

**The Predictors of Earnings Enabling Likely Roll Departure for SSDI Beneficiaries
With Visual Impairments in Vocational Rehabilitation**

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Abstract

We examined individual, socioeconomic, disability, service, and state-level factors predicting Vocational Rehabilitation (VR) closure earnings exceeding Substantial Gainful Activity for Social Security Disability Insurance (DI) beneficiaries in VR who were blind or visually impaired (BVI). We used 2011 Rehabilitation Services Administration (RSA)-911 data from 3,505 individuals exiting VR. Using multilevel modeling, we found positive relationships for beneficiaries who: were male, younger, African American; held higher education levels; were without additional disabilities; had higher earnings and DI benefits at application; received services related to job placement and on-the-job supports; did not receive “work basics” (job-readiness) training; received training/support services in rehabilitation technology and other supports; and resided in states with lower unemployment rates. Interactions with VR-agency structure revealed compensatory effects—negative relationships for being female and for being older were overcome by receiving services in a blind (rather than combined) agency. We concluded that prior work experience of a DI-beneficiary consumer contributes substantially to high earnings likely to lead to benefits termination due to work for the BVI consumer exiting VR and may serve to level race/ethnicity differences in outcome. Policy recommendations include retaining separate VR agencies for BVI consumers and strongly encouraging work experiences for consumers in VR.

Keywords: Visual impairment, services, employment, vocational rehabilitation, Social Security Disability Insurance, earnings, SGA

**The Predictors of Earnings Enabling Likely Roll Departure for SSDI Beneficiaries
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The federal income-replacement programs overseen by the Social Security Administration (SSA), including Social Security Disability Insurance (DI), face rising enrollment and high costs that threaten solvency. DI benefit rolls rose from five million in 2000 to 10.8 million in 2015; DI benefit payments reached a peak of \$143.4 billion in 2015 (SSA, 2017). Such financial patterns have spurred keen interest in encouraging return to work. The DI program rules offer a number of provisions for employment support, such as the Trial Work Period (TWP), that are intended as incentives for return to work. In addition, beneficiaries are eligible for SSA-paid employment services, such as through the Ticket to Work (TTW) program, in which beneficiaries could present their “tickets” for vocational services to qualified private providers or state vocational rehabilitation (VR) agencies. In spite of these provisions, return-to-work rates are low and rarely affect benefits. In 2014, benefits were withheld because of work for just under half of 1% of DI beneficiaries and terminated because of successful return to work at essentially the same rate (SSA, 2015). Estimates are somewhat higher (3.7%) in longitudinal studies (e.g., Liu & Stapleton, 2011).

In contrast to DI program rules and provisions, we focus on the service delivery process—on factors associated with the service delivery process, their relationships to employment outcomes, and achievement of earnings sufficient for successful departure from the benefit rolls. We examine a specific population of DI beneficiaries—consumers of state-federal VR services who are blind or visually impaired (BVI). We use multilevel modeling to identify individual characteristics, VR services, socioeconomic factors, and state-level characteristics that are associated with quality VR employment outcomes with substantial earnings that indicate the

potential to leave the benefit rolls.

A number of investigations examined factors that affect the odds of employment specifically for DI beneficiaries (e.g., Hennessey, 1997; Kennedy & Olney, 2006; Liu & Stapleton, 2010; Mamun, O’Leary, Wittenburg, & Gregory, 2011). Generally, positive factors are being male, more education, being younger and younger than age 40, having better health, higher socioeconomic status, being single, residing in the Midwest or Northern Plains, residing in states with low unemployment rates, learning a new job skill, having transportation, returning to the same job held predisability, and spending less time on the DI rolls. Negative factors include being older, receiving higher DI benefit amounts, being married, having family income below the federal poverty level, residing in the South, and reporting poor health or mobility. Race was investigated, and differences were generally absent.

It should be noted that the studies referenced above vary along some important methodological dimensions, such as how employment is defined, sample size and composition, and extent of participation in VR. For example, Kennedy and Olney (2006) considered employment as workforce participation based on self-reported weekly hours worked, whereas Mamun et al. (2011) defined employment as documented annual earnings over \$1,000.

In VR, a number of studies have examined services delivered and their effects on employment for DI beneficiaries. Over 25% of VR consumers receive disability benefits from SSA (GAO, 2007). Participating in VR is associated with substantially improved employment and earning levels for DI beneficiaries (O’Neill, Mamun, Potamites, Chan, & da Silva Cordoso, 2015).

Although some beneficiaries return to work (about 7% [Kennedy & Olney, 2006]), fewer (almost 4%) terminate benefits due to work, with as many as 27% of these being reinstated within 10 years (Stapleton, Liu et al., 2010). Research involving factors associated with

termination of DI benefits due to work is very limited (e.g., Ben-Shalom & Mamun, 2015; Liu & Stapleton, 2011; Muller, 1992). Positive factors for termination of DI benefits include more education, higher family income, no cognitive impairment, being White (Muller), being African American (Ben-Shalom & Mamun), awarded benefits before age 40, and living in states with low unemployment rates at award. Negative factors were receiving a high DI benefit amount, SSI benefits, or Medicare. Given the very few studies of DI benefits termination here and the time between them, factors show emerging consistency, except for race.

Considering outcome research specifically for those who are blind, findings for factors impacting VR employment outcomes for adults who are BVI (including DI and SSI beneficiaries) have been established from multiple investigations spanning more than three decades, with more recent studies focusing on competitive-sector employment. Reviews (e.g., Capella-McDonnall, 2005; Giesen & Cavanaugh, 2012) indicate demographic, disability, socioeconomic, and work-history factors influence employment outcomes in logically expected ways. For example, positive factors for competitive employment included being younger, White, or male, with race-gender interaction favoring White males; having no secondary disabilities or less severe ones; less severe visual impairment; higher educational levels; prior work experience; and having personal sources of support at VR referral. Beneficiary status (SSI or DI) generally has been a risk (negative) factor.

