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An Investigation of the Variables Related to Competitive Employment and Earnings
of Vocational Rehabilitation Consumers with Blindness or Visual Impairments

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**An Investigation of the Variables Related to Competitive Employment and
Earnings of Vocational Rehabilitation Consumers with Blindness or Visual
Impairments**

by

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Dedication

I dedicate this dissertation to my brothers and sisters in blindness, for we see things in a manner that the sighted world may not fully understand.

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**An Investigation of the Variables Related to Competitive Employment
and Earnings of Vocational Rehabilitation Consumers with Blindness or Visual
Impairments**

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Individuals with blindness or visual impairments as a major cause of disability are at an extreme disadvantage to obtain and maintain employment and thus may seek the assistance of vocational rehabilitation counselors. Information on these individuals, encompassing demographics, disability, public support, and vocational rehabilitation services, is collected by the Rehabilitation Services Administration (RSA) and becomes a part of the RSA-911 data file.

The purpose of this study was to investigate the relationships among demographics, service provisions, competitive employment, and earnings of vocational rehabilitation consumers with blindness or visual impairments. Using a sample of 3,610 cases from the RSA-911 data file from Fiscal Year 2006, logistic regression was utilized to examine the relationships among 20 consumer demographic and 14 case service variables related to competitive employment outcomes. With a

sample of 2,320 cases, multiple regression was used to examine which 20 consumer demographic and 14 case service variables predicted weekly earnings at closure for those consumers with competitive employment outcomes.

Results from the logistic regression indicated the most important consumer demographic predictors of competitive employment were age, gender, receipt of Medicaid, severity of vision loss, source of referral, and weekly earnings at application. Specifically, those aged 36 or younger who were self-referred, male, had lesser severity of vision loss, and did not receive Medicaid were more likely to find competitive employment. Among case service variables, receiving job-placement assistance and maintenance services were related to competitive employment; receipt of disability-related augmentative skills training and miscellaneous training had a negative impact.

Multiple regression revealed that the consumer demographics of gender, higher level of education at closure, receiving Social Security Disability Insurance (SSDI), and weekly earnings at application were important predictors of weekly earnings at closure. Disability-related augmentative skills training was the only case service related to weekly earnings, with a negative impact.

Based on these findings, males with earnings at application who did not receive disability-related augmentative skills training were most likely to reach competitive employment outcomes and to have higher earning potential at closure. Limitations of the study as well as implications for practice and future research are discussed.

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CHAPTER 1

INTRODUCTION

Worldwide, approximately 161 million people are blind or visually impaired (Resnikoff et al., 2004). Of this number, an estimated 9.446 million individuals in the United States have blindness or visual impairments (Resnikoff et al., 2004).

According to Resnikoff et al., the major causes of blindness or visual impairment in the United States are, in order of significance, age-related macular degeneration (50%), glaucoma (18%), and diabetic retinopathy (17%). According to the National Eye Institute (NEI, 2002), more than 1.6 million Americans age 60 and older have advanced macular degeneration. In addition, more than 5.3 million Americans have diabetic retinopathy, according to the NEI. Based on the NEI report, the prevalence of blindness in the United States is increasing each year, which may be related to the Baby Boomer generation growing older.

Research has indicated that females are more likely than males to be blind or visually impaired (Resnikoff et al., 2004). Furthermore, cataract is the leading cause of blindness or visual impairments worldwide, except in developed countries (Resnikoff et al., 2004). However, no matter of the status of the country, people with blindness or visual impairments may encounter many challenges throughout life.

Individuals with blindness or visual impairments are most likely to face economic hardship, based on a lack of employment (Houtenville, 1997). Specifically, women with blindness are at a greater disadvantage, since they are less likely to obtain employment in comparison with men with blindness. Houtenville found such

an economic status for individuals with blindness to be similar to other severe disability groups, including individuals with quadriplegia, cerebral palsy, and mental retardation.

Individuals with blindness as a major cause of disability have been at an extreme disadvantage to obtain and maintain employment. In 1997, statistics indicated that 70–80% of working-age individuals with blindness or visual impairments were unemployed (Kirchner & Schmeidler, 1997). Those rates decreased in 2001 to about 60% of individuals with blindness or visual impairments who were not working (McNeil, 2001). However, these rates of unemployment were significantly higher than those for the general population and other disability populations (McNeil, 2001).

Individuals with blindness or visual impairments who were at a lower socioeconomic level and have experienced difficulties with gaining employment may seek the assistance of government agencies. Among these agencies are the Social Security Administration (SSA) and the Rehabilitation Service Administration (RSA). Found within both of these entities are personnel, such as vocational rehabilitation counselors, who assist persons with blindness or visual impairments with obtaining and maintaining competitive employment. In order to receive such services, a person must meet the requirements of being either legally blind or visually impaired. To be considered legally blind a person's central visual acuity with best correction is less than 20/200 in the better eye or the largest diameter of visual field is less than 20 degrees with best correction (Rehabilitation Research and Training Center [RRTC] on

Blindness and Low Vision, n.d.). Furthermore, to be considered visually impaired, a person must have a central visual acuity better than 20/200 but less than 20/70 with best correction or the largest diameter of visual field of less than 30 degrees (RRTC on Blindness and Low Vision, n.d.)

The RSA's principle Title I formula allows for the funding of state vocational rehabilitation entities to conduct employment-related service provisions for individuals with disabilities (U.S. Department of Education Office of Special Education Programs, n.d.). Such case service provisions include but are not limited to assessment, diagnosis and treatment of impairments, training, and job-related services (RSA, 2006). Appropriate case service provision by the rehabilitation counselor leads to competitive employment, which refers to employment at the time of case closure in an integrated environment, self-employment, or state-managed Business Enterprise Program, according to the RSA. Such employment should result in earnings at or above minimum wage, in which case earnings represents all wages, salaries, tips, and commissions received as income before payroll deductions of federal, state, and local income taxes and Social Security payroll tax (RSA, 2006).

Each year those consumers whose cases have been closed by a state vocational rehabilitation agency are reported to RSA (Bruyere & Houtenville, 2006). The data collected by RSA include information about the consumer received during the application process, service provisions, and closure, which may encompass demographics, disability, public support, and vocational rehabilitation services (Bruyere & Houtenville, 2006; RSA, 2006). These data are known as the RSA 911

data, and this database is representative of over 80 state-federal vocational rehabilitation agencies across the country (Bruyere & Houtenville, 2006).

In addition to the assistance of government agencies, legislation such as the Americans with Disabilities Act of 1990 (ADA) was created to enable more individuals with blindness or visual impairments the ability to become employed. Specifically, Title 1 of the ADA relates to employment for individuals with disabilities (U.S. Department of Justice, 2005). For employers with 15 or more employees, qualified individuals with disabilities should be afforded equal opportunities to full inclusion in the workplace, which may include recruitment, hiring, promotion, salary, training, and social activities (U.S. Department of Justice, 2005). In addition, ADA requires that employers must make reasonable accommodations for an individual's known disability, unless this may cause an undue hardship (U.S. Department of Justice, 2005). Therefore, legislation has been created to protect the rights of individuals with blindness or visual impairments to become gainfully employed.

Since the passage of the ADA, individuals with blindness or visual impairments continue to experience employment discrimination. Kennedy and Olney (2001) facilitated research about job discrimination post-ADA using data from the Disability Supplement to the 1994 and 1995 National Health Interview Surveys. Results from their research indicated that job discrimination for individuals with disabilities did exist and that those reporting discrimination were more likely to be unemployed. Further findings revealed that severity of the disability limiting work

capabilities was significantly associated with job discrimination (Kennedy & Olney, 2001). Individuals who were younger in age or in a lower socioeconomic status were more prone to job discrimination (Kennedy & Olney, 2001). Women and individuals from minority groups were also more likely to experience job discrimination. Therefore, job discrimination has continued for persons with disabilities even after the passage of ADA.

For individuals with blindness or visual impairments, the ADA has played a major role in their employment. Markowitz (1996) examined the barriers, awareness of job discrimination, and harsh attitudes in the work environment for individuals with blindness or visual impairments. A further purpose of Markowitz's study was to determine if individuals with blindness or visual impairments reported their quality of life as being affected by the passage of ADA. Findings indicated that transportation continued to be a major barrier to employment (Markowitz, 1996). Markowitz reported that individuals with blindness or visual impairments experienced job discrimination from supervisors and coworkers. Coworkers perceived that individuals with blindness or visual impairments were receiving special treatment due to their disability (Markowitz, 1996). Participants in Markowitz's study indicated that they were not hired because potential employers were unaware of their capabilities. Thus, though the ADA was to protect the rights of individuals with blindness or visual impairments, job discrimination and workplace barriers have continued to impede their employment success.

For those individuals with blindness or visual impairments who have overcome the barriers and obtained employment, their occupations have been in many areas. Wolffe and Spungin (2002) conducted research to generate an index to determine the jobs being performed by individuals with blindness or visual impairments with membership in the World Blind Union. The results of Wolfe and Spungin's survey revealed that teacher, telephone operator, and factory worker were the jobs with the highest percentage of employees with blindness or visual impairments. Individuals with blindness or visual impairments who had completed 8 or more years of education were performing jobs in the area of professional specialties or administrative support (Wolffe & Spungin, 2002). Further results indicated those individuals with fewer than 8 years of education most often held jobs as operators or fabricators (Wolffe & Spungin, 2002). Furthermore, the survey revealed that the jobs with the highest pay for individuals with blindness or visual impairments were teacher, lawyer, professor, or computer programmer. Thus, Wolffe and Spungin provided information about the employment of individuals with blindness or visual impairments.

When looking at employment, emphasis was given to direct labor, as these jobs had the largest population of individuals with blindness or visual impairments with fewer than 8 years of education (Wolffe & Spungin, 2002). Direct labor employment involved jobs being performed by individuals with blindness or visual impairments in settings that were reflective of sheltered workshops. In a study for the National Industries for the Blind, Crudden and Moore (1996) examined the level of

job satisfaction through surveys completed by 24 NIB organizations and interviews with 502 employees. Crudden and Moore reported that a large majority of the employees were satisfied with their jobs.

Crudden and Moore (1996) also identified the major themes that either negatively or positively effected the job satisfaction of the employees with blindness or visual impairments. Crudden and Moore suggested that job satisfaction improved as a result of good coworkers, management, and consistent employment. However, job satisfaction began to decrease as the level of education of the employees with blindness or visual impairments increased (Crudden & Moore, 1996). Such an increase could be related to the underemployment of individuals with blindness or visual impairments with advanced education (Crudden & Moore, 1996). Thus, Crudden and Moore found that education was negatively correlated with job satisfaction.

When an individual with blindness or visual impairments becomes employed, certain predictive variables may have been associated with this outcome. Giesen et al. (1985) conducted a major study that addressed the predictors of employment status for individuals with blindness or visual impairments. The vocational-rehabilitation services process variables that predicted employment status included amount of funding for adjustment to blindness skills training, receipt of educational training, receipt of nonacademic training, and employment goal (Giesen et al, 1985). Other predictive variables related to employment status included age at onset of vision loss, the presence of a secondary disability, education level, race, gender, and marital

status (Giesen et al, 1985). Giesen et al. found that financial or disincentive factors, such as financial support at referral and receipt of Social Security Disability Insurance (SSDI) during the vocational-rehabilitation service process, were correlated with employment outcomes. Work history variables related to employment status outcomes included the number of jobs held, the period of time between the previous job and referral, and length of time spent at previous occupation before referral to vocational rehabilitation services (Giesen et al, 1985). Thus, Giesen et al. found that the variables associated with vocational rehabilitation, finances, and work history were predictors of employment status outcomes for individuals with blindness or visual impairments.

Purpose of the Study

Despite the assistance of government agencies and legislation, employment still remains a concern for individuals with blindness or visual impairments. With such high rates of unemployment, significant factors must be precluding the socioeconomic advancement of individuals with blindness or visual impairments, as has been shown in previous research (Giesen et al., 1985). The purpose of this study was to examine the variables related to competitive employment outcomes and earnings at closure for individuals with blindness or visual impairments, using the RSA 911 data file from Fiscal Year 2006. Specifically, the relationships were examined between demographics, service provisions, earnings at closure, and competitive employment outcomes for individuals with blindness or visual

impairments who participated in vocational rehabilitation services. The 14 demographic variables were (a) age, (b) gender, (c) race or ethnicity, (d) source of referral, (e) type of secondary education, (f) Individualized Education Program (IEP), (g) living arrangement at application, (h) severity of vision loss, (i) presence of a secondary disability, (j) type of secondary disability, (k) weekly earning at application, (l) receipt of Supplemental Security Income (SSI) or SSDI at application, (m) receipt of Medicaid or Medicare at application, and (n) educational level at closure. The 14 case service variables were (a) vocational rehabilitation counseling and guidance, (b) college or university training, (c) occupational or vocational training, (d) on-the-job training, (e) basic academic remedial or literacy training, (f) job readiness training, (g) disability-related augmentative skills training, (h) miscellaneous training, (i) job search assistance, (j) job placement assistance, (k) transportation, (l) maintenance, (m) rehabilitation technology, and (n) reader services.

Significance of the Study

Currently, no previous research has been identified that utilized the RSA 911 data file from Fiscal Year 2006 to examine the variables related to competitive employment and earnings at closure for individuals with blindness or visual impairments. Though previous research has indicated predictors to competitive employment (Bohman, 1993; Capella-McDonnall, 2005; Cavanaugh & Rogers, 2002; Fields, 2004; Leonard, 2002; Leonard, D'Allura, & Horowitz, 1999) and earnings (Capella, 2001), the replication of such studies can enhance the field of vocational

rehabilitation services. Because this study involved the examination of many vocational-rehabilitation case service variables, counselors could benefit from the results gathered by this research. When planning services for individuals with blindness or visual impairments, rehabilitation counselors can choose those services that meet the needs of the consumer and those significantly related to competitive employment outcomes. Consequently, adequate service provision leads to competitive employment, thereby decreasing the unemployment rate for individuals with blindness or visual impairments.

Research Questions

The purpose of this study was to examine the variables related to competitive employment outcomes and earnings at closure for individuals with blindness or visual impairments using the RSA 911 data file from Fiscal Year 2006. Specifically, the relationships were examined between demographics, service provisions, earnings at closure, and competitive employment outcomes for individuals with blindness or visual impairments who participated in vocational rehabilitation services. The research questions for this study were the following:

1. Among individuals with blindness or visual impairments who have received services from state vocational rehabilitation agencies, which demographic and service variables best predict competitive employment attainment?

2. Among individuals with blindness or visual impairments who have received services from state vocational rehabilitation agencies, which demographic and service variables best predict amount of earnings at closure?

Definition of Terms

Case service provisions. Services provided to a consumer participating in vocational rehabilitation process (RSA, 2006). These services should be made available to individuals to determine eligibility or composition and follow through with the Individualized Plan for Employment (RSA, 2006). Examples include but are not limited to the following 14 services:

1. *Vocational rehabilitation counseling and guidance.* Separate therapeutic counseling and guidance services needed by the consumer to obtain employment, including personal adjustment counseling; counseling focusing on medical, family, or social factors; and vocational counseling (RSA, 2006).

2. *College or university training.* The receipt of assistance with full-time or part-time academic training beyond the high school education level resulting in some type of degree (RSA, 2006). Such degrees include associate, baccalaureate, graduate, or professional (RSA, 2006).

3. *Occupational or vocational training.* Occupational, vocational, or job-skills training taught at the community college or business, vocational and trade school, or technical school to plan consumers for jobs not related to employment requiring degrees or certifications (RSA, 2006).

