What Predicts Job Quality of Vocational Rehabilitation Consumers who are Blind or Have Low Vision?

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Abstract

The Workforce Innovation and Opportunity Act emphasizes promoting high quality, competitive employment for people served by vocational rehabilitation (VR), but few studies have assessed VR consumers' job quality. The purpose of this study was to investigate job quality and factors that predict job quality of VR consumers with blindness or low vision (B/LV), taking into consideration their employment status at application. We utilized RSA-911 data of VR consumers with B/LV who were closed in competitive employment during 2015, creating two separate hierarchical linear models to predict job quality for VR consumers (a) who were employed at application and (b) who were not employed at application. We investigated individual-level (consumer personal characteristics and VR services) and state/agency-level predictors. Job quality and some predictors of job quality differed by employment status at application, although the strongest predictors (education level at application, gender, benefit receipt at application, receipt of a bachelor's or higher degree) were consistent across the models. While several additional individual-level variables were significantly associated with job quality, their effect sizes were very small. With the exception of advancing education to a bachelor's degree or higher while receiving services, consumer characteristics at application were the primary determinants of their job quality.

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Blind or Have Low Vision?**

A large, persistent gap in employment rates exists between people with blindness or low vision (B/LV) and the general U.S. population (Lauer et al., 2020; McDonnall & Sui, 2019). In 2008 to 2017, employment rates were 33 to 37 percentage points lower for people with B/LV compared to people without disabilities (McDonnall & Sui, 2019). Similar gaps between these groups are evident in other facets of employment. According to recent estimates from the American Community Survey, full-time/full-year employment rates and median annual earnings of full-time/full-year employees were substantially lower for people with B/LV than the general population (Erickson et al., 2020). These discrepancies underscore the need to examine aspects of employment beyond basic dichotomous employment rates—such as quality of employment— for people with B/LV, as full-time employment and higher-income jobs are closely related to higher job quality (Rothwell & Crabtree, 2019).

Job quality is a growing topic of interest among policymakers and researchers from multiple disciplines (Burchell et al., 2012; Howell & Kalleberg, 2019), and conceptualizations of job quality vary across disciplines and studies. Job quality measures are typically multidimensional and may include various combinations of objective and subjective indicators, such as earnings, health insurance, retirement benefits, job security and flexibility, job satisfaction, career advancement opportunities, and psychological well-being (Findlay et al., 2013; Howell & Kalleberg, 2019; Rothwell & Crabtree, 2019). Research indicates that job quality is associated with quality of life (Rothwell & Crabtree, 2019) in the general population, and the Workforce Innovation and Opportunity Act (WIOA, 2014) emphasizes promoting high quality, competitive employment for people with disabilities. However, job quality has been minimally explored in studies focusing on people with B/LV (Lund & Cmar, 2019b, 2020).

Research on factors associated with employment outcomes for people with B/LV has been synthesized in four systematic literature reviews (Goertz et al., 2010; Lund & Cmar, 2019a, 2019b, 2020). These reviews and articles published following the reviews (Giesen & Lang, 2018; Zapata, 2020) provide a holistic view of three decades of literature on employment predictors for the B/LV population across various data sources and samples, including vocational rehabilitation (VR) consumers. The most common outcome measure in these studies was a dichotomous employment indicator (e.g., employed or not), typically conceptualized as competitive employment in Rehabilitation Services Administration Case Service Report (RSA-911) analyses. Few studies included outcomes such as earnings and job quality. Socioeconomic factors—particularly education level and previous work experience—were the most prominent predictors of employment outcomes in this body of literature. Education was positively associated with employment (Goertz et al., 2010; Lund & Cmar, 2019b, 2019a, 2020; Zapata, 2020), job quality and higher-level jobs (Lund & Cmar, 2019a, 2020), and earnings (Giesen & Lang, 2018; Lund & Cmar, 2019b, 2019a). Variables representing work experience, including working since the onset of disability, earnings at VR application, and self-support at VR application, were positively associated with employment (Lund & Cmar, 2019b, 2019a, 2020) and earnings above substantial gainful activity levels for Social Security Disability Insurance (SSDI) recipients (Giesen & Lang, 2018).

Other socioeconomic and demographic predictors had less consistent evidence or were studied infrequently; however, several patterns emerged. Supplemental Security Income (SSI) or SSDI receipt predicted lower odds of competitive employment for VR consumers in several studies (Lund & Cmar, 2019b, 2020), and higher SSDI amount predicted better employment outcomes for SSDI recipients (Giesen & Cavenaugh, 2013; Giesen & Lang, 2018). Male gender

was positively associated with employment in some studies (Goertz et al., 2010; Lund & Cmar, 2019b, 2019a, 2020); associations between male gender and higher earnings were more consistent (Giesen & Lang, 2018; Lund & Cmar, 2019b, 2019a). Legal blindness (vs. less severe visual impairment) was negatively associated with employment in several studies of VR consumers (Lund & Cmar, 2019b, 2020), but other studies yielded mixed findings (Goertz et al., 2010; Lund & Cmar, 2019a, 2020). Associations between secondary disabilities and employment outcomes were typically either negative (Giesen & Lang, 2018; Goertz et al., 2010; Lund & Cmar, 2019b, 2020) or non-significant (Lund & Cmar, 2019a). Analyses of age, race, and ethnicity yielded mixed findings across studies (Giesen & Lang, 2018; Goertz et al., 2010; Lund & Cmar, 2019b, 2019a, 2020; Zapata, 2020).

