed was the SSI and SSDI benefits programs and the impact they had on employment decisions. The majority of the study participants expressed the value of working, but many cited financial need as a reason for remaining on benefit rolls. Some participants revealed that they could only find jobs with low wages, and the SSA paid more than they would earn. Health

insurance costs, and the cost of transportation were both directly invoked by interviewees. Percentages of the research participants who received benefits were not available. Also, some study participants were employed and some were not, but no specifics were given. However, concerns about benefits were important to individuals with visual impairments in Mississippi.

Various programs have been initiated to try to help Social Security beneficiaries return to work. The Florida Freedom Initiative (FFI) was one such program (Conley & Conroy, 2009). It began in 2004. Its goal was to increase participation in the primary labor force by individuals with significant disabilities and to improve their ability to choose services and make decisions about employment goals. The FFI utilized employment coordinators (ECs) to operate the initiative. As an incentive to participation, the SSA allowed program participants to earn a higher amount of money before it affected their SSI payments and to save money in an account to purchase a car, home, or other work-related technology. FFI participants were also allowed to use Medicaid waivers to pay for needed services with the approval of the EC. However, only 35 people were enrolled and of those, only 19 provided data for the research.

Conley and Conroy reported several problems in operating the FFI. First, there was difficulty in persuading family and clients to participate in work activities, despite the SSA incentives. Families expressed fear of losing income and benefits. Potential participants doubted the stability and longevity of the program and were hesitant to get involved. The ECs were not all hired immediately; therefore the program did not perform at full capacity for much of the trial period. The authors also noted that the ECs expressed frustration with employees of local offices of government agencies because they often provided contradictory information, or did not know about the FFI. Finally, the goal of establishing a “circle of friends,” comprised of family, friends, and professionals, to assist in vocational decision making was not achieved. The reasons for this

failure were that people could not coordinate their schedules to meet and the unwillingness of some agency personnel to participate. These difficulties illustrate some reasons that programs designed to lessen dependence on SSA benefits have met with obstacles.

The SSA attempts to help individuals enter the workforce by providing work incentives and other programs that assist people in obtaining training and placement in jobs. The Plan for Achieving Self Support (PASS) and the Work Incentives Planning and Assistance Project (WIPA) are two such programs (Kregel, 2012). The WIPA project provides benefits counseling throughout the United States and its territories. Kregel reported that 500 staff members have assisted 450 thousand individuals. The number of WIPA staff in an area is dependent on the number of SS recipients in residence. A variety of agencies provide WIPA services. They include vocational rehabilitation agencies, advocacy organizations, independent living centers, and others. The agencies receive funding from SSA. The WIPA staff are not permitted to assist clients to apply for SS benefits. In order to be eligible, a person must be of working age, and a recipient of SSDI, SSI, or both. Agencies can only receive a maximum of three-hundred thousand dollars, and Kregel expressed the concern that this limits the ability of agencies to provide service and needed outreach to individuals who may be interested in pursuing employment goals (Kregel, 2012). Hanophy (2012) mentioned the importance of preventing overpayment by the SSA when a person begins working. The overpayment can result in a large debt, and has been shown to be a disincentive to work. The WIPA project staff try to prevent this from happening by assisting the client to report their employment data quickly and accurately (Kregel, 2012). Hanophy noted in his testimony that it is crucial for SSA staff to process the information provided to them in an efficient manner. Kregel noted while the savings achieved from the WIPA are modest, the program's effectiveness can only be measured over time as more

beneficiaries receive services and the amount of their benefits is reduced or eliminated. These programs have not been successful in alleviating the employment gap, though with refinement they may make a lasting contribution.

McDonnall (2005) investigated the participation of individuals with visual impairments in her research on the use of the Ticket to Work (TTW) program. Congress passed the Ticket to Work and Workforce Investment Act in 1999. It is an effort of the Social Security Administration to decrease dependence on its benefits by individuals with disabilities. Each individual has a ticket, which he/she can assign to an employment network (EN), or a state vocational rehabilitation agency. McDonnall analyzed available data from 2004. First, individuals who were blind were more likely to assign their tickets than those in other disability groups. This finding was contrary to suppositions of professionals. She also found that individuals who were legally blind, or who had low vision, were less likely to stop receiving benefits. McDonnall proposed that this may be due to discrimination by employers, or the higher earning allowance permitted by the SSA for individuals with visual impairments to offset assistive technology and transportation costs.

Social Security Administration provided the data for the McDonnall (2005) study. A little more than a decade has passed since the implementation of the TTW program. Recently, Congress amended the TTW to include a program called Partnership Plus (Hanophy, 2012). This program allows more than one agency to be reimbursed for job training and placement costs. The SSA pays employment networks (EN) in different phases under this new initiative. Hanophy, in his testimony before Congress pointed out that several state vocational rehabilitation agencies have worked with other agencies who are ENs to provide more support for individuals seeking employment and utilizing their tickets. These partnerships help the individual by maintaining

ongoing job support even after the closure of a client's case in the state vocational rehabilitation agency. A follow-up study might reveal if the combined TTW and Partnership Plus initiative has had lasting results. In addition, research might focus on the experiences of individuals who have participated in it. Their insights might yield useful data that could be used to improve outcomes.

Currently, less than 1 percent of Social Security beneficiaries participate in enough substantial gainful activity (SGA) to allow them to leave the SSA roles by returning to work (Tremblay et al., 2011). While discouraging, possible solutions for this problem exist. Conley and Conroy (2009) suggested several alternatives. First, the government should increase the SGA allowance from its current amount of 85 dollars for SSI recipients. This would allow beneficiaries to utilize transportation options and to earn more before benefits would be lost. The increased wages may serve as an incentive to take the fear out of the process of returning to work. Tremblay et al. (2011) proposed a similar idea for the recipients of SSDI. Currently, if a beneficiary of SSDI earns any money above the SGA, then his/her benefit check is cut totally. This is referred to as the cash cliff. Congress mandated that SSA study methods of eliminating the cash cliff as a disincentive to work in the TTW. Tremblay et al. studied participants of a pilot program in Vermont. The control group was allowed to utilize current benefits and services. The treatment group only lost one dollar for every two earned, once they exceeded the SGA. Participants could also access a by-in option for Medicaid, therefore, they did not lose health insurance as a result of working. The results of the study indicated that individuals who enrolled early had greater rates of returning to work. Benefits counselors reported that these individuals were more work ready than later enrollees. Tremblay et al. (2011) demonstrated some positive effect of the program. However, they suggested that results may differ if SSA adopts the policy as regulation because people may have been reluctant to participate in the trial study, especially

since the raised SGA allowance was temporary.

Work incentive benefits counseling can serve as a support system for those individuals trying to return to work. This type of counseling focuses on providing clients with information to maximize options for employment and the use of work incentives provided by SSA to achieve employment goals (Delin, Hartman, & Sell, 2012). It differs from the commonly held perception of benefits counseling since the goal is furthering work opportunities, rather than a means of helping clients gain public assistance. Delin et al. (2012) published a study that focused on the effect work incentive benefits counseling exerted. They utilized data from two Wisconsin projects designed to assist individuals in returning to work. Participants were SSDI recipients. The authors found that the counseling produced a statistically significant effect on earnings levels, although actual income increases were small. The largest predictor of the success of counseling was employment prior to the start of benefits counseling. Individuals who were employed utilized counseling services for more hours than did those who were not employed prior to the start of the projects. Although the argument was made that the people who utilized counseling were more motivated to work, further use and studies of work incentive benefits counseling were warranted. Although there was no data specific to the outcomes for individuals who were blind/visually impaired, Delin et al. (2012) examined those with physical and/or sensory impairments. In order to maximize the impact that this service can have, it behooves professionals to provide information in alternate formats, i.e. braille, large print, audio recording, or electronic copy. In benefits counseling, discussion only is not adequate, since the information about SSA benefits involves many specifics such as SGA amounts and time periods. Providing the needed format also lessens the dependence of the client on others when accessing the information and optimizes the opportunity for decision making on the part of clients. Kregel

(2012) noted that the amount saved by SSA as a result of the WIPA which provides benefits counseling continues to grow annually. While savings have not offset the cost yet, the amount that employed individuals pay as taxes, in addition to the diminished amount that SSA pays these individuals, will be measurable over longer periods of time.

Peer counseling may yield favorable results. Sulewski et al. (2010) studied the efficacy of peer counseling as a means of encouraging work force participation among SS recipients. The researchers recruited individuals with disabilities who agreed to serve as peer leaders. They received three to four days of training in benefits issues, networking strategies, and local resources that promoted employment. The peer counselors spoke at club meetings and held informal meetings with others with disabilities at agencies that provided day treatment programs, as well as those that provided employment services. The authors conducted a follow up survey. Twenty-five percent of respondents indicated that they had taken action toward employment. The study was not longitudinal and it was reflected as was one of its limitations. This strategy may be a useful one, since people may be more likely to trust those with similar life situations.

### **Attainment of Specific Skills and Their Relation to Employment**

There is a lack of research about the relationship between reading format and a relationship to employment. Lack of literacy skills has been linked to lower employment rates. Ryles (1996) surveyed patrons of a branch of the state library for the blind, which is a branch of the National Library Service for the Blind and Physically Handicapped; a program of the Library of Congress (NLS). She noted that visually impaired individuals who read large print were less likely to be employed than those who were braille readers. The effect of the use of assistive technology on information access and its relationship to employment levels was not examined. This is crucial information for rehabilitation service providers, since many jobs that are available

require the use of technology.

Bengisu, Izbirak, and Mackieh (2008) conducted qualitative research about employment issues in Turkey. Bengisu, Izbirak, and Mackieh found that the odds ratio was 1.75 for people with high-school or post-secondary education to be employed. Those who were literate in braille were 1.37 times more likely to be employed.

Yuh et al. (2013) studied individuals with visual impairments in Taiwan. Individuals were predominantly employed as massage therapists and 313 completed programs that are equivalent to vocational rehabilitation services. Two-hundred seventy-one (87%) were employed at case closure, with 224 as massage therapists. Factors relating to employment were having a vocational certificate, post-employment services, and fewer pre-employment services.

Crudden et al. (2005) cited access to print as an important barrier to be overcome. The rehabilitation professionals who comprised the study stated that they felt assistive technology was a key way to overcome this obstacle. Keeping the technology current is necessary. Braille literacy skills were also noted as an important method of reading and accessing information.

