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Skills Associated with Job Retention among Persons with Visual Impairments

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Abstract

Introduction: The Workforce Innovation and Opportunity Act of 2014 reinforced the state-federal vocational rehabilitation program's commitment to job retention and career advancement for persons with disabilities. We continue to have limited information about what job-related skills are most helpful to persons with visual impairments in retaining or advancing in employment.

Method: Descriptive statistics and logistic regression were used to investigate the association between current employment status and skills among persons with visual impairments who had a competitive employment history. Data were from a national volunteer survey of persons with visual impairments born between 1950 and 1991. Snowball sampling methods generated the sample.

Results: Persons with professional licensure or certificates were more than twice as likely to be employed as those who did not possess these qualifications. Employed participants were less likely to need job-related training to find or keep a job.

Discussion: Though additional research to explore the relationships between skills and employment is indicated, persons with visual impairments should be encouraged to explore and pursue job-skills training and professional licensure or certification in fields compatible with their career goals.

Implications for practitioners: Even persons with a work history may need additional job-skills training to continue employment. Professional licensure or certification may be of value in obtaining employment, but persons with visual impairments may need support to obtain those

credentials. Careful career planning to promote positive employment outcomes should include research about the credentials associated with employment goals.

Skills Associated with Job Retention among Persons with Visual Impairments

People with disabilities, including people with visual impairments, i.e., persons who are blind or have low vision, continue to experience challenges obtaining, retaining, and advancing in employment. Employed persons with visual impairments may receive services from their state vocational rehabilitation (VR) programs to support efforts to address these challenges. VR's focus on job retention and career advancement is long-standing (Hope & Rice, 1995), and the Workforce Innovation and Opportunity Act of 2014 (WIOA, 2014) reinforced providing those services. However, we have limited information about the skills people with visual impairments need to retain and advance in their jobs. Therefore, this study examined skills associated with job retention among persons with visual impairments.

Legislation Concerning Job Retention and Career Advancement

Although the Rehabilitation Act Amendments of 1992 stated that state VR programs could provide job retention services and community rehabilitation programs could provide career advancement services, the Act did not define these services (Rehabilitation Act Amendments of 1992, 102-569). A technical report generated by the Institute on Rehabilitation Issues (Hope & Rice, 1995) recognized that although the Act recommended “high quality placements” for people with disabilities, most remained in entry-level jobs.

WIOA (2014) stated that eligible persons with disabilities could receive VR services to advance in their careers. Further, to be considered competitively employed, program participants must have the same opportunities for career advancement as persons without disabilities in similar jobs, and priority for services should be extended to persons at risk of losing their jobs. In discussion groups of VR personnel, participants described the renewed emphasis on career advancement as a “cultural shift” for the agencies, which despite the 1992 amendments,

continued to focus on job placement (U. S. Government Accounting Office, 2018). These WIOA guidelines for state VR agencies may help reduce inconsistencies regarding how the states offer services, a concern expressed by VR stakeholders and partners (Martin, 2017).

As a part of the performance accountability measures established by WIOA, VR agencies must determine the percentage of program participants enrolled in education or training programs that result in or lead to recognized credentials or employment (WINTAC, n.d.). For some persons with disabilities, additional education or training that improves their skills is necessary for job retention or career advancement.

Job Retention

An early analysis (Herndon, 1995) of VR program participants with visual impairments and competitive work experience identified differences among persons who, at case closure, were employed in the same type of job (*n*=84), in a different type of job (*n*=197), or were not competitively employed (*n*=506). Applicants exiting the VR system with the same type of job at closure tended to have received the least amount of training. Applicants who left VR with a different type of job were most likely to have received support for education and training, including college expenses, institutional training, or business and vocational training. Persons exiting unemployed were most likely to have less than high school education and to have received more personal and vocational adjustment and mobility training than persons who exited VR employed. Herndon (1995) concluded that education beyond high school was related to job retention, with college-educated persons most likely to have the same type of job at application and closure of VR services.