VR consumers who received rehabilitation technology, on-the-job supports, job placement assistance, and job search assistance had better employment outcomes than consumers who did not receive those services (Cimera et al., 2015; Giesen & Cavenaugh, 2012; Giesen & Hierholzer, 2016; Giesen & Lang, 2018). Moreover, technology training was associated with employment in higher-level jobs after referral for vocational placement (Leonard et al., 1999). One job-related service, job readiness training, has evidence for a negative relationship with employment (Cimera et al., 2015; Giesen & Hierholzer, 2016; Giesen & Lang, 2018). Receipt of college or university training was positively associated with employment outcomes for transition-age youth (Lund & Cmar, 2020); however, Capella-McDonnall (2005) found that this service was only related to competitive employment for VR consumers when it resulted in the receipt of a degree or certificate. Other VR services have limited evidence for their relationship to employment outcomes.

Few studies included state- and agency-level predictors of employment for people with

B/LV. Results have been inconsistent, but some state-level economic indicators have been

significant predictors of employment: state unemployment rate was negatively associated with

employment for SSDI recipients (Giesen & Cavenaugh, 2013; Giesen & Lang, 2018) and the

employment-population ratio was positively associated with employment for consumers who

were not employed at application (McDonnall, 2016). These findings support the importance of

accounting for state economic conditions in analyses of employment outcomes. Considering the

structure of the VR service-delivery system in the United States, agency type has been a factor of

interest in several RSA-911 studies. Some states have a *separate agency* that serves only

consumers with B/LV and a *general agency* that serves consumers with other disabilities

(including some who have mild visual impairments or additional disabilities). Other states have

one *combined agency* that serves all consumers in that state. Although findings regarding agency

type have varied (Lund & Cmar, 2019b), receiving services from a separate agency (compared to

a general or combined agency) was associated with better employment outcomes in some studies

(e.g., Giesen & Cavenaugh, 2013; Giesen & Lang, 2018; McDonnall & Cmar, 2018).

Findings from this body of literature highlighted areas of need for future employment

research, some of which are particularly relevant to VR consumers with B/LV. First,

the limited research on job quality for adults with B/LV identified through the systematic

literature reviews corroborates the critical need for research in this area (Lund & Cmar, 2019a,

2019b). Since competitive jobs do not necessarily equate to high-quality jobs for people with

disabilities (Heyman et al., 2016), distinguishing between the outcomes of competitive

employment and job quality is vital. Second, employment status at VR application has received

little attention in previous B/LV RSA-911 studies, although some researchers accounted for

previous employment or earnings. Considering that job retention is a role of VR, and employment status at application was a strong predictor of competitive employment for consumers with sensory disabilities (Dutta et al., 2008), differentiating between employed and unemployed applicants is warranted.

Only a few studies have focused on VR consumers with B/LV who were employed at application, although employed applicants comprised approximately one-third of B/LV case closures in fiscal year (FY) 2015 (Crudden, Giesen, et al., 2018; Crudden, McDonnall, et al., 2018). Crudden, Giesen, et al. (2018) documented several notable differences between competitively employed and unemployed B/LV applicants in characteristics and service receipt. Compared to unemployed applicants, employed applicants were more likely to be older and White, not have a non-cognitive disability, have higher education levels, and not receive SSI or SSDI (Crudden, Giesen, et al., 2018). Furthermore, employed applicants were more likely to receive certain VR services, including on-the-job supports–short-term, on-the-job supports– supported employment, and rehabilitation technology (Crudden, Giesen, et al., 2018). In another study of employed B/LV applicants, Crudden, McDonnall, et al. (2018) identified several predictors of job retention, including being male, not having a secondary disability, having at least a bachelor's degree, being a Business Enterprise Program vendor at application, having a previous successful VR closure, and working more hours at application.

No research has focused on predictors of job quality for the broader population of VR consumers with B/LV (Lund & Cmar, 2019b), although one RSA-911 analysis of job quality for transition-age youth was conducted (Cimera et al., 2015). Another job quality study included VR consumers with all types of disabilities (Chan et al., 2016). Two subsequent analyses of job quality focused on small subpopulations of individuals with B/LV: VR consumers who are deaf-

blind (McDonnall & Cmar, 2019) and VR consumers with combined traumatic brain injury and

B/LV (McDonnall et al., 2020). Across the studies, personal characteristics were the primary

predictors of job quality, with education level and male gender predicting higher job quality and

receipt of cash benefits (including SSI or SSDI) predicting lower job quality (Chan et al., 2016;

Cimera et al., 2015; McDonnall et al., 2020; McDonnall & Cmar, 2019). Conversely,

relationships between job quality and state-level, agency-level, and service-related predictors

varied across studies (Chan et al., 2016; Cimera et al., 2015; McDonnall et al., 2020; McDonnall

& Cmar, 2019).