Leonard (2002) investigated factors associated with employment from a population who had received services from the Lighthouse for the Blind. Leonard interviewed 167 participants and 46% were employed, 22% were doing other activities such as training, and the rest were unemployed. Higher education was a predictor of employment. Also, this study found use of print an indicator as 78% more likely to be employed if they used print as their reading format. People who received technology training were twice as likely to be employed. Further, people who were integrated in school were more likely to work. Receipt of rehabilitation teaching and orientation and mobility (O&M) training were not statistically significant in the study.

Some programs focused on preparation for specific jobs. The report written by Zamora

(2002) provided an example of a successful relationship between Marriott International, the California Department of Rehabilitation, and Braille Institute of America. From November 1990-2002, 37 reservations agents who were blind or visually impaired were hired at the company's Santa Ana location. Marriott provided advanced announcements of job openings. The Braille Institute of America (BIA) and the California department of Rehabilitation Services (DORS) spread the word among job seekers and prepared them to compete for the positions. Candidates met qualification standards set by the corporation and the agencies ensured that prospective job applicants had the desired skills before supporting their application and committing to provide accommodations if they were hired. This report provided an effective example of how these entities worked together to meet mutual needs and achieved successful employment outcomes.

Two recent articles described specific job training techniques and curriculum that were designed for students who were blind or visually impaired. Jacko et al. (2010) wrote about the Miami Lighthouse for the Blind's recent development of a training program to prepare individuals for careers in music production. Along with describing the training and specific technology utilized by participants, the authors stated that six graduates of the training have obtained employment and others pursued education at the college level, or have produced music in their own studios. Armstrong and Murray (2010) conducted research in an Australian university to determine the efficacy of employment training in the information technology field for people who were blind or visually impaired. Their study described research conducted in the use of a specific curriculum. The curriculum was used with a sample population of individuals with visual impairments and a control group of students who are sighted. Results demonstrated the ability of the sample population to learn the material as effectively as the control group.

## **Early Preparation**

Several studies identified the relationship between the preparation of the individual during high school to future employment (Crudden, 2012; Giesen & Cavanaugh, 2012; McDonnall 2011). The Individuals with Disabilities Education Act (IDEA, 1990) and the most recent version (Individuals with Disabilities Education Improvement Act of 2004) promote employment for those with disabilities by mandating that all students are guaranteed a “free appropriate public education” (IDEA 1990). In the 2004 version, it discussed transition services:

The term individualized education program or (IEP) means a written statement for each child with a disability that is developed, reviewed, and revised in accordance with this section and that includes... 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...beginning not later than the first IEP to be in effect when the child is 16, and updated annually thereafter (Individuals with Disabilities Education Improvement Act of 2004).

Career planning is part of transition services. The purpose of the IEP meeting is to ensure the school system provides students in special education with appropriate services and that goals are set and achieved from year to year. Participants include the student, his/her parent or guardian, teachers, and other school personnel. When a child reaches transition age, vocational rehabilitation counselors may attend the meeting. As the student advances through school, ideally he/she takes a more active role in leading the meeting and setting goals (Crudden, 2012). Crudden noted that this process encouraged leadership skills and an internal locus of control.

However, if the student had not been referred to the vocational rehabilitation agency, or if the counselor had scheduling conflicts due to an excessively large case load or other reasons, they were often not present (Crudden, 2012). Crudden (2012) researched the views of professionals who worked with transition age students. One theme expressed was the need for parents and educators to work together to set high expectations for young people. One of the skills that they deemed essential was self-advocacy. They discussed the difficulty of helping family to actively encourage work participation. Parents were noted to be protective of children, and sometimes unable to allow their children with visual impairments to take more responsibility for independent actions and decision making. The participants in Crudden's study cited the lack of funding as one reason that transition services do not usually begin before age sixteen.

Studies have attempted to determine the outcomes for students who received transition services in high school. The research specifically focused on employment or the lack thereof in this population. The Department of Education conducted the second National Longitudinal Transition Study (NLTS2). A representative sample of high school students who receive special education services participated, along with parents and service providers (Kirchner & Smith, 2005; McDonnall, 2010).

Kirchner and Smith (2005) described statistics of transitional students from the initial data set of the NLTS2. Ninety-five percent of parents planned for their children to attend two or four year colleges. Sixty-nine percent were actually attending college when the study was conducted. Seventy-three percent had worked at paid employment, as opposed to 83% of students with other disabilities. Findings from the early stages of the NLTS2 should be viewed with caution, since students were still completing their education.

The NLTS2 yielded sample populations among various disability groups. Data from the study

conducted by the Department of Education provided material for McDonnall's (2011) later investigation of the experiences of this age group. McDonnall ascertained that youth with visual impairments were employed at lower rates than youth with other disabilities. She also found that the employment lasted less than six months on average. McDonnall (2011) noted that only eight percent used public transportation to get to work. Approximately one-third walked or rode bicycles. Forty-six percent relied on others to get to work, usually a family member. These results may demonstrate the need for more skills training in orientation and mobility, along with highlighting the possible lack of public transportation.

Only 32% of post-secondary students who were not attending college were employed (McDonnall, 2011). However, youths without additional disabilities had a higher rate of employment (77%). A higher percentage of youths with visual impairments attended some type of college than youths without disabilities. Since some of the study participants were still in high school, their ultimate employment outcomes are not available. Shaw et al. (2007) focused their research on Canadian youths and they found that only 29% of youths with visual impairment between the ages of fifteen and thirty were employed. They also noted that those with better vision were more likely to be employed. As with other studies, high parental expectations, good social skills, and higher levels of education were found to be significantly associated with higher levels of employment. McDonnall (2011) noted that students with additional disabilities have greater difficulty getting hired than do those with only a visual disability. Both McDonnall (2011) and Shaw et al. (2007) found that work experience in high school was positively correlated to employment in adulthood. Preparation and adequate skill development during the transition years are cited as crucial. Crudden (2012) published a qualitative study with rehabilitation professionals as participants. She conducted five focus groups and the groups were

asked questions concerning their beliefs about services and strategies that had positive results for their clients. The interviewers asked the participants to make recommendations for improvement of services. The results were analyzed and grouped into themes. A recurring theme stated by participants was that transition activities needed to begin as early as possible. Some participants mentioned elementary school as the ideal starting point. Group members expressed frustration that the transition process does not routinely begin before age sixteen. They stated a need for improved communication strategies between the schools and rehabilitation professionals; emphasizing the importance of attending IEP and Section 504 meetings held for each child. Skill preparation in the areas of social skills, orientation and mobility, and academics were crucial according to the Crudden's research.

Two recent reports were published that detail specific regions' efforts to assist adult clients to prepare to enter the work world (McMann et al., 2013; Whittich et al., 2013). These programs focused on development of good job seeking skills. McMann et al. (2013) established an Employability Skills Program in Maine based on a similar program provided in the United Kingdom. The program provided participants the opportunity to learn about their work personality, strengths and weaknesses. Fourteen consumers of the Maine division for the Blind participated in a week-long intensive training. It was found to be valuable, due to the skills and perspectives gained about the work world. Several individuals found jobs soon after participating and others entered training programs to improve either academic, job specific, or independent living skills. The agency continued the support by providing a job club via telephone conference call. Eight of the 14 participants were working either full or part time jobs within 18 months after the program including self-employment. Others participated in more extensive training programs.

Whittich et al. (2013) described a similar employability skills program in Quebec. About 1/3 of the individuals with visual impairments are employed. The program used a modified version of the Royal National Institute for the Blind (RNIB) program to prepare consumers for employment. The program included English speakers and there were eight participants of whom four were employed after eight months, three full-time and one part-time. Some participants returned to school.

### **Knowledge and Attitudes of Employers**

Negative attitudes of employers toward hiring individuals with disabilities has been mentioned in the literature. Lynch (2013) in conjunction with the National Industries for the Blind conducted a survey of hiring managers. Lynch found that the majority of employers did not believe that there were jobs in their companies that could be done by those who are blind or visually impaired. Also, they believed that assistive technology is cost prohibitive. Employers who knew someone with a visual impairment were significantly more likely to hire someone with this disability.

McDonnall, O'Mally, and Crudden (2014) studied knowledge and attitudes of employers in four states. Sixty-seven percent were unaware of how employees completed tasks. Twenty-three percent could identify one method of completing the five task sample. Employers with more knowledge about visual impairments correlated at .37 with a positive attitude.

Sanders (2013) explored employment of individuals in Mississippi with a visual impairment. Twenty people participated in the phenomenological study. He interviewed both employed and unemployed individuals. Negative employer attitudes was a common theme stated in Sanders's research. Several responses reported by Sanders expressed that potential employees

felt that many employers lack information about blindness and the capabilities of individuals who are blind or visually impaired. They stated that during the interview process that they felt an obligation to explain their disability and how they could do a particular job, but were not given an opportunity to demonstrate their skills.

Candela and Wolffe (2001) provided suggestions to increase the awareness of employers and strengthen positive ties with rehabilitation professionals. Further, the researchers advocated using an employment consortium to improve job placement results. The report detailed how to form the consortium, its purpose, and benefits that it should provide. They suggested that members be drawn from the rehabilitation profession, business sector, and others who may have an interest in job placement. No data were provided to suggest that individuals who received assistance obtaining work from an employment consortium remained employed for an extended time. A benefit of this approach is that employers and counselors can network and share ideas. Rehabilitation professionals gain the opportunity to learn what skills and expectations that employers have of workers. This information helps counselors stay current with trends, so that they can give appropriate career guidance to clients. By networking with employers, counselors will meet other employers with jobs to fill.

Wolffe and Candela (2002) published the results of a qualitative study that demonstrated that employers overcame misapprehensions about hiring employees with visual impairments when those employees demonstrated good skills and had adequate support in making accommodations. They interviewed nine employers who had hired 35 workers who were blind or visually impaired. The majority of the workers performed telephone work in the areas of customer service, market research and technical support. The researchers reported both anticipated and actual challenges faced by the managers. Equipment was cited as the greatest

actual challenge that materialized at 36 percent. Eighty-nine percent of the employers expressed very positive feelings regarding their employees' job performance and the rest were neutral.

Wolffe and Candela proposed establishing a database of employers who have hired someone with a visual impairment. Job developers and other employers could then network in order to share information. Employers with experience making accommodations could provide mentoring to other employers.