Sikka and Stephens (1997) found that VR counselors frequently provided job site modifications to support job retention among persons with visual impairments. VR counselors

often provided retraining and hardware to access large print to support job retention; retraining most frequently addressed equipment use and adjustment to visual impairment (Sikka & Stephens, 1997). In a qualitative study (Crudden & Fireison, 1997), nine of ten participants identified computers with assistive technology as the primary job site modification needed for job retention; six required training to use that technology. More recent research using the Rehabilitation Services Administration (RSA) case service data found that employed VR applicants with visual impairments who retained their jobs tended to receive rehabilitation technology services and to have at least an undergraduate degree (Crudden et al., 2018).

Skills and Employment

In a systematic review, Lund and Cmar (2019) assessed various factors associated with employment and found a positive association with educational level in seven of nine studies, indicating that academic skills may lead to employment among persons with visual impairments. Educational level was a significant factor but not a main contributor to predicting earnings at VR closure in a study by Estrada-Hernandez (2008). Lund and Cmar also found that reading braille was positively associated with employment, though one study found print readers had higher employment outcomes. Early work experience where persons with visual impairments found their own jobs, had multiple jobs, and worked more extended periods was associated with later employment (McDonnall & O'Mally, 2012).

State VR programs and other service delivery programs have recognized and responded to the need to improve the skills of persons with visual impairments to facilitate employment. For example, Maine's Division for the Blind and Visually Impaired provided a week-long intensive training program to provide employability skills to persons unemployed for over one year or who could not advance in their current positions (McMahon et al., 2013). The program

included training in blindness-specific skills, such as braille and assistive technology. McMahon et al. (2013) concluded that the program successfully improved job-seeking skills and that participants met their goals.

Although results specific to employment were not available, Parker (2020) reported that National Industries for the Blind developed a technology skills training program for persons with visual impairments to improve their employment options. Interestingly, Parker reported difficulty finding trainers with advanced assistive technology skills to teach persons with visual impairments with intermediate technology skills. The perceived need to increase the technology skills of persons with visual impairments and the difficulty finding qualified individuals to provide that training indicate that a segment of the population of people with visual impairments may not be getting adequate training in advanced technical skills needed for employment.

Similarly, Farrow and Parken-Bashizi (2019) described a job-readiness program that emphasized problem-based learning and incorporated job-specific skills training. Other training areas included access technology and compensatory and problem-solving skills. Although empirical data supporting programmatic outcomes were unavailable, this program supports service providers' recognition and attempts to support skill development among persons with visual impairments.

One measure of skill acquisition is obtaining licensure or certification. Professions, industries, or educational institutions may award certificates; a government agency typically issues a license and requires meeting specific criteria to attain it (Leventoff, 2018). An analysis of the 2016 Adult Training and Education Survey found that among adults 25 to 64 with at least a high school education but no undergraduate degree earning between $20,000 to $40,000, 32%

had a nondegree credential, most commonly in health care occupations, and persons with higher incomes were more likely to hold a credential in trades (Columbus, 2019).

Purpose and Research Question

Everyone needs skills to obtain or retain employment, yet we know little about the specific skills people with visual impairments need to keep their jobs. Previous research has examined services provided to persons with visual impairments, but how those services may translate into skills is unclear. This study used a survey of persons with visual impairments who had an employment history to determine what skills were associated with continued employment, i.e., job retention. Investigating skills addresses a gap in the literature and is timely given that WIOA emphasizes job retention and advancement and that VR agencies are now recording program participants' measurable skill gains.