About 2% of DI beneficiaries are visually impaired (Mann, Mamun, & Hemmeter, 2015). In addition, these authors include BVI beneficiaries with four other primary-impairment groups that they identify as important because they are most likely to be employed. Visual impairment is the fourth largest disability category (7.4%) among all DI beneficiaries in VR, and about one-third (34%) of legally blind individuals enrolled in VR are DI beneficiaries (Giesen, 2016), yet very

little research has examined return-to-work outcomes for DI beneficiaries in VR.

One study examined client, state, and VR-agency structure factors that predict an RSA-defined (RSA, 2008) competitive-sector VR closure for BVI DI beneficiaries (Giesen & Cavanaugh, 2013). Factors predicting competitive employment included being served in a blindness-specific (termed “blind”) agency, higher levels of education, higher weekly earnings at VR application, and greater monthly DI payments at application. Negative factors were a higher state unemployment rate, being female, being Asian, having noncognitive secondary disabilities, having more severe visual impairments, and also receiving SSI at application. Cross-level interactions with all four state/agency-level factors (state unemployment rate, per capita income, state population, and VR-agency structure type) emphasized the importance of thorough consideration of state-level contextual factors.

Recently, this line of research was extended by focusing on the influences of VR *services* on competitive-sector employment outcomes for DI beneficiaries who are BVI (Giesen & Hierholzer, 2016). Services were grouped based on factor analysis, and client, state, and agency-structure factors also were taken into account in the analysis. Most job-related services (i.e., placement, search, supports, and training), counseling and guidance, rehabilitation technology, and maintenance were positively related to competitive employment. However, reader and interpreter services, job-readiness training, augmentative-skills training, and assessment were negatively related to employment. Cross-level interactions were again obtained with state unemployment rate and state per capita income. The study findings emphasized the advantage of the previous work experience of DI beneficiaries for achieving competitive employment.

In the present study, our major objective was to identify factors impacting the achievement of employment with earnings at levels that exceed SGA for DI beneficiaries in VR who are BVI. A

comprehensive set of factors—suggested by previous research—was investigated, including individual-level demographic, socioeconomic, and disability factors; VR services; and the direct and moderating influences of state-level contextual factors, involving state socioeconomic indicators and state VR-agency structure. Our focal outcome measure was achieving VR closure with earnings exceeding SGA. Closure requires sustaining the same employment for 90 days. The SGA earnings level exceeds the DI-program Trial Work Period (TWP) threshold and is necessary for benefits suspension during the Extended Period of Employment (EPE) and termination after EPE. Also, when the 90-day period coincides with three months of earnings over SGA, the beneficiary will have been in the TWP for three of the nine required months. Thus, we use earnings exceeding SGA criterion to declare an individual a “prime candidate” to achieve suspension and possible termination of benefits, thereby leading to DI-program roll departure. In addition, this criterion meets the earnings level to achieve the critical suspension or termination for work milestone delineated by Ben-Shalom and Mamun (2015).

Our investigation was guided by these research questions: (1) What are the influences of individual-level demographic and socioeconomic factors and VR services on attainment of “prime candidacy”? Also, which interactions are likely influential? (2) What are the direct influences of selected contextual, state-level factors (e.g., state socioeconomic factors, VR agency structure) on outcome? (3) How do the contextual, state-level factors influence the relationships of individual-level factors with outcome? Our research questions and predictor variables are based on previous research involving factors and interactions—including cross-level interactions—predictive of achieving employment and competitive-sector employment for VR consumers, including those who are BVI. Findings can contribute to the effectiveness of the VR program, achievement of higher incomes for DI beneficiaries who are BVI, and provide a

basis for policy and practice recommendations.

Method

Data and Measures

Data source. Data were from the RSA-911 Case Service Report for FY 2011. This is an annual, cross-sectional, national administrative database that provides demographic, socioeconomic (e.g., employment, earnings, public supports), and disability information at referral; services received; and socioeconomic and employment status information at closure for all cases closed during each fiscal year (see RSA, 2008). Selected cases were legally blind or had other visual impairments, were DI beneficiaries only at application and excluded those ever receiving SSI. All cases had received services (closed with or without a VR employment outcome status at closure), were age 18 to 65 at application, and received services in either a blind or a combined agency (no general agencies). Territories were excluded; $N = 3,505$. For sample characteristics, see the Total Sample column in Table 1.

Outcome measure. The outcome measure was whether amount of weekly earnings at closure was above the SGA amount for a person who was blind (\$1,640 monthly or \$410 weekly), and was coded 1 if earnings exceeded SGA and 0 if not. If the consumer met this criterion, they were termed a prime candidate to eventually suspend or terminate DI benefits. Cases coded 0 were those with a VR employment outcome, meaning they had a known code for Employment Status at Closure (to include Homemaker and Unpaid Family Worker; see RSA, 2008) and earnings at closure did not exceed SGA. Also included were those who received services but were closed (i.e., exited VR) without information on Employment Status at Closure—unsuccessful closures with earnings assumed less than SGA.

Predictor variables. Predictors were in three categories—individual-level (level-1) socio-

demographic and disability measures; specific VR services; and state- or agency-level (level-2) socioeconomic measures—and were selected based on previous employment outcome research for VR consumers, including those with BVI (e.g., Capella-McDonnall, 2005; Darensbourg, 2013; GAO, 2007; Giesen & Cavanaugh, 2012; Giesen & Cavanaugh, 2013; Giesen & Hierholzer, 2016).

Sociodemographic measures. These included age at application, gender, race and ethnicity (White was the reference category), education level, presence of cognitive and noncognitive secondary disability, legal blindness (versus visual impairment, not legally blind), weekly earnings (natural log transformed), and DI income at application.