Counselors and job developers have traditionally focused their efforts on preparing the client for employment and then finding a job (Luecking, 2008). An alternate approach is to shift the focus to ascertain the needs of employers. Luecking (2008) discussed the development of tactics used to encourage employers to hire people with disabilities. Some fifty years ago, "hire the handicapped" provided charitable motivation for an employer to hire someone with a disability. The "stick and carrot" model then replaced this marketing strategy. Employers could be penalized if they discriminated against individuals with disabilities, but they could receive tax credits if they hired the person. Studies demonstrated that people with disabilities could be viewed positively by their employers. But, they had the adverse effect of creating stereotypes of super-achievers. Luecking tried to determine how employers view the job development process. Employers express the feeling that the job developers were not in touch with the needs of the business community and did not participate in activities that encourage networking. Employers expressed frustration that job developers seemed to disappear after the hire took place and did not provide enough consultation about accommodations and other procedural details that assist the new employee in fitting into the new work environment. The viewpoint that rehabilitation service providers were not in touch with the labor market had negative implications for job seekers with disabilities. If employers doubt the service providers' competence, it then follows

that they will be reluctant to hire job seekers who utilize placement specialists viewed to be inadequate. He explained that employers may not find rehabilitation professionals in organizations that cater to business interests. The Chamber of Commerce is an example of such an organization that provides a networking opportunity for rehabilitation professionals. By participating in these arenas, counselors gain the opportunity to learn about job openings and gain a forum to present the vocational rehabilitation agency as a community participant with a productive source of workers to meet business demands.

Employers provided positive feedback about hiring a person with a disability when he/she demonstrated good job qualifications. They pointed to receiving support from competent job developers and rehabilitation professionals as a component of a good employment match. Luecking (2008) advocated the use of customized employment as a tool. The process begins when a rehabilitation professional works with a client and identifies strengths and aptitudes that he/she brings to a job, as well as a list of needed accommodations or supports. The second step is to create a list of the employers that might be able to utilize the client's skills. The third phase is contacting the employer and negotiating a specific job assignment that may carve out a niche that meets both employer needs and the worker's aptitudes. Providing necessary support is the final stage of creating customized employment. Assistive technology may be an important support. Others may include on-the-job training and consultation should problems arise (Luecking, 2008).

McDonnall and Crudden's (2013) study asked rehabilitation counselors and other personnel who are involved in job placement what strategies they use to overcome negative attitudes of employers. Responses were grouped into this question in to two categories. These were education and service delivery strategies. Providing information about job accommodations to employers was most common among the techniques used by participants at 35%. Other

common strategies included on-the-job training and work experience, emphasizing the abilities of employees rather than disabilities, educating employers about tax incentives, and encouraging open discussion of employers' concerns. The authors found that business relations staff, such as job developers and placement specialists reported that they utilized strategies that focused on the dual purpose of the relationship and catered to the employers' needs. McDonnall and Crudden (2013) found that rehabilitation counselors were more likely to have expectations about employer attitudes toward hiring someone with a visual impairment, than do business relations staff. The researchers encouraged rehabilitation counselors to evaluate their perceptions and beliefs about employers' attitudes and strive not to allow these to adversely influence job placements by expecting failure and difficulties. It was important that potential employees not develop poor attitudes toward employers based on negative expectations of rehabilitation staff. Use of the techniques mentioned by research participants and a positive attitude toward building relationships with employers were found to be key components of successful employment outcomes.

Educational outreach by rehabilitation professionals is another means of changing employer attitudes (Crudden et al., 2005). This can be done by having conferences where speakers can present information about the supports that vocational rehabilitation agencies can provide. They can also explain legislation and demystify the process of making accommodations. Competent people with visual impairments ideally should participate because it gives the employers an unthreatening opportunity to learn that blindness and visual impairment are only a characteristic of a person, and that people with this disability are capable of fully contributing to society and make valuable contributions through their work.

Golub's (2003, 2006) qualitative work examined factors that contribute to successful

employment. In 2003, she explored these factors and interviewed eight employers, two employees, and two service providers. The results emphasized positive attitudes on the part of both employer and employee, in addition to the need for solid compensatory skills. The ability to travel independently and to complete work without assistance were the two skill areas that participants mentioned most frequently. Employers also communicated that the successful employees worked in environments that allowed flexibility in performing job tasks, while still being held to the same standard of job performance as other workers. Other necessary skills included the ability to navigate the social aspects of the workplace and the ability to put others at ease with their disability. While Golub's work provided valuable insight to the beliefs and expectations of employers, only two workers contributed to the research.

Golub's (2006) work continued exploring the themes in her previous study. Twenty-two employers in eleven states were interviewed. Interview questions asked employers to identify steps that employers can take to help workers be successful, actions that employees with visual impairments do that put coworkers at ease, and the skills that successful employees exhibit. The emergent themes provided the basis for a dual set of actions that both employers and employees can take to create an environment conducive to success. Golub suggested the analogy of two staircases and a landing where they meet at the top. Each party, the worker and employer would implement seven steps. The employer begins these steps by promulgating positive attitudes about diversity in the workplace from the top down. Managers reinforce the idea that diversity is a strength, rather than an accommodation. The employer does this through training, as well as ensuring that the organization's mission statement and philosophy reflect an inclusive attitude. The second step is to provide the tools that employees with visual impairments need to do their jobs. This includes assistive technology. Golub suggested that supervisors seek the input of

subordinates when planning accommodations. The third step suggests that the employers ensure that all aspects of the workplace are accessible. Special mention was given to ensure information that is disseminated to all employees is provided in an accessible format. The fourth step is to demonstrate a transparent attitude about disability. This includes encouraging the employee to answer coworker questions about equipment and allowing the employee to take the lead in asking for assistance when needed. The fifth step encourages employers to use good verbal communication, both with the employee who is blind, as well as allowing discussion of feelings that new employees to the organization may have in reaction to someone who has a disability. Expecting the same work performance from the employee with the visual impairment, after providing necessary accommodations, is step six. Mutual accommodation is step seven. It involves recognizing that differences are inherent in individuals and must be accommodated, whether they add value or not (Golub, 2006).

Golub then provided seven steps for employees to follow in order to empower themselves. She based them on employer perceptions provided in the interviews conducted as part of the study. First, the employee should demonstrate comfort with his/her visual impairment because this influences coworkers positively. Second, the employee needs to have good compensatory skills. The employers suggested that these be demonstrated during the job interview if possible. The importance of being current in the use of assistive technology, in addition to having back-up strategies to use if a system fails are key components of success in this area. The third step is to realize the necessity of being an ambassador for blindness/visual impairment. Maintaining a positive attitude is step four. The employee does not use his/her vision as a crutch, and views challenges as learning opportunities. Using good work etiquette is the fifth step. Step six is for the employee to insist on being held to the same standard as

coworkers. The seventh step is mutual accommodation. The employee acknowledges and values the differences of everyone in the workplace. This level means that parties are comfortable discussing needs, perspectives, and accommodations. Golub stressed that flexibility and openness must be present for the mutual accommodation model to flourish.

The Tilting at Windmills curriculum is a useful means of educating employers and encouraging a positive attitude toward people with disabilities (Brostrand, 2006). Originally written in Californian in 1982, it was revised in 1993 to reflect the passage of the ADA and the changes it brought to the work place. It consists of eleven modules, and groups can choose to use part or all of the curriculum. The time suggested is from one to eight hours. The activities included are experiential as well as group discussions. The windmills curriculum educates people about myths concerning disability. It also covers legislation and accommodations. Its purpose is to change behaviors of employers by changing their attitudes. This curriculum has been used by governmental agencies, as well as corporations. This system may be one that could have more positive impact if offered more frequently by rehabilitation service providers.

Gold et al. (2012) emphasized the importance of understanding, trust, and relationship building between the three main groups of stakeholders: employees, employers, and service providers. They conducted a qualitative study in Maryland using focus groups comprised of members from these three groups. Their purpose was to determine how accommodations were negotiated and the motivations involved in the actions of each group. Based on stakeholder comments, Gold et al. made several recommendations to improve the likelihood of receiving accommodations. Employees must be transparent in disclosing their disabilities and accommodation needs. The authors acknowledged that this may be difficult because of experiences that the employee may have of societal stigma placed on disability and requesting

assistance. When asking for accommodations, the employee must document how the request will benefit the productivity of the work place. Service providers need to demonstrate to employers that they are working for both the employer and employee and are not only advocating for the worker's benefit. The relationship of all parties is crucial. It should be one of trust and respect.

In order to achieve this relationship, Gold et al. (2012) suggested the need to recognize that parties may approach the negotiating table with different viewpoints. They reported that the perceptions of employers and employees concerning legal obligation versus moral obligation, for example, are often different. Employers emphasized a focus on profit and complying with the law. Doing the right thing was a concern but only when the prior two objectives were met. Employees, on the other hand, understood the need for employers to make a profit but felt that employers should make accommodations because it was the "right thing" to do. Service providers can help bridge this gap to educate each group about the other's viewpoint in order to develop work environments that emphasize diversity and inclusivity as positive components of a productive organization.

The participants in the Crudden et al. (2005) study reported that temporary work placements have the potential to be a means of assisting consumers to obtain full-time work. This type of temporary work includes volunteer positions, summer work jobs, and internships. They revealed that allowing the employer to feel less obligated makes the situation less threatening to them, because they do not have to go through the process of terminating the employee should the worker not meet expectations. Often these types of placements do lead into more permanent work.

Farnsworth (1998) advocated the use of a temporary staffing agency. He suggested that this technique allows the employer an opportunity to assess a worker's suitability for a position

without obligation to keep the employee on the job should the match not be ideal. Potential job seekers may be resistant to this approach for several reasons. First, many employers in today's economy prefer to use temporary workers as a way of avoiding paying for health insurance benefits. Second, individuals who receive Medicaid or Medicare may be reluctant to accept work if there is a possibility they may lose this important benefit. Another concern may be that a rehabilitation case can be closed after ninety days of employment. It would be difficult to close a case when the employment is unstable and very prone to change. The needed accommodations might vary considerably from job site to job site. Therefore, the worker may need more extended support in order to be successful. Job placement professionals must consider these important issues if temporary staffing companies are utilized as a source of employment.