Despite the history of employment disparities between people with B/LV and the general

U.S. population and the recent policy emphasis on high-quality employment for all people with

disabilities, few studies have focused on job quality for people with B/LV. Research on B/LV

VR consumers' job quality is limited to transition-age youth and small subpopulations. Focusing

on job quality aligns with the goals of WIOA and can provide a more comprehensive

understanding of consumers' employment outcomes following VR case closure. Accordingly,

the purpose of this study was to investigate job quality among adult VR consumers with B/LV

and identify factors that predict high quality, competitive employment for those consumers who

enter VR with a job and those who enter VR without a job.

Method

Sample

We utilized FY 2015 RSA-911 data for this study. Our sample consisted of 8,723

consumers with a primary disability of "blindness" or "other visual impairment" who received

services from separate, general, or combined VR agencies, whose cases were closed with

competitive employment, and who were between the ages of 18 and 67 at case closure.

Competitive employment was defined as working and earning at least the federal minimum wage and included consumers closed with or without supports in an integrated setting, as self-employed, and in the Business Enterprise Program. We excluded consumers who were served by agencies in the U.S. territories. We divided our sample into two subsamples for the analyses: consumers who were competitively employed at application ($n = 4,133$) and those who were not competitively employed at application ($n = 4,590$).

A slight majority (53.9%) of consumers were male, and a slight majority (52.7%) had visual impairments less severe than legal blindness. Just over a third (34.9%) had another disability in addition to visual impairment or blindness. The majority (71.5%) of consumers in the sample were White, 23.8% were African American, 2.2% were Asian, 1.4% were of mixed race, less than 1% were American Indian, and less than 1% were Pacific Islander; 11.5% reported Hispanic ethnicity. In terms of education level at application, 18.4% of the sample had less than a high school education, 32% had a high school diploma or equivalent, 20% had education beyond high school but no academic degree, 8.7% had an associate degree, 13.6% had a bachelor's degree, and 7.3% held an advanced degree. Additional descriptive information about the sample as a whole, and information by subsample, is provided in Table 1.

Variables & Measures

Job Quality Index

The dependent variable was an index created by the authors to represent job quality. The measure is comprised of three variables: (a) whether the consumers' job provided medical insurance (yes = 1, no = 0), (b) the proportion of consumers' weekly earnings to their state's living wage, and (c) the proportion of consumers' hourly wage to their state's median hourly wage. Living wage is an established minimum income that provides for financial independence;

it is higher than the poverty threshold and considers the cost of living within states (Nadeau, 2017). State median hourly earnings were obtained from the U.S. Bureau of Labor Statistics' website (https://www.bls.gov/oes/tables.htm). Principal component analysis (PCA) was utilized to create the composite index variable. We included all consumers with B/LV who were closed with employment to develop the index. The principal axis method was utilized to extract the components, and ones were used as prior communality estimates. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy of .54 met the minimum acceptable cutoff (Kaiser & Rice, 1974), and Bartlett's Test of Sphericity was significant (10,206.66, $p < .0001$), supporting the appropriateness of our data for PCA. We determined that one factor provided an appropriate solution for the data, based on the eigenvalue greater than 1 criteria, and all factor loadings were above .40 (i.e., .58, .93, and .88). This factor explained 66% of the total variance. The job quality index (JQI) is a standardized factor score (a linear composite of the weighted observed variables) with a mean of zero and a standard deviation of 1. Positive scores represent job quality that was higher than the average job quality of all consumers with B/LV who were closed in 2015, and negative scores indicate job quality that was lower than average.

State- and Agency-level Predictors

To account for the hierarchical nature of the RSA-911 data, we included both level-2 (state/agency) and level-1 (individual) variables in our models. We included four state-level economic indicators to control for the economic conditions within consumers' states: per capita personal income (SSTI, 2016), employment-population ratio (U.S. Census Bureau, 2018), percent who live below poverty (U.S. Census Bureau, 2018), and the state gross domestic product (U.S. Bureau of Economic Analyses, 2020). We selected these indicators based on the hypothesis that they may be more closely related to state earning levels than other economic

indicators. The four state-level variables were grand-mean centered prior to their inclusion in the statistical analyses. We also included agency type as a dichotomous variable to explore the effect of separate agency on job quality (1=separate agency, 0=combined or general agency).

Individual-level Predictors

Given the limited research on predictors of job quality for consumers with B/LV, we included individual-level predictors with evidence for a relationship with any type of employment outcome for this population. Variables consisted of consumer personal characteristics and specific services received or service-related factors. We also included disability-related skills training, as this service can help consumers develop important workplace skills. Personal characteristics treated as dichotomous variables included: (a) race and ethnicity, assessed with five variables (African American race only, Asian race only, American Indian race only, mixed race, and Hispanic ethnicity of any race); (b) level of vision loss (legal blindness = 1, less severe visual impairment = 0); (c) sex (female = 1, male = 0); (d) presence of an additional disability; (e) receipt of SSI at application; (f) receipt of SSDI at application; and (g) personal income as primary source of support at application. Continuous personal characteristics were age at case closure and education level, which ranged from 0 (no formal schooling) to 12 (academic degree above a master's). These continuous variables were grand-mean centered prior to their inclusion in the models. Service-related variables were all dichotomous and fell into two categories: (a) the receipt of six services (i.e., disability-related skills training, rehabilitation technology, job placement, job search assistance, job readiness, on-the-job supports–supported employment, and on-the-job supports–short-term) and (b) three variables representing advancement in education while receiving VR services (i.e., receipt of a certificate, receipt of an associate degree, and receipt of a bachelor's or higher degree). The educational advancement

variables were calculated by comparing education level at application to education level at case closure.