Service measures. These were based on the 22 available services in the RSA Case Service Report (2008) and were placed into four groups based on factor analysis and validated outcome analysis procedures (Giesen & Hierholzer, 2016). The four factors represented *special and remedial services*, *job-related services*, *evaluation*, and *training and support services*. Previous analysis linking these factors and their individual component services to competitive employment outcome revealed the need to further subdivide the factors into subgroups of services that had consistent positive relationships (**A** groups) or negative/no relationships (**B** groups) with employment outcome. The measures for factor subgroups were based on sums of indicators of receipt of specific services. For *special and remedial services* (S&R), the S&R-A group measure summed receipt of (a) Personal Attendant services and (b) Academic Remedial or Literacy training; the S&R-B group summed receipt of (a) Reader services, (b) Interpreter services, and (c) College training. For *job-related services* (JR), JR-A summed (a) Job placement, (b) Job search, (c) On-the-Job supports, and (d) On-the-Job training; the JR-B subgroup was Job Readiness training alone. For *evaluation services* (E), E-A summed (a) VR

Counseling and Guidance and (b) Technical Assistance services; E-B summed (a) Information and Referral and (b) Assessment. For *training and supports* (T&S), T&S-A summed (a) Rehabilitation Technology, (b) Other services, (c) Maintenance, (d) Occupational or Vocational training, and (e) Miscellaneous training, whereas T&S-B summed (a) Transportation and (b) Disability-related Augmentative Skills training.

State- and agency-level predictors. These were state unemployment rate (U.S. Department of Labor, 2012), per capita income (U. S. Census Bureau, 2012), state population (in thousands; U. S. Census Bureau, 2013), and VR-agency structure type. In states with a *separate agency structure*, the *blind agency* serves visually impaired consumers, whereas the *general agency* serves consumers with all other disabilities. In states with a *combined agency structure*, all disabilities are served in the combined agency. Agency structure was coded 1 for blind agencies or 0 for combined agencies. On rare occasions some BVI consumers may be served in general agencies. Due to the very small numbers and noncomparability of visual impairment severity, general agencies were excluded.

Analyses

Because we had predictors at the individual level, at the state/agency level, and a dichotomous criterion measure, we employed multilevel logistic regression (two-level hierarchical generalized linear modeling [HGLM]). We used HLM 6.08 (Raudenbush, Bryk, & Cogdon, 2010) using the logit link function and full PQL (Penalized Quasi-Likelihood) estimation.

Following guidance from Heck, Thomas, and Tabata (2012), we first calculated an unconditional two-level model. We then entered all predictors, including the four state/agency-level predictors of the intercept, all level-1 predictors, and selected interactions suggested by previous research. We also included cross-level interaction terms for each state-level predictor

with each individual-level predictor because previous research (e.g., Giesen & Cavanaugh, 2013) found cross-level interactions with all four state-level predictors, and we wanted to thoroughly address our third research question. Finally, nonsignificant ($p > .15$) interaction terms not related to the research questions were deleted in the final model. All continuous predictors at either level were centered at their grand mean. No difficulties regarding multicollinearity among all predictors were present.

Results

Univariate descriptive statistics for all predictors are shown by outcome category and for the total sample in Table 1. Candidacy-Noncandidacy group differences are small for gender, age, and race/ethnicity measures. The candidacy group is elevated on education, income, earnings, and decreased on levels of secondary disabilities. Average services-per-person rates for Special & Remedial services (e.g., 0.115 for B group, total sample) were low. In contrast, the Training & Supports-A total mean rate of 1.548 was relatively high, indicating that each consumer received one or two of these services, on average.

Models and Findings

Unconditional model. The no predictor (unconditional) 2-level model yielded a significant intercept with odds of prime candidacy $OR = 0.111$, $p < .001$. DI consumers have about 89% lower odds of candidacy than noncandidacy within an average agency. This corresponds to baseline estimated probability of being a prime candidate to suspend benefits of .10. The state-level (level-2) estimated intercept variance component was 0.161, $\chi^2(50) = 96.05$, $p < .001$, indicating that significant variability in likelihood of candidacy existed across state agencies. The ICC indicated that 4.7% of the variance in odds of prime candidacy lies between states. These findings supported the development of a multilevel model.

Final model. Table 2 provides hierarchical logistic (unit-specific) model results for predicting employment with earnings exceeding SGA. All odds ratios for a specific predictor are interpreted while controlling for all other predictors in the model.

State/Agency-level measures. Residing in a state with a higher unemployment rate was associated with decreased odds of prime candidacy, $OR = 0.882$, such that for a 1% increase in state unemployment rate, the odds of candidacy decreased by approximately 12%. There were no overall direct effects for state population, state per capita income, or agency structure type. However, effects of all four state/agency-level factors did emerge as interactions.

Demographic and disability factors. Being female was associated with decreased odds of prime candidacy, $OR = 0.615$, consistent with previous research (e.g., Kennedy & Olney, 2006). But the effect was moderated, as indicated by a gender by agency structure cross-level interaction, $OR = 1.65$, $p = .052$. We use the Model Graphs feature in HLM 6 to investigate interaction patterns. The pattern (not shown) indicated that females tend to have higher odds of candidacy when served in blind agencies, whereas males' success essentially was unaffected by agency structure type. This finding adds to the substantial existing body of evidence in support of significant employment-outcome advantages of services provided by separate blind agencies that exclusively serve consumers who are BVI (e.g., Cavanaugh, 2010).