Crudden et al. (2005) conducted a qualitative study of rehabilitation professionals to ascertain how they overcome barriers to employment. One major barrier that participants cited was employer attitudes. Participants revealed that employers fear blindness, as well as having workers who they believe will be dependent on other coworkers.

McDonnall and Crudden (2013) surveyed rehabilitation counselors and personnel who worked directly with employers to ascertain the techniques they used to overcome negative attitudes toward hiring individuals who are blind. They gathered both quantitative and qualitative data. Responses from 210 professionals provided information for the study. The participants worked for 41 state/federal rehabilitation agencies, and the mix of personnel from agencies who serve only visually impaired clients and those who work for agencies who serve the total population were about equal in representation. The researchers asked three questions. First, whether employers demonstrated greater reluctance to hire those with visual impairments compared to those with other disabilities. The second piece of information gathered was the

percentage of employers with negative attitudes toward hiring staff with visual impairments; in the experience of the respondents. Finally, they were asked to provide effective strategies they used to combat negative attitudes of employers. The results of the third question provided valuable insights. McDonnall and Crudden found that 83.6% of professionals felt that employers had more negative attitudes toward hiring someone who is visually impaired. Rehabilitation counselors who served caseloads of visually impaired clients were more likely to have this perception than were those who performed other tasks such as job development or placement and who worked with clients who have a variety of disabilities. The majority of respondents expressed that over half of employers initially exhibit negative attitudes.

Federal legislation attempted to guarantee that employees with disabilities will not face discrimination in the workplace. The Rehabilitation Act of 1973 was the initial employment law that specifically addressed the civil rights of people with disabilities. Section 504 discusses programs that receive federal funds, including employers. The section states,

No otherwise qualified individual with a disability in the United States, as defined in section 705 of this title, shall, solely by reason of his or her disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity conducted by any Executive agency or by the United States Postal Service (Rehabilitation Act of 1973).

The Americans with Disabilities Act (1990) was passed by Congress in 1990. Its purpose is to guarantee equal rights to citizens with disabilities. Title I of the legislation covers issues related to employment. The general rule of discrimination in Title I states, “No covered entity shall discriminate against a qualified individual on the basis of disability in regard to job application

procedures, the hiring, advancement, or discharge of employees, employee compensation, job training, and other terms, conditions, and privileges of employment” (Americans with Disabilities Act of 1990). The definitions provided under section I define a “covered entity” as “an employer, employment agency, labor organization, or joint labor-management committee” (Americans with Disabilities Act of 1990).

Examining the history of complaints filed under the ADA revealed that employees with disabilities experience discrimination from employers. Unger et al. (2005) studied the outcomes of complaints to the Equal Employment Opportunity Commission (EEOC), from the years 1993-2002. They found that 51% of complaints were dismissed as groundless, and another 11% were closed for administrative reasons. The EEOC defined administrative reasons as those resulting from lack of cooperation by the complainant, or inability to contact the complainant.

Approximately 6% of persons with visual impairment received settlements by means of litigations. Another 6% of cases were closed when the individual making the complaint and the employer reached a settlement independent of the EEOC. These figures were higher than those who were not visually impaired. The EEOC was less likely to grant letters of right to sue to complainants with visual impairments than to others with different disabilities (Unger et al., 2005). The study indicated the need to educate individuals with disabilities about their rights under the law. It may also indicate a need to ensure that information provided to individuals with visual impairments is in accessible formats. Although people who cannot access print may utilize assistive technology, or help from a reader, the EEOC could pursue a policy of inclusion by using the telephone, e-mail, or mailing materials in an alternate format such as braille, large print, or audio recording. This may reduce the number of cases closed due to administrative reasons. The fact that the employers did reach more settlements, whether through litigation or

not, is indicative of discrimination in the workplace (Unger et al. 2005). The Americans with Disabilities Act as Amended (ADAAA of 2008) may help lower these figures. It was enacted because findings by the EEOC and courts were generally in favor of the employers, rather than those seeking their rights under the law (Klein, 2012).

Three cases, known as the Sutton trilogy, were heard by the Supreme Court in 1999. These were *Sutton v. United Airlines*, *Murphy v. United Parcel Service*, and *Albertsons v. Kirkingburg*. The court ruled in favor of the employers in these cases. The ADAAA eliminated the mitigation standard applied by the court in *Sutton v. United Airlines Inc.* (97-1943) 527 U.S. 471 (1999). The Suttons were twin sisters who applied to be pilots with United Airlines. They had severe myopia. They were legally blind when their vision was uncorrected. Legal blindness is a criteria used by the federal government and other agencies to determine eligibility for services. It means that without correction a person has visual acuity of less than 20/200. The sisters had 20/20 vision when using corrective lenses. However, the airlines had a requirement that a person needed to have 20/100 visual acuity without correction to be hired as a pilot. The U.S. Supreme Court upheld a federal district court decision that ruled that the use of lenses mitigated the eye condition; therefore, the sisters were not disabled under the provisions of the ADA. They also ruled that the job requirement of the airlines was not discrimination. In essence, the pilots were not disabled enough, but too disabled at the same time. Klein (2012) refers to this as the “Goldie Locks” paradox (2012). The Supreme Court ruled in a similar manner in other instances. Disability rights advocates urged Congress to clarify language in the ADA to guide judges in order to provide protection for those for whom Congress intended it. The ADAAA was passed in 2008 and took effect January, 2009. It eliminated mitigation as a parameter for the courts to use in determining whether a person has a disability. However, Klein cautioned that

Congress drastically increased the list of what are considered to be life activities. If one of these activities is substantially limited, then a person can legally claim to have a disability. The ADAAMA increased the number of Americans who are protected under this legislation. This could result in the courts tightening other definitions, such as substantially limits, in order to not protect everyone under the ADAAMA. Since Congress retained the language of “substantially limits one or major life activities”, employers may still have a loophole to use when defending against litigation. It remains to be seen how the new legislation will affect the ability of individuals who are blind or visually impaired to obtain and maintain employment.

### **Lack of Support Systems**

Qualitative research revealed other perceived barriers to employment by individuals who are blind or visually impaired. Some of these include difficulty with transportation and problems related to inadequate provision of services by rehabilitation agencies. Crudden and Sansing (2013) conducted research to determine the needs of clients of vocational rehabilitation. The research was done as a part of the needs assessment required by the RSA. State administrators allowed Crudden and Sansing to use the data on the condition that the state was not named. Consumers comprised two of the five focus groups, and agency personnel, vendors and members of the state rehabilitation council made up the other three. The interviewers guided the discussion, but did not participate in it. One of the main problems found was the inconsistency of the services provided by counselors in different regions of the state. No specifics were mentioned, but this could refer to types of services provided and communication with counselors. Good service can promote better employment outcomes, whereas, a dearth of services has the opposite effect. Lack of transportation was one of the main hindrances cited by the groups. Focus members mentioned that people with visual impairments often relocate to

urban areas to improve their access to public transit systems; however, these are in many cases unreliable and/or do not provide enough travel options.

Crudden et al. (2005) found that administrative difficulties of rehabilitation counselors contribute to unemployment in this population. Participants in their study mentioned that large workloads meant that limited time can be spent on placement and working with individuals as much as is needed. Communication between agencies can be problematic. The time to process service referrals and get needed items and/or training slows down the process of getting clients to work.

Lack of transportation was cited by Crudden et al. (2005) as a barrier to employment. This is especially true for consumers who live in rural areas. It is a common adage that if a person who is blind wants to work, than they must live in town. This can be difficult to achieve depending on family dynamic. Also, if a person needs to move to obtain work, relocating can be expensive and possibly disruptive to other support systems that the person may have in place. Crudden et al. (2005) expressed that it is difficult to gauge the impact that lack of transportation has on employment statistics. Orientation and mobility skills are closely linked to transportation. Other studies also cited the lack of transportation as a major barrier to employment. Kelley (2001) reported that it was a reason given for unemployment among people with vision impairments in Tennessee. Popivker et al. (2010) found that adults stated that it was one of the functional goals most affected by loss of vision. It in turn adversely impacted employment as well as other social and leisure goals.

Papakonstantinou and Papadopulos (2009) analyzed both positive and negative emotional and practical support received by a group of 15 workers in Thessaloniki, Greece. Social supports were defined as being emotional or practical. Positive practical supports included

accommodations and assistance by guides if needed. Emotional support included valuing the workers' contributions and utilizing their skills. Negative practical supports were not providing accommodations or assistance. Negative emotional supports included disparaging workers' abilities or ability to contribute, offering too much or inappropriate help. They found more mention of positive supports than of negative ones. Individuals with colleagues who also had visual impairments, expressed receiving more positive supports from them than from others in the work place. The workers expressed more satisfaction than dissatisfaction. The authors found a positive correlation between high satisfaction and positive received practical support of .697 and a high negative correlation between negative practical supports and satisfaction of .802. Similar findings occurred for emotional supports. A .607 correlation between satisfaction levels and positive supports, and .720 negative correlation between satisfaction and negative emotional support.

Sanders's (2013) research in Mississippi provided evidence that consumers of vocational rehabilitation services perceived a lack of support systems. Participants in his qualitative study cited both the inadequacy of the state's vocational rehabilitation agency and the lack of transportation as barriers to employment. Sanders noted that while a few participants expressed satisfaction with services they received, the majority verbalized the opposite sentiment. Complaints included the lack of provision of technology, the lack of assistance in finding a job, and the lack of knowledge by counselors about available training programs. Those who were satisfied with services reported that they received appropriate training, technology, and assistance locating employment.

Although Sanders (2013) located his study in a city in Mississippi (the name of the city was not stated), the study participants cited lack of transportation as a substantial barrier to

employment. Individuals stated that the public transit in the city was inadequate because of its hours of operation and the area it served. Sanders reported that participants expressed that transportation costs impacted their decisions to seek work or to remain at home. The high cost of taking taxis and hiring drivers were two specific problems. Sanders did not provide statistics to describe the percentage of individuals who expressed difficulties, or the frequency that they arose during the research.

Boerner and Wang's (2012) qualitative research delved into the lack of support systems. They conducted research with clients of a Northeastern rehabilitation agency who were between the ages of 40-64. The information was gathered by telephone interview. They were first time applicants for services and they had all lost vision after age 18. The purpose of the qualitative study was to determine how persons in midlife dealt with the interruption of goals. Participating in work and advancing the career is one of the four most commonly reported goals for this age group. Boerner and Wang reported that out of 214 participants who provided information about their employment at the time of the study, only 60 were employed. Seventy-five people attributed their loss of vision as a cause of their not working. Thirty-three people were retired, but of those, 18 said that they retired due to changes in their vision. Participants reported using a variety of coping strategies including formal and informal help, new approaches such as assistive technology, and psychological strategies.