Method

Data Source and Study Sample

This study's data was from a survey developed by the (excluded for review) and conducted between November 2018 and August 2019. The survey included questions regarding demographics, training and skills, VR services received, employment, unemployment, and career advancement. Participants were volunteers born between 1950 and 1991 with a history of competitive employment after completing their education. Snowball sampling strategies were used to recruit participants from a list of volunteers maintained by (excluded for review) and through social media announcements, contacts with organizations for persons with visual impairments, professional organizations, personal connections, and referrals from other participants. A total of 687 responses (35 phone and 652 electronic) were reviewed. Responses were deleted when participants did not complete at least 30% of the items or submitted duplicate

responses. Survey design and preliminary findings can be found in the recent publication (excluded for review). The authors' Institutional Review Board for the Protection of Human Subjects approved this project. All respondents provided informed consent prior to participation.

This study focused on the survey items concerning personal skills that could facilitate job retention and advancement. All participants indicated employment earning at least minimum wage after completing their education. Job retainers included all persons employed, either in the same or different jobs, when they responded to the survey. Our study sample consisted of 358 respondents with complete answers to all questions of interest. The sample of 223 women (62.3%) and 135 men (37.7%) were an average age of 51.1 years (*SD* = 11.6). Just over a quarter of the sample (25.6%) were unable to read standard print from birth, and 62.8% were unable to read print by age 18 (22 did not answer this question). Level of visual impairment included 42.7% who categorized themselves as totally blind, 21.8% as legally blind with minimal functional vision, 31.8% as legally blind with some functional vision, and 3.6% with other visual impairments. The average age at the first job earning at least minimum wage was 22.4 years, and most (76.8%) experienced vision loss before that job. The majority were White (83.5%), followed by 8.9% African American, 1.7% Asian, and 5.9% other races. At the time of the survey, 72.9% of the sample (*n* = 261) reported "Yes," and 27.1% (*n* = 97) said "No" to the question "Are you currently employed?" When relating their current employment to their first job after completing their education, 19.2% retained the same position, 77.4% retained employment but changed employers, and 3.5% did not disclose this information.

Variables

The dependent variable was the employment status at the time of the survey. Employed participants were coded "1," and unemployed were coded "0". The independent variables

reflected personal skills, including academic skills (four levels: high school diploma/certificate or less; some college/associate or technical degree; Bachelor's degree; and graduate degree), professional skills (whether the person held a professional license or certification; 1 = Yes, 0 = No), braille reading skills (0 = no or minimal braille skills, 1 = moderate or proficient braille skills), keyboard typing skills (0 = less than 45 words per minute and 1 = at least 45 words per minute). The use of assistive technology consisted of four dichotomous variables: print access technology, braille, mobile apps, or bioptics: the use of *print access technology* included using a handheld or portable magnifier, video magnifier or CCTV, screen reader (JAWS, NVDA), and magnification software; the use of *braille* included using a braillewriter, braille labeler, and refreshable braille display; the use of *mobile apps* referred to software applications installed in a smartphone or electronic tablet to access visual information; the use of *bioptics* referred to a small telescopic system to drive (1 = Yes, 0 = No). Two independent variables to indicate the current need for skill-related training were also included—perceived adequate training in the use of assistive technology (1 = Yes, 0 = No) and the need for additional training to find or keep a job (1 = Yes, 0 = No). Control variables were age at the time of the survey, age at first job, gender, and race.

Data Analysis

Descriptive statistics were used to examine personal characteristics and skills for both currently employed and unemployed groups. Logistic regression was applied to investigate the association between participants' current employment situation and their skills. We used SAS version 9.4 to conduct all statistical analyses.

Results

Descriptive Statistics

Since all participants in the sample reported being employed at some point since completing their education, their current employment situation reflected their job retention status. More than two-thirds of participants held Bachelor's or graduate degrees; currently employed persons were more likely to have a graduate degree than persons currently unemployed (44.1% vs. 27.8%). A third of the overall sample had professional licenses or certificates; among employed participants, 41% had a professional license or certificate, and 24.9% currently had jobs requiring credentials. Over half the sample reported skill in using contracted Grade Two braille (moderate braille skill); two-thirds could use the keyboard to type more than 45 words per minute. The majority of the sample used print access technology and mobile apps; a few used bioptic devices to drive a vehicle. Most participants reported having adequate training in assistive technology use. Nearly one-third reported a need for job-related training to find or keep a job. Table 1 includes the characteristics of the overall sample as well as subgroups.