Older age at application for VR services was associated with declining odds of achieving prime candidacy status, $OR = 0.806$ (adjusted to 5-year increments), $p < .001$. There was a 19% decrease for being five years older. Because previous competitive employment research found a cross-level interaction with agency structure type and a nonlinear trend for age at application (Giesen & Cavanaugh, 2013), we included a cross-level interaction term—age at application by agency structure—but found no significant effect, $p = .26$. We further investigated the age at

application by agency structure relationship by graphic means. We aggregated the level-1 data and created a scatterplot of mean candidacy rate by yearly age, showing rates for each agency-structure type. We graphically explored this plot by applying linear and quadratic trend lines for each of the agency subgroups. This led to the inclusion in the model of a quadratic term for age at application (the square of centered age) and an interaction term for quadratic age by agency structure. Shown by the last two effects in Table 2, older age at application also was associated with a nonlinear decline in odds of prime candidacy, $OR = 0.956$ (adjusted to 5-year increments), $p = .042$. The quadratic age by agency structure interaction also was significant, $OR = 1.062$ (adjusted to 5-year increments), $p = .026$, revealing different nonlinear decline patterns for blind and combined agencies (see Figure 1). We applied the Loess smoothing function fit method (using IBM SPSS Version 23) to provide an optimum plot of the decline patterns for both agency types. The trend line patterns in Figure 1 suggest advantages and mitigation of negative influences of age for those served in blind agencies for application ages earlier than about the mid-30s and mid-40s or older. These findings for earnings exceeding SGA extend competitive employment outcome research, which has reported advantages for being younger (generally younger than age 40) for general disability populations of DI beneficiaries (e.g., Mamun et al., 2011) and for DI beneficiaries who were BVI and in VR (e.g., Giesen & Cavanaugh, 2013). These findings add to the literature indicating advantages of services in blind agencies.

For race and ethnicity, there was an effect favoring African American consumers relative to White consumers in odds of prime candidacy, $OR = 1.52$, $p = .019$. Also, this effect was moderated by a cross-level interaction with state population, $OR = 0.965$, $p = .05$. As state population increased, the difference favoring African American consumers was reduced. More diversity in larger states along with more high-end job competition may incline employers to

respond more to experience and capabilities and less to race differences. American Indian and Pacific Islander samples were insufficient for testing. There were no other race/ethnicity effects.

The main effect of an outcome advantage for African American consumers warrants further consideration. Although definite outcome *disadvantages* are typical for African American VR consumers in general disability samples comprised of nonbeneficiaries and a mix of DI and SSI beneficiaries (e.g., Dutta, Gervery, Chan, Chou & Ditchman, 2008; Olney & Kennedy, 2002) and in BVI samples in VR (Giesen & Cavanaugh, 2012), this pattern seems to differ specifically for DI-recipient populations. Our literature review of employment-related factors focusing on DI beneficiaries indicated race differences were generally absent. We found advantages in achieving prime candidacy for African American compared to White BVI DI-beneficiary consumers, but the important point is that we did not detect *disadvantages* for African American consumers. Our general finding also is consistent with the small advantage for African American DI beneficiaries in achieving return-to-work milestones (e.g., TWP completion) reported by Ben-Shalom and Mamun (2015). In addition, other recent large-sample research examining VR competitive-sector employment outcomes for DI-recipient consumers who were BVI found no differences (and thus no deficits) for African Americans (Giesen & Cavanaugh, 2013). Apparently this lack of difference (or lack of disadvantage; even advantage) for African American consumers also is maintained for achieving earnings exceeding SGA. Similarly, we did not detect differences or outcome disadvantages for Asian or Hispanic, compared to White, consumers.

A consumer with a cognitive secondary disability has about 81% lower odds of achieving candidacy than one who does not have a cognitive disability, $OR = 0.193$, $p < .026$. Odds of candidacy are about 40% lower if the consumer has a noncognitive disability in addition to visual impairment, $OR = 0.604$. These work and earnings disadvantages were expected from

previous research (e.g., Capella-McDonnall, 2005; Kennedy & Olney, 2006). Additional disabilities add to overall disability severity and, not surprisingly, hinder earnings potential. These individuals require special attention, added efforts, and probably more time in VR, which should be reflected in the Individualized Plan of Employment (IPE) of the consumer.

However, being legally blind, compared to being visually impaired but not legally blind, was not associated with odds of candidacy, $p = .39$. This is surprising because legal blindness has been a substantial negative employment factor (Giesen & Cavanaugh, 2013). All those achieving prime-candidacy status also attained a competitive employment closure. The rate of legal blindness was even somewhat higher in the prime candidate group (79% vs. 73%). Perhaps once the milestone of competitive employment is achieved, individuals who are legally blind make a successful and effective adjustment to their visual impairment, putting them on par with visually impaired individuals in attaining earnings over SGA. It is also possible that we could not detect deficits for more severe levels of visual impairment, such as total blindness, because they could not be distinguished within the legally blind group.

Socioeconomic factors. Odds of achieving prime candidacy were enhanced for consumers with higher levels of education, $OR = 1.36$, $p < .001$. This finding is consistent with those for achieving employment for visually impaired and general-disability DI populations (e.g., Ben-Shalom & Mamun, 2015; Giesen & Cavanaugh, 2013). Assessing the need for educational advancement, perhaps including an additional certificate or degree, is recommended to VR service providers serving BVI DI-beneficiary consumers who aspire to high earnings at closure.

Concerning earnings and DI benefits, prime candidacy odds were greater for those with more weekly earnings at application, $OR = 1.79$, $p < .001$. Also, DI amount at application was positively related to odds of candidacy, $OR = 1.058$ (based on \$100 increments), $p = .003$. For a

\$100 increase in DI amount at application, the odds of achieving candidacy increase by about 6%. Both earnings and DI-benefit amount have been found to be positive predictors of competitive employment for DI-beneficiary BVI consumers in VR (Giesen & Cavanaugh, 2013). However, findings are mixed. Higher DI-benefit amount was reported to decrease odds of return to work (Hennessey, 1997) and of achieving benefits suspension milestones, although effect sizes were very small (Ben-Shalom & Mamun, 2015). More research will be needed to determine when DI amount is perceived as a disincentive to return-to-work and higher earnings levels.