Statistical Analyses

We utilized hierarchical linear modeling (HLM) and conducted separate, but identical, analyses with both samples to determine whether the associations between job quality and (a) personal characteristics and (b) services were different for consumers who were employed and who were not employed at VR application. We first evaluated the variability in job quality across state VR agencies by estimating unconditional two-level models, which didn't include any predictor variables. Then, we entered the 5 state/agency-level and 23 individual-level variables of interest to examine the effect of each variable on the JQI. PROC MIXED in SAS Version 9.4 using maximum likelihood estimation was utilized for the analyses. Given the large sample sizes, an alpha level of .01 was used to determine statistical significance.

We utilized f^2 as a quantitative measure of the magnitude of the predictor variables' association with the outcome. We calculated this effect size for all level-1 and level-2 variables in the final models. This effect size measures the proportion of variance explained by a given fixed effect variable relative to the proportion of outcome variance unexplained by the final model (Lorah, 2018). A larger effect size reflects a stronger relationship between the JQI and the predictor variable. Standard conventions for the magnitude of f^2 are small at 0.02, medium at 0.15, and large at 0.35 (Cohen, 1992).

<div align="center">

Results

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Job Quality of VR Consumers with B/LV

The JQI had a range of -1.03 to 12.78 and a median of -0.35 for our sample. There were several outliers on the higher end of the scale: 120 people had scores three or more standard

deviations above the mean. Considering the individual factors that make up the JQI to evaluate

job quality, 25.7% of our overall sample had a job that provided medical insurance, 37.5%

earned at or above a living wage, and 22.7% earned at or above their state's median hourly wage.

Weekly earnings ranged from 3% to 1370% of state living wage levels and hourly wages ranged

from 30% to 1090% of state median wages, but most people had earnings on the lower end of the

range (medians of 82.5% and 65.5%, respectively). Job quality indicators were higher for

consumers who were employed at application (33.4% had medical insurance, 47.7% earned at

least a living wage, 29.3% earned at least their state's median hourly wage) than for those not

employed at application (18.9% had medical insurance, 28.3% earned at least a living wage,

16.8% earned at least their state's median hourly wage),

Employed at Application Model

In the unconditional model, the level-2 variance component was 0.065, and the level-1

variance component was 1.189, resulting in an intra-class correlation coefficient (ICC) of 0.052,

which indicates that 5.2% of the total variance in job quality was attributed to differences among

state agencies. The only fixed effect estimation in the unconditional model was the intercept of

0.267 ($SE = 0.042$, $df = 69$, $t = 6.41$, $p < .001$), which indicates an average JQI of 0.267 across

consumers in the 70 state agencies in the sample. Because this value is greater than zero, the

average job quality at VR case closure for people who were employed at application was greater

than the average job quality of all consumers with B/LV.

Results of the full model for the employed sample are displayed in Table 2. Job quality at

VR case closure was positively associated with several personal characteristics: older age at VR

case closure, education level, legal blindness, and personal income as the primary source of

support at application. Job quality was negatively associated with female gender, African

American race, having an additional disability, receipt of SSDI, and receipt of SSI. In terms of

VR services, job quality was positively related to receiving a bachelor's or higher degree,

disability-related skills training, and rehabilitation technology, but was negatively related to

receiving job placement assistance. Education level and receipt of SSDI had small-to-medium

effect sizes, and other variables had very small or small effect sizes. None of the state-/agency-

level variables were associated with job quality. This model explained 26.8% of the variance in

job quality at case closure among consumers who were employed at application.

Not Employed at Application Model

In the unconditional model, the estimated level-2 variance component of 0.020 and the

level-1 variance component of 0.579 yielded an ICC of 0.033, indicating 3.3% of the total

variance in job quality was between agencies. The average JQI at VR case closure was -0.189

($SE = 0.023$, $df = 73$, $t = -8.13$, $p < .001$) for people who were not competitively employed at VR

application across the 74 state agencies in the sample. This negative value indicates that job

quality for this sample was lower than the average job quality of all consumers with B/LV at VR

case closure.

Statistical results of the final model for the not employed at application sample are

displayed in Table 3. In regard to personal characteristics, job quality at closure was positively

associated with education level, legal blindness, while job quality at closure was negatively

associated with female gender, African American race, having an additional disability, receipt of

SSDI, and receipt of SSI. In terms of VR services, receipt of certificate, receipt of associate

degree, and receipt of bachelor's or higher degree were positively associated with job quality at

VR case closure, while receipt of job readiness training and on-the-job supports–supported

employment were negatively associated with job quality. Education level and receipt of

bachelor's or higher degree had small-to-medium effects, and other variables had very small

effects. None of the state/agency-level variables were associated with job quality. This model

explained 18.7% of the variance in job quality at case closure among consumers who were not

employed at application.