4. *On-the-job training.* Training in certain job tasks provided by a prospective employer (RSA, 2006).
5. *Basic academic remedial or literacy training* Remediation or literacy training for basic academic skills necessary to perform on the job (RSA, 2006).
6. *Job readiness training.* Training to plan consumer for “the world of work,” such as job behaviors, work attire, and time management (RSA, 2006, p. 26).
7. *Disability-related augmentative skills training.* Training in the areas of orientation and mobility skills and Braille (RSA, 2006).
8. *Miscellaneous training.* According to the RSA (2006), any training not covered by the other training areas (including college or university training, occupational or vocational training, on-the-job training, basic academic remedial or literacy training, job readiness training, and disability-related augmentative skills training).
9. *Job search assistance.* Assistance with locating appropriate employment, including developing a résumé, making contacts, and practicing interview skills (RSA, 2006)
10. *Job placement assistance.* A particular job resulting in an interview, regardless if the consumer achieved the job (RSA, 2006).
11. *Transportation.* Services including efficient training in the use of public transportation and assistance with travel-related expenses needed to participate in vocational rehabilitation services (RSA, 2006).

12. *Maintenance*. Monetary assistance for expenses beyond normal, such as those for expenses such as food, shelter, and clothing, and needed for participation in vocational rehabilitation services (RSA, 2006).

13. *Rehabilitation technology*. The “systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of, and address the barriers confronted by, individuals with disabilities in areas that include education, rehabilitation, employment, transportation, independent living, and recreation” (RSA, 2006, p. 27). These services include rehabilitation engineering services, assistive technology devices, and assistive technology services (RSA, 2006).

14. *Reader services*. Services for consumers unable to read print, which may include the transcription of printed material into Braille or auditory recordings (RSA, 2006).

Competitive employment. Employment at the time of case closure in an integrated environment, self-employment, or state-managed Business Enterprise Program (RSA, 2006). Such employment should result in earnings at or above minimum wage (RSA, 2006).

Consumer. A person participating in vocational rehabilitation services.

Consumer demographics. Characteristics about a consumer that may or may not be a result of vocational rehabilitation services. Examples include but are not limited to the following 14 consumer demographic characteristics:

1. *Age*. Characteristic based on the day, month, and year of birth (RSA, 2006).

2. *Gender*. Characteristic referring to male and female (RSA, 2006).
3. *Race and ethnicity*. Characteristic which a consumer self-identifies with a particular race or ethnicity (RSA, 2006). Examples include White, Black or African American, Hispanic or Latino, American Indian or Alaska Native, Asian, and Native Hawaiian or other Pacific Islander (RSA, 2006).
4. *Source of referral*. The individual, agency, or other entity that initially referred the consumer to vocational rehabilitation services (RSA, 2006).
5. *Type of secondary education*. Variable that indicates if a consumer attended primarily special education or integrated education (RSA, 2006)
6. *Individualized Education Program (IEP)*. Variable that distinguishes if a consumer received services under the Individuals with Disabilities Education Act leading to the provision of an IEP (RSA, 2006).
7. *Living arrangements at application*. Variable that indicates where the consumer resided at the time of application (RSA, 2006). This living arrangement may be temporary or permanent (RSA, 2006)
8. *Severity of vision loss*. Characteristic that refers to the consumer's primary disability resulting from either blindness or visual impairment (RSA, 2006).
9. *Presence of a secondary disability*. Characteristic that indicates if a consumer has a disability impeding employment other than the primary disability (RSA, 2006)
10. *Type of secondary disability*. A disability impeding employment but not the primary disability (RSA, 2006). Such disabilities include sensory or

communicative impairments other than blindness or visual impairments, physical impairments, and mental impairments (RSA, 2006)

11. *Weekly earnings at application.* Amount of money earned per week at the time of application (RSA, 2006). This amount is rounded up to the nearest dollar and includes all wages, salaries, tips, and commissions received as income before payroll deductions of federal, state, and local income taxes and Social Security payroll tax (RSA, 2006).

12. *Receipt of SSI or SSDI.* Variable found within the RSA codes for type of public support at application (RSA, 2006). Public support refers to the receipt of funding from federal, state, or local governments for any basis, which includes SSI for the Aged, Blind, or Disabled or SSDI (RSA, 2006).

13. *Receipt of Medicaid or Medicare at application.* Variable that indicates if a consumer receives insurance coverage as a result of public support from SSI or SSDI at the time of application (RSA, 2006).

14. *Level of education attained at closure.* The level of education completed by the consumer at the time of case closure (RSA, 2006).

Legal blindness. Disability that refers to a person having a central visual acuity with best correction of less than 20/200 in the better eye, or the largest diameter of visual field is less than 20 degrees with best correction (RRTC on Blindness and Low Vision, n.d.).

Primary disability. The “primary physical or mental impairment that causes or results in a substantial impediment to employment” (RSA, 2006, p. 12).

Rehabilitation Services Administration (RSA). RSA is a subdivision of the Office of Special Education and Rehabilitation. RSA's principle Title I formula allows for the funding of state vocational rehabilitation entities to conduct employment-related service provisions for individuals with disabilities (U.S. Department of Education Office of Special Education Programs, n.d.). RSA also collects data on consumers whose cases have been closed by a state vocational rehabilitation agency (Bruyere & Houtenville, 2006).

Visual impairment. A disability that refers to a person having a central visual acuity better than 20/200 but less than 20/70, with best correction or the largest diameter of visual field of less than 30 degrees (RRTC on Blindness and Low Vision, n.d.).

Weekly earnings at closure. The amount of money (rounded to the nearest dollar) as a result of a consumer obtaining employment (RSA, 2006). This amount includes all wages, salaries, tips, and commissions received as income before payroll deductions of federal, state, and local income taxes and Social Security payroll tax (RSA, 2006).

CHAPTER 2

REVIEW OF LITERATURE

This chapter discusses the critical research related to employment outcomes for individuals with blindness or visual impairments. The chapter is divided into three major sections. The first section addresses research pertaining to employment barriers for individuals with blindness or visual impairments. The second section discusses the research related to strategies used by individuals with blindness or visual impairments to overcome such barriers to employment. Finally, the third section addresses the critical research on predictors of employment outcomes for individuals with blindness or visual impairments.

Employment Barriers

Kirchner, Johnson, and Harkins (1997) examined the barriers to employment and strategies needed to overcome these obstacles for individuals with blindness or visual impairments. Kirchner et al. conducted seven focus groups with service providers of the Illinois Bureau of Blindness, and surveys were completed by 264 individuals with blindness or visual impairments as well as by 289 employers. Survey data analysis was utilized to evaluate individuals who were working with those who were not but were interested in becoming employed and with individuals who were not employed and were not interested in working (Kirchner et al., 1997). Findings from Kirchner et al.'s survey indicated that individuals in the group not working and not interested in employment were more likely to be older in age, to have less

education, to receive retirement funding, and to live in smaller communities. For persons in the group interested in working compared to individuals who were in the employed group, the social characteristics had smaller differences. More individuals interested in working were 45 years or older, fewer obtained college degrees, and a higher proportion were non-White, compared to the individuals who were in the employed group (Kirchner et al., 1997). Results further indicated that disability characteristics for individuals in the group interested in working differed slightly from those of the employed group. Individuals in the group interested in working were more likely to have lost their vision in middle or later years, to have a small amount of usable vision, and to continue to lose vision. Individuals in the group not interested in working were found to be very dissimilar to both of the other two groups based on disability and social characteristics (Kirchner et al., 1997). Those individuals who were not interested in working were more likely to be older at the start of their vision loss, to have other health issues that they deemed more restraining than their vision loss, to have some usable vision, and to continue to lose vision (Kirchner et al., 1997). Consequently, Kirchner et al. cited disability and social characteristics as major barriers for individuals with blindness or visual impairments to obtain employment.

Other barriers to employment for individuals with blindness or visual impairments were elicited from Kirchner et al.'s (1997) surveys. Individuals in the group interested in working cited their lack of work history as a barrier to gaining employment (Kirchner et al., 1997). All of the consumer groups addressed that

employer attitudes was a major barrier in obtaining employment (Kirchner et al., 1997). Kirchner et al.'s findings also indicated that individuals in the employed groups felt underemployed and were not using their potential job skills. Finally, the largest barrier addressed by the employers was their lack of contact by vocational rehabilitation services. Therefore, Kirchner et al.'s research identified many barriers but had one commonality: employer attitudes as a major factor in the impediment of the employment of individuals with blindness or visual impairments.

In a case study by Rumrill, Schuyler, and Longden (1997), 5 employed individuals who were blind identified barriers to employment and potential job modifications to overcome these impediments. Participants indicated that traveling to and from their place of employment and in the workplace was a major barrier (Rumrill et al., 1997). Participants also had difficulty with signs in the workplace including identification signs and those for warning devices (Rumrill et al., 1997). Participants further reported having problems accessing printed materials and navigating around obstacles within their work environment (Rumrill et al., 1997). Therefore, the research findings of Rumrill et al. (1997) revealed that the barriers of traveling independently and gaining access to print presented challenges for individuals with blindness in the workplace.

Rumrill, Roessler, Battersby-Longden, and Schuyler (1998) addressed employment barriers to better prepare for job accommodations for individuals with blindness or visual impairments. Rumrill et al. (1998) conducted structured interviews with 35 individuals with visual impairments who were employed. In the area of

accessibility, the barrier most often cited by the participants was the lack or inadequacy of identification signs, followed by dimly lit areas and the absence of appropriate warning devices (Rumrill et al., 1998). With regards to performing essential functions on the job, participants discussed further barriers, such as their inability to drive, lack of awareness of potential obstructions in their paths, and inefficiency to read printed materials (Rumrill et al., 1998). Therefore, based on the research, major barriers include print access, transportation, and insufficient orientation and mobility skills.

A major research study that addressed the barriers to employment for individuals with blindness or visual impairments was conducted by Crudden, McBroom, Skinner, and Moore (1998). In this survey study, 166 individuals with severe visual impairments who were employed were contacted to determine barriers to employment, the strategies used to overcome these obstacles, and their insights on why they achieved successful employment when many persons with blindness or visual impairments do not (Crudden et al., 1998). Participants cited employer attitudes as the largest barrier to obtaining employment (Crudden et al., 1998). Other major barriers included difficulties with transportation and print access (Crudden et al., 1998). Participants further noted that they were hesitant to change employment, due to issues with employer attitudes, transportation, print access, and adaptive equipment (Crudden et al., 1998). Some participants cited difficulty with career advancement, due to employer attitudes, challenges with print access, absence of transportation, lack of prospects, and insufficient work pace (Crudden et al., 1998).

To further their study, Crudden et al. (1998) inquired as to what might deter someone with blindness or visual impairment from looking for a job. Major barriers cited by the participants included difficulties with transportation, employer and public attitudes, absence of job abilities, challenges of print access, and issues with computers, (Crudden et al., 1998). One-way analysis was performed to make comparisons, and these factors included age at vision loss, annual income, functional vision, and school type. Major findings indicated that individuals with adventitious blindness or visual impairment were more likely to encounter discrimination than those with congenital blindness or visual impairments (Crudden et al., 1998). Crudden et al. (1998) also found that individuals who attended schools for the blind identified as having greater difficulty with job training than those from other educational settings. Individuals with more functional vision reported having fewer problems with print access, and those with greater incomes noted having less difficulty with computers (Crudden et al., 1998). Thus, the major barriers to employment discussed by Crudden et al.'s (1998) research included a lack of transportation, problems with print access, difficulties with computers, and employer attitudes.

O'Day (1999) conducted a qualitative study to determine if resources, such as the SSA and vocational rehabilitation services, posed further barriers to employment for individuals with blindness or visual impairments. O'Day conducted structured interviews with 20 individuals with legal blindness who were unemployed, were interested in working, and received SSI or SSDI. During the interviews, the

participants noted that their barriers to employment stemmed from both society and public programs (O'Day, 1999). Such societal barriers included decreased expectations, stereotyping, and negative public views about individuals with blindness or visual impairments (O'Day, 1999). Participants also stated the SSA posed further barriers by reinforcing their dependence on these supports by not providing information on work incentives for individuals to obtain employment and support themselves (O'Day, 1999). O'Day's findings further indicated that participants interested in obtaining employment thought their earnings would not offset their loss in SSA supports and healthcare benefits, causing another obstacle in gaining employment. O'Day also addressed the barriers created by vocational rehabilitation services. The largest barrier cited by the participants was the lack of knowledge about the services provided by vocational rehabilitation services. Further barriers noted by the participants were lack of funding for services and timeliness for providing services (O'Day, 1999). Based on O'Day, both societal and public programs placed additional barriers to employment for individuals with blindness or visual impairments.

Crudden and McBroom (1999) examined the barriers to employment through their comprehensive survey of 176 employed individuals with blindness or visual impairments. Participants in the study were asked to address what barriers they faced to become employed, how they faced these barriers, who was supportive during this process, and why they were able to prevail over these barriers when others are not able to do so (Crudden & McBroom, 1999). Findings indicated that the largest barrier

to employment was employer attitude, followed by transportation and print access (Crudden & Mc Broom, 1999). Particularly, those participants with a greater amount of vision had more difficulty with transportation than those with less vision. However, the results also revealed that the participants with less vision had greater difficulty with the attitudes of rehabilitation counselors (Crudden & McBroom, 1999). Consequently, similarly to Kirchner et al. (1997), Crudden and McBroom found that disability characteristics created further barriers to employment for individuals with blindness or visual impairments.

Kelley (2003) looked at the employment barriers for individuals with blindness or visual impairments. Surveys were completed by 63 employed and unemployed individuals with blindness or visual impairments who resided in Tennessee (Kelley, 2003). Results of Kelley's survey indicated that the largest barrier to employment faced by these participants was difficulty with transportation. Specifically, findings indicated that individuals noted limitations due to their visual disabilities as a major cause of barriers to employment (Kelley, 2003). Another major barrier cited by the participants was employer and coworker attitude, which also could preclude their ability for career advancement, thereby creating an additional employment barrier (Kelley, 2003). Therefore, findings of Kelley revealed that both societal and disability characteristics presented barriers to employment for individuals with blindness or visual impairments.

In a focus-group study of 43 rehabilitation providers, Crudden, Sansing, and Butler (2005) examined the barriers and strategies to overcome these obstacles to

employment for individuals with blindness or visual impairments. Participants cited employer attitudes as a major impediment to the employment success for consumers with blindness or visual impairments (Crudden et al., 2005). Participants also cited assistive technology as a potential barrier, due to incompatibility, the constant change in devices, and lack of training. Further findings revealed administrative barriers to successful employment, such as vendor selection, inadequate service provision, and lack of time (Crudden et al., 2005). Participants also addressed that some consumers have attempted to return to work without gaining the necessary adjustment to blindness skills, which impedes employment (Crudden et al., 2005). Thus, Crudden et al. (2005) found that employer attitude, assistive technology, administrative factors, and lack of adjustment to blindness skills were barriers to the successful employment of individuals with blindness or visual impairments.

Using RSA 911 data for 19,054 cases, Cavanaugh and Steinman (2006) examined the effects of race and ethnicity on the acceptance rates of vocational rehabilitation services for individuals with blindness or visual impairments. To enhance their study, Cavanaugh and Steinman also explored disability and demographic characteristics. Findings indicated that African Americans, Hispanic Americans, and Native Americans were less likely to be accepted for rehabilitation services than White Americans with blindness or visual impairments (Cavanaugh & Steinman, 2006). Results further revealed that severity of disability in conjunction with race or ethnicity was associated with the acceptance rates for vocational rehabilitation services. Further findings indicated that the control variables of age,

secondary disability, and level of education in combination with race or ethnicity affect access to vocational rehabilitation services (Cavanaugh & Steinman, 2006). Consequently, Cavanaugh and Steinman concluded that race and ethnicity, along with disability and demographic characteristics, are impediments to the vocational rehabilitation program, which poses a major barrier to employment for individuals with blindness or visual impairments.