Service factors. Unlike individual and socioeconomic factors, services represent interventions planned and delivered in VR. Ideally these are in accord with the needs and goals of the individual within the VR system. For measures of special and remedial services, the S&R-A group was not related to candidacy, $p = .57$. However, there was a trend for the S&R-B group (i.e., reader services, college) to be positively related to candidacy, $OR = 1.30$, $p = .071$.

Job-related services. Receiving more job-related services (JR-A) was associated with increasing odds of achieving candidacy, $OR = 1.28$, $p < .001$. Services in this grouping included job placement and search and on-the-job supports and training. These may be needed by job-ready individuals to find employment and to help with adjustment at the start of work in a particular employment setting. For an additional job-related service received, the odds of candidacy increase by 28%. This effect was moderated by cross-level interactions with state unemployment rate and with per capita income. There was a significant increase in the relationship between job-related services and candidacy (slope) as state unemployment rate increased, $OR = 1.14$, $p < .002$, and as state per capita income increased, $OR = 1.05$, $p < .006$, (\$1,000 increments). The job-related services-prime candidacy relationship was expected from a range of previous research (e.g., Berry & Caplan, 2010; Giesen & Hierholzer, 2016; Rogers et

al., 2005). Because such services are received near the end of the VR process—almost concomitant with VR closure—their predictive usefulness is questionable. The interactions suggest that job-related services are more important when state unemployment rate is high and when the individual resides in a state where per capita incomes are higher—where jobs may be higher paying and attract more competition. Job-related services, thus, are even more important for BVI individuals to achieve high earnings, such as exceeding SGA, when job market conditions are more competitive and/or lucrative.

Job-readiness training and evaluation services. Receiving job-readiness training involving work basics—appropriate behaviors, timeliness, dress, grooming—predicted lower odds of candidacy, $OR = 0.41$, $p = .005$, with a 59% reduction in odds of achieving prime candidacy. However, this effect was strongly positively moderated by a cross-level interaction with agency structure, $OR = 2.37$, $p < .032$. The job-readiness-candidacy relationship was substantially enhanced (by 137%) if the consumer was served in a separate agency rather than a combined one. Regarding evaluation services, receiving more services in either of the subgroupings of evaluation was not associated with likelihood of candidacy: E-A, $p = .33$; E-B, $p = .26$.

The negative relationship between job-readiness training and achieving prime candidacy perhaps says as much about the individual in need of this training as the effect of this training, per se. Job-readiness training involves appropriate work behaviors, timeliness, dress, and grooming. Consumers assessed as needing job-readiness training typically are closer to the beginning of the progression of skill building for job readiness. Receipt of this training can be viewed as indicating that these individuals are “at risk” for failing to achieve competitive employment and high earnings outcomes, and they probably will need more efforts, sustained training, and support services to achieve employment with earnings over SGA. Previous research

found that slightly under half of those receiving job-readiness training were eventually able to achieve competitive employment (Giesen & Hierholzer, 2016). In our study, the similar rate of job-readiness training (13.9% vs. 13.5% for noncandidate/candidate groups) indicates that some recipients of job-readiness training do go on to achieve earnings over SGA.

However, when consumers are served in a blind agency, the job-readiness—candidacy relationship is increased a great deal (an estimated 137%) over when the consumer is served in a combined agency. This is consistent with the hypothesis that blind agencies provide the extra attention, necessary training, and support services needed for these consumers to have the best chance to achieve earnings leading to DI-benefits suspension.

Training and supports. Receiving more services related to training and supports in the first subgroup, T&S-A (e.g., Rehabilitation Technology, Maintenance, Occupational or Vocational training), was associated with increased odds of prime candidacy, $OR = 1.37, p < .001$. For an additional service related to training and supports in the T&S-A subgroup, the odds of competitive employment increased by 37%. However, for services from the other subgroup of training and support services, T&S-B (i.e., Transportation and Augmentative Skills training), there was no relationship with odds of candidacy, $p = .56$. The T&S-A set of training and support services appear logically beneficial. Rehabilitation technology, for example, could be provided for individuals better educated and otherwise capable of profiting from technology-related educational training, adding to their potential for employment with high earnings. Maintenance and other services likely would be provided to support individuals making good progress and to those viewed as established or having high vocational potential.

Discussion

This study examined a comprehensive set of factors influencing the achievement of earnings

at closure exceeding SGA, an indicator of prime candidates to eventually suspend benefits, for a national population of DI-beneficiary consumers who are BVI and served in the state-federal VR program. The base rate of achieving prime candidacy status was 9.93%, a relatively low rate that indicates we are identifying a select group. This level can be compared with a base competitive-sector employment rate of about 45% for all BVI consumers exiting VR (Giesen & Hierholzer, 2016). Also, all prime candidates in our study had a competitive-sector employment closure.

Major contributions of this study are in three areas, one contributing to VR-practice considerations and two with potential policy implications. First, we identified a comprehensive summary profile of the DI-beneficiary consumer who is BVI, who has earnings exceeding SGA, and who may eventually suspend benefits due to work. Positive characteristics are being younger, relatively well educated, African American, male, blind *or* visually impaired but with no secondary disabilities. Prime candidates also have relatively high earnings and DI benefits upon entering VR and live in states with lower unemployment rates. In VR, they receive job placement-related services; do not need remedial, “work basics” training; and are suited to receive rehabilitation technology and other support services. Most of these characteristics suggest persons that might logically be considered ideal, experienced job candidates without complicating secondary disabilities. The importance and utility of such information is that the profile—and deviations from it—can provide a reminder to service providers and increase sensitization to particular issues that will require extra effort and specialized services to overcome disadvantages and optimize outcomes.