<div align="center">**Discussion**</div>

Little is known about the job quality of individuals with B/LV or the factors that are

associated with job quality for this population. To address this gap in the literature, we

investigated job quality and predictors of job quality for VR consumers with B/LV who obtained

competitive employment, taking into consideration their employment status at application.

Typically, almost a third of VR consumers with B/LV are employed at the time they apply for

services, and just under half of the consumers in our sample who achieved competitive

employment in FY 2015 were employed at application. Accounting for employment status at

application was important as our samples differed at entry and exit from VR services. A majority

(76.4%) of consumers who entered VR with employment reported personal income as their

primary source of support as application, and this percentage increased to 90.1% at case closure.

While only a small portion (9.4%) of those not employed at VR application were self-supporting

prior to receiving services, 81.9% reported personal income as their primary source of support at

case closure.

We found that job quality of VR consumers varied widely, and individuals who came to

VR with employment had higher average and median job quality at case closure than those who

were not employed at application. Reasons for seeking VR assistance may differ for these

groups, as do the services they receive (Crudden, Giesen, et al., 2018), and therefore the

association between services received and outcomes may differ. We documented in this study

that the association between job quality and services received did differ among those who

entered VR with employment and those who entered VR without a job. Of note is that the model

for consumers who entered VR with employment explained a greater amount of variance in job

quality than the model for consumers who entered VR without a job.

Several variables demonstrated a consistent relationship with job quality across the two

models. Education level at entry to VR was a significant predictor of higher job quality in both

models, as found in studies of job quality for the general U.S. population (Brucker & Henly,

2019; Rothwell & Crabtree, 2019) and VR consumers (Chan et al., 2016), including

subpopulations of VR consumers with B/LV (Cimera et al., 2015; McDonnall et al., 2020;

McDonnall & Cmar, 2019). Education level was the strongest predictor of job quality for VR

consumers with B/LV who were employed at application and the second strongest predictor for

consumers who were not employed at application. Obtaining a bachelor's or advanced degree

was associated with higher job quality for both groups of consumers. This variable explained

more variance in job quality for consumers who were not working at VR application and was the

strongest predictor for this group.

Gender also had a significant association with job quality in both models, with males

having higher job quality than females. Similar findings regarding gender and job quality have

been documented in the general population (Brucker & Henly, 2019) and other populations of

VR consumers (Chan et al., 2016; Cimera et al., 2015; McDonnall et al., 2020; McDonnall &

Cmar, 2019). White race was associated with higher job quality in other populations (Brucker &

Henly, 2019; Rothwell & Crabtree, 2019), but only African American consumers had

significantly lower job quality than consumers of other races in our models, and the effect size

was very small. Despite the negative associations between legal blindness (vs. less severe visual

impairment) and employment outcomes for VR consumers documented in the literature

(Cavenaugh & Rogers, 2002; Cimera et al., 2015; Darensbourg, 2013; Giesen & Cavenaugh,

2012, 2013; McDonnall, 2016), legal blindness was associated with *higher* job quality in our

models. The positive relationship between legal blindness and job quality is supported by

Leonard et al.'s (1999) finding that blindness (vs. low vision) was associated with higher-level

jobs. In both models, SSDI recipients had significantly lower job quality than non-recipients, as

found in previous studies (McDonnall et al., 2020; McDonnall & Cmar, 2019). SSDI receipt was

the second strongest predictor of job quality for consumers who were employed at application. A

potential explanation for this finding is that SSDI recipients limited their earnings to avoid losing

benefits.

Although obtaining a bachelor's or advanced degree was associated with higher job

quality for all consumers, obtaining an associate degree or a certificate were only significant

predictors of higher job quality for consumers who entered VR without a job. Perhaps this

difference is due to the fact that consumers employed at application began VR with a higher

quality job, and this type of educational advancement was not able to add significantly to

existing job quality. In addition, certifications were strongly associated with job quality only for

people in the general population who did not have postsecondary education (Rothwell &

Crabtree, 2019), so consumers' existing education level may determine the impact of obtaining a

certificate. While consumers without a job at VR entry were much more likely to obtain an

associate degree or certificate, only a small portion of either group obtained these credentials

(less than 3%, see Table 1). Associate degrees and certificates offer labor market returns for the

general population, although the amount of return varies by field of study and its match to local

labor market conditions (Carnevale et al., 2020; Holzer & Dunlop, 2013). Earnings associated

with some certificates and associate degrees surpass those for four-year degrees, and an approximately equal number of these credentials and bachelor's degrees are awarded each year (Carnevale et al., 2020). Given the value of advancing education but knowing that not all consumers will be interested in or capable of completing a bachelor's degree, VR counselors should be aware of the opportunities for employment and higher job quality that some certificates and associate degrees afford.

Differences in the associations between specific services received and job quality were observed for the two groups. In general, the job-related services either did not have a relationship with job quality or had a small, negative relationship. Job placement was associated with lower job quality only for consumers employed at application, and job readiness and on-the-job supports-supported employment were associated with lower job quality only for consumers who were not employed at application. These findings are consistent with other studies, in which a negative relationship between job-related services and job quality was found (Chan et al., 2016; McDonnall et al., 2020; McDonnall & Cmar, 2019). While job-related services have consistently been associated with obtaining employment, these negative relationships observed in this and other studies indicate that consumers who require assistance from VR with preparing for or locating employment, rather than being able to prepare for and find it on their own, are more likely to obtain lower quality jobs.