Strategies to Overcome Barriers to Employment

Horath (1992) established a taxonomy of skills needed by individuals with blindness or visual impairments to gain and retain competitive employment and further determined the significance of these skills. An extensive review of the literature was performed to create the taxonomy of skills, followed by interviews with 35 successfully employed consumers from the Texas Commission for the Blind to establish the importance of the skills in the taxonomy (Horath, 1992). Findings from the interviews indicated that efficient communication within the workplace was the most significant skill needed by individuals to gain and retain competitive employment (Horath, 1992). Horath's results also revealed that the use of many effective communication skills was related to self-assurance within the work environment. Horath noted that individuals with blindness or visual impairments used job-related organizational skills, such as a systematic work environment, in order to be successful in their employment circumstances.

Participants in Horath's (1992) study further noted skills from the taxonomy they deemed important in gaining and maintaining competitive employment. Findings from the interviews revealed that general orientation and mobility skills were essential for individuals with blindness or visual impairments to gain and retain employment (Horath, 1992). Participants further addressed that the requirement of concentrated orientation and mobility methods, such as cane travel, should be based on the personal choice and visual disability of the individual (Horath, 1992). Horath's results also indicated that proficiency using adaptive aids and assistive technology is not essential, unless these devices are provided at the work environment. Participants discussed that if such adaptive aids and assistive technology was provided in the workplace, they would put them to use (Horath, 1992). Thus, Horath found that the skills of effective communication, organization, orientation and mobility, adaptive aids, and assistive technology were essential for individuals to gain and maintain competitive employment.

Young (1995) conducted a focus-group study with 9 employed individuals who were blind to better understand the strategies used to gain and maintain employment. Young's findings indicated that all the participants had similar attributes that advanced their careers, including positive views about job outlooks, the ability to acclimate to the sighted environment, and the skills of alternative methods to work without sight. Specifically, the use of Braille and learning how to travel independently were seen as significant strategies in obtaining and maintaining successful employment. Participants further noted they held high standards for

themselves, which were reiterated by family and friends (Young, 1995). The participants discussed that they presumed they would become employed, as reliance on public programs was undesirable (Young, 1995) Young also found that participants cited educating employers about their disability and job capabilities as important strategies to gaining and maintaining employment. Participants also addressed the need to create similar interests with coworkers and employers in order to lessen the challenges of the societal attitudes about blindness. Consequently, Young's findings presented the strategies of alternative methods and education to overcome the impediments of societal attitudes, print access, and transportation.

In a national study interviewing 89 rehabilitation counselors, Sikka and Stephens (1997) examined the strategies that individuals used to maintain competitive employment after significant vision loss. The participants discussed 189 consumer cases in which they had firsthand accounts about successful job retention after the onset of significant vision loss (Sikka & Stephens, 1997). Rehabilitation counselors indicated that the most used strategy for job maintenance was job adaptation, which typically involved some type of assistive technology (Sikka & Stephens, 1997). Training with the assistive technology was also seen as a major strategy in job retention for individuals with blindness or visual impairments. Another major strategy noted by the participants was the use of adjustment to blindness skills, such as Braille and orientation and mobility, in order to maintain competitive employment (Sikka & Stephens, 1997). Thus, Sikka and Stephens found that the strategies of assistive

technology and adjustment to blindness were essential in job maintenance of competitive employment for individuals with blindness or visual impairments.

Crudden and Fireison (1997) also looked at job maintenance after vision loss, using an intensive case study approach to examine the strategies used by 10 persons who maintained competitive employment after vision loss. All participants in the study cited job adaptations, such as assistive technology, as a major strategy in employment retention. Participants also noted the importance of receiving training on the assistive technology as a strategy for retention of competitive employment (Crudden & Fireison, 1997). Crudden and Fireison's findings further revealed that Braille was an important strategy for job maintenance. Consequently, as in the case of Sikka and Stephens (1997), Crudden and Fireison found that Braille and assistive technology were important strategies for competitive employment retention for individuals with blindness or visual impairments.

Kirchner et al. (1997) conducted seven focus groups with rehabilitation providers along with surveys for consumers and employers. These focus groups and surveys were to provide information about the barriers to employment and the strategies needed to overcome these obstacles for individuals with blindness or visual impairments (Kirchner et al., 1997). Findings from the focus group revealed the need for improved communication between rehabilitation services, consumers, and potential employers (Kirchner et al., 1997). Literacy, through the proficient use of Braille and assistive technology, was seen as essential for job-ready consumers to compete for employment. Further findings indicated the need to use competitively

employed individuals with blindness or visual impairments as potential resources (Kirchner et al., 1997)

After the focus groups were conducted, Kirchner et al. (1997) conducted surveys with 264 consumers and 289 employers. As described earlier in the Employment Barriers section of this chapter, the consumers were divided into three groups: (a) those employed, (b) those interested in working, and (c) those not interested in working. Consumer surveys revealed that self-confidence was deemed as an important strategy for obtaining employment (Kirchner et al., 1997). Further results also indicated that nearly all participants had received assistance from rehabilitation services (Kirchner et al., 1997). Specifically, the consumers noted the need for proficiency with assistive technology, orientation and mobility, and Braille as a strategy to obtain employment (Kirchner et al., 1997). Findings from the employer survey indicated that more education about how individuals with blindness or visual impairments access print was a helpful strategy (Kirchner et al., 1997). Information about assistive technology was also an important strategy in the hiring of an individual who was blind or visually impaired. Therefore, Kirchner et al. found that assistive technology and Braille were essential in overcoming the impediments to employment for individuals with blindness or visual impairments.

In a survey study of 166 employed individuals with visual impairments, Crudden et al. (1998) looked at the barriers to employment, the strategies these persons used to overcome these obstacles, and why they were successful when other persons were not. Participants in the study cited education and previous employment

experience as significant strategies in obtaining employment (Crudden et al., 1998). Participants also noted the assistance of rehabilitation counselors as being helpful in gaining employment. Of the services provided by rehabilitation counselors, most participants cited locating potential employment and contacting employers as the most significant supports received (Crudden et al., 1998). Other services provided by rehabilitation counselors' participants deemed as important included financial support for education, assistive technology, Braille, and orientation and mobility skills (Crudden et al., 1998). Therefore, Crudden et al. (1998) found that education, previous work experience, and the support of rehabilitation counselors were important strategies in obtaining employment for individuals with blindness or visual impairments.

Crudden and McBroom (1999) conducted survey research with 176 individuals with blindness or visual impairments who overcame obstacles to become successfully employed. Findings from their survey were categorized into support from vocational rehabilitation, employers, and significant others. Participants noted that finding potential jobs was the most important support received from vocational rehabilitation services (Crudden & McBroom, 1999). Other important services received from vocational rehabilitation services included financial assistance for education, the purchase of assistive technology, and the purchase of training in Braille and in orientation and mobility (Crudden & McBroom, 1999). Participants further revealed that providing work adaptations was the most important support received by employers (Crudden & McBroom, 1999). Help and encouragement from significant

others were cited as important supports by the participants in the study. Thus, Crudden and McBroom indicated that support from vocational rehabilitation services, employers, and significant others was an important strategy for obtaining employment for individuals with blindness or visual impairments.

Crudden (2002) used a case study approach to examine the strategies of 10 individuals with blindness or visual impairments who maintained employment after vision loss. All of the participants reported using some type of job adaptations in order to retain their employment, according to Crudden. The most frequently cited modification used by the participants was computers with assistive technology. Crudden's findings also indicated that participants used other job adaptations, including closed-circuit televisions, cassette-tape players, and magnifiers. Another major strategy used by participants for employment retention was orientation and mobility skills (Crudden, 2002). Thus, similar to the research of Sikka and Stephens (1997) and Crudden and Fireison (1997), Crudden indicated that assistive technology as well as orientation and mobility skills were important strategies for maintaining employment after vision loss for individuals with blindness or visual impairments.

Crudden, Williams, McBroom, and Moore (2002) conducted seven focus groups with a total of 49 successfully employed consumers with blindness or visual impairments and 19 employers who hired persons with blindness or visual impairments to examine the strategies needed to overcome the barriers to employment. Findings from the focus groups revealed that many strategies used in collaboration with rehabilitation counselors were deemed as essential to obtaining and

maintaining employment (Crudden et al., 2002). One such strategy was the need to educate the public and employers about disability characteristics and the capabilities of individuals with blindness or visual impairments. Participants further noted that rehabilitation counselors needed to assist in the area of transportation by helping in the provision of transportation plans with coworkers and employers and by providing funding for training in orientation and mobility skills (Crudden et al., 2002). Findings also indicated that consumers deemed the provision of evaluation, training, and assistive technology as necessary strategies for obtaining and maintaining employment (Crudden et al., 2002). Consumers also addressed the necessity for employers to be receptive to ideas from rehabilitation counselors and individuals with blindness or visual impairments about employment preferences (Crudden et al., 2002).

Findings from Crudden et al.'s (2002) employer focus groups also presented important strategies for overcoming barriers to employment. Employers cited rehabilitation counselors as making initial contacts and forming relationships with employment organizations to advocate for hiring individuals with blindness or visual impairments as necessary strategies to meeting challenges for employment barriers (Crudden et al., 2002). Findings also indicated that employers addressed rehabilitation counselors should assist consumers with adapting to their work environment through socialization, perhaps with a mentor (Crudden et al., 2002). Employers further noted the need for orientation and mobility training at the workplace and the purchase of compatible assistive technology in a timely fashion by

rehabilitation counselors. Results indicated that employers cited strategies for other employers to hire individuals with blindness or visual impairments that included methods for transportation plans, print access, and assistive technology (Crudden et al., 2002). Therefore, Crudden et al. (2002) found that assistance from rehabilitation counselors and employers were important strategies in the employment of individuals with blindness or visual impairments.

Crudden et al. (2005) conducted a focus-group study with 45 rehabilitation providers to examine the barriers to employment and the strategies used by individuals with blindness or visual impairments to overcome these obstacles to employment. Findings from these focus groups included educating employers about blindness and increasing the contact between potential employers and individuals with blindness or visual impairments to improve the challenge of employer attitudes. Participants also cited the need for strategies in the area of transportation, which included networking with coworkers, hiring, and relocation (Crudden et al., 2005). Transportation strategies included having the employer assist in advocating for increased access to public transportation (Crudden et al., 2005). Findings further indicated participants found various methods to ensure that their assistive technology needs were met on the job so they gained access to print (Crudden et al., 2005). Thus, findings from Crudden et al. (2005) revealed that strategies for overcoming the barriers of employer attitudes, transportation, and access to print were essential in obtaining and maintaining employment for individuals with blindness or visual impairments.

Predictors to Employment

Bohman (1993) conducted surveys with 240 individuals with blindness or visual impairments who resided in Utah to examine the factors that predict employment, underemployment, and unemployment. Survey results revealed that proficient orientation and mobility skills were predictors of employment success for individuals with blindness or visual impairments. Specifically, independent travel in new environments was significantly correlated with the achievement of successful employment (Bohman, 1993). Bohman also identified access to reading and writing print, such as through the means of computers, closed-circuit televisions, and Braille, as predictors of successful employment. Thus, Bohman found that proficiency in orientation and mobility skills and access to reading and writing print were significantly correlated to successful employment for individuals with blindness or visual impairments.

In a study of 167 individuals with blindness or visual impairments, Leonard et al. (1999) examined employment status as well as the variables predicting employment, employment level, and underemployment. Findings indicated that both higher levels of education and attending integrated education were associated with successful employment for individuals with blindness or visual impairments. In particular, individuals who attended integrated education for most of their life were 74% more likely to become employed (Leonard et al., 1999). Results also revealed that using print as a main reading source was a significant predictor of successful employment. Specifically, individuals with print as a primary reading source were

78% more likely to become employed (Leonard et al., 1999). Job-related skills such as computer and typing abilities and capability to use public transportation were also related to successful employment outcomes (Leonard et al., 1999). Leonard et al.'s results further indicated a significant relationship between assistive technology training and achieving employment. Those individuals who received assistive technology training were twice as likely to achieve employment success (Leonard et al., 1999). Consequently, Leonard et al. indicated that education, use of print, and assistive technology training were significant predictors of successful employment for individuals with blindness or visual impairments.

Leonard et al. (1999) further discussed the predictors of employment status of individuals with blindness or visual impairments. Higher level employment was found to be significantly related to completion of higher levels of education. Results also indicated that individuals who were totally blind, as opposed to having some usable vision, were more likely to have higher levels of employment status (Leonard et al., 1999). Computer and typing abilities were also found to be significantly related to higher levels of employment. Findings further indicated that both the receipt of assistive technology and orientation and mobility training were predictors of higher levels of employment (Leonard et al., 1999). Thus, Leonard et al. found that education, visual status, and training with assistive technology and orientation and mobility were predictors of higher levels of employment for individuals with blindness or visual impairments.

Using RSA 911 data for 16,270 cases, Capella (2001) looked at the predictors of earnings for individuals with blindness or visual impairments who had achieved successful employment. Findings from the multiple linear regression indicated that age was a highly significant predictor of employment earnings (Capella, 2001). Capella's results also indicated that education was related to the earnings of competitively employed individuals with blindness or visual impairments. Findings further revealed that the amount of funding provided to a consumer was significantly related to the earnings from employment (Capella, 2001). Therefore, Capella found that age, education, and amount of funding spent on a consumer were significant predictors of earnings for competitively employed individuals with blindness or visual impairments.

Leonard (2002) examined the predictors of job-seeking behaviors of unemployed individuals with blindness or visual impairments by using case information and structured interviews with 70 participants. Leonard's findings revealed that individuals with no other health or physical conditions were associated with job-seeking behavior; specifically, individuals without a secondary disability were 8.5 times more likely to seek employment than those with another health condition. Leonard's results further indicated that individuals who were not working for 1 year or less were more likely to seek employment. Individuals not working for one year or less were 6.5 more times likely to be seeking employment than those out of work for a longer period of time (Leonard, 2002). Consequently, the research of Leonard revealed that the presence of another health or physical condition and length

of time being unemployed were predictors of job-seeking behaviors of individuals with blindness or visual impairments.

In a study using RSA 911 data, Cavanaugh and Rogers (2002) examined the predictors of competitive employment for individuals 55 years and older with blindness or visual impairments. Through the means of stepwise multiple regression, Cavanaugh and Rogers analyzed 8,676 cases. Findings revealed that approximately 24% of the consumers were competitively employed (Cavanaugh & Rogers, 2002). Results also indicated that consumer's earning level at time of application was the most significant predictor of successful employment (Cavanaugh & Rogers, 2002). Other significant predictors included being younger in age, more funding being spent for vocational-rehabilitation service provisions, and shorter duration of services (Cavanaugh & Rogers, 2002). Findings further revealed that having some usable vision, as opposed to being totally blind, was a predictor of competitive employment (Cavanaugh & Rogers, 2002). Further predictors were found to be gender, the presence of a secondary disability, and previous employment experience. Therefore, Cavanaugh and Rogers found seven predictors of competitive employment for older individuals with blindness or visual impairments, with consumer earnings at application being the most significant.