Logistic Regression Analysis

We first entered four control variables (age at the time of the survey, age at first job, gender, and race) to the logistic regression model; the model was not statistically significant based on the likelihood ratio test, $\chi^2(4, n = 358) = 6.74$, $p = 0.15$, and only explained 2.7% (Nagelkerke R^2) of the total variance in the current employment and job retention situation. Then, after adding the remaining variables of interest, the final model was statistically significant, $\chi^2(16, n = 358) = 47.83$, $p < 0.01$, and explained 18.2% of the total variance in the current employment situation. The Hosmer and Lemeshow goodness-of-fit test of the final model was not significant, $\chi^2(8, n = 358) = 11.07$, $p = 0.20$, indicating that predicted and observed event rates were well-calibrated.

Table 2 shows the logistic regression model results for each independent variable, including estimated coefficients (*b*), standard errors (*SE*), degrees of freedom (*df*), Wald χ^2 statistics, observed significance level (*p*), odds ratios (OR), and associated 95% confidence intervals. When a variable has a significant positive estimate (when $p < .05$ and OR > 1), it indicates an association with job retention; if a variable has a significant negative estimate (when $p < .05$ and OR < 1), the variable indicates an association with losing employment. The results suggest that a person with a professional license or certificate was more likely to be currently employed. The odds of being employed for those who had professional licenses or certificates were 2.26 times higher than the odds of being employed for those who did not have a professional license or certificate. In addition, currently employed people reported less need for job-related training to find or keep a job than those currently unemployed.

Discussion

We explored the potential relationship between skills and employment status among persons with visual impairments who had an employment history, examining those who retained employment (either in the same or a different job) and those who did not retain employment. Some employed respondents may have experienced periods of unemployment, and some unemployed respondents may return to work. Participants previously employed in positions less amenable to modifications may not have been able to find another job compatible with their skills and qualifications.

Contrary to the results using the RSA data (Crudden et al., 2018; Herndon, 1995), we did not find a significant relationship between academic skills (education) and job retention, though employed participants were more likely to have graduate degrees. There may be a relationship between the onset of vision loss and education, or our sample may not be large or diverse enough

to find this relationship. The dataset does not include the age of onset of vision impairment; however, the age at first employment, age when a person could no longer read standard print, and the large number of persons with braille skills indicate that most of the sample had an early onset of visual impairment.

We found that individuals with a professional license or certificate were more than twice as likely to retain employment. Because having a professional license or certification is associated with higher income (Columbus, 2019), employed persons with these qualifications may be economically motivated to retain their jobs. Additionally, jobs requiring credentials may be positions that are more amenable to modifications to accommodate visual impairments. Of the 41.0% of employed participants who had a professional license or certification, almost 60% said their current employment required that credential. Some participants may have elected to obtain credentials even when their jobs did not require it. Others may have changed jobs and found their new position did not require the credentials. Even when employed participants are in jobs that do not require the credentials, having earned them demonstrates their work-related skills.

Potentially, acquiring a license or certificate demonstrating competency in a particular field is more marketable than educational experience alone. A person may earn a degree but be unable to acquire the license or certification required for professional practice. Work experience may be required to obtain some professional licenses or certificates, and persons with visual impairments may find it challenging to gain that experience. Given that VR agencies are now collecting data about measurable skill gains (WINTAC, n.d.), including earning a license or certification, it may be worthwhile to conduct research tracking employment associated with these credentials. Additional research regarding obstacles that persons with visual impairments may face in acquiring professional licenses or certificates also appears indicated.