Another service difference was the value of receiving disability-related skills training and rehabilitation technology: these services were significantly associated with higher job quality only for consumers who were employed at application. Neither of these services were significant predictors of job quality in prior studies of subpopulations of consumers with B/LV, which included all consumers (those who came in with employment and those who did not) in one

model (McDonnall et al., 2020; McDonnall & Cmar, 2019). Individuals who have a job at

application may be seeking VR services for different reasons than those who are not employed.

Although the RSA-911 data does not allow us to determine whether employed consumers were

seeking assistance with job retention, it is likely that many who enter VR with a job need specific

help to maintain their current job (e.g., additional technology, assistance with other

accommodations, training in blindness skills). Assistance in these areas would help them

maintain an existing job, which is likely to have higher job quality than a new job obtained by

someone without a recent work history. It is also possible that people who enter VR with a job

have recently experienced vision loss and need initial training in blindness skills and assistance

with technology to continue working in their current position. Given that the employed at

application group was older and had a higher education level, this group is likely to have more

years of work experience and a higher level of earnings.

Only a small amount of variability in our job quality measure was associated with level-2

factors, indicating that the vast majority of the variability in job quality is attributable to

individual-level rather than agency- or state-level factors. None of the state- and agency-level

variables in these models were significant predictors of job quality, as found in a study of

consumers with combined B/LV and traumatic brain injury (McDonnall et al., 2020). Chan and

colleagues (2016) did identify state- and agency-level variables that predicted their job quality

measure for all consumers served by VR, and they also documented a greater, although still

relatively small (i.e., 7%), amount of variance explained at the agency-level. One potential

reason for the lack of significant state-level economic indicators in our study is that the job

quality measure already took into account differences in cost of living and state earnings levels

based on how the factor score was developed, while Chan and colleagues' measure did not. We

included only one agency-level variables in our model, agency type. Several studies have

investigated the association between agency type and B/LV consumers' outcomes, and findings

have been mixed (Lund & Cmar, 2019b). This study adds to the small number of studies that

have documented lack of meaningful differences in earnings or job quality based on agency type

(Capella, 2001; Estrada-Hernandez, 2008; McDonnall et al., 2020).

Limitations and Future Research Directions

Job quality measures commonly include both objective and subjective indicators due to

the multidimensional—and often subjective—nature of this construct; however, only objective

indicators were available in the RSA-911 dataset. Given this limitation of the data, our job

quality measure included objective criteria with a focus on earnings, which may not capture all

aspects of job quality that are important to B/LV consumers. For example, some people may not

need or want to work full time or earn a living wage and may seek work that provides intrinsic,

lifestyle, or social benefits (Cooke et al., 2013). Some jobs (e.g., self-employment) do not

provide insurance and would result in lower job quality in our index, but these jobs may provide

other benefits such as flexible work hours. It would be valuable to include subjective indicators

(e.g., flexibility, job security, job satisfaction) in future investigations of job quality for people

who are B/LV. Other potential individual-level predictors of job quality that were not available

in the RSA-911 dataset would be important to consider in future job quality analyses. One

example is self-reported health status, which was associated with job quality for people with and

without disabilities in a previous study (Brucker & Henly, 2019).

Several other limitations associated with the data should be acknowledged. RSA-911 is

data coded by VR counselors which may be incomplete, similar to self-report data, and it is

archival data. It is not possible to establish a causal relationship between variables with this type

of data. Another limitation is the age of the data. Because the FY 2015 RSA-911 dataset reflects

pre-WIOA services and outcomes, this study does not capture the potential impact of WIOA on

B/LV consumers. Furthermore, the data do not reflect the dramatic social and economic changes

resulting from the COVID-19 pandemic. Therefore, our results may not generalize to consumers

who received VR services in the years following WIOA and COVID-19. Despite this limitation,

this study is the first known investigation of job quality for VR consumers with B/LV, and it

provides a baseline for comparison with future post-WIOA and post-COVID-19 studies. Future

research that uses more current RSA-911 data from multiple FYs to investigate the relationship

between key demographic and service variables and job quality for B/LV consumers would

extend our findings.

Implications for Practice

Several predictors of job quality for consumers with B/LV identified in this study have

implications for VR agencies that serve this population. First, our findings extend the literature

documenting the importance of educational advancement in improving job quality for VR

consumers (Chan et al., 2016; McDonnall et al., 2020) to the B/LV population. The most

relevant step that VR counselors can take to increase B/LV consumers' job quality is to support

their obtainment of a degree, particularly a bachelor's degree or higher. Obtaining an associate

degree or a certificate may also improve job quality, although the return on investment can vary.

VR counselors should be aware of the differences in return on investment for associate degrees

and certificates for various fields of study in their local areas and provide guidance to consumers.

Counselors should encourage consumers to consider these options and explain that advancing

their education can help them secure higher-quality jobs.