Fields (2004) investigated the factors related to employment outcomes for individuals with blindness or visual impairments. The employment status, type, and classification of 610 consumers of vocational rehabilitation services were evaluated through the methods of logistic regression, cross tabulation, and chi-square (Fields,

2004). Findings revealed that factors correlated with employment status included severity of vision disability, onset of vision loss, access to assistive technology, orientation and mobility skills, access to transportation, and financial status at application (Fields, 2004). Age, level of education, access to assistive technology, orientation and mobility skills, access to transportation, and financial status at application were found to be significantly related to employment type. Further results revealed that age, level of education, access to assistive technology, orientation and mobility skills, access to transportation, and financial status at application were predictors of employment classification (Fields, 2004). Consequently, the research of Fields indicated that only the variable of access to assistive technology was significantly related to employment status, type, and classification.

Using data from the Longitudinal Study of the Vocational Rehabilitation Services Program, Capella-McDonnall (2005) examined the factors that predicted successful competitive employment of individuals with blindness or visual impairments. Capella-McDonnall used the statistical method of logistic regression to determine what variables were predictors of competitive employment. Results indicated that having previous work experience since the onset of the visual disability was significantly related to competitive employment outcomes (Capella-McDonnall, 2005). The purpose of applying for vocational rehabilitation services was also significantly related to the achievement of successful employment. Findings further revealed that the rehabilitation counselor and consumer relationship was a predictor of competitive employment (Capella-McDonnall, 2005). Receiving education as a

service provision from rehabilitation services that resulted in a degree or certificate was significantly associated with successful employment outcomes (Capella-McDonnall, 2005). Thus, the research model of Capella-McDonnall was found to be statistically significant.

Summary

Based on previous research, many factors contribute to the barriers of employment for individuals with blindness or visual impairments. Major barriers cited in research include both societal attitudes (Crudden & McBroom, 1999; Crudden et al., 1998; Crudden et al., 2005; Kelley, 2003; Kirchner et al., 1997; O'Day, 1999) and disability characteristics (Crudden & McBroom, 1999; Kelley, 2003; Kirchner et al., 1997). Other significant barriers noted by researchers as precluders to employment of individuals with blindness or visual impairments include difficulties with transportation (Crudden & McBroom, 1999; Crudden et al., 1998; Rumrill et al., 1997; Rumrill et al., 1998) and print access (Crudden & McBroom, 1999; Crudden et al., 1998; Rumrill et al., 1997; Rumrill et al., 1998). Further barriers addressed in the research include additional impediments created by public programs such as SSA (O'Day, 1999) and vocational rehabilitation services (Cavanaugh & Steinman, 2006; Crudden & McBroom, 1999; Crudden et al., 2005; Kirchner et al., 1997; O'Day, 1999).

Previous research has addressed the strategies to overcome the impediments to employment for individuals with blindness or visual impairments (see Table 1).

Research addressed strategies that focused on improving difficulties with transportation (Crudden et al., 2005; Young, 1995) print access (Crudden et al., 2005; Young, 1995), and employer attitudes (Crudden et al., 2005).

Other major strategies discussed in the research include the use of assistive technology (Crudden, 2002; Crudden & Fireison, 1997; Horath, 1992; Kirchner et al., 1997; Sikka & Stephens, 1997), orientation and mobility (Crudden, 2002; Horath, 1992), and Braille (Crudden & Fireison 1997; Kirchner et al., 1997) to meet the challenges of employment. Further strategies cited in the research are collaborations with rehabilitation counselors (Crudden et al., 1998; Crudden & McBroom, 1999; Crudden et al., 2002) and employers (Crudden & McBroom, 1999; Crudden et al., 2002) to overcome barriers to employment.

Many trends about the predictors to employment for individuals with blindness or visual impairments were found in the research (see Table 1). Significant predictors revealed in the research include age (Capella, 2001; Cavanaugh & Rogers, 2002; Fields, 2004), education (Capella, 2001; Capella-McDonnall, 2005; Fields, 2004; Leonard et al., 1999), the presence of a secondary disability (Cavanaugh & Rogers, 2002; Leonard, 2002), and reading and writing print (Bohman 1993; Leonard et al., 1999). Other important predictors include severity of vision loss (Cavanaugh & Rogers, 2002; Fields, 2004; Leonard et al., 1999), orientation and mobility skills (Bohman, 1993; Fields, 2004; Leonard et al., 1999), access to assistive technology (Bohman, 1993; Fields, 2004), and assistive technology training (Leonard et al., 1999). Further research indicated that vocational rehabilitation services played a

major role in the prediction of employment of individuals with blindness of visual impairments (Capella, 2001; Capella-McDonnall, 2005; Cavanaugh & Rogers, 2002).

Table 1

Summary of Review of Literature by Category and Theme

Category and theme	Source
Barriers to employment	
Societal attitudes	Crudden & McBroom (1999); Crudden, McBroom, Skinner, & Moore (1998); Crudden, Sansing, & Butler (2005); Kelley (2003); Kirchner, Johnson, & Harkins (1997); O'Day (1999)
Disability characteristics	Crudden & McBroom (1999); Kelley (2003); Kirchner, Johnson, & Harkins (1997)
Transportation	Crudden & McBroom (1999); Crudden, McBroom, Skinner, & Moore (1998); Rumrill, Schuyler, & Longden (1997); Rumrill, Roessler, Battersby-Longden, & Schuyler (1998)
Print access	Crudden & McBroom (1999); Crudden, McBroom, Skinner, & Moore (1998); Rumrill, Schuyler, & Longden (1997); Rumrill, Roessler, Battersby-Longden, & Schuyler (1998)
Public programs	Cavanaugh & Steinman (2006); Crudden & McBroom (1999); Crudden, Sansing, & Butler (2005); Kirchner,; O'Day (1999)
Strategies to employment	
Transportation enhancement	Crudden, Sansing, & Butler (2005); Young (1995)
Print access	Crudden, Sansing, & Butler (2005); Young (1995)
Employer attitude improvement	Crudden, Sansing, & Butler (2005)
Assistive technology	Crudden (2002); Crudden & Fireison (1997); Horath (1992); Kirchner, Johnson, & Harkins (1997); Sikka & Stephens (1997)

Category and theme	Source
Orientation and mobility	Crudden (2002); Horath (1992)
Braille	Crudden & Fireison (1997); Kirchner, Johnson, & Harkins (1997)
Collaboration with vocational rehabilitation counselors and employers	Crudden, McBroom, Skinner, & Moore (1998); Crudden & McBroom (1999); Crudden, Williams, McBroom, & Moore (2002)
Predictors to employment	
Age	Capella (2001); Cavanaugh & Rogers (2002); Fields (2004)
Education	Capella (2001); Capella-McDonnall (2005); Fields (2004); Leonard, D'Allura, & Horowitz (1999)
Presence of a secondary disability	Cavanaugh & Rogers (2002); Leonard (2002)
Reading and writing print	Bohman (1993); Leonard, D'Allura, & Horowitz (1999)
Severity of vision loss	Cavanaugh & Rogers (2002); Fields (2004); Leonard, D'Allura, & Horowitz (1999)
Orientation and mobility skills	Bohman (1993); Fields (2004); Leonard, D'Allura, & Horowitz (1999)
Access to assistive technology and training	Bohman (1993); Fields (2004); Leonard, D'Allura, & Horowitz (1999)
Vocational rehabilitation services	Capella (2001); Capella-McDonnall (2005); Cavanaugh & Rogers (2002)

CHAPTER 3

METHOD

The purpose of this study was to examine the variables related to competitive employment outcomes and earnings at closure for individuals with blindness or visual impairments. Specifically, the relationships were examined between demographics, service provisions, earnings at closure, and competitive employment outcomes for individuals with blindness or visual impairments who participated in vocational rehabilitation services. The two research questions for this study were the following:

1. Among individuals with blindness or visual impairments who have received services from state vocational rehabilitation agencies, which demographic and service variables best predict competitive employment attainment?

2. Among individuals with blindness or visual impairments who have received services from state vocational rehabilitation agencies, which demographic and service variables best predict amount of earnings at closure?

The 14 demographic variables were (a) age, (b) gender, (c) race or ethnicity, (d) source of referral, (e) type of secondary education, (f) IEP, (g) living arrangement at application, (h) severity of vision loss, (i) presence of a secondary disability, (j) type of secondary disability, (k) weekly earnings at application, (l) receipt of SSI or SSDI at application, (m) primary source of support at application, (n) receipt of Medicaid or Medicare at application, and (o) educational level at closure. The 14 case service variables were (a) vocational rehabilitation counseling and guidance, (b) college or university training, (c) occupational or vocational training, (d) on-the-job

training, (e) basic academic remedial or literacy training, (f) job readiness training, (g) disability-related augmentative skills training, (h) miscellaneous training, (i) job search assistance, (j) job placement assistance, (k) transportation, (l) maintenance, (m) rehabilitation technology, and (n) reader services.

Participant Selection

This study utilized data from the RSA 911 data file from Fiscal Year 2006 (RSA, 2006). This database includes information about each consumer that is closed within that fiscal year and is representative of over 80 state-federal vocational rehabilitation agencies across the country. Based on the RSA 911 data, three criteria were used to select the participants. First, participants were selected for this study if they had a primary disability of blindness or visual impairments as coded in the *RSA 911 Case Service Reporting Manual* under the major category of Sensory/Communicative Impairments (RSA, 2006). Because of the outcome variables of competitive employment and employment earnings, participants 65 years old and younger were selected. Finally, participants were selected if they were not employed at the time of application, in order to determine the effect of the service provisions to help them obtain employment rather than focus on job retention.

Data Collection

The data analyzed for this study were from the RSA-911 national data file Fiscal Year 2006. These data contained quantitative information about each consumer's case, beginning with initial referral and proceeding to the case closure

phase. Codes were assigned to represent the data for each consumer throughout the rehabilitation process. These codes included demographic, socioeconomic, disability characteristics as well as service-provision information for each consumer found in the database. The *RSA-911 Case Service Reporting Manual* (RSA, 2006) was used as a reference guide for this study. This manual contains reporting guidelines and definitions of demographic, disability characteristics, and case service variables.

Variables

Through the use of the RSA (2006) manual, codes were established for the outcome variables of employment earnings and competitive employment. Codes were also established for the predictor variables for this study, including consumer demographics and case service provisions.

Demographic Variables

The 14 variables for each case in the sample were the following:

1. *Age* is a continuous variable recoded into categories by using the day, month, and year of birth (RSA, 2006). This variable was coded as follows: Age Group 1 = 0–36 years old, Age Group 2 = 37–50 years old, and Age (51–65 years old, coded 3) = 51–65 years old.
2. *Gender* is a dichotomous variable referring to male and female (RSA, 2006). This variable was coded as 0 = male and 1 = female.
3. *Race and ethnicity* is a dichotomous variable in which a consumer self-identifies with a particular race or ethnicity (RSA, 2006). This variable was coded as

0 = White and 1 = Other, which includes Black or African American, Hispanic or Latino, American Indian or Alaska Native, Asian, and Native Hawaiian or other Pacific Islander.

4. *Source of referral* is a dichotomous variable that distinguishes what individual, agency, or other entity initially referred the consumer to vocational rehabilitation services (RSA, 2006). This variable was coded as follows: 0 = self-referral and 1 = elementary or secondary educational institutions, postsecondary educational institutions, physician or other medical personnel or medical institutions, welfare agency, community rehabilitation programs, SSA, one-stop employment or training centers, and other sources.

5. *Type of secondary education* is a dichotomous variable that indicates if a consumer attended primarily special education or integrated education (RSA, 2006). This variable was coded as 0 = did not receive special education certificate of completion and 1 = did receive special education certificate of completion.

6. *IEP* is a dichotomous variable that distinguishes if a consumer received services under the Individuals with Disabilities Education Act (IDEA) leading to the provision of an IEP (RSA, 2006). This variable was coded as 0 = did not have an IEP and 1 = did have an IEP.

7. *Living arrangements at application* is a dichotomous variable that indicates where the consumer resided at time of application; this living arrangement may be temporary or permanent (RSA, 2006). This variable was coded as follows: 0 = private residence and 1 = other, including community residential or group home,

rehabilitation facility, mental health facility, nursing home, adult correctional facility, halfway house, substance abuse treatment center, homeless shelter, and other.

8. *Severity of vision loss* is an ordinal variable that refers to the consumer's primary disability resulting from either blindness or visual impairment (RSA, 2006). This variable was coded as 0 = blindness and 1 = visual impairments.

9. *Presence of a secondary disability* is a dichotomous variable that indicates if a consumer has a disability impeding employment other than the primary disability (RSA, 2006). This variable was coded as 0 = does not have a secondary disability and 1 = does have a secondary disability.

10. *Type of secondary disability* is a dichotomous variable that represents a disability impeding employment but not the primary disability (RSA, 2006). This variable was coded as 0 = sensory or communicative impairments other than blindness or visual and physical impairments and 1 = mental impairments.

11. *Weekly earnings at application* is a continuous variable recoded into a dichotomous variable that refers to amount of money earned per week at the time of application (RSA, 2006). This amount is rounded up to the nearest dollar and includes all wages, salaries, tips, and commissions received as income before payroll deductions of federal, state, and local income taxes and Social Security payroll tax (RSA, 2006). This variable was coded as 0 = does not have any earnings and 1 = does have earnings.

12. *Receipt of SSI or SSDI* is a dichotomous variable found within the RSA codes for type of public support at application (RSA, 2006). Public support refers to

the receipt of funding from federal, state, or local governments for any basis, which includes SSI for the Aged, Blind, or Disabled or SSDI (RSA, 2006). This variable was coded as 0 = did not receive SSI or SSDI and 1 = did receive SSI or SSDI.

13. *Receipt of Medicaid or Medicare at application* is a dichotomous variable that indicates if a consumer receives insurance coverage as a result of public support from SSI or SSDI at the time of application (RSA, 2006). This variable was coded as 0 = did not have Medicaid or Medicare coverage and 1 = did have Medicaid or Medicare coverage.

14. *Level of education attained at closure* is an ordinal variable that indicates the level of education completed by the consumer at the time of case closure (RSA, 2006). This variable was coded as follows: Group 1 = elementary education, Group 2 = secondary education and Group 3 = postsecondary education.

Case Service Variables

The following 14 case service variables were used for this study for each case in the sample:

1. *Vocational rehabilitation counseling and guidance* is a dichotomous variable that indicates separate therapeutic counseling and guidance services needed by the consumer to obtain employment, including personal adjustment counseling; counseling focusing on medical, family, or social factors; and vocational counseling (RSA, 2006). This variable was coded as 0 = did not receive counseling and guidance and 1 = did receive counseling and guidance.

2. *College or university training* is a dichotomous variable that refers to the receipt of assistance with full-time or part-time academic training beyond the high school education level resulting in some type of degree (RSA, 2006). Such degrees include associate, baccalaureate, graduate, or professional (RSA, 2006). This variable was coded as 0 = did not receive college or university training and 1 = did received college or university training.

3. *Occupational or vocational training* is a dichotomous variable that refers to occupational, vocational, or job-skills training taught at the community college, business, vocational or trade school, or technical school to plan consumers for jobs not related to employment requiring degrees or certifications (RSA, 2006). This variable was coded as 0 = did not receive occupational or vocational training and 1 = did receive occupational or vocational training.

4. *On-the-job-training* is a dichotomous variable that indicates training in certain job tasks provided by a prospective employer (RSA, 2006). This variable was coded as 0 = did not receive on-the-job training and 1 = did receive on-the-job training.

5. *Basic academic remedial or literacy training* is a dichotomous variable that refers to remediation or literacy training for basic academic skills necessary to perform on the job (RSA, 2006). This variable was coded as 0 = did not receive basic academic remedial or literacy training and 1 = did receive basic academic remedial or literacy training.