Second, our findings emphasize the importance of separate agencies, which specialize in serving consumers who are BVI. Our new findings revealed that services in blind agencies help overcome risk factors for failing to achieve high earnings outcomes over SGA. Being served in a

separate blind agency (versus a combined agency) potentially can overcome the outcome and earnings disadvantage of being female, help provide substantial earnings advantage for individuals younger than about 40 and some advantage for those older than about 45, and potentially overcome at risk status due to needing work basics (i.e., job-readiness) training. Thus, our study extends the considerable existing evidence demonstrating the significant employment outcome advantages of services provided in separate agencies.

Historically, because early VR agencies served all other disabilities but very few BVI consumers, these consumers sought services in separate, nongovernmental organizations, which evolved into separate state VR agencies (e.g., Cavanaugh, 2010). Existing evidence indicates that BVI consumers served in separate agencies are more likely to attain competitive employment even though these consumers are more workforce disadvantaged (i.e., more economically and socially at risk for poor employment outcomes) and are the most significantly disabled. They are more likely to be female, have less than a high school education, more severe vision loss, higher levels of secondary disabilities, and are more likely to receive public assistance. Compared to combined agencies, separate agencies provide more services at only a slightly higher cost, suggesting greater cost-effectiveness when all factors are considered (e.g., Cavanaugh, 2010; Giesen & Cavanaugh, 2013). However, state fiscal-austerity measures have led to consideration of administrative structure changes in VR, such as elimination of separate blind agencies—most recently, in Texas in 2016. Our strong policy recommendation is that separate blind agencies be preserved. Merging separate agencies or changes to the provision of specialized categorical services for blind consumers are clearly in opposition to the established and growing body of evidence showing clear employment and earnings advantages of services in separate blind agencies. Further, the feasibility and effectiveness of specialized services for other disability

categories may be an important avenue for future research.

Third, work experience may be key to better employment outcomes and enhanced earnings and may attenuate race/ethnicity differences. Both earnings and DI-benefit amount at application are associated with achieving prime candidacy in our study and may be additive factors, as both are general indicators of current and past employment and work experience. Although all of our study population were DI beneficiaries, most were likely to have had sufficient work quarters to qualify as DI beneficiaries, and their payments reflect the duration and level of previous work. However, some (an estimated 12.3% [SSA, 2017]) of the DI beneficiaries may be disabled adult children or disabled widow(er)s and may not have work experience. There is considerable evidence across disability types that work experience is a strong indicator of future employment (e.g., Berry, Price-Ellingstad, Halloran, & Finch, 2000; Giesen & Cavanaugh, 2013; Stodden, Dolwick, Gilmore, & Galloway, 2001). Thus, our evidence indicates that work experience generalizes beyond employment, *per se*—it is also an important predictor of employment with earnings over SGA. As a policy recommendation, those interested in improving return-to-work outcomes of DI beneficiaries, such as VR administrators and other policy makers, should keep in mind the importance of adequate work experience, given the vocational goal of the consumer. Consumers who aspire to a vocational objective with expected high earnings (e.g., exceeding SGA) need to evaluate whether additional work experience-related training is warranted in their VR services plan. Obtaining work experiences whenever and wherever possible may not be too strong a recommendation.

In addition to the advantages for employment outcomes, work experience may be involved in another important emerging dynamic: It seems likely that the documented prior work experience earned by DI beneficiaries operates to overcome typical employment outcome differences

between race or ethnicity groups, particularly regarding longstanding disadvantages for African Americans. The work experience of the DI beneficiary seems to provide more or less similar advantages—a leveling effect on race/ethnicity differences—not only for return to work, but also for achieving earnings above SGA. This kind of influence may generalize to disabilities other than BVI. The pattern again points to the importance of strong policy stressing the need for work experience opportunities wherever possible in the VR process.

In terms of limitations, we propose that consumers achieving earnings over SGA are prime candidates for eventually having DI benefits terminated, but we do not know for certain that they will go off the DI rolls. Consumers who are prime candidates in this study have been continuously employed for 90 days with earnings in excess of SGA, but there remains long periods (TWP and EPE) before benefits termination due to work. However, earnings over SGA has been recognized as a key policy interest, is considered by others as a precursor to benefit suspension or termination, and has been similarly used in other recent research (Mann, Mamun, & Hemmeter, 2015). Future research, most likely longitudinal, will be needed to verify that our factors pointing to earnings over SGA will continue to predict work milestones progressing to actual DI-roll departure.