An additional consideration related to educational advancement and job quality is the supply and demand for various fields of study. An increase in education may not be associated with greater job quality if demand is low and high-quality jobs are not available in that field (Findlay et al., 2017). Howell and Kalleberg (2019) emphasized the need to focus on areas in which demand is projected to increase by obtaining education and upgrading skills for "high-quality jobs of the future" (p. 43). VR professionals can use labor market information to learn about high-demand fields, jobs in those fields, education and training requirements, and characteristics of jobs (e.g., salary, working conditions), taking into consideration the labor market in the consumer's area. Sharing this information with consumers can help them make an informed choice and pursue education in fields of interest that offer suitable jobs that match their definition of quality.

Our findings also indicate that consumers with B/LV who receive SSDI benefits or job-related services may be at risk for low job quality. Regardless of employment status at VR application, SSDI receipt was associated with lower job quality at closure, which substantiates the importance of benefits counseling. Considering that SSDI beneficiaries often lack knowledge about work incentives (Olney & Lyle, 2011), VR counselors can provide education about disability benefits to ensure consumers are aware of and understand the intricacies of work incentives. Benefits counseling may be particularly helpful for consumers who are reluctant to exit the SSDI program but have the skills and qualifications to obtain higher-quality jobs. Employer-provided health insurance may be a critical element of job quality for individuals who fear losing the medical benefits associated with SSDI (Olney & Lyle, 2011). Receipt of job-related services, including job placement, is associated with lower job quality, although receipt of these services likely indicates a need for these services. Compared to consumers who require

assistance from the rehabilitation system to find a job, consumers who find a job on their own

may be more likely to negotiate higher pay and benefits or have the option of being more

selective in their job choices. They may also have a larger social network or be more aware of

how to use their social network to assist in obtaining a job. Therefore, teaching and encouraging

proactivity and independence in job-seeking could be another avenue for improving consumers'

job quality.

Conclusions

While this study discovered several previously unidentified variables that were related to

job quality of VR consumers, including the provision of some VR services, the effect sizes for

these new variables were very small. An overall conclusion of job quality studies of VR

consumers with B/LV is that, with the exception of assisting the person with advancing their

education to a bachelor's or higher degree, VR services do not contribute substantially to job

quality. More evidence exists to support the importance of VR services for increasing the

chances of B/LV consumers obtaining a job (Cimera et al., 2015; Giesen & Cavenaugh, 2012;

Giesen & Hierholzer, 2016; Giesen & Lang, 2018; McDonnall et al., 2020). However, other

factors surrounding VR services that are unaccounted for may contribute to consumers' job

quality. For example, differences in counselors' skills and counselor connections with businesses

could potentially influence job quality of the consumers they serve, but data related to these

factors is unavailable in the RSA-911 data. Individual personal characteristics generally play a

more predominant role in determining job quality than the available VR service-related factors.

While most of these individual factors are beyond the control of VR, the impact of receipt of

SSDI benefits is one factor that VR may be able to influence by providing benefits counseling.

Much of the variance in job quality of VR consumers is unexplained, and there is more unexplained variance for job quality associated with newly obtained jobs rather than job retention cases (i.e., consumers who come to VR with employment). Assuming that a majority of consumers who enter VR with a job are seeking to retain that job, their job quality is pre-determined at application, although some may advance in their positions through VR services. The larger amount of unexplained variance for consumers who come to VR without employment could be associated with greater discrepancies in amount of work experience (e.g., some likely have a significant work history and some have no work experience), as well as differences in consumers' social networks and connections that may influence not only their ability to obtain a job but also their jobs' wages (Cappellari & Tatsiramos, 2015).

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Table 1

Descriptive Statistics for Individual-level and Outcome Variables

	Employed at Application	Not Employed at Application	Overall
Consumer personal characteristics			
Age at closure	49.2 (11.8)	41.9 (14.0)	45.3 (13.5)
Education	5.7 (2.4)	4.8 (2.3)	5.3 (2.4)
Female	49.1	43.5	46.1
African American	21.6	25.9	23.9
Asian	2.2	2.2	2.2
American Indian	0.8	0.9	0.9
Multiple races	0.9	1.5	1.2
Hispanic ethnicity	11.3	11.7	11.5
Legal blindness	45.4	49.0	47.3
Additional disability	33.0	36.7	34.9
Receipt of SSDI	19.6	26.6	23.3
Receipt of SSI	6.6	19.0	13.1
Source of support (personal income)	76.4	9.4	41.2
Receipt of certificate	1.3	2.9	2.1
Receipt of associate degree	1.6	2.8	2.2
Receipt of bachelor's or higher degree	3.4	11.5	7.7
Service-related factors			
Disability-related skills training	27.2	32.5	30.0
Rehabilitation technology	60.5	60.7	60.6
Job placement assistance	9.0	32.8	21.5
Job search assistance	5.4	22.8	14.5
Job readiness training	3.3	17.5	10.8
On-the-job supports–supported employment	2.08	4.58	3.39
On-the-job supports–short-term	8.66	15.32	12.16
Job Quality Index (factor score)	0.21 (1.12)	-0.19 (0.77)	0.0 (0.97)

Note. Values are percentages or means. Values in parentheses are standard deviations adjacent to means. SSDI = Social Security Disability Insurance. SSI = Supplemental Security Income. Total $N = 8,723$; employed at VR application $n = 4,133$; not employed at application $n = 4,590$.