Participants' knowledge about vocational rehabilitation agencies and support systems were not identified in this study. Support systems can be a vital element in extending existing employment and assisting the person in finding work. Additional evidence regarding support systems was a lack of consumer groups and adjustment counseling. The authors reported narrative comments that illustrated prominent themes. The majority of the statements that related

to work demonstrated a lack of confidence in ability and the belief that work was not possible, or that the person might be able to work from home. The study provided evidence of an important lack of support systems both physical and psychological.

Cartwright and Kim (2006) conducted a survey in a state vocational rehabilitation program to determine how counselor education and how counselor attitudes toward people with disabilities impacted employment outcomes. They found a positive relationship between the counselor's level of education and clients obtaining health insurance benefits from employers at the time of case closure. The counselors' attitude about disability was not shown to have an impact on employment outcomes.

### **Summary**

The literature reviewed in this chapter demonstrates the importance of several factors related to the employment of individuals with visual impairments. Thorough preparation for work by learning needed skills is essential. The transition years provide educators an extended time to assist students to learn self-advocacy skills, as well as orientation and mobility, assistive technology, academic, and job-seeking skills. Having adequate support systems has also been cited as a valuable resource. It is also crucial that rehabilitation counselors and other service providers play a role in the education of employers to help overcome negative attitudes and discrimination. The following chapter will detail the collection of the data for this study. It will then describe the methods that were used to analyze data.

## Chapter 3 Methods

### Introduction

This chapter will describe the collection of the data that were used in this research. It will also detail the methods that were used to analyze the data. A detailed description of the data and the variables used in the analyses will be provided.

### Purpose of the Study

The purpose of this study was to examine the relationships between demographic data such as gender and ethnicity, age of onset of visual impairment, visual acuity, attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired and who participated in vocational rehabilitation training in a southern state in the United States. The data was provided by a state vocational rehabilitation agency for cases closed in fiscal year 2013.

### Research Questions

The following research questions were used in this study:

1. To what extent is there a relationship between the **age of onset of vision loss** and employment outcome?
2. To what extent is there a relationship between **gender** and employment outcome?
3. To what extent is there a relationship between **ethnicity** and employment outcome?

4. To what extent is there a relationship between **educational attainment** and employment outcome?
5. To what extent is there a relationship between **visual acuity** and employment outcome?
6. What is the relationship between **the use of assistive technology** and employment outcome?
7. To what extent is there a relationship between **reading format** and employment outcome?
8. To what extent is there a relationship between **the use of a mobility aid** and employment outcome?
9. How do the independent variables work together to predict employment outcomes when correlated together in a multivariate analysis?

## **Data Collection**

A state vocational rehabilitation agency in a Southern state provided data from cases that were closed during fiscal year 2013. The study utilized a random sample of 200 cases. The Institutional Review Board (IRB) of Auburn University approved the research (see Appendix A). No personal identifiers were collected. A staff member from the agency assisted with data collection due to inaccessibility of some printed material within case files.

The research questions guided the collection of these data. Demographic information included gender, age at the time of case closure, ethnicity, age of onset of vision loss, and visual acuity. All participants' data were used in the analyses of data related to gender and age of onset of vision loss. Participant (N=199) data were used in the analyses related to visual acuity. There were 197 participants that provided data for analyses related to ethnicity. Skill attainment data included the following variables. First, the client's education level at the time of case closure.

This variable was divided into the categories of some education, which included individuals with elementary, some high school, and special education certificates. The second category was individuals with a high school diploma. The third category consisted of those with some college. The fourth category was associate's degree or vocational certificate. The fifth was a Bachelor's degree. The sixth was a graduate degree.

Another variable related to skill was the use of a mobility aid. Categories included the use of a cane, guide dog, bioptic glasses for driving, or none. Information was not available for every case in the sample. Categorical data may have been missing if case notes were not added, or the agency had not purchased a mobility aid, or paid for instruction. It is possible that some individuals did not need or want to use a mobility aid. A total of 115 participants from the sample of 200 were included in the analyses concerning the use of mobility aids.

A third variable examined was the reading format of participants. Categories included braille, large print, audio, and combinations of those three. As was the case with the previous variable discussed, the case data did not always contain information about reading preferences of clients. A total of 159 of the sample of 200 were included in tests related to reading preference.

A final skill area that was examined was the use of assistive technology by clients. Categories included speech output devices, magnification, and braille. Information about this variable was also not always available. Therefore, 110 of the participants were included in the analyses related to technology.

The dependent variable was employment outcome. The categories were employed or unemployed at the time of case closure. This information was included in all cases, therefore, it was obtainable for the total sample population.

The following variables were included in this study. Demographic information: gender, age of onset of visual impairment, ethnicity, and visual acuity. Skill attainment variables: education level at time of case closure: some high school, high school, some college, Associate's/vocational certificate, Bachelor's degree, or graduate degree. The use of a mobility aid: cane, guide dog, bioptic glasses for driving, and none. Reading format: braille, large print, audio, and combinations of the three. Assistive technology: magnification, speech output, and braille displays. Employment outcome: employed or unemployed.

## **Analysis**

Methods were used to analyze these data that were consistent with previous literature on this topic (Giesen & Cavanaugh, 2012; Goertz et al., 2010; McDonnall, 2005). Correlations, chi-square tests, and logistic regressions were performed. Alpha was set at .05 for all analyses. This is the standard in educational research (Punch, 2009; Spalding, Voegtler, & Lodico, 2010). This level provides an acceptable amount of assurance that test results are not coincidental. The independent variables were either categorical or ordinal and the dependent variable was categorical. The computer program IBM SPSS was used to conduct the statistical analyses.

First, simple correlations were completed. They provided information about associations of the independent variables to the dependent variable of employment outcome. No cause or effect relationship is expressed by correlations. Both Pearson's and Spearman Rho correlations were used depending on the variables. The Pearson correlation was used in cases where the variables examined were ordinal in nature. Spearman's rho was used when the independent variables were categorical (Green & Salkind, 2014).

Pearson Chi-Squares were also used to analyze these data. The Chi-Square test allows the researcher to learn if the variation in the sample occurs as it is expected and if the number of observed cases are consistent with the expected frequency based on the sample size (Green & salkind, 2014). This analysis is effective when data is categorical and for smaller sample sizes that do not meet the assumptions for other quantitative tests.

Finally, logistic regression was done to gain an overall picture of the importance of relationships between variables. McDonnall (2005) described this analysis as:

Logistic regression is a multivariate technique that allows one to evaluate each variable's impact on a successful employment outcome while holding the other variables in the model constant. By evaluating the significance of each independent variable in the model, one knows whether a particular variable has a significant impact on the dependent variable when the other variables in the model are controlled. Logistic regression also allows for the calculation of odds ratios, which are used to compare groups in terms of the response variables. An odds ratio provides information about how two people who are the same on all but one variable will differ, on the basis of that one variable. (p. 309)

The logistic regression in this study utilized a four-step model of adding variables to the equation. The variables were added to the logistic regression model based on the potential of causality in their relationships. They were not randomly assigned to the equation. Categorical variables were dummy coded using 0 or 1 as the possibilities. This was done to improve the accuracy of the analyses. Information about each variable and its effect on the equation is provided in Chapter 4.

The independent variables that were ordinal were age of the onset of vision loss, visual acuity, and the level of education obtained at the time of case closure. The independent variables that were categorical were gender, ethnicity, use of a mobility aid, preferred reading format, and type of assistive technology that was utilized. The dependent variable in all cases was employment outcome. Employed or unemployed were the two categories possible.

### **Summary**

Data were gathered from case closure information furnished by a state vocational rehabilitation agency from the year 2013. No personal identifiers were collected about participants. The information that was retrieved from the case records directly answers the research questions proposed in this study.

The methods utilized in this research are consistent with previous literature on this topic. The statistical tests included in this study are correlations, Chi-Squares, and logistic regression. All of the independent variables were analyzed for their relationship to the dependent variable of employment outcome. The next chapter will provide analyses of the results for each research question.

## **Chapter 4 Findings**

### **Introduction**

This chapter contains the results of the data analyses. IBM SPSS software was the instrument used to conduct the statistical tests. An analysis for each research question follows. The methods used to analyze these data included correlations, Chi-Squares, and logistic regression.

### **Purpose of the Study**

The purpose of this study was to examine the relationships between demographic data such as gender and ethnicity, age of onset of visual impairment, visual acuity, attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired and who participated in vocational rehabilitation training in a southern state in the United States. The data was provided by a state vocational rehabilitation agency for cases closed in fiscal year 2013.

### **Research Questions**

The following research questions were used in this study:

1. To what extent is there a relationship between the age of onset of vision loss and employment outcome?
2. To what extent is there a relationship between gender and employment outcome?
3. To what extent is there a relationship between ethnicity and employment outcome?

4. To what extent is there a relationship between educational attainment and employment outcome?
5. To what extent is there a relationship between visual acuity and employment outcome?
6. What is the relationship between the use of assistive technology and employment outcome?
7. To what extent is there a relationship between reading format and employment outcome?
8. To what extent is there a relationship between the use of a mobility aid and employment outcome?
9. How do the independent variables work together to predict employment outcomes when correlated together in a multivariate analysis?

## **Results**

**Question 1.** To what extent is there a relationship between the age of onset of vision loss and employment outcome? The variable of age of onset was divided into two categories; congenital and adult. The reason for this division was due to the lack of specific years for the age at which vision loss occurred for most individuals in the sample. For example, only six participants provided a specific age in the teenaged years. To obtain statistical power, the decision was made to group participants as described. A correlation was found between this variable and employment outcome (See Table 1). A negative correlation existed at  $-.244$ . Therefore, if the person lost vision as an adult, the chances of becoming employed were adversely affected.

(See Table 1 for the results of correlations).