6. *Job readiness training* is a dichotomous variable that refers to training to plan consumer for “the world of work,” such as job behaviors, work attire, and time management (RSA, 2006, p. 26). This variable was coded as 0 = did not receive job readiness training and 1 = did receive job readiness training.

7. *Disability-related augmentative skills training* is a dichotomous variable that refers to training in the areas of orientation and mobility skills and Braille (RSA, 2006). This variable was coded as 0 = did not receive disability-related augmentative skills training and 1 = did receive disability-related augmentative skills training.

8. *Miscellaneous training* is a dichotomous variable that indicates any training not covered by the other training areas of college or university training, occupational or vocational training, on-the-job training, basic academic remedial or literacy training, job readiness training, and disability-related augmentative skills training (RSA, 2006). This variable was coded as 0 = did not receive miscellaneous training and 1 = did receive miscellaneous training.

9. *Job search assistance* is a dichotomous variable that refers to assistance with locating appropriate employment, including developing a résumé, making contacts, and practicing interview skills (RSA, 2006). This variable was coded as 0 = did not receive job search assistance and 1 = did receive job search assistance.

10. *Job placement assistance* is a dichotomous variable that indicates a particular job resulting in an interview, regardless if the consumer achieved the job (RSA, 2006). This variable was coded as 0 = did not receive job placement assistance and 1 = did receive job placement assistance.

11. *Transportation* is a dichotomous variable that refers to services including efficient training in the use of public transportation and assistance with travel-related expenses needed to participate in vocational rehabilitation services (RSA, 2006). This variable was coded as 0 = did not receive transportation services and 1 = did receive transportation services.

12. *Maintenance* is a dichotomous variable that refers to monetary assistance for expenses beyond normal, such as expenses for food, shelter, and clothing, and that are needed for participation in vocational rehabilitation services (RSA, 2006). This variable was coded as 0 = did not receive maintenance services and 1 = did receive maintenance services.

13. *Rehabilitation technology* is a dichotomous variable that refers to the “systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of, and address the barriers confronted by, individuals with disabilities in areas that include education, rehabilitation, employment, transportation, independent living, and recreation” (RSA, 2006, p. 27). These services include rehabilitation engineering services, assistive technology devices, and assistive technology services (RSA, 2006). This variable was coded as 0 = did not receive rehabilitation technology services and 1 = did receive rehabilitation technology services.

14. *Reader services* is a dichotomous variable that refers to services for consumers unable to read print and that may include the transcription of printed

material into Braille or auditory recordings (RSA, 2006). This variable was coded as 0 = did not receive reader services and 1 = did receive reader services.

Outcome Variables

The two outcome variables used in this study were competitive employment and weekly earnings at closure:

1. *Competitive employment* is a dichotomous variable that refers to employment at the time of case closure in an integrated environment, self-employment, or state-managed Business Enterprise Program (RSA, 2006). Such employment should result in earnings at or above minimum wage (RSA, 2006). This variable was coded as 0 = not competitively employed and 1 = competitively employed.

2. *Weekly earnings at closure* is a continuous variable that refers to the amount of money (rounded to the nearest dollar) as a result of a consumer obtaining employment (RSA, 2006). This amount includes all wages, salaries, tips, and commissions received as income before payroll deductions of federal, state, and local income taxes and Social Security payroll tax (RSA, 2006).

Data Analysis

Coding Variables

The Statistical Package for the Social Sciences (SPSS) was used to perform the computations for the data analysis. To begin this process, descriptive statistics, including frequency, mean, median, and standard deviation, were computed for each

variable. Based on this output, the variables were then recoded into either categorical or dichotomous forms. The categorical variables were further recoded to have “dummy” codes in order to meet the requirements of logistic regression (Chan, 2004b; Tabachnick & Fidell, 1996).

The dichotomous variables were coded with a value of 0 to reflect the reference group and a value of 1 to reflect the response group (Chan, 2004b; Hosmer & Lemeshow, 2004; Tabachnick & Fidell, 1996). For most of the dichotomous consumer demographic variables, the reference group was based on the category with the highest number of responses (Chan, 2004b). For example, when looking at race or ethnicity, the White group was the reference group, as this response had the highest frequency. However, for the dichotomous case service variables, the response group reflected those individuals receiving a particular service. For example, those consumers receiving college training were in the response group, and those individuals not receiving this service were in the reference group. Based on this recoding, the consumer demographics increased by 6, reflecting a final count of 20 variables. In addition to the 20 consumer demographic covariates, there were 14 case service variables, for a total of 34 predictors in this study.

Sampling Process

After the recoding process, descriptive statistics were computed again for all the variables (see Appendix A). The output revealed that many of the response values were very low for the case services, with an overall range of 2–57% of the cases being in the response group from the total population of 25,574 cases. Only 3 of the

14 case services selected for this were received by more than 20% of the overall population. These services included vocational rehabilitation counseling and guidance (57%), rehabilitation technology (27%), and transportation services (23%). Because of this discovery, cases were selected from the response groups for each case service variable. During the first sampling process, cases from the response groups of the case service variables were going to compose the sample. However, many of the cases in this sample were missing data. Consequently, a new sampling process began. In the next sampling process, cases were only selected if there was not any missing data on the 34 predictor variables of interest in this study. This produced a sample size of 3610 cases without missing data from the original population of 25,574 cases.

Logistic Regression

Logistic regression was used to answer Research Question 1 for this study, regarding the variables related to competitive employment. This method was chosen because logistic regression allows for the prediction of dichotomous variable outcomes based on covariates that are continuous, discrete, dichotomous, or categorical in nature (Tabachnick & Fidell, 1996). In addition, the conditional mean of the logistic regression equation must be between the values of 0 and 1 (Hosmer & Lemeshow, 2004). For this study, the binomial distribution explained the dispersion of the errors and represented the statistic that was the basis for the data analysis (Hosmer & Lemeshow, 2004).

Significance within the logistic regression can be determined by examining the *p*-values, and importance of the significance can be explained further by the Wald

statistic and odds-ratio values for the predictor variables (Chan, 2004b; Hosmer & Lemeshow, 2004; Tabachnick & Fidell, 1996). For this study, all three of these values were used to examine significance and importance of the variables related to competitive employment outcomes. Furthermore, in this study, the Wald statistic was attained by SPSS, representing a comparison of the maximum likelihood estimate of the slope parameter to the estimate of its standard error (Hosmer & Lemeshow, 2004). The Wald statistic is used to determine the importance of each variable, and the larger the value, the more impact the covariate has on the logistic model (Chan, 2004b). For this study, in order to determine the importance of the relationship of the covariates to the outcome, the odds ratio was used, as a majority of the predictor variables were dichotomous (Hosmer & Lemeshow, 2004). Hosmer and Lemeshow's goodness-of-fit chi-square test was used to test the fit of the model.

Multiple Regression

Multiple regression was used to answer Research Question 2, regarding the variables related to weekly earnings at closure. Multiple regression was chosen because this method allows for the prediction of a continuous variable outcome based on several covariates that are continuous or dichotomous (Tabachnick & Fidell, 1996). In a multiple linear regression model, the residual of each observation results from the difference between the observed and fitted values of the regression line (Chan, 2004a). For a multiple linear regression to be valid, three assumptions must be clarified based on the residuals: (a) no outliers, (b) independent data points, and (c) normal distribution (Chan, 2004a; Tabachnick & Fidell, 1996).

In order to check the assumptions of the residuals for the multiple linear regression, SPSS was utilized. If the sample size is greater than 1000, then a standardized residual minimum or maximum of plus or minus 3.3 would indicate that outliers existed (Tabachnick & Fidell, 1996). To examine if there were any outliers, a casewise diagnostics was produced through SPSS (Chan, 2004a). Based on the casewise diagnostics, an attempt was made to remove all the outliers. The Durbin-Watson estimate was used to determine if the data points were independent (Chan, 2004a). This estimate ranges from 0–4, where values closest to 0 indicated a strong positive relationship, and values nearest 4 suggested a strong negative relationship (Chan, 2004a). For the data points to have appeared independent, the Durbin-Watson value needed to be closest to 2 (Chan, 2004a). If the Durbin-Watson estimate for this study suggested a relationship between variables, an attempt would be made to remove these covariates. To check further for independence, a histogram and normal probability plots were constructed by SPSS (Chan, 2004a). Unlike logistic regression, in a multiple linear regression the residuals need to reflect a normal distribution, with an error mean of zero and a constant variance (Chan, 2004a; Hosmer & Lemeshow, 2004; Tabachnick & Fidell, 1996). To check for constant variance a scatter plot was produced through SPSS with the standardized residual and the regression standardized predicted value (Chan, 2004a). In order to assume that the variance is constant, the data points in the scatter plot should show no pattern (Chan, 2004a; Tabachnick & Fidell, 1996).

In this study, significance of the covariates was examined through p -values less than .0001, and the importance of these variables was determined by the unstandardized coefficients (B) at the 95% confidence interval (CI) and the standardized coefficients (β) (Chan, 2004a). The unstandardized coefficients (B) at the 95% CI reflected the comparison of the reference with the response group of each variable in this study to determine to what extent the covariates were related to the outcome (Chan, 2004a). Those variables with higher absolute values for the standardized coefficients (β) were seen to have had the most impact on the multiple regression model (Chan, 2004a). Furthermore, the R assesses the relationship of the observed values of the outcome variables and the predicted value based on the regression line (Chan, 2004a). The adjusted R square was used for this study, as the R square has a tendency to be an overestimate of the population parameter (Chan, 2004a).

CHAPTER 4

RESULTS

The purpose of this study was to examine the variables that were related to competitive employment outcomes and earnings at closure for individuals with blindness or visual impairments using the RSA 911 data file from Fiscal Year 2006. Specifically, the relationships were examined between demographics, service provisions, earnings at closure, and successful employment outcomes for individuals with blindness or visual impairments who participated in vocational rehabilitation services. The research questions for this study were the following:

1. Among individuals with blindness or visual impairments who have received services from state vocational rehabilitation agencies, which demographic and service variables best predict competitive employment attainment?

2. Among individuals with blindness or visual impairments who have received services from state vocational rehabilitation agencies, which demographic and service variables best predict amount of earnings at closure?

Research Question 1

Description of Sample

Consumer demographics. The sample represented in Research Question 1 had 3,610 cases. When examining the frequency and valid percentages, inferences could be made about the sample with regards to the consumer demographics (see Table 2).

Table 2

Frequency and Percentage of Consumer Demographic Variables, Research Question 1

Variable	Frequency	Valid percentage
Age		
0–36 years, coded 1	808	22.4
37–50 years, coded 2	1,112	30.8
51–65 years, coded 3	1,690	46.8
Gender	1,881	52.1
Race and ethnicity	796	22.0
Source of referral	2,065	57.2
Secondary education	102	2.8
IEP	420	11.6
Living arrangements	123	3.4
Severity of vision loss	1,862	51.6
Secondary disability	3,610	100.0
Type of secondary disability	2,672	74.0
Weekly earnings at application	1,467	40.6
Receipt of SSI	620	17.2
Receipt of SSDI	960	26.6
Receipt of Medicaid	864	23.9
Receipt of Medicare	723	20.0
Level of education		
Elementary (Coded1)	668	18.5
High school (Coded 2)	1,271	35.2
Postsecondary (Coded3)	1,671	46.3

Note. $N = 3,610$.

More consumers in the sample were aged 37–50 (coded 2), at 31%, than 36 or younger (coded 1), at 22%. However, the largest proportion (47%) was the group

aged 51–65 (coded 3). A somewhat even dispersion appeared between males (48%) and females (52%) in the sample. A large majority of the group (78%) self-identified with the race and ethnicity group of White. Severity of vision loss had an even dispersion of consumers with blindness (48%) and visual impairments (52%).

In terms of source of referral, 43% self-referred and 57% identified other sources, such as educational institutions and medical professionals, as the source of referral. Almost all of the group did not primarily attend special education (97%) and thus did not receive services based on an IEP (88%). Almost the entire group also lived in private residents (97%). Those consumers who self-identified as having a secondary disability primarily had other physical impairments (74%). More consumers reported not having any weekly earnings at application (60%) than those with earnings (41%). A large majority of consumers reported not receiving support from SSI (83%) or SSDI (73%) and thus did not receive Medicaid (76%) or Medicare (80%).

Case services. When looking at the frequencies and valid percentages of the case service variables, inferences could be made about the sample (Table 3). Many of the consumers in this sample did not receive services, as less than 25% of respondents received 10 of the 14 case services: (a) college training (9%), (b) occupational or vocational training (10%), (c) on-the-job training (6%), (d) basic academic or literacy training (2%), (e) job-readiness training (11%), (f) miscellaneous training (23%), (g) job-search assistance (20%), (j) job-placement assistance (22%), (k) maintenance (15%), and (l) reader services (2%). However, the receipt of vocational rehabilitation

counseling and guidance was significantly higher, with 76% of the sample receiving this service. Disability-related augmentative skills were received by 35% of the sample. Transportation services were received by 30% of the sample, and rehabilitation technology was provided to 40% of the sample.

Table 3

Frequency and Percentage of Case Service Variables, Research Question 1

Case service variable	Frequency	Valid percentage
Counseling and guidance	2,759	76.4
College training	326	9.0
Vocational training	355	9.8
On-the-job training	210	5.8
Basic academic training	74	2.0
Job readiness	410	11.4
Disability skills training	1,265	35.0
Miscellaneous training	837	23.2
Job search	716	19.8
Job placement	782	21.7
Transportation	1,064	29.5
Maintenance	531	14.7
Rehabilitation technology	1,457	40.4
Reader services	78	2.2

Note. $N = 3,610$.

Data Analysis

In order to answer Research Question 1, logistic regression was performed to determine if any of the 34 consumer demographic and case service variables was

significantly related to the competitive employment outcome. Before beginning the logistic regression, a correlation matrix was constructed based on all 34 consumer demographic and case service variables to determine if any multicollinearity existed among the covariates (Chan, 2004b; Tabachnick & Fidell, 1996). Based on this correlation matrix, variables with correlations of 0.9 or greater would be removed from the logistic regression model (Tabachnick & Fidell, 1996). There were no correlations that had values of 0.9 or greater in this model, so no variables were removed for multicollinearity. The presence of a secondary disability variable was seen as a constant and was omitted from the model.

Variables were also excluded from the logistic regression model if their reference or response valid percentage was 90% or greater, to reduce outliers (Tabachnick & Fidell, 1996). These six excluded variables were (a) type of secondary education, (b) living arrangement at application, (c) vocational or occupational training, (d) on-the-job training, (e) basic academic remedial or literacy training, and (f) reader services. Even though college training had a reference frequency of 91%, it was not removed, due to interest in this covariate's importance to predict competitive employment. Two other variables were omitted because they did not meet the requirements of SPSS for the logistic model: (a) age (51–65 years old, coded 2) and (b) level of education at closure (postsecondary education, coded 3). Based on the above omission of variables, there was a final count of 25 consumer demographic and case service variables included in the results of the logistic model.

There were 3,610 cases examined with 29 consumer demographic and case service variables through the logistic model. A power analysis was conducted to determine the effect size. The power analysis revealed an effect size of .076 with an overall power of .80 and an alpha level of .0001. Because of the large sample, the logistic regression model was very sensitive and had the ability to reveal the slightest difference between the sample findings and the null hypothesis, even with a very small effect size (Murphy, 2004). The small effect size was deemed acceptable, because such low values have been argued to have scientific and practical importance (Maxwell, Kelley, & Rausch, 2008). The Nagelkerke *R* square of .542 indicated that 54% of the variation of the competitive employment was explained by the logistic model. The overall accuracy of this logistic model to predict competitive employment outcomes is 86%, based on a predicted probability of .5 or greater. The sensitivity was slightly higher at 93% and lower at 65%. The fit of the model was assessed using the Hosmer and Lemeshow goodness-of-fit chi-square test, which had a value of 13.73 ($p = .089$).