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Table 1

Proportions, Means, and Standard Errors for Predictors by Outcome Group

Predictor	Outcome Groups					
	Non-Candidate		Prime Candidate		Total Sample	
	<i>p</i>	<i>SE</i>	<i>p</i>	<i>SE</i>	<i>p</i>	<i>SE</i>
Female	0.453	0.009	0.431	0.027	0.451	0.008
Age (<i>M</i>)*	46.860	0.190	44.460	0.582	46.620	0.181
White	0.649	0.009	0.667	0.025	0.651	0.008
African American	0.247	0.008	0.233	0.023	0.246	0.007
American Indian or Alaskan Native	0.010	0.002	0.000	0.000	0.009	0.002
Asian	0.011	0.002	0.023	0.008	0.012	0.002
Hawaiian or Pacific Islander	0.003	0.001	0.000	0.000	0.003	0.001
Hispanic of any race	0.071	0.005	0.066	0.013	0.071	0.004
Multi-race	0.009	0.002	0.012	0.006	0.009	0.002
Education level (<i>M</i>)*	4.820	0.029	5.750	0.085	4.910	0.028
Weekly earnings (<i>M</i>)*	\$62.43	\$2.60	\$226.30	\$18.34	\$78.70	\$3.08
SSDI monthly benefit (<i>M</i>)*	\$996.11	\$7.06	\$1118.65	\$23.87	\$1008.28	\$6.81
Cognitive secondary disability*	0.028	0.003	0.006	0.004	0.026	0.003
Noncognitive secondary disability*	0.407	0.009	0.285	0.024	0.395	0.008
Legal blindness*	0.725	0.008	0.793	0.022	0.732	0.007
Special/remedial services-A (<i>M</i>)*	0.015	0.002	0.037	0.012	0.017	0.002
Special/remedial services-B (<i>M</i>)*	0.104	0.006	0.210	0.026	0.115	0.006
Job-related services-A (<i>M</i>)*	0.514	0.015	0.747	0.054	0.537	0.015
Job readiness training-B	0.139	0.006	0.135	0.018	0.138	0.006
Evaluation services-A (<i>M</i>)*	0.823	0.010	0.943	0.034	0.835	0.010
Evaluation services-B (<i>M</i>)	1.024	0.012	1.026	0.039	1.025	0.012
Training & supports-A (<i>M</i>)*	1.505	0.021	1.940	0.063	1.548	0.020
Training & supports-B (<i>M</i>)	0.793	0.013	0.813	0.041	0.795	0.012

Note. *p* = proportion. *M* = mean. *indicates candidacy groups differ at $p < .05$. All non-service measures were at application. *SE* is to the right of each proportion or mean. Total $N = 3,505$; non-candidate $n = 3,157$; prime candidate $n = 348$. Data from RSA-911 Case Service Report, 2011.

Table 2

Hierarchical Logistic Regression Results and Model Equations for Predicting Odds of Employment Earnings Exceeding SGA for SSDI Beneficiaries with Visual Impairments Exiting VR

Model	Param	Coef	SE	T-ratio	df	OR	p
For Intercept 1 (B0)							
Intercept 2	G00	-2.348	0.2319	-10.13	46	0.0956	<.001
Unemployment rate	G01	-0.126	0.0603	-2.09	46	0.8816	.042
State population	G02	0.019	0.0121	1.58	46	1.0193	.121
Agency structure	G03	-0.145	0.2460	-0.59	46	0.8650	.558
Per capita income	G04	-0.037	0.0236	-1.59	46	0.9633	.119
For Education level slope (B1)							
Intercept 2	G10	0.311	0.0427	7.28	3463	1.3643	<.001
For SSDI amount slope (B2)							
Intercept 2	G20	0.001	0.0002	3.06	3463	1.0006	.003
State population	G21	0.000	0.0000	1.42	3463	1.0000	.155
For Age slope (B3)							
Intercept 2	G30	-0.043	0.0115	-3.74	3463	0.9579	<.001
Agency structure	G31	0.015	0.0138	1.12	3463	1.0156	.263
For Cog Sec disab slope (B4)							
Intercept 2	G40	-1.644	0.7378	-2.23	3463	0.1931	.026
For Noncog Sec disab slope (B5)							
Intercept 2	G50	-0.504	0.1373	-3.67	3463	0.6043	<.001
For Female slope (B6)							
Intercept 2	G60	-0.486	0.2054	-2.37	3463	0.6148	.018
Agency structure	G61	0.502	0.2590	1.94	3463	1.6514	.052

For Legal blindness slope (B7)

Intercept 2	G70	0.134	0.1549	0.86	3463	1.1432	.388
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For Job readiness trn slope (B8)

Intercept 2	G80	-0.898	0.3166	-2.84	3463	0.4072	.005
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Agency structure	G81	0.864	0.4027	2.15	3463	2.3735	.032
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For African American slope (B9)

Intercept 2	G90	0.418	0.1780	2.35	3463	1.5184	.019
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State population	G91	-0.035	0.0180	-1.96	3463	0.9652	.050
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For Asian slope (B10)

Intercept 2	G100	0.155	0.4731	0.33	3463	1.1680	.743
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For Hispanic slope (B11)

Intercept 2	G110	-0.054	0.2679	-0.20	3463	0.9475	.841
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For Multi-race slope (B12)

Intercept 2	G120	0.385	0.5791	0.66	3463	1.4691	.506
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For Spc/remedial srv-B slope (B13)

Intercept 2	G130	0.266	0.1477	1.80	3463	1.3049	.071
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For Spc/remedial srv-A slope (B14)

Intercept 2	G140	0.229	0.4018	0.57	3463	1.2574	.568
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For Job-related srv-A slope (B15)

Intercept 2	G150	0.250	0.0755	3.32	3463	1.2845	.001
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Unemployment rate	G151	0.130	0.0422	3.09	3463	1.1393	.002
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Per capita income	G152	0.046	0.0168	2.77	3463	1.0474	.006
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For Evaluation srv-A slope (B16)

Intercept 2	G160	0.114	0.1179	0.97	3463	1.1206	.334
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For Evaluation srv-B slope (B17)

Intercept 2	G170	-0.115	0.1026	-1.12	3463	0.8913	.262
For Training/supports-A slope (B18)							
Intercept 2	G180	0.317	0.0610	5.19	3463	1.3724	<.001
For Training/supports-B slope (B19)							
Intercept 2	G190	0.085	0.1466	0.58	3463	1.0884	.563
Agency structure	G191	-0.249	0.1815	-1.37	3463	0.7792	.170
For Weekly earnings slope (B20)							
Intercept 2	G200	0.585	0.0829	7.05	3463	1.7941	<.001
Agency structure	G201	-0.169	0.1065	-1.59	3463	0.8444	.112
For Age squared slope (B21)							
Intercept 2	G210	-0.002	0.0009	-2.03	3463	0.9982	.042
Agency structure	G211	0.002	0.0011	2.22	3463	1.0024	.026

Note. Analysis of FY 2011 RSA-911 data. Param = Parameter. Coef = Coefficient.