Table 1

*Correlations between Independent Variables and Employment*

		Employment	Acuity	Age	Education	Onset
Employment	Point Biserial	1	-.100	.013	.318**	-.244**
Acuity	Point Biserial	-.100	1	.004	.058	-.059
Education	Point Biserial	.318**	.058	.013	1	-.123
Onset	Spearman's rho	-.244**	-.044	.339**	-.093	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Question 2.** To what extent is there a relationship between gender and employment outcome? The variable of gender was not found to be significant in relation to employment outcome. The odds, or likelihood ratio, is almost even at .963. The odds ratio provides the likelihood of the dependent variable occurring, when considering a single independent variable, discounting the effect of other variables. (See Tables 2-3 for the results of the analysis using Chi-Squares).

Table 2

*Cross Tabulations for Gender and Employment*

			Employment		Total
			Unemployed	Employed	
Gender	Female	Count	42	48	90
		% within Gender	46.7%	53.3%	100.0%
		% within Employment	41.6%	48.5%	45.0%
	Male	Count	59	51	110
		% within Gender	53.6%	46.4%	100.0%
		% within Employment	58.4%	51.5%	55.0%
Total	Count	101	99	200	
	% within Gender	50.5%	49.5%	100.0%	
	% within Employment	100.0%	100.0%	100.0%	

Table 3

*Chi-Square Tests for Gender*

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.962 <sup>a</sup>	1	.327		
Continuity Correction <sup>b</sup>	.703	1	.402		
Likelihood Ratio	.963	1	.327		
Fisher's Exact Test				.394	.201
Linear-by-Linear Association	.957	1	.328		
N of Valid Cases	200				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 44.55.

b. Computed only for a 2x2 table

**Question 3.** To what extent is there a relationship between ethnicity and employment outcome? The relationship between ethnicity and employment outcome was not statistically significant. The Fisher's Exact test was very close, however, with a result of .067. (See Chapter 5 for further discussion of this result.) (See Tables 4-5 for Chi-Square results).

Table 4

*Cross Tabulations for Ethnicity and Employment*

			Employment		Total
			Unemployment	Employed	
Ethnicity	African American	Count	51	40	91
		% within Ethnicity	56.0%	44.0%	100.0%
		% within Employment	52.0%	40.4%	46.2%
White		Count	47	59	106
		% within Ethnicity	44.3%	55.7%	100.0%
		% within Employment	48.0%	59.6%	53.8%
Total		Count	98	99	197
		% within Ethnicity	49.7%	50.3%	100.0%
		% within Employment	100.0%	100.0%	100.0%

Table 5

*Chi-Square Tests for Ethnicity and Employment*

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.683 <sup>a</sup>	1	.101		
Continuity Correction <sup>b</sup>	2.235	1	.135		
Likelihood Ratio	2.689	1	.101		
Fisher's Exact Test				.117	.067
Linear-by-Linear Association	2.670	1	.102		
N of Valid Cases	197				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 45.27.

**Question 4.** To what extent is there a relationship between educational attainment and employment outcome? The relationship between educational level and employment outcome was statistically significant. Participants with higher levels of education were more likely to be employed. Educational data were available for all study participants. The variable of education was divided into the following categories: some formal education, high school diploma, some college, associate’s degree or technical certificate, bachelor’s degree, and graduate degree. The category of some formal education included a few participants with an elementary school education, several with some high school, and several with a special education certificate, instead of a conventional high school diploma. The decision to group them in this way was made to increase the statistical power of the analyses. A Pearson Correlation analysis showed a moderate

association of .318 between higher levels of education and positive employment outcome. (See Table 1 for the results of correlations).

**Question 5.** To what extent is there a relationship between visual acuity and employment outcome? Visual acuity was divided into several categories. The reason the numbers were not used as a continuous variable is due to the manner in which medical documentation was written. The visual acuity for each eye was provided in the data. The analysis utilized the eye with the better vision. Categories were: 20/1000 or less, 20/400 to 20/999, 20/200 to 20/399, 20/199 and above. The acuities did not take into account restriction in visual fields, which could also impact an individual's visual function. Some participants in the last category were legally blind, due to a restriction of the visual field, and others were eligible for vocational rehabilitation services, although not legally blind. The results of the Pearson correlation was weak at .1. It demonstrated a small association between higher visual acuity and a positive employment outcome.

Table 6

*Cross-Tabulations for Acuity and Employment*

		Employment		Total
		Unemployment	Employed	
Acuity	1.00	24	19	43
	2.00	13	13	26
	3.00	41	53	94
	99.00	22	14	36
Total		100	99	199

Table 7

*Chi-Square Tests for Acuity and Employment*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.886 <sup>a</sup>	3	.274
Likelihood Ratio	3.906	3	.272
Linear-by-Linear Association	1.982	1	.159
N of Valid Cases	199		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is

12.93.

**Question 6.** What is the relationship between the use of assistive technology and employment outcome? This variable had several categories within it: use of magnification, speech output, braille, or combinations of the above. Both magnification and speech output were significant. The sample population included the following: the total count of those using assistive technology devices was 110. 69 of those used magnification, 32 used speech output, 1 used braille, 1 used both speech output and braille, and 7 used both magnification and speech. 33 individuals who used assistive technology were unemployed and 77 were employed at the time of case closure. The Chi-Square demonstrated a likelihood ratio of .35 which indicated that people who used assistive technology were more likely to be employed than those who did not use assistive technology.

Table 8

*Cross-Tabulations for Assistive Technology and Employment*

			Employment		Total
			Unemployed	Employed	
AsisTech	Magnification	Count	18	51	69
		% within AsisTech	26.1%	73.9%	100.0%
		% within Employment	54.5%	66.2%	62.7%
	Screen Reader	Count	11	21	32
		% within AsisTech	34.4%	65.6%	100.0%
		% within Employment	33.3%	27.3%	29.1%
	Braille	Count	1	0	1
		% within AsisTech	100.0%	0.0%	100.0%
		% within Employment	3.0%	0.0%	0.9%
Screen Reader and Braille	Count	0	1	1	
	% within AsisTech	0.0%	100.0%	100.0%	
	% within Employment	0.0%	1.3%	0.9%	
Magnification and Screen Reader	Count	3	4	7	
	% within AsisTech	42.9%	57.1%	100.0%	
	% within Employment	9.1%	5.2%	6.4%	
Total	Count	33	77	110	
	% within AsisTech	30.0%	70.0%	100.0%	
	% within Employment	100.0%	100.0%	100.0%	

Table 9

*Chi-Square Tests for Assistive Technology and Employment*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.108 <sup>a</sup>	4	.392
Likelihood Ratio	4.439	4	.350
Linear-by-Linear Association	1.204	1	.273
N of Valid Cases	110		

Six cells (60.0%) have expected count less than 5. The minimum expected count is .30.

**Question 7.** To what extent is there a relationship between reading format and employment outcome? Reading format was not a significant predictor of employment. The likelihood ratio was found to be .081. The analysis included 159 individuals from the sample population. (See Tables 10-11 for Chi-Square results).

Table 10

*Cross-Tabulations for Reading Format and Employment*

			Employment		Total
			Unemployed	Employed	
Reading Format	Braille	Count	5	3	8
		% within Reading Format	62.5%	37.5%	100.0%
		% within Employment	7.4%	3.3%	5.0%
Large Print	Large Print	Count	33	59	92
		% within Reading Format	35.9%	64.1%	100.0%
		% within Employment	48.5%	64.8%	57.9%
Audio	Audio	Count	8	10	18
		% within Reading Format	44.4%	55.6%	100.0%
		% within Employment	11.8%	11.0%	11.3%
Braille and Large Print'	Braille and Large Print'	Count	5	3	8
		% within Reading Format	62.5%	37.5%	100.0%
		% within Employment	7.4%	3.3%	5.0%
Braille and Audio	Braille and Audio	Count	6	8	14
		% within Reading Format	42.9%	57.1%	100.0%
		% within Employment	8.8%	8.8%	8.8%
Large Print and Audio	Large Print and Audio	Count	7	8	15
		% within Reading Format	46.7%	53.3%	100.0%
		% within Employment	10.3%	8.8%	9.4%
Braille, Large Print, and Audio	Braille, Large Print, and Audio	Count	4	0	4
		% within Reading Format	100.0%	0.0%	100.0%
		% within Employment	5.9%	0.0%	2.5%
Total	Total	Count	68	91	159
		% within Reading Format	42.8%	57.2%	100.0%
		% within Employment	100.0%	100.0%	100.0%

Table 11

*Chi-Square Tests for Reading Format and Employment*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.800 <sup>a</sup>	6	.133
Likelihood Ratio	11.242	6	.081
Linear-by-Linear Association	2.592	1	.107
N of Valid Cases	159		

a. 6 cells (42.9%) have expected count less than 5. The minimum expected count is 1.71.

**Question 8.** To what extent is there a relationship between the use of a mobility aid and employment outcome? The use of various mobility aids was analyzed for the sample population. The use of a cane, guide dog, and bioptic glasses used for driving were analyzed. The Pearson Chi-Square generated a result of .6 and the likelihood ratio was .599. The relationship between the use of a mobility aid and employment outcome was significant. Participants who used mobility aids were more likely to be employed. Information about the use of a mobility aid was available for only 115 of the 200 participants in the study. (See Tables 12-13 for Chi-Square results).

Table 12

*Cross-Tabulations for Mobility Aid and Employment*

			Employment		Total
			Unemployed	Employed	
MAid	Cane	Count	39	30	69
		% within MAid	56.5%	43.5%	100.0%
		% within Employment	38.6%	30.3%	34.5%
	Bioptics	Count	5	6	11
		% within MAid	45.5%	54.5%	100.0%
		% within Employment	5.0%	6.1%	5.5%
	Guide Dog	Count	3	2	5
		% within MAid	60.0%	40.0%	100.0%
		% within Employment	3.0%	2.0%	2.5%
99	Count	54	61	115	
	% within MAid	47.0%	53.0%	100.0%	
	% within Employment	53.5%	61.6%	57.5%	
Total	Count	101	99	200	
	% within MAid	50.5%	49.5%	100.0%	
	% within Employment	100.0%	100.0%	100.0%	

(MAid mobility aid in the table)

Table 13

*Chi-Square Tests for Mobility Aid and Employment*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.871 <sup>a</sup>	3	.600
Likelihood Ratio	1.876	3	.599
Linear-by-Linear Association	1.356	1	.244
N of Valid Cases	200		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.48.