Because of the large number of covariates, many of the consumer demographic and case service variables were found to be statistically significant in relation to the competitive employment outcome. Due to the large number of significant predictors, the Wald statistic and odds ratios for only those variables with the most impact on the logistic model are discussed.

Outcome variable. Of the 3,610 cases, 2,742 consumers had achieved competitive employment outcomes. Those cases with competitive employment at

closure represented consumers who had part-time or full-time employment in integrated environments, self-employment, or a state-managed Business Enterprise Program (RSA, 2006). In addition, these consumers have earnings at or above minimum wage (RSA, 2006). The remaining 868 consumers in the sample did not achieve competitive employment at the time of closure. Based on a histogram presenting the distribution of competitive employment within the sample, the outcome variable appeared to be positively skewed.

Consumer demographics. Of the 13 consumer demographic variables included in the logistic model, 6 covariates were found to be statistically significant ($p < .0001$) in relation to competitive employment outcomes (see Table 4): (a) age (0–36 years old, coded 1), (b) gender, (c) source of referral, (d) severity of vision loss, (e) weekly earning at application, and (f) receipt of Medicaid.

Table 4

Significant Consumer Demographic Variables, Research Question 1

Variable	Wald	Exp (B)	Sig.
Age (0–36 years old)	43.3875	3.0617	0.0000
Gender	34.8262	0.5329	0.0000
Source of referral	40.5934	0.4942	0.0000
Severity of vision loss	35.8211	2.0070	0.0000
Weekly earning at application	365.1675	15.4017	0.0000
Receipt of Medicaid	27.7594	0.4826	0.0000

Based on the Wald statistic, the six covariates showing the most impact on the logistic model were (a) weekly earning at application (Wald = 365.17), (b) age (0–36

years old, coded 1; Wald = 43.39), (c) source of referral (Wald = 40.59), (d) severity of vision loss (Wald = 35.82), (e) gender (Wald = 34.83), and (f) receipt of Medicaid (Wald = 27.76). These six variables were more probable to predict competitive employment outcomes, due to odds ratios values of 2 or greater. Weekly earning at application was found to be 15 times more probable to predict competitive employment. Age (0–36 years old, coded 1) was found to be 3 times more probable to predict competitive employment. Severity of vision loss was found to be twice as likely to predict competitive employment, with consumers with lesser vision loss being more likely to find such employment. Those consumers who self-referred for services were twice as probable to have a competitive employment outcome. Similarly, males were twice as likely as females to reach the competitive employment outcome. Also, consumers not receiving Medicaid were twice as likely as those receiving Medicaid to reach competitive employment. Based on these results, the most significant predictors of competitive employment were weekly earnings at application, age of 36 or younger, source of referral (self-referral), gender (male), severity of vision loss, and not receiving Medicaid.

Case services. Of the 10 case service variables represented in this logistic model, 4 covariates were found to be statistically significant ($p < .0001$) in relation to competitive employment outcomes (see Table 5): (a) disability-related augmentative skills training, (b) miscellaneous training, (c) job-placement assistance, and (d) maintenance. Based on the Wald statistic, the top 4 case service variables found to impact the overall logistic model were (a) job-placement assistance (Wald = 101.94),

(b) disability-related augmentative skills training (Wald = 56.92), (c) miscellaneous training (Wald = 25.88), and (d) maintenance service (Wald = 24.94).

Table 5

Significant Case Service Variables, Research Question 1

Variable	Wald	Exp(B)	Sig.
Disability skills training	56.9213	0.4226	0.0000
Miscellaneous training	25.8797	0.5366	0.0000
Job placement	101.9441	9.1604	0.0000
Maintenance	24.9359	2.4616	0.0000

Four of the case service variables were more probable to predict competitive employment outcomes, due to odds ratios values of 2 or greater. Job-placement assistance was found to be 9.0 times more probable to predict competitive employment outcomes. Receipt of maintenance was found to be 2.5 times more probable to predict competitive employment outcomes. Compared to consumers receiving disability-related augmentative skills training, those consumers who did not receive this service were predicted to be 2.5 times more likely to achieve competitive employment outcomes. Similarly, compared to consumers receiving miscellaneous training, those consumers who did not receive this service were predicted to be twice as likely to reach competitive employment outcomes. Based on these findings, the four most significant predictors of competitive employment were (a) job-placement assistance, (b) maintenance services, (c) disability-related augmentative skills training, and (d) miscellaneous training.

Research Question 2

Description of Sample

Consumer demographics. There were 2,320 cases represented in the sample for Research Question 2. When looking at the frequencies and valid percentages of the consumer demographics, inferences could be made about the sample (see Table 6). An even dispersion existed among the younger consumers in age: those aged 36 or younger were 26% of the sample, and those aged 37–50 were 29% of the sample. However, those aged 51–65 comprised 44% of the sample. There was an even dispersion among those consumers self-identifying as male (50%) and female (50%). A large majority (76%) of the consumers self-identified with the race or ethnicity of White. More consumers had a primary disability of visual-impairment (60%) than those with blindness (40%). Most also reported a secondary disability of physical impairments (72%).

Based on the referral source, 45% of the sample self-referred and 54% of the sample reported using other sources, such as educational institutions and medical professionals, for referral sources. Almost all of the consumers reported not primarily attending special education (97%) and thus did not receive services on an IEP (86%). Also, almost all of the sample reported living in private residences at the time of application (97%). An even dispersion existed between those consumers reporting weekly earnings at application (50%) and those not reporting weekly earnings at application (50%). Many of the consumers did not receive monthly public support from SSDI (77%) or SSI (87%) and subsequently also did not receive Medicaid

(82%) or Medicare (82%). Finally, 46% of the sample reported achieving some type of postsecondary education (see Table 6).

Table 6

Sample Frequency and Percentage of Consumer Demographic Variables, Research Question 2

Variable	Frequency	Valid percentage
Age		
0–36 years, coded 1	606	26.1
37–50 years, coded 2	685	29.5
51–65 years, coded 3	1,029	44.4
Gender	1,156	49.8
Race and ethnicity	554	23.9
Source of referral	1,264	54.5
Secondary education	65	2.8
Individualized Education Program	293	12.6
Living arrangements	69	3.0
Severity of vision loss	1,388	59.8
Secondary disability	2,320	100.0
Type of secondary disability	1,666	71.8
Weekly earnings at application	1,157	49.9
Receipt of SSI	307	13.2
Receipt of SSDI	530	22.8
Receipt of Medicaid	418	18.0
Receipt of Medicare	405	17.5
Education		
Elementary (coded 1)	419	18.1
High school (coded 2)	832	35.9
Postsecondary (coded 3)	1,069	46.1

Note. $N = 2,320$.

Case services. When examining the frequencies and valid percentages of the case service variables, further inferences could be made about the sample. Many of the consumers in this sample did not receive services, as 9 of the 14 case service variables in this multiple linear model were received by fewer than 25% of the sample. These 9 services were (a) college training (10%), (b) occupational or vocational training (11%), (c) on-the-job training (8%), (d) basic academic or literacy training (2%), (e) job-readiness training (13%), (f) miscellaneous training (19%), (g) job-search assistance (24%), (h) maintenance (17%), and (i) reader services (2%). However, vocational rehabilitation counseling and guidance was received by 76% of the sample, making this the most frequently received service. Rehabilitation technology services were received by 35%, of the sample followed by transportation services at 30%, job-placement services at 28%, and disability-related augmentative skills training at 27% (see Table 7).

Table 7

*Frequency and Percentage of Case Service Variables,
Research Question 2*

Variable	Frequency	Valid percentage
Counseling and guidance	1,763	76.0
College training	232	10.0
Vocational training	264	11.4
On-the-job training	177	7.6
Basic academic training	44	1.9
Job readiness	293	12.6
Disability skills training	619	26.7
Miscellaneous training	453	19.5
Job search	564	24.3
Job placement	645	27.8
Transportation	707	30.5
Maintenance	398	17.2
Rehabilitation technology	816	35.2
Reader services	49	2.1

Note. $N = 2,320$.

Data Analysis

In order to answer Research Question 2, a multiple linear regression was performed to determine if any of the 36 consumer demographics and case service variables were significantly related to weekly earnings at closure outcomes. All those consumers who had competitive employment outcomes were chosen for this model, which gave a beginning sample of 2,742 cases. Before performing the multiple linear regressions, collinearity was examined for all of the 34 consumer demographic and

case service variables. Based on the correlation matrix, variables with correlations of 0.9 or greater would be removed from the multiple regression model (Tabachnick & Fidell, 1996). Correlations were not found that had values of 0.9 or greater in this model, so no variables were removed. Two variables removed due to not meeting the requirements of SPSS were (a) age (51–65 years old, coded 3), and (b) level of education at closure (postsecondary education, coded 3)

To meet the assumption of the multiple linear regression (Chan, 2004a; Tabachnick & Fidell, 1996), the model was examined for outliers so that they could be removed. Dichotomous variables were omitted if their reference or response valid percentage was 90% or greater to reduce outliers. These six variables were (a) type of secondary education, (b) living arrangement, (c) presence of a secondary disability, (d) on-the-job training, (e) basic academic remedial or literacy training, and (f) reader services. Even though college training had a reference frequency of 91%, it was not removed, due to interest in this covariate's importance to predict earnings at closure. In addition, the standardized residual statistics were examined for any outliers in the sample (Chan, 2004a; Tabachnick & Fidell, 1996). If the standardized residual maximum or minimum statistic for the overall sample was above plus or minus 3.3, then the outliers were removed.

The removal of outliers brought about an issue with the multiple linear regression model. When the outliers were removed and the multiple linear regression was performed, the Durbin-Watson became much smaller, indicating a very strong positive relationship among the variables. For example, when individual cases with a

standardized residual more than a value of 3.00 were removed from the sample, this produced a standardized residual minimum of 2.40 and a maximum of 4.10 and a Durbin-Watson of 0.03 for the overall sample. These statistical values suggested that some outliers existed, and there was a strong positive relationship among the variables. Similar results occurred when conducting a stepwise linear regression with cases being removed if their standardized residual statistic was above 3.00. This stepwise linear regression resulted in a standardized residual minimum of 2.34, a maximum of 4.21, and a Durbin-Watson of 0.04 for the overall sample, indicating the presence of outliers and a strong positive relationship among the variables.

Many trials were conducted, removing cases based on various individual values of the standardized residual statistic in the hope of removing the outliers and keeping the independence of the variables, so as to meet all the assumptions of the multiple linear regression model (Chan, 2004a). However, all the assumptions were not met, due to the problems with removing all the outliers. Thus, the results for Research Question 2 are based on the multiple linear regression model, with only those cases having a standardized residual statistic less than plus or minus 1.00, which resulted in the removal of 422 cases from the original 2,742 cases with competitive employment outcomes. This resulted in a standardized residual minimum value of -2.39 and a maximum value of 3.33 for the overall sample, suggesting that a majority of the outliers had been removed. However, the Durbin-Watson value of 0.24 implied that a strong positive correlation existed among the variables in the sample.

Due to the omission of variables because of correlations, outliers, constants, and low frequencies, 28 consumer demographic and case service variables were examined. Also, after the attempt to remove the outliers, the new sample size was 2,320 cases. The power analysis for the multiple regression revealed an effect size of .94, with overall power set at .80 and an alpha level of .0001. As with the previous case, low effect sizes have been argued to have scientific and practical importance (Maxwell et al., 2008).

Based on the R square of 16% and the adjusted R square value, only 15% of the weekly earnings at closure outcome was explained by the 28 consumer demographic and case service variables. The scatter plot of standardized residual versus standardized predicted values indicated no clear pattern, suggesting that the variance was constant. However, due to the standardized residual and Durbin-Watson values, all the assumptions were not met for this model.

Because of the large number of covariates, many of the consumer demographic and case service variables were found to be statistically significant in relation to predicting weekly earnings at closure. Due to the large number of significant predictors, the unstandardized coefficients (B) at the 95% CI for variables with the most impact are discussed. In addition, the standardized coefficients (β) for the variables with the most influence on the model are discussed.

Outcome variables. All 2,320 consumers in the sample in Research Question 2 had weekly earnings at closure at or above the minimum wage level. The mean weekly earning at closure was \$278.56. The mean hours worked per week were

30.59, which gave a mean of \$9.11 per hour for the weekly earning outcome. The median weekly earning at closure was \$254.00. The range was \$585.00, with a minimum value of \$45.00 and a maximum of \$630.00 for weekly earnings at closure. In the histogram representing the weekly earning distribution and the values of the mean and median, the outcome variable appeared to be positively skewed.

Consumer demographics. Of the 13 consumer demographic variables in this multiple linear model, 5 were found to be statistically significant ($p < .0001$) in relation to weekly earnings at closure (see Table 7): (a) gender, (b) weekly earnings at application, (c) receipt of SSDI, (d) level of education at closure (elementary education, coded 1), and (e) level of education at closure (high school education, coded 2). Compared to consumers with an elementary education, consumers with higher levels of education had on average an increase of \$58.27 (95% CI -73.20 to -43.35) in their weekly earning at closure potential. Similarly, compared to consumers with a high school education, consumers with higher levels of education had on average an increase of \$33.95 (95% CI -45.68 to -22.22) in weekly earning at closure. Compared to consumers receiving SSDI, consumers who did not receive this public support had an average increase of \$46.48 (95% CI -62.78 to -30.18) in weekly earning at closure prospective. For those consumers self-identifying as male, there was an average increase of \$46.19 (95% CI -56.35 to -36.03) in weekly earning at closure capability in comparison with females. Persons with weekly earnings at application had an average increase of \$29.97 (95% CI 18.45 to 41.48) in their earnings potential.

Based on the absolute value of the standardized coefficients (β), the five consumer demographic variables with the most influence on weekly earning at closure were (a) level of education at closure (elementary education, coded 1; $\beta = .17$), (b) gender ($\beta = .17$), (c) receipt of SSDI ($\beta = .15$), (d) level of education at closure (high school education, coded 2; $\beta = .12$), and (e) weekly earnings at application ($\beta = .11$). Thus, the consumer demographic variable with the greatest impact on weekly earning at closure capability was level of education at closure (elementary education, coded 1). See Table 8.

Table 8

Significant Consumer and Case Service Variables, Research Question 2

Variable	Unstandardized coefficient <i>B</i>	Standardized coefficient Beta	95% CI for <i>B</i>	
			Lower bound	Upper bound
Demographic variables				
Gender	-46.1902	-0.1740	-56.3518	-36.0286
Weekly earning at application	29.9686	0.1129	18.4519	41.4853
Receipt of SSDI	-46.4809	-0.1471	-62.7786	-30.1833
Elementary education (coded 1)	-58.2752	-0.1689	-73.2029	-43.3475
High school education (coded 2)	-33.9547	-0.1227	-45.6821	-22.2272
Case service variable				
Disability skills training	-26.3817	-0.0879	-38.9778	-13.7857

Note. Sig. = 0.0000 for all variables.

Case services. Of the 11 case service variables, 1 was found to be statistically significant ($p < .0001$) in relation to weekly earnings at closure (see Table 8):

disability-related augmentative skills training. Compared to consumers who received disability-related augmentative skills training, consumers who did not receive this service had an average increase of \$26.38 (95% CI -38.98 to -13.79) in their weekly earning potential. The absolute value of the standardized coefficients (β) revealed the significant case service variable's overall impact on weekly earning at closure, with disability-related augmentative skills training having the most impact ($\beta = .09$). Due to these statistics, the case service variable with the most impact on weekly earning at closure was disability-related augmentative skills training.