Skills Associated with Job Retention

Perhaps it is not surprising that individuals who did not retain employment were more likely to report the need for additional job-related training to find or keep a job. However, workplace changes, particularly technological advances, typically make it necessary for employees to learn new skills. Sikka and Stephens (1997) found that retraining was frequently needed to facilitate job retention. Employed participants may have already participated in the training needed to retain employment or may have better opportunities to engage in on-the-job training. Potentially, unemployed persons previously held jobs that were not readily accommodated for a person with visual impairment, or ongoing technology updates or other changes at the job site made it difficult to retain their jobs. Some unemployed persons may not understand what job-related skills are necessary for employment. Some persons new to visual impairment may need a period of adjustment before pursuing training to learn compensatory techniques to complete various job tasks using adaptive techniques and practice to make their performance competitive with nondisabled workers. Job-specific skills training appears challenging to acquire, as evidenced by the programs attempting to address this need (Farrow & Parkin-Bashizi, 2019; McMahon et al., 2013; and Parker, 2020).

Unemployed participants were not more likely than employed participants to report needing assistive technology training to become or retain employment. VR agencies typically provide assistive technology training free of charge to VR program participants. The availability of this training, as opposed to the more challenging to acquire job-skills training, may mean that persons with visual impairments have adequate opportunities to gain the assistive technology skills needed for employment. However, because of the difficulty of finding persons to teach intermediate assistive technology skills (Parker, 2020), some employed and unemployed persons may not have had the opportunity to learn or fully appreciate the more complex technical skills

necessary to become, maintain, or advance in employment. Additionally, some participants may be overestimating their assistive technology skills. Additional research to explore the quality and availability of advanced assistive technology training appears necessary.

Skills are just one of many factors that may influence job retention. For example, VR counselors' relationships with employers and employers' attitudes about visual impairment influence employment outcomes for persons with visual impairments (McDonnall, 2016). The VR counselors' relationships with employers or the employers' attitudes may have influenced survey respondents' ability to retain employment. Sikka and Stephens (1997) found that job site modifications were typically needed for job retention. Some employers have limited knowledge about job accommodations (McDonnall et al., 2014) and may be unwilling, unable, or uninformed about how to make job sites accessible. The VR agency type is another variable found to influence employment outcomes (Estrada-Hernandez, 2008), and this may include an influence on job retention.

Our model did not find that other skills, such as assistive technology use, braille, or typing speed, were associated with job retention. However, the importance of these skills should not be underestimated. Over half of the participants had at least moderate braille skills; almost two-thirds (65.4%) could type at least 45 words per minute. Even among the unemployed, nearly 80% said they had adequate training in assistive technology use. A larger, more diverse sample may find differences in these areas that our analysis did not. Additional research should continue to explore the relationships between employment and skills. Results suggest that individuals with visual impairments may increase their ability to retain employment by identifying the professional licenses or certifications associated with their chosen profession and pursuing the education, job-related skills, and other requirements to attain those credentials.

Limitations

This analysis is based on the self-report of persons with visual impairments about their characteristics and skill levels. Participants were volunteers recruited through snowball sampling strategies and do not represent the population of persons with visual impairments in the United States. Almost half of the survey attempts were not included in the final analysis because they were incomplete, duplicates, or participants did not meet the criteria for this analysis. Persons who respond to volunteer surveys tend to be those interested in the topic. Those who did not finish the survey may have become fatigued with its length or frustrated by technology issues. Few participants used the telephone option. As noted in a report of survey results (omitted for review), participants tended to be female, White, from the southern U.S., well-educated, skilled in assistive technology, and more lost their vision early in life. The sample reflects a partial picture of the population of persons with visual impairments, yet it provides new insight regarding skills associated with job retention. Results should be considered exploratory and should not be generalized to the overall population of persons with visual impairments.

Conclusion

Previous research supported the importance of early work experience in subsequent employment (McDonnall & O'Mally, 2012). However, as demonstrated by this nonrandom sample of people with work experience, additional factors influence job retention. Among people with visual impairments and work experience, persons with a professional license or certificate were more likely to retain employment. In addition, the need for job-related skills training was associated with those who stopped working. Although additional research is needed, particularly given the limitations associated with the sample, these results indicate that persons with visual

impairments and service providers should be mindful of the importance of job-skills training and the ability to acquire professional licensure or certifications.