**Question 9.** How do the independent variables work together to predict employment outcomes when correlated together in a multivariate analysis? The logistic regression used a four step model building process of adding variables to the equation. The findings for most of the variables were similar to those in the analyses described earlier in this chapter. The variables that showed statistical significance in the logistic regression were: age of onset of vision loss, educational attainment, visual acuity, and assistive technology. Age of onset of vision loss demonstrated statistical significance at step four of the process, with all variables added, it showed a significance of .03. (See Table 1 for the results of this variable in simple correlations). The logistic regression generated questions about the effect of some variables on others. Education attainment was significant at  $<.001$  in the logistic regression analysis at step three when it was added. However, it was not significant at .065 once assistive technology was also added to the equation in Step 4. This presents the question of whether assistive technology allows greater educational attainment, or do people with higher levels of education utilize more assistive technology options. This question will be discussed further in chapter 5. (See Table 1 for the results of this variable in the analysis using correlations). Visual acuity also showed significance in step three of the equation at .05, but .154 in step 4 of the process. The use of assistive technology may mitigate the effect for lower visual acuity. This question will be discussed in Chapter 5. (See Table 1 for results of this variable in analysis using correlations). The use of assistive technology was statistically significant. It was added in the fourth step of the equation. Speech output was a predictor of employment at .03. The use of magnification was a strong predictor as well at  $p<.002$ . The use of a braille device was not predictive at .575. Logistic regression was not conducted using an interaction of technologies, such as braille and speech, or

magnification and speech; however, this could be pursued in future research. (See Table 1 for the results of correlations using assistive technology).

Several variables did not show statistical significance in the logistic regression: gender, ethnicity, reading format and the use of a mobility aid. Gender and ethnicity were added to the equation in step one. Reading format and the use of a mobility aid were added in step four. The overall interpretation of the logistic regression is that the regression accounted for substantial variance in employment outcomes. As variables were added, the model demonstrated greater accuracy in predicting employment outcomes (73.8% accuracy). (See Tables 14-19 for the results of the logistic regression).

Table 14

*Logistic Regressions Steps 0-4*

Observed			Predicted		
			Employment		Percentage Correct
			Unemployed	Employed	
Step 0	Employment	Unemployment	0	83	0
		Employed	0	85	100
	Overall Percentage				
Step 1	Employment	Unemployment	44	39	53
		Employed	26	59	69.4
	Overall Percentage				
Step 2	Employment	Unemployment	54	29	65.1
		Employed	31	54	63.5
	Overall Percentage				
Step 3	Employment	Unemployment	60	23	72.3
		Employed	28	57	67.1
	Overall Percentage				
Step 4	Employment	Unemployment	62	21	74.7
		Employed	23	62	72.9
	Overall Percentage				

Table 15

*Results of Cox, Snell and the Nagelkerke Tests for Logistic Regression*

	Cox & Snell R Square	Nagelkerke R Square
Block 1	0.071	0.095
Block 2	0.088	0.117
Block 3	0.167	0.223
Block 4	0.289	0.386

Table 16

*Step 1 of the Logistic Regression Equation*

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup> Gender	-.103	.328	.099	1	.753	.902
Ethnicity	-.214	.333	.411	1	.522	.808
Age of onset	-1.118	.364	9.420	1	.002	.327
Constant	1.166	.636	3.359	1	.067	3.209

a. Variable(s) entered on step 1: Gender, Ethnicity, Age of onset.

Table 17

*Step 2 of the Logistic Regression Equation*

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 2 <sup>a</sup> Gender	-.059	.332	.032	1	.859	.943
Ethnicity	-.234	.336	.482	1	.487	.792
Age of onset	-1.102	.367	9.013	1	.003	.332
Acuity	.397	.230	2.992	1	.084	1.488
Constant	.617	.711	.753	1	.386	1.853

a. Variable(s) entered on step 2: Acuity\_split128.

Table 18

*Step 3 in the Logistic Regression Equation*

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 3 <sup>a</sup> Gender	-.009	.347	.001	1	.979	.991
Ethnicity	.000	.357	.000	1	.999	1.000
Age of onset	-1.066	.384	7.720	1	.005	.344
Acuity	.475	.242	3.846	1	.050	1.609
Education	.444	.122	13.217	1	.000	1.559
Constant	-1.242	.900	1.906	1	.167	.289

a. Variable(s) entered on step 3: Education.

Table 19

*Step 4 in the Logistic Regression Equation*

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 4 <sup>a</sup> Gender	.323	.403	.641	1	.423	1.381
Ethnicity	.192	.406	.224	1	.636	1.211
Age of onset	-.932	.430	4.689	1	.030	.394
Acuity	.400	.281	2.031	1	.154	1.492
Education	.263	.143	3.395	1	.065	1.300
MAid Cane	-.506	.438	1.334	1	.248	.603
MAid Bioptic Glasses	-.514	.825	.388	1	.533	.598
MAid Dog	-.740	1.561	.225	1	.636	.477
AsisTech Mag	1.468	.473	9.630	1	.002	4.340
AsisTech Speech	1.712	.791	4.681	1	.030	5.540
AsisTech Braille	1.229	2.191	.314	1	.575	3.417
Reading Format Braille	-.562	.508	1.228	1	.268	.570
Reading Format LP	.587	.490	1.435	1	.231	1.799
Reading Format Audio	-.026	.466	.003	1	.956	.974
Constant	-1.762	1.108	2.527	1	.112	.172

a. Variable(s) entered on step 4: (MAid refers to mobility aid), MAid cane, MAid bioptic glasses, MAid dog, (AssisTech refers to Assistive Technology) AsisTech magnification (mag), AsisTech Speech Output (speech), AsisTech braille display, Reading Format braille, Reading Format large print (LP), Reading Format audio.

## Summary

This chapter discussed the results of the analyses conducted in this study. Correlations, Chi-Squares and logistic regression were used. Several variables were statistically significant predictors of employment. Educational attainment, visual acuity, age of onset of vision loss, and the use of assistive technology all demonstrated statistical significance.

The logistic regression was completed in several steps. At each step, new variables were added to the equation to test their predictive value. The program first tested an empty model. It had an accuracy rate of 50.6%. The first step used a model with demographic variables added to the equation. The age of onset of vision loss was the only significant variable. It allowed a 61.3% accuracy in predicting employment. The next step added visual acuity to the equation and had an accuracy rate of 64.3%. It approached significance at .08.

Step 3 added education to the equation. Both age of onset and education were significant at this step. The accuracy rate of prediction was 69.6%. The final step in the regression added the variables of assistive technology, reading format, and use of a mobility aid to the equation. The following variables were significant at this level: age of onset of vision loss, use of magnification, and the use of speech output. The model predicted employment with 73.8% accuracy. The use of a mobility aid, reading format, gender, and ethnicity were not found to be statistically significant predictors of employment.

The next chapter will discuss these findings in greater detail. First, the limitations of this study will be considered. Then, recommendations for future research will follow. Finally, implications for educators and professionals will be provided.

## **Chapter 5**

### **Limitations, Conclusions, Recommendations, Implications, and Summary**

#### **Introduction**

The data for this study were drawn from clients of a state vocational rehabilitation program in a Southern state using case closure data from fiscal year 2013. This study found that several factors were associated with successful employment outcomes, which were early age of onset of loss of vision, higher levels of education, and the use of magnification and speech output. These are not surprising in light of previous research. This chapter will discuss limitations of this study and conclusions. It will also detail future possibilities for research in this field. It will conclude with implications for practice.

#### **Purpose of the Study**

The purpose of this study was to examine the relationships between demographic data such as gender and ethnicity, age of onset of visual impairment, visual acuity, attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired and who participated in vocational rehabilitation training in a southern state in the United States. The data was provided by a state vocational rehabilitation agency for cases closed in fiscal year 2013.

## **Research Questions**

The following research questions were used in this study:

1. To what extent is there a relationship between the age of onset of vision loss and employment outcome?
2. To what extent is there a relationship between gender and employment outcome?
3. To what extent is there a relationship between ethnicity and employment outcome?
4. To what extent is there a relationship between educational attainment and employment outcome?
5. To what extent is there a relationship between visual acuity and employment outcome?
6. What is the relationship between the use of assistive technology and employment outcome?
7. To what extent is there a relationship between reading format and employment outcome?
8. To what extent is there a relationship between the use of a mobility aid and employment outcome?
9. How do the independent variables work together to predict employment outcomes when correlated together in a multivariate analysis?

## **Limitations of the Study**

Several factors may have contributed to the results obtained in this study. First, the sample size was limited to 200 individuals from a single year. This limited the number in some categories to a fairly small sample size. If the number had been increased, the statistical tests would have been more powerful (Creswell, 2009).

Another important limitation was the variance in case documentation. Several variables, such as the use of mobility aids, reading medium, and assistive technology had fewer numbers in the analyses due to the information not being available in the case file. There a variety of reasons as to the lack of case details. For instance, some clients may not utilize a mobility aid because they can travel safely using their vision. Individuals may not need an assistive technology device to meet their career goals. Some clients may have been served previously, so that information about them may have been noted in paper files which are not in online storage. Some counselors may think it is not necessary to note details if clients are successfully performing tasks. As a result, services in these skill areas will not be provided as part of the Individualized Plan of Employment (IPE). The IPE is required in the vocational rehabilitation in every state in accordance with the Rehabilitation Act of 1973 and subsequent amendments.

All of these factors may have influenced the outcomes of the analyses performed in this research.

### **Future Research Recommendations**

Education and the use of assistive technology were predictors of successful employment outcomes for the participants in this research. However, this finding can be confusing. Do individuals attain higher levels of education because they can access printed material via assistive technology? Or, does higher levels of education indicate that individuals are more likely to use assistive devices? This topic would be a further avenue for investigation. Which types of technology are used may influence employment. In this study, magnification was considered as a whole. However, individuals may use hand held devices, closed circuit televisions, and screen magnification programs on computers. Do employment statistics differ depending upon which variety of technology the person utilizes?