CHAPTER 5

DISCUSSION

The purpose of this study was to examine the variables that were related to competitive employment outcomes and earnings at closure for individuals with blindness or visual impairments, using the RSA 911 data file from Fiscal Year 2006. Specifically, the relationships were examined between demographics, service provisions, earnings at closure, and competitive employment outcomes for individuals with blindness or visual impairments who participated in vocational rehabilitation services. This final chapter discusses the major findings of this study in relation to (a) previous research, (b) limitations, and (c) implications for practice and future research.

Relevance of the Study Findings With Past Literature

In Research Question 1, a total of 3,610 cases were examined based on the cases closed during Fiscal Year 2006. Of this number, 2,742 cases were closed in competitive employment. For Research Question 2, a total of 2,320 cases were examined that were closed in competitive employment. Of this number, all the participants had some type of earnings at closure. The following section is a discussion of the findings of the research questions.

Research Question 1

Based on the findings of Research Question 1, the six most important demographic variables related to competitive employment were (a) weekly earnings at application, (b) age, (c) source of referral, (d) gender, (e) severity of vision loss, and (f) receipt of Medicaid. Specifically, individuals with weekly earnings at application, 36 years old or younger, who were self-referred, who had vision impairment rather than blindness, and who did not receive Medicaid were more likely to achieve competitive employment.

Previous research conducted with individuals aged 55 years and older with blindness or visual impairments suggested earnings at application, severity of vision loss, and age were predictors of competitive employment (Cavanaugh & Rogers, 2002). Though this present study did not include major findings about individuals aged 55 years and older, the results were similar to Cavanaugh and Rogers's research in that earnings at the time of application were significantly related to competitive employment outcomes. In addition, comparable to Cavanaugh and Rogers's research, the present study found that being younger in age had an impact on the prediction of competitive employment. The results revealed that individuals aged 36 or younger were more likely to achieve competitive employment than those aged 51–65. This study further indicated that lessened severity of vision loss was an important predictor of competitive employment (Cavanaugh & Rogers, 2002).

Similar to previous research, the finding of this study suggested that receipt of Medicaid had a negative impact on competitive employment. This finding indicated

that as a consumer went from receiving Medicaid to not receiving this public program, the individual was more likely to become competitively employed. Such a finding supported previous research suggesting that persons do not want to rely on public programs (Young, 1995). The finding of this study also reinforced previous research (O'Day, 1999) that indicated that public programs resulting from the receipt of SSI or SSDI presented barriers to employment for individuals with blindness or visual impairments. However, unlike other previous research (Fields, 2004; Leonard et al., 1999), this study found that those individuals who were visually impaired were more likely to achieve competitive employment compared to persons with blindness.

The results of this present study add to previous research by the discovery of gender and referral source as predictors to competitive employment. Even though Capella-McDonnall (2005) examined gender as a predictor, the results did not indicate this variable as being related to competitive employment for individuals with blindness or visual impairments. However, the present study found that gender was important: males were predicted to be more likely to achieve competitive employment outcomes. Furthermore, referral source was not previously thought of as a predictor of competitive employment. The results from this study suggest that self-referrals for vocational rehabilitation services had an impact on predicting the achievement of competitive employment outcomes. Such a finding may indicate that those individuals more focused on obtaining competitive employment are more likely to meet this goal.

Though the variable of race and ethnicity was not found to be related to competitive employment for the present study, special emphasis needs to be made on the representation of consumers from culturally and linguistically diverse backgrounds in the sample. The racial and ethnic composition of this sample reinforced previous research in that a large majority of this group self-identified with the race or ethnicity of White. Previous research (Cavenaugh & Steinman, 2006) indicated that more White individuals with blindness or visual impairments were accepted for services than persons from the African American, Hispanic American, and Native American races or ethnicities. Therefore, the results of the present study reiterate previous research suggesting more White consumers receive services from vocational rehabilitation counselors that leads to competitive employment outcomes.

In this study, the four most important case service predictors of competitive employment were (a) job placement assistance, (b) maintenance services, (c) disability-related augmentative skills training, and (d) miscellaneous training. Specifically, receipt of job-placement assistance and maintenance services predicted competitive employment; receipt of disability-related augmentative skills training and miscellaneous training had a negative impact on competitive employment.

A subset of the service of disability-related augmentative skills training is the teaching of orientation and mobility and of Braille. Braille skills and proficiency in both orientation and mobility have been indicators of competitive employment for individuals with blindness or visual impairments (Bohman, 1993; Crudden et al., 1998; Fields, 2004; Leonard et al., 1999). In addition, gaining proficiency in

orientation and mobility skills has been proven to be a strategy for obtaining and maintaining employment for persons who are blind or visually impaired (Crudden, 2002; Crudden & McBroom, 1999; Crudden et al., 1998; Crudden et al., 2002; Sikka & Stephens, 1997; Young, 1995). In addition, having the ability to use Braille efficiently has been seen as a method to obtain and retain employment (Crudden & Fireison, 1997; Crudden & McBroom, 1999; Crudden et al., 1998; Kirchner et al., 1997; Sikka & Stephens, 1997; Young, 1995). However, in the present study, disability-related augmentative skills training was seen as having a negative impact in relation to competitive employment. Compared to consumers not receiving disability-related augmentative skills training, consumers receiving this service were less likely to obtain competitive employment. Therefore, the current study contradicts previous research indicating the provision of disability-related augmentative skills training as an effective method to obtain and retain competitive employment.

Capella-McDonnall (2005) investigated case service provisions by vocational rehabilitation counselors as a predictor to competitive employment. The findings of the present study revealed that job-placement assistance, maintenance services, and miscellaneous training are important in the prediction of competitive employment outcomes for individuals with blindness or visual impairments. The receipt of job-placement assistance and maintenance were also positively correlated to competitive employment outcomes. However, a consumer receiving miscellaneous training was significantly less likely to achieve competitive employment. This finding suggests that the receipt of miscellaneous training is not beneficial, but that job-placement

assistance and maintenance are effective services for consumers to achieve competitive employment.

In terms of those consumer demographic and case service variables that had a negative impact on the relationship with competitive employment outcomes, further clarification should be given. Though relevant with past literature, the finding that consumers not receiving Medicaid were more probable to achieve employment outcomes may be related to other variables not found to be important in this study. Perhaps those individuals not receiving Medicaid had higher levels of education, which also has been found in previous research (Capella-McDonnall, 2005; Leonard et al., 1999) to be predictors of competitive employment. In addition, those consumers who did not receive disability related augmentative skills training or miscellaneous training were more probable to achieve competitive employment, which contradicts previous research. However, this finding does not take into consideration that those individuals receiving these services might be older in age, which has been shown by previous research (Capella-McDonnall, 2005; Cavanaugh & Rogers, 2002) to have a negative impact on competitive outcomes. Therefore, these findings can have alternate interpretations.

Research Question 2

The findings of this study suggest that the five most important consumer demographic variables related to of weekly earnings at closure are (a) gender, (b) weekly earnings at application, (c) receipt of SSDI, (d) level of education at closure (elementary education), and (e) level of education at closure (high school education).

Specifically, higher levels of education led to increased earnings. Those not receiving monthly support from SSI or SSDI were more likely to have increased income. Males had a higher earning potential than females.

Similar to Capella (2001), this study found an important relationship between level of education and weekly earnings at closure. These findings suggest that compared to consumers with lower levels of education, consumers with higher levels of education had an increase of earning potential. Consequently, as a person with blindness or visual-impairment obtained greater levels of education, earning capacity increased. Similarly, these results indicated that monthly public support of SSI was a negative, significant predictor of weekly earnings outcomes. Those individuals not receiving monthly support from SSI or SSDI were more likely to have higher earnings than those benefiting from this public program. This finding is supported by previous research that indicated consumers did not want to depend on public programs (Young, 1995). These results also support previous research (O'Day, 1999) suggesting receiving SSDI benefits is a barrier to employment.

The results of this present study enhanced previous research conducted by Capella (2001) investigating the predictors of earnings for consumers with blindness or visual impairments. Capella examined consumer demographics in relation to the prediction of earnings but did not have gender and earnings at application as variables. The present study took the Capella study one step further and not only included gender and earnings at application as variables, but also found that these covariates were important in predicting earnings at closure. Results indicated that

males had a higher earning potential than females. Such findings suggest that gender has been an important factor in the earning capacity of individuals with blindness or visual impairments. Furthermore, the findings revealed that individuals with some amount of earnings at application were more probable to have higher wage potentials. Thus, the addition of gender and earnings at application enhanced Capella's previous research by indicating additional consumer demographics that are related to earnings at closure.

As in the case of Research Question 1, the variable of race and ethnicity was not found to be related to weekly earnings at closure. However, the importance of the sample composition should be stressed in terms of the lack of representation of individuals from culturally and linguistically diverse backgrounds. Similar to the sample in Research Question 1, the consumers in this sample primarily self-identified with the White race or ethnicity group. As previously mentioned, Cavanaugh and Steinman (2006) suggested that more White individuals are accepted for services than those from the African American, Hispanic American, and Native American races or ethnicities. The current study reinforces Cavanaugh and Steinman's research, as this sample was not culturally and linguistically diverse.

The results of this study further revealed that the most significant case service related to weekly earnings at closure was disability-related augmentative skills training. Capella (2001) examined the amount and cost of case services that predicted earnings. Capella's research did not investigate any specific service provision related to earning potential. The current study took Capella's research one step further by

examining the case services provided by vocational rehabilitation in relation to predicting weekly earnings at closure for consumers with blindness or visual impairments.

The current study also enhanced Capella's (2001) research by identifying disability-related augmentative skills training as important factors in the prediction of weekly earnings for individuals with blindness or visual impairments. The results of the current study enhance previous research on disability-related augmentative skills training (Bohman, 1993; Crudden et al., 1998; Fields, 2004; Leonard et al., 1999) which indicated the necessity of this service to obtain and maintain employment. However, the present study's findings revealed that receiving disability-related augmentative skills predicted decreased earning potential. Consequently disability-related augmentative skills training was found to have a negative impact on the prediction of earnings at closure.

As in the case of the results from Research Question 1, special emphasis should be given to those consumer demographic and case service variables having a negative impact on earnings at closure outcomes. Perhaps those consumers receiving SSDI benefits were older in age, which has been shown by previous research (Capella, 2001) to have a negative impact on earnings potential. Also, those consumers not receiving disability-related augmentative skills training might have received major funding for other training, which has been shown by previous research (Capella, 2001) to be related to earnings at closure. Thus, these findings with negative

impacts on earnings at closure outcomes may have further interpretations not examined through this study.

Limitations

After examining the results for this study, certain limitations were observed. The study design only examined correlations between consumer demographics, case services, competitive employment, and earnings at closure. This ex post facto study design did not allow for causal relationships to be examined. In addition, the sampling process was limited due to an inability to perform random sampling which did not allow for cross-validation of the results. Random sampling was unable to occur due to low numbers of consumers receiving case services. This inability to perform random sampling caused issues with generalizability, as the sample for this study might not reflect the larger population of individuals with blindness or visual impairments.

As a further limitation, this study only focused on the 2006 fiscal year, which might have been statistically different from other years. In addition, missing values on the selected variables forced a decrease in the available sample. These missing data caused the overall population of 25,574 to decrease to a sample of 3,610 cases containing information on all the selected variables for Research Question 1 of this study. The sample further decreased to 2,320 cases with all the selected variables for Research Question 2. In addition, the results for Research Question 2 were not as valid, because of the inability to meet all the assumptions of a multiple linear

regression (Chan, 2004a; Tabachnick & Fidell, 1996). These assumptions were not met due to the outliers that were unable to be completely omitted, as their removal caused the data to have strong positive correlations. Further limitations of the multiple regression model could have been due to the distribution of the weekly earning outcome, which appeared to be positively skewed.

Other limitations can be drawn from the amount of predictors and sample size of this study. Limitations might have existed due to the ratios of covariates to the outcome variable. With both research questions, there were at least 27 predictors to one outcome variable. This ratio might have caused the outcome variable to appear skewed (Tabachnick & Fidell, 1996). In addition, the amount of cases might have caused further limitations within the study. As the number of cases in the sample for each research question was quite large, there might have been multiple correlations appearing significant, including those that predicted slight variance (Tabachnick & Fidell, 1996).

With regards to the consumer demographics, some limitations existed. There is no information on the relationship of those individuals 51–65 years old and competitive employment and earnings outcomes, as they were removed from both the logistic and multiple linear models. A large majority of the sample for both the logistic and multiple linear models self-identified with the White race or ethnicity, causing the sample to be not culturally and linguistically diverse and not generalizable. The other racial or ethnic groups had to be combined to form the category of other. Such a collapse in this variable might have caused further

limitations to the study. The presence of a secondary disability variable was seen as a constant in both models and was removed, resulting in an inability to determine the effect of a secondary disability on competitive employment and earning outcomes. Those individuals who achieved education beyond the high school level were not represented in either model, so there is inconclusive information from this study about the relationship of people with college education and competitive employment and earnings outcomes.

When examining the case service variables, limitations in this study further existed. For both the logistic and multiple linear models, less than 30% of the sample reported receiving a large majority of the selected case services for this study. As a result, case service variables found to be statistically significant in predicting competitive employment and earning outcomes had low participation values. The case service with the highest participation value was vocational rehabilitation counseling and guidance, which can be seen as a subjective service provision and might have had effects on the construct validity of this study. Due to the subjective nature of this service provision, the rehabilitation counselors could have inadvertently entered the receipt of vocational rehabilitation counseling and guidance into a large majority of the consumers' case files. This entry would have produced a higher proportion of consumers receiving this service than those who actually participated in vocational rehabilitation counseling and guidance. Further limitations existed in defining what was considered to be disability-related augmentative skills training. Though the RSA (2006) coding manual attempted to provide descriptions of the

service provisions, disability-related augmentative skills training represented many types of skills training associated with a person's disability. Because disability-related augmentative skills training was such a broad term, there was no way to determine which particular training was related to competitive employment and earnings capability. Consequently, for some consumers, vocational rehabilitation counselors might have incorrectly reported the receipt of vocational rehabilitation counseling and guidance or disability-related augmentative skills training, as there is no validation of counselor coding for case services.

After further examination of the service variables, other limitations might have existed due to extraneous variables. Such limitations include the quality of services received by a consumer. Some consumers might have received more services than others based on the availability of these service provisions or as a reflection of the job performance of the vocational rehabilitation counselor. Furthermore, some consumers might have received a particular service more frequently than other consumers. There were no steadfast regulations by RSA as to which particular services were to be received by individual consumers and to what frequency these provisions should occur. Rather, the descriptions of these services existed, and these provisions were to occur on an individual, case-by-case basis.

Implications

Practice

The implications for practice should be taken with some caution given the limitations of the current study. However, findings from this study present some important implications for the field of vocational rehabilitation. Due to the large proportion of White individuals found within both samples, vocational rehabilitation counselors should make efforts to reach out to persons from culturally and linguistically diverse backgrounds. Perhaps if more attempts were made to inform individuals from culturally and linguistically diverse backgrounds about the services provided by vocational rehabilitation services, more persons with blindness and visual impairments from minority groups would seek needed assistance to gain and maintain employment. Additionally, vocational rehabilitation counselors should be taught the necessary skills to be culturally inclusive. Therefore, when individuals from culturally and linguistically diverse backgrounds seek the assistance of vocational rehabilitation counselors, they may be more likely to be accepted for services and to receive the needed service provisions to achieve competitive employment.