Table 2

Hierarchical Linear Model Predicting Job Quality for Vocational Rehabilitation Consumers Who Were Employed at Application

	Coefficient	SE	*t*-value	*p*	f^2
Intercept	0.209	0.067	3.12	.003	
State/agency-level					
Per capita personal income	0.005	0.007	0.69	.495	0.001
Employment-population ratio	0.003	0.006	0.41	.685	0.000
Below poverty rate	0.019	0.019	1.02	.312	0.000
Gross domestic product	0.000	0.000	-1.21	.231	0.002
Agency type	-0.003	0.066	-0.04	.968	0.000
Individual-level					
Age at closure	0.004	0.001	3.39	.001	0.002
Education	0.153	0.007	23.12	<.001	0.135
Female	-0.280	0.030	-9.37	<.001	0.019
African American	-0.130	0.038	-3.45	.001	0.004
Asian	-0.058	0.103	-0.56	.573	0.000
American Indian	0.119	0.169	0.71	.479	0.000
Multiple races	-0.171	0.159	-1.07	.284	0.000
Hispanic ethnicity	-0.082	0.052	-1.58	.115	0.001
Legal blindness	0.156	0.038	4.13	<.001	0.007
Additional disability	-0.105	0.033	-3.19	.001	0.003
Receipt of SSDI	-0.576	0.044	-13.06	<.001	0.042
Receipt of SSI	-0.425	0.063	-6.72	<.001	0.011
Personal income as primary source of support	0.252	0.041	6.16	<.001	0.006
Receipt of certificate	-0.037	0.133	-0.28	.782	0.000
Receipt of associate degree	0.021	0.119	0.18	.859	0.000
Receipt of Bachelor's or higher degree	0.544	0.083	6.54	<.001	0.013
Disability-related skills training	0.147	0.038	3.84	.000	0.004
Rehabilitation technology	0.183	0.037	4.99	<.001	0.009
Job placement assistance	-0.179	0.059	-3.04	.002	0.003
Job search assistance	-0.056	0.074	-0.76	.447	0.000
Job readiness training	-0.186	0.088	-2.10	.035	0.000
On-the-job supports–supported employment	-0.041	0.116	-0.35	.725	0.000
On-the-job supports–short-term	0.024	0.062	0.39	.696	0.000

Note. $N = 4,133$ at the individual level. $N = 70$ at the state/agency level. *SE* = standard error. f^2 = effect size measure. Intraclass correlation coefficient, ICC = 0.036 / (0.036 + 0.882) = 0.040. SSDI = Social Security Disability Insurance. SSI = Supplemental Security Income.

Table 3

Hierarchical Linear Model Predicting Job Quality for Vocational Rehabilitation Consumers Who Were Not Employed at Application

	Coefficient	SE	*t*-value	*p*	f^2
Intercept	-0.099	0.035	-2.87	.006	
State/agency-level					
Per capita personal income	-0.004	0.004	-0.93	.357	0.001
Employment-population ratio	0.008	0.004	2.18	.033	0.001
Below poverty rate	0.025	0.011	2.29	.025	0.002
Gross domestic product	0.000	0.000	-0.21	.832	0.000
Agency type	0.027	0.039	0.71	.482	0.000
Individual-level					
Age at closure	-0.002	0.001	-2.22	.026	0.002
Education	0.078	0.005	16.03	<.001	0.059
Female	-0.130	0.021	-6.18	<.001	0.008
African American	-0.085	0.025	-3.40	.001	0.003
Asian	0.155	0.072	2.17	.030	0.001
American Indian	0.119	0.108	1.10	.272	0.000
Multiple races	-0.106	0.085	-1.25	.211	0.000
Hispanic ethnicity	-0.040	0.035	-1.14	.254	0.000
Legal blindness	0.072	0.025	2.89	.004	0.003
Additional disability	-0.073	0.022	-3.25	.001	0.003
Receipt of SSDI	-0.180	0.026	-6.90	<.001	0.011
Receipt of SSI	-0.175	0.028	-6.28	<.001	0.007
Personal income as primary source of support	0.042	0.036	1.17	.243	0.001
Receipt of certificate	0.202	0.062	3.24	.001	0.002
Receipt of associate degree	0.221	0.064	3.48	.001	0.003
Receipt of Bachelor's or higher degree	0.684	0.035	19.73	<.001	0.086
Disability-related skills training	0.016	0.026	0.60	.546	0.000
Rehabilitation technology	0.055	0.025	2.19	.029	0.002
Job placement assistance	-0.061	0.026	-2.39	.017	0.002
Job search assistance	-0.063	0.029	-2.20	.028	0.002
Job readiness training	-0.097	0.031	-3.18	.002	0.001
On-the-job supports–supported employment	-0.134	0.052	-2.57	.010	0.001
On-the-job supports–short-term	-0.040	0.033	-1.23	.219	0.000

Note. $N = 4{,}590$ at the individual level. $N = 74$ at the state/agency level. *SE* = standard error. f^2 = effect size measure. Intraclass correlation coefficient, ICC $= 0.011/ (0.011+ 0.476) = 0.023$. SSDI = Social Security Disability Insurance. SSI = Supplemental Security Income.