Other skills did not correlate with positive employment outcomes in this research. For example, both Bengisu, Izbirak, and Mackieh (2008) and Ryles (1996) found the use of braille to be a positive predictor of employment. The analyses did not demonstrate that to be the case for this sample population. Additionally, the use of mobility aids was not found significant in predicting employment. As cited in Chapter 2, employers fear hiring people who are dependent on others. The acquisition of orientation and mobility skills should then provide individuals with visual impairments more success competing in the job market. The acquisition of travel skills is an area where further research might provide useful data. For example, the link between the use of a mobility aid, and the availability of transportation compared with employment outcomes might allow professionals to advocate for better transportation networks, in addition to ensuring that clients have the skills to utilize them. Data from areas with well-developed public transit systems would allow researchers the opportunity to further analyze employment patterns among individuals with visual impairments to determine how much of a role transportation plays in obtaining and maintaining a job. Qualitative research might address these questions by gathering perceptions of a variety of stakeholders in the rehabilitation system: potential employees, professionals, and employers.

Clients may be served in vocational rehabilitation agencies multiple times. Research might investigate the relationship between higher educational attainment and recidivism. Thorough preparation for employment makes sense on several levels. First, tax payer funds are not wasted, which may occur if a person completes a rehabilitation training program and cannot find a job because he/she does not have relevant skills. Also, a person may be hired, but may not be able to compete, so the employment is terminated. This leads to the necessity of remaining on the disability roles and receiving SSA benefits. The person may experience discouragement and

not attempt to enter the work force (Livermore et al., 2007) (Boerner and Wang, 2012).

Rehabilitation professionals have the ability to play an important role in supporting positive employment outcomes by setting high expectations for consumers to prepare for work and providing them the opportunities that are necessary to succeed.

### **Implications for Practice**

The information gained in this study is useful because it indicates that education and use of assistive technology are important tools for a person with visual impairment to assist in achieving the goal of employment. This is evidence that the ability to access print information is key. Professionals need to advocate for technologies to be developed in ways that incorporate principles of universal design. These principles ensure that all people can access technology; avoiding the technological divide.

An additional area that administrators of programs of rehabilitation may wish to examine further is the ethnicity of the populations who receive services. African-American participants in this research were less likely to be employed than were white participants. Although not statistically significant at .06, it is still an area that needs further consideration. Administrators of programs may wish to be vigilant to ensure that all residents receive access to education and assistive devices.

Additionally, some ethnicities were not represented in this study. The U.S. Census Bureau estimated the population of the state in 2014 at 4,849,377. Approximately 66% of residents were white, 27% African-American, 4% Latino, 1% Asian, approximately 1% Native-American or Pacific Islander, and 1% two or more races (U.S. Census Quick Facts 2014). The sample population listed no participants as Latino, and only three as Asian or Pacific Islander. This generates the question whether individuals these ethnicities are not represented in this state

among the population of people with visual impairments, or are they not represented because they are not receiving services. Providers of rehabilitation services may wish to investigate whether they are reaching all of the people in the state who could become contributing members of society through vocational rehabilitation. It may be that some populations are unaware that assistance is available to them. Research might investigate the level of awareness that medical professionals have of vocational rehabilitation services in their state. These services can be vital to assisting their patient's losing vision. The study might also investigate how often they have recommended this resource to patients.

Similar studies might investigate the relationship between educators throughout the state and the vocational rehabilitation system. How actively do educators encourage students to become active participants in rehabilitation programs and advocate for services for themselves. As noted in Chapter 2, students need to begin developing skills and attitudes for employment as early as possible in the transition phase of their education. Qualitative research might focus on the strategies that rehabilitation professionals and educators use to promote transition, and on the supports they feel would encourage greater success for their students who are potential employees.

## **Summary**

This study examined the effect of demographic variables and skill attainment on employment outcomes. Educational attainment, early age of the onset of vision loss, visual acuity, and the use of assistive technology all were predictors of success. Since individuals bring a variety of life circumstances to the rehabilitation process, these factors combine in unique ways for each person. The variables are interrelated and it can be difficult to determine causality among them.

The information gathered in this research may assist educators and rehabilitation counselors. They can encourage students and clients to maximize educational opportunities. They can also assist them to obtain appropriate assistive technology. The use of such devices narrows gaps in access to printed information, which is vital to successfully compete in the labor market.

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## Appendix A: IRB

### AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS REQUEST FOR EXEMPT CATEGORY RESEARCH

For Information or help completing this form, contact: THE OFFICE OF RESEARCH COMPLIANCE, 115 Ramsay Hall  
Phone: 334-844-5966 e-mail: IRBAdmin@auburn.edu Web Address: <http://www.auburn.edu/research/vpr/ohs/index.htm>

Revised 2/1/2014 Submit completed form to [IRBsubmit@auburn.edu](mailto:IRBsubmit@auburn.edu) or 115 Ramsay Hall, Auburn University 36849.

Form must be populated using Adobe Acrobat / Pro 9 or greater standalone program (do not fill out in browser). Hand written forms will not be accepted.

Project activities may not begin until you have received approval from the Auburn University IRB.

#### 1. PROJECT PERSONNEL & TRAINING

##### PRINCIPAL INVESTIGATOR (PI):

Name Tabitha Brecke Title Graduate Assistant Dept./School EFLT/Education  
Address 427 Harper Ave. Apt. 3 Auburn, AL 36830 AU Email tzb0019@tigermail.auburn.edu  
Phone 334 332-6623 Dept. Head Sheri Downer

##### FACULTY ADVISOR (if applicable):

Name Maria M. Witte, Ed.D., Title Professor Dept./School EFLT/Education  
Address 4012 Haley Center, Auburn University  
Phone 334 844-3078 AU Email witemm@auburn.edu

KEY PERSONNEL: List Key Personnel (other than PI and FA). Additional personnel may be listed in an attachment.

Name	Title	Institution	Responsibilities



KEY PERSONNEL TRAINING: Have all Key Personnel completed CITI Human Research Training (including elective modules related to this research) within the last 3 years?  YES  NO

TRAINING CERTIFICATES: Please attach CITI completion certificates for all Key Personnel.

#### 2. PROJECT INFORMATION

Title: Examination of Academic and Assistive Technology Skills and Employment Outcomes

Source of Funding:  Investigator  Internal  External

List External Agency & Grant Number: \_\_\_\_\_

List any contractors, sub-contractors, or other entities associate with this project.

List any other IRBs associated with this project (including those involved with reviewing, deferring, or determinations).

FOR ORC OFFICE USE ONLY			
DATE RECEIVED IN ORC:	<u>4.14.15</u>	by <u>(signature)</u>	APPROVAL # _____
DATE OF IRB REVIEW:	_____	by _____	APPROVAL CATEGORY: _____
DATE OF ORC REVIEW:	_____	by _____	INTERVAL FOR CONTINUING REVIEW : _____
DATE OF APPROVAL:	_____	by _____	
COMMENTS:	_____		

3. **PROJECT SUMMARY**

a. Does the research involve any special populations?

- YES  NO Minors (under age 19)  
 YES  NO Pregnant women, fetuses, or any products of conception  
 YES  NO Prisoners or Wards  
 YES  NO Individuals with compromised autonomy and/or decisional capacity

b. Does the research pose more than minimal risk to participants?  YES  NO

*Minimal risk means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. 42 CFR 46.102(i)*

c. Does the study involve any of the following?

- YES  NO Procedures subject to FDA Regulation Ex. Drugs, biological products, medical devices, etc.  
 YES  NO Use of school records of identifiable students or information from instructors about specific students  
 YES  NO Protected health or medical information when there is a direct or indirect link that could identify the participant  
 YES  NO Collection of sensitive aspects of the participant's own behavior, such as illegal conduct, drug use, sexual behavior or use of alcohol  
 YES  NO Deception of participants

*If you checked "YES" to any response in Question #3 STOP. It is likely that your study does not meet the "EXEMPT" requirements. Please complete a PROTOCOL FORM for Expedited or Full Board Review. You may contact IRB Administration for more information. (Phone: 334-844-5966 or Email: [IRBAdmin@auburn.edu](mailto:IRBAdmin@auburn.edu))*

4. **PROJECT DESCRIPTION**

a. Subject Population (Describe, include age, special population characteristics, etc.)

The purpose of this study is to examine the relationships between attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired who participated in vocational rehabilitation programs.

b. Describe, step by step, all procedures and methods that will be used to consent participants.

- N/A (Existing data will be used)

N/A

- c. **Brief summary of project.** (Include the research question(s) and a brief description of the methodology, including recruitment and how data will be collected and protected.)

The purpose of this study is to examine the relationships between attainment of academic skills, the use of assistive technology, and employment outcomes of individuals who are blind or visually impaired who participated in vocational rehabilitation programs. The objectives of the study include the determining the effect of reading medium on obtaining a job; investigating whether the age of the onset of vision loss influences employment; and examining the role of assistive technology, such as screen readers, screen magnification, and braille displays in relation to employment. The following variables will be coded and used: level of education, age, gender, ethnicity/race, and use of a mobility aid; employment outcomes, use of assistive technology; and reading format.

The following research questions will be used in this study:

1. To what extent is there a relationship between reading medium and employment outcome?
2. To what extent is there a relationship between the age of onset of vision loss and employment outcome?
3. What is the relationship between the use of assistive technology and employment?

Existing data will be used that was collected by the Alabama Department of Rehabilitation Services. Permission was granted by the Alabama Department of Rehabilitation Services. No personal identifiers will be collected or retained. The researcher may read identifying details during collection; however, only coded variables will be noted in the data set.

- d. **Waivers.** Check any waivers that apply and describe how the project meets the criteria for the waiver.

- Waiver of Consent (Including existing de-identified data)
- Waiver of Documentation of Consent (Use of Information Letter)
- Waiver of Parental Permission (for college students)

N/A

- e. **Attachments.** Please attach Informed Consents, Information Letters, data collection instrument(s), advertisements/recruiting materials, or permission letters/site authorizations as appropriate.

Signature of Investigator	Tabitha Brecke <small>Digitally signed by Tabitha Brecke DN: cn=Tabitha Brecke, o=, ou= equal=10205192@alum.edu, c=US Date: 2015.03.11 13:48:58 -0500'</small>	Date	03/11/2015
Signature of Faculty Advisor	Maria M. Witte <small>Digitally signed by Maria M. Witte DN: cn=Maria M. Witte, o=Alabama University, ou=Alabama University, email=mmw@alum.edu, c=US Date: 2015.03.16 16:54:05 -0500'</small>	Date	03/16/2015
Signature of Department Head	Sherida Downer <small>Digitally signed by Sherida Downer DN: cn=Sherida Downer, o=Alabama University, ou=RT Department, email=sherid@alum.edu, c=US Date: 2015.03.17 09:08:41 -0500'</small>	Date	03/17/15