A stronger collaboration between vocational rehabilitation services and the SSA should be forged. The findings of this study indicated that those individuals not receiving benefits from SSA were more likely to have higher earning potential. In addition, both the samples were composed of more people not having assistance from SSA programs. A better effort to form a relationship with the SSA may lead to more

individuals with blindness or visual impairments being transitioned from receiving assistance from the SSA into competitive employment and receiving benefits from their employers. Furthermore, based on previous research (O'Day, 1999) and the current study, the SSA should provide more information to individuals with blindness or visual impairments on how gaining and maintaining employment would affect their benefits. Information also should be provided on how individuals with blindness or visual impairments can find vocational rehabilitation services and receive the necessary services to achieve successful employment.

Special emphasis should be placed on vocational rehabilitation services providing assistance with educational pursuits to individuals with blindness or visual impairments. The findings of this study revealed that higher education level and the receipt of college or university training were significant predictors of an increased earning capability. Due to these results, vocational rehabilitation counselors should work closely with educators to ensure that consumers have smooth transitions into postsecondary settings or vocational environments. As part of this transitioning process, vocational rehabilitation counselors should assist educators at the secondary level with ensuring that persons with blindness or visual impairments have the needed skills to progress into postsecondary education or employment. For those individuals who transition into postsecondary education, vocational rehabilitation counselors need to ensure that consumers have all the necessary supports to complete their college or university training. In addition, vocational rehabilitation counselors need to form relationships with postsecondary departments, such as services for students with

disabilities. These relationships only can guarantee further that individuals with blindness or visual impairments have the needed services to achieve postsecondary completion and then future job attainment.

Another service that should receive special attention by vocational rehabilitation counselors is disability-related augmentative skills training. Even though disability-related augmentative skills training was found to be negatively correlated with competitive employment and earnings potential in this study, many previous research studies (Bohman, 1993; Crudden et al., 1998; Fields, 2004; Leonard et al., 1999) found this service to be an important predictor of successful employment. In addition, disability-related augmentative skills training is an umbrella term for any training related to a consumer's disability, which includes orientation and mobility and Braille (RSA, 2006). As a limitation of this study, there is no way of determining which disability-related augmentative skills training is negatively related to earnings potential or if there were any other contributing factors, such as onset of vision loss. Therefore, based on the findings of previous research, vocational rehabilitation counselors should make attempts to provide this service to consumers with blindness or visual impairments, as this service provision has been found to predict competitive employment.

Future Research

The findings of the current study also produced implications for future research. Based on the racial and ethnic composition of the samples for this study, future research efforts can focus on determining the reasons for the lack of

participation in vocational rehabilitation services by individuals from culturally and linguistically diverse backgrounds. Instead of collapsing the race or ethnicity variable into two categories containing White and other, future research can examine all the racial or ethnic groups independently. Specifically, research could focus on the rates of acceptance and service provisions for individuals from culturally and linguistically diverse backgrounds with blindness or visual impairments. In addition, future research can examine the comparison of White individuals and persons from culturally and linguistically diverse backgrounds in relation to competitive employment and earning outcomes.

Because of the limited research on earning outcomes for individuals with blindness or visual impairments, future research could investigate further the predictors to employment wage potentials for individuals with blindness or visual impairments. To advance this current study, future studies could focus on only those variables already found to be significant predictors to earning outcomes by this study and previous research. In addition, research could look at only demographic or case services in relation to earning outcomes, unlike the current study, which combined these variables.

The current study only used data from the 2006 fiscal year found in the RSA-911 database. Future research could be longitudinal and examine predictors to competitive employment and earning outcomes for multiple fiscal years. Such research has the potential to uncover patterns in what demographics and service provisions continually predict competitive employment and earning outcomes for

individuals with blindness or visual impairments. This research would assist RSA and vocational rehabilitation counselors in determining which case services are more readily needed by consumers with blindness or visual impairments to achieve employment and higher earning potential.

Because the present study only used the RSA-911 database as the main data source, future research can examine the predictors to competitive employment and earnings outcomes for individuals with blindness or visual impairments by utilizing multiple sources. Such sources could include either interviewing consumers closed in competitive employment or survey research with persons closed with successful employment outcomes from vocational rehabilitation services. Such research would help to better understand the quality of service provisions for individuals closed in competitive employment. In addition, such studies would assist in better determining what connotes vocational rehabilitation counseling and guidance as well as which abilities are obtained through disability-related augmentative skills training. Therefore, future research has the potential to enhance the current study by including the consumer's perspective.

APPENDIX A

FREQUENCY OF VARIABLES INCLUDED IN RESEARCH STUDY FROM RSA
911 DATABASE, FISCAL YEAR 2006

Variable	Frequency	Valid percentage
Age		
0-36 years, coded 1	8,267	32.3
37-50 years, coded 2	8,206	32.1
51-65 years, coded 3	9,101	35.6
Gender	12,116	47.4
Race and ethnicity		
White	18,870	73.9
African American	5,989	23.5
American Indian	350	1.4
Asian	413	1.6
Native Hawaiian	131	0.5
Hispanic or Latino	3,144	12.3
Source of referral	13,644	53.4
Secondary education	468	1.8
IEP	2,843	11.2
Living arrangements	963	3.8
Severity of vision loss	13,498	52.8
Secondary disability	10,158	39.7
Type of secondary disability	6,170	70.1
Weekly earnings at application	8,654	33.8
Receipt of SSI	4,815	19.0
Receipt of SSDI	5,698	22.4
Receipt of Medicaid	5,978	23.4
Receipt of Medicare	4,274	16.7
Level of education		
Elementary (coded 1)	5,004	20.2
High school (coded 2)	8,767	34.4
Postsecondary (coded 3)	11,048	44.5
Case service variables		
Counseling and guidance	14,668	57.4
College training	2,440	9.5
Vocational training	1,962	7.7
On-the-job training	722	2.8
Basic academic training	433	1.7
Job readiness	1,802	7.0
Disability skills training	4,984	19.5
Miscellaneous training	3,928	15.4

Variable	Frequency	Valid percentage
Job search	3,366	13.2
Job placement	3,457	13.5
Transportation	5,774	22.6
Maintenance	2,726	10.7
Rehabilitation technology	6,909	27.0
Reader services	621	2.4

APPENDIX B

FREQUENCY OF ALL VARIABLES INCLUDED IN RESEARCH QUESTION 1

Variable	Frequency	Valid percentage
Age		
0-36 years, coded 1	808	22.4
37-50 years, coded 2	1,112	30.8
51-65 years, coded 3	1,690	46.8
Gender	1,881	52.1
Race and ethnicity	796	22.0
Source of referral	2,065	57.2
Secondary education	102	2.8
IEP	420	11.6
Living arrangements	123	3.4
Severity of vision loss	1,862	51.6
Secondary disability	3,610	100.0
Type of secondary disability	2,672	74.0
Weekly earnings at application	1,467	40.6
Receipt of SSI	620	17.2
Receipt of SSDI	960	26.6
Receipt of Medicaid	864	23.9
Receipt of Medicare	723	20.0
Level of education		
Elementary (coded 1)	668	18.5
High school (coded 2)	1,271	35.2
Postsecondary (coded 3)	1,671	46.3
Case service variables		
Counseling and guidance	2,759	76.4
College training	326	9.0
Vocational training	355	9.8
On-the-job training	210	5.8
Basic academic training	74	2.0
Job readiness	410	11.4
Disability skills training	1,265	35.0
Miscellaneous training	837	23.2
Job search	716	19.8
Job placement	782	21.7
Transportation	1,064	29.5
Maintenance	531	14.7
Rehabilitation technology	1,457	40.4
Reader services	78	2.2

APPENDIX C

ALL VARIABLES INCLUDED IN RESEARCH QUESTION 1

Variable	B	SE	Wald	df	Sig.	Exp(B)	95% C.I for Exp(B)	
							Lower	Upper
Age								
0-36 years, coded 1	1.1190	0.1699	43.3875	1.0000	0.0000	3.0617	2.1947	4.2714
37-50 years, coded 2	0.3847	0.1204	10.2037	1.0000	0.0014	1.4692	1.1603	1.8605
Gender								
	-0.6294	0.1067	34.8262	1.0000	0.0000	0.5329	0.4324	0.6568
Race and ethnicity								
	0.3158	0.1312	5.7951	1.0000	0.0161	1.3713	1.0604	1.7734
Source of referral								
	-0.7047	0.1106	40.5934	1.0000	0.0000	0.4942	0.3979	0.6139
Individualized Education Program								
	0.2720	0.1920	2.0071	1.0000	0.1566	1.3126	0.9010	1.9122
Severity of vision loss								
	0.6967	0.1164	35.8211	1.0000	0.0000	2.0070	1.5976	2.5213
Type of secondary disability								
	-0.3355	0.1336	6.3057	1.0000	0.0120	0.7150	0.5502	0.9290
Weekly earning at application								
	2.7345	0.1431	365.1675	1.0000	0.0000	15.4017	11.6349	20.3879
Receipt of SSI								
	-0.3705	0.1563	5.6232	1.0000	0.0177	0.6904	0.5083	0.9377
Receipt of SSDI								
	-0.4185	0.1420	8.6909	1.0000	0.0032	0.6580	0.4982	0.8691
Receipt of Medicaid								
	-0.7286	0.1383	27.7594	1.0000	0.0000	0.4826	0.3680	0.6328
Receipt of Medicare								
	-0.1668	0.1494	1.2474	1.0000	0.2640	0.8463	0.6315	1.1342
Level of education								
Elementary (coded 1)	-0.5930	0.1512	15.3872	1.0000	0.0001	0.5526	0.4109	0.7432
High school (coded 2)	-0.4816	0.1214	15.7334	1.0000	0.0001	0.6178	0.4869	0.7838
Case service variables								
Counseling and guidance								
	-0.2705	0.1262	4.5939	1.0000	0.0321	0.7630	0.5957	0.9771
College training								
	0.9367	0.2427	14.8973	1.0000	0.0001	2.5516	1.5858	4.1059
Job readiness								
	-0.2734	0.1890	2.0935	1.0000	0.1479	0.7608	0.5253	1.1018
Disability skills training								
	-0.8612	0.1141	56.9213	1.0000	0.0000	0.4226	0.3379	0.5286
Miscellaneous training								
	-0.6225	0.1224	25.8797	1.0000	0.0000	0.5366	0.4222	0.6820
Job search								
	0.6211	0.1997	9.6759	1.0000	0.0019	1.8609	1.2583	2.7522
Job placement								
	2.2149	0.2194	101.9441	1.0000	0.0000	9.1604	5.9592	14.0812
Transportation								
	0.0723	0.1280	0.3196	1.0000	0.5719	1.0750	0.8365	1.3815
Maintenance								
	0.9008	0.1804	24.9359	1.0000	0.0000	2.4616	1.7285	3.5057
Rehabilitation technology								
	-0.1695	0.1173	2.0872	1.0000	0.1485	0.8441	0.6707	1.0623
Constant								
	1.6457	0.2438	45.5705	1.0000	0.0000	5.1847		

APPENDIX D

FREQUENCY OF ALL VARIABLES INCLUDED IN RESEARCH QUESTION 2

Variable	Frequency	Valid percentage
Age		
0-36 years old, coded 1	606	26.1
37-50 years old, coded 2	685	29.5
51-65 years old, coded 3	1,029	44.4
Gender	1,156	49.8
Race and ethnicity	554	23.9
Source of referral	1,264	54.5
Secondary education	65	2.8
IEP	293	12.6
Living arrangements	69	3.0
Severity of vision loss	1,388	59.8
Secondary disability	2,320	100.0
Type of secondary disability	1,666	71.8
Weekly earnings at application	1,157	49.9
Receipt of SSI	307	13.2
Receipt of SSDI	530	22.8
Receipt of Medicaid	418	18.0
Receipt of Medicare	405	17.5
Education		
Elementary (coded 1)	419	18.1
High school (coded 2)	832	35.9
Postsecondary (coded 3)	1,069	46.1
Case service variables		
Counseling and guidance	1,763	76.0
College training	232	10.0
Vocational training	264	11.4
On-the-job training	177	7.6
Basic academic training	44	1.9
Job readiness	293	12.6
Disability skills training	619	26.7
Miscellaneous training	453	19.5
Job search	564	24.3
Job placement	645	27.8
Transportation	707	30.5
Maintenance	398	17.2
Rehabilitation technology	816	35.2
Reader services	49	2.1

APPENDIX E

ALL VARIABLES INCLUDED IN RESEARCH QUESTION 2

Variable	Unstandardized coefficients		Standardized coefficients	<i>t</i>	Sig.	95% Confidence interval for <i>B</i>	
	<i>B</i>	<i>SE</i>	Beta			Lower bound	Upper bound
(Constant)	307.0678	11.9711		25.6507	0.0000	283.5924	330.5431
Age							
0-36 years, coded 1	17.6136	7.5371	0.0583	2.3369	0.0195	2.8334	32.3938
37-50 years, coded 2	21.5646	6.2944	0.0741	3.4260	0.0006	9.2212	33.9080
Gender	-46.1902	5.1818	-0.1740	-8.9139	0.0000	-56.3518	-36.0286
Race and ethnicity	4.5637	6.0862	0.0147	0.7499	0.4534	-7.3712	16.4987
Source of referral	-1.9381	5.4324	-0.0073	-0.3568	0.7213	-12.5910	8.7147
Individualized Education Program	-21.9584	8.4352	-0.0550	-2.6032	0.0093	-38.4998	-5.4170
Severity of vision loss	3.0333	5.9875	0.0112	0.5066	0.6125	-8.7081	14.7747
Type of secondary disability	5.6166	6.1757	0.0190	0.9095	0.3632	-6.4940	17.7273
Weekly earning at application	29.9686	5.8729	0.1129	5.1029	0.0000	18.4519	41.4853
Receipt of SSI	-46.4809	8.3109	-0.1471	-5.5928	0.0000	-62.7786	-30.1833
Receipt of SSDI	-35.3811	9.1434	-0.0904	-3.8696	0.0001	-53.3114	-17.4508
Receipt of Medicaid	-26.6710	8.1845	-0.0773	-3.2587	0.0011	-42.7208	-10.6212
Receipt of Medicare	-8.1350	8.7603	-0.0233	-0.9286	0.3532	-25.3139	9.0439
Level of education							
Elementary (coded 1)	-58.2752	7.6123	-0.1689	-7.6554	0.0000	-73.2029	-43.3475
High school (coded 2)	-33.9547	5.9803	-0.1227	-5.6777	0.0000	-45.6821	-22.2272
Case service variables							
Counseling and guidance	9.8323	6.0594	0.0317	1.6226	0.1048	-2.0502	21.7148
College training	18.8024	9.5007	0.0425	1.9791	0.0479	0.1715	37.4333
Vocational training	17.9107	8.6644	0.0429	2.0672	0.0388	0.9199	34.9015
Job readiness	-30.3732	8.6152	-0.0760	-3.5255	0.0004	-47.2676	-13.4789
Disability skills training	-26.3817	6.4233	-0.0879	-4.1072	0.0000	-38.9778	-13.7857
Miscellaneous Training	12.5631	6.9447	0.0375	1.8090	0.0706	-1.0554	26.1816
Job search	4.7310	8.4039	0.0153	0.5629	0.5735	-11.7492	21.2111
Job placement	-3.6976	8.1028	-0.0125	-0.4563	0.6482	-19.5872	12.1920
Transportation	-3.4852	6.4736	-0.0121	-0.5384	0.5904	-16.1799	9.2096
Maintenance	9.0318	7.8255	0.0257	1.1542	0.2486	-6.3140	24.3776
Rehabilitation technology	17.4492	6.3098	0.0628	2.7654	0.0057	5.0757	29.8226

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