Model Equations. *Level-1 Model:* $\log[P/(1-P)] = B0 + B1*(\text{Education level}) + B2*(\text{SSDI amount}) + B3*(\text{Age}) + B4*(\text{Cognitive secondary disability}) + B5*(\text{Noncognitive secondary disability}) + B6*(\text{Female}) + B7*(\text{Legal blindness}) + B8*(\text{Job readiness training}) + B9*(\text{African American}) + B10*(\text{Asian}) + B11*(\text{Hispanic}) + B12*(\text{Multi-race}) + B13*(\text{Special/remedial services-B}) + B14*(\text{Special/remedial services-A}) + B15*(\text{Job-related services-A}) + B16*(\text{Evaluation services-A}) + B17*(\text{Evaluation services-B}) + B18*(\text{Training/supports-A}) + B19*(\text{Training/supports-B}) + B20*(\text{Weekly earnings}) + B21*(\text{Age squared}).$

Level-2 Model: $B0 = G00 + G01*(\text{Unemployment rate}) + G02*(\text{State population}) + G03*(\text{Agency structure}) + G04*(\text{Per capita income}) + U0$; $B1 = G10$; $B2 = G20 + G21*(\text{State population})$; $B3 = G30 + G31*(\text{Agency structure})$; $B4 = G40$; $B5 = G50$; $B6 = G60 + G61*(\text{Agency structure})$; $B7 = G70$; $B8 = G80 + G81*(\text{Agency structure})$; $B9 = G90 + G91*(\text{State population})$; $B10 = G100$; $B11 = G110$; $B12 = G120$; $B13 = G130$; $B14 = G140$; $B15 = G150 + G151*(\text{Unemployment rate}) +$

$G152 * (\text{Per capita income})$; $B16 = G160$; $B17 = G170$; $B18 = G180$; $B19 = G190 + G191 * (\text{Agency structure})$; $B20 = G200 + G201 * (\text{Agency structure})$; $B21 = G210 + G211 * (\text{Agency structure})$.

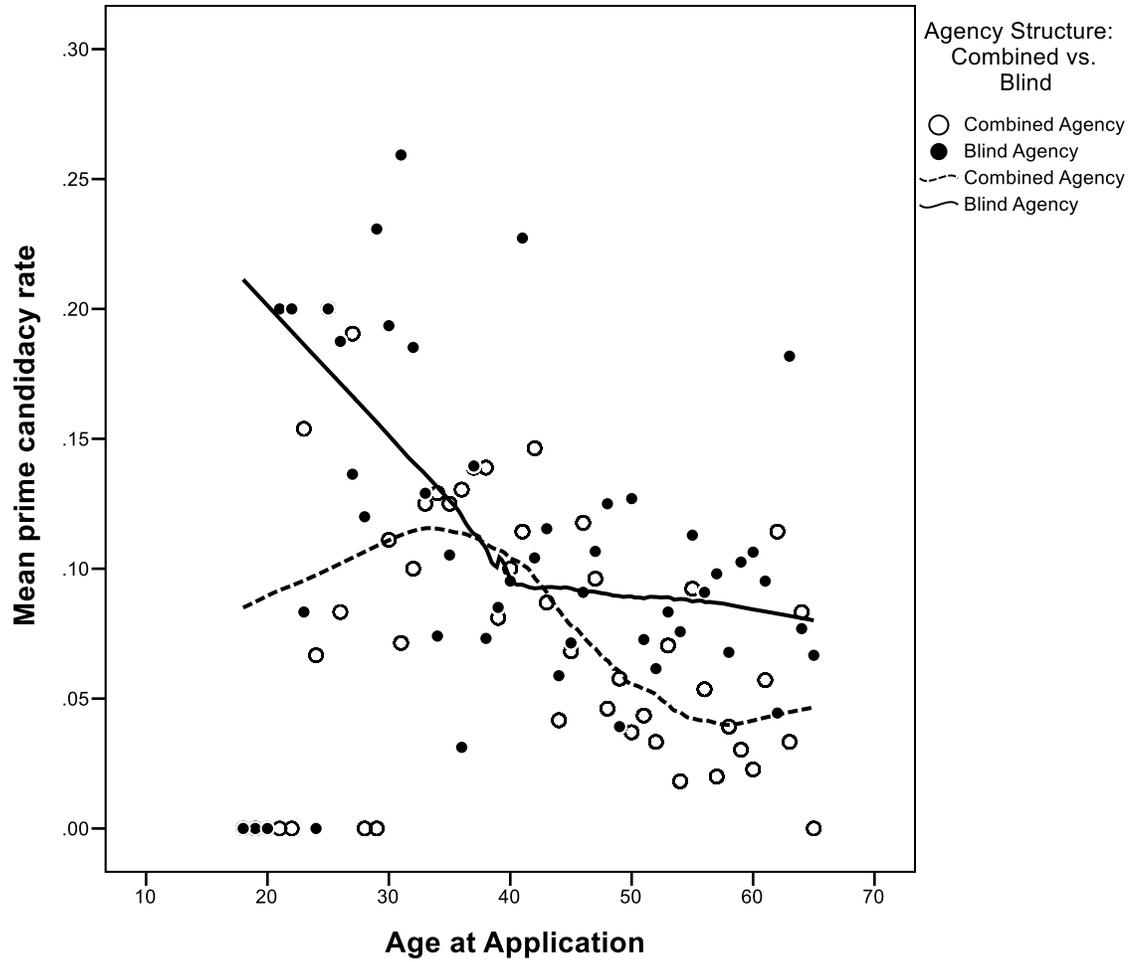


Figure 1. Trends in prime candidacy rate by age at application and combined vs. blind VR-agency structure type. Prime candidacy indicates earnings at VR closure exceeding SGA.