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Table 1

Descriptive statistics

Variables	Overall	Currently employed	Currently unemployed
Age (*M*)	51.1 (11.6)	50.2 (11.3)	53.7 (11.9)
Age at first job (*M*)	22.4 (5.1)	22.5 (5.2)	22.3 (4.8)
Female	62.3	62.5	61.9
Race			
White	83.5	82.8	85.6
African American	8.9	9.2	8.3
Asian	1.7	1.9	1.0
Multiple races/others	5.9	6.1	5.2
Education			
High school or less	6.2	5.4	8.3
Some college, associate degree, or technical degree	21.5	19.9	25.8
Bachelor's degree	32.7	30.7	38.1
Graduate degree	39.7	44.1	27.8
Have professional license/certificate	35.5	41.0	20.6
Moderate braille skill	55.6	54.4	58.8
Use keyboard type (> 45 words/minute)	65.4	67.4	59.8
Use of assistive technology			
Print access technology	89.1	89.3	88.7
Braille	47.8	46.7	50.5
Mobile apps	77.7	80.1	71.1
Bioptics	3.4	4.2	1.0
Perceived adequate training in the use of assistive technology	83.8	85.4	79.4
Need job-related training to find or keep a job	31.0	25.3	46.4

Note. Values are percentages or means. Standard deviations (*SD*) presented in parenthesis adjacent to means (*M*) for age at the time of survey and age at starting first job. Overall sample $n = 358$, ever been employed in a job earning at least minimum wage; currently employed (job retainers), $n = 261$; currently unemployed (non-retainers), $n = 97$.

Table 2

Logistic regression model results

Variable	*b*	*SE*	*df*	Wald χ^2	*p*	OR [95% CI]
Age	-0.03	0.01	1	5.39	0.02	0.97 (0.95, 1.00)
Age at first job	-0.01	0.03	1	0.21	0.65	0.99 (0.94, 1.04)
Female	-0.07	0.27	1	0.07	0.80	0.93 (0.55, 1.58)
White	-0.28	0.38	1	0.55	0.46	0.76 (0.36, 1.59)
Education (ref = some college, associate degree, or technical degree)			3	2.67	0.45	
High school or less	-0.06	0.53	1	0.01	0.92	0.95 (0.33, 2.70)
Graduate degree	0.57	0.38	1	2.28	0.13	1.77 (0.84, 3.72)
Bachelor's degree	0.22	0.36	1	0.37	0.54	1.24 (0.62, 2.50)
Have professional license/certificate	0.81	0.31	1	6.85	<.01	2.26 (1.23, 4.16)
Moderate braille skill	-0.38	0.38	1	0.99	0.32	0.68 (0.32, 1.45)
Use keyboard type (> 45 words/minute)	0.20	0.33	1	0.37	0.54	1.22 (0.64, 2.33)
Use of assistive technology						
Print access technology	-0.35	0.59	1	0.35	0.56	0.71 (0.22, 2.24)
Braille	-0.24	0.41	1	0.34	0.56	0.79 (0.35, 1.76)
Mobile apps	0.40	0.35	1	1.32	0.25	1.50 (0.75, 2.98)
Bioptics	1.66	1.11	1	2.24	0.13	5.27 (0.60, 46.30)
Perceived adequate training assistive technology use	0.48	0.47	1	1.07	0.30	1.62 (0.65, 4.07)
Need job-related training to find or keep a job	-1.14	0.29	1	15.28	<.01	0.32 (0.18, 0.57)
Constant	2.68	1.02	1	6.91	<.01	

Note. SE = standard error. OR = odds ratio. *df* = degrees of freedom. CI = confidence interval. Overall sample $n = 358$, ever been employed in a job earning at least minimum wage; currently employed (job retainers), $n = 261$; currently unemployed (non-retainers), $n = 97$.