

# Six-year earnings and disability benefit outcomes of youth vocational rehabilitation applicants

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## Abstract.

**BACKGROUND:** Limited information exists about the long-term outcomes of youth who applied and were eligible for vocational rehabilitation (VR) services.

**OBJECTIVE:** We document the earnings in the sixth calendar year after youths' VR applications and Social Security Administration (SSA) benefit outcomes during the six years after their VR applications.

**METHODS:** We use descriptive and multivariate analyses to track outcomes for a cohort of 570,146 youth ages 14 to 24 (including those in and out of school) who applied for VR services from 2004 to 2007 using administrative data from the Rehabilitation Services Administration and SSA.

**RESULTS:** We find strong correlations between youths' human capital characteristics and their eventual long-term outcomes. Youth who were working or in postsecondary school when they applied for VR services and those who exited from VR with employment had higher earnings and better SSA program outcomes. Youth who did not have a high school diploma and were neither working nor in school at the time they applied for VR services had poorer outcomes.

**CONCLUSION:** New federal policies will provide many VR agencies with opportunities to increase their investment in youth, but some types of youth are more at risk of experiencing poor outcomes than others.

Keywords: Career/vocational counseling, transition, program evaluation, rehabilitation

## 1. Introduction

State vocational rehabilitation (VR) agencies have the potential to help youth increase their future earnings and reduce their long-term reliance on Social Security Administration (SSA) disability benefits. However, few studies have shown the long-term earnings and SSA outcomes of youth who participate in VR and the role of human capital investments (such as work experience and educational attainment). Addi-

tionally, the practices and policies of VR agencies regarding youth, and particularly students with disabilities, are changing as a result of the Workforce Innovation and Opportunity Act (WIOA) (P.L. 113-128), increasing the interest in rehabilitation services for youth and their potential outcomes.

Using multiple federal administrative data sources from the Rehabilitation Services Administration (RSA) and SSA, we tracked youth VR applicants who were ages 14 to 24 and eligible for services up to six years after their VR application. We give special consideration to three youth characteristics relevant to human capital development and WIOA programs and policies, including their receipt of SSA

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disability benefits at the time of their VR application. The analysis examines youths' annual earnings in the sixth calendar year after VR application and two SSA outcomes throughout six years after VR application: receipt of Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI) for non-SSA beneficiaries and benefits forgone due to work (BFW) for SSI recipients and SSDI beneficiaries. BFW is important for SSI recipients and SSDI beneficiaries because it is an indicator of whether a youth had earnings from employment that were high enough to reduce SSI or SSDI benefit amounts.

We found new long-term evidence about the relationship between earnings and SSA outcomes for youth VR applicants. Among all youth, exiting from VR successfully—meaning that a youth received VR services and worked upon leaving VR—correlated positively with long-term earnings and SSA outcomes, compared to exiting VR after receiving services but without an employment outcome. We also observed large differences by a youth's educational and employment status at application. Youth who were working or enrolled in postsecondary school at the time they applied to VR had better earnings and SSA outcomes than their counterparts not so engaged. Overall, 43 percent of all VR-eligible youth had annual earnings greater than \$1,200 in the sixth year after their VR applications, with substantially lower rates of earnings for youth who did not have a high school diploma and were neither working nor in school at the time they applied for VR services. The \$1,200 threshold is equal to one quarter of coverage (QC) for Social Security benefit purposes in 2014, the benchmark year of our data analysis. The \$1,200 threshold is an important benchmark to track because QCs are used, in part, to calculate disability-insured status.

State VR directors and counselors who work with transition-age youth might find these results especially important because VR agencies vary widely in the composition of their youth who receive services. Understanding this variation is especially important as agencies are now statutorily required to provide pre-employment services to potentially eligible students, which may lead to a higher number of younger applicants.

### *1.1. Literature review*

Youth with disabilities face multiple barriers to living independently as they transition to adulthood from school. Transition-age youth (those ages 14

to 24) with disabilities have poorer employment and other postsecondary outcomes compared to their peers without disabilities and are also more likely to live in poverty or be involved in the juvenile justice system (Bureau of Labor Statistics, 2017; Cobb et al., 2013; Horvath-Rose, Stapleton, & O'Day, 2004).

Successful transition can be enhanced through investments in human capital, such as education, training, and paid work experiences. These investments, particularly while youth are still in high school, have been associated with better career and earnings outcomes (Cameto, 2005; Hemmeter, Donovan, Cobb, & Asbury, 2015; Horvath-Rose et al., 2004; Fraker, Mamun, Honeycutt, Thompkins, & Valentine, 2014). Evidence also shows that people with higher levels of educational attainment are more socially advantaged, obtain higher wages, and are employed at higher rates compared to individuals who drop out of high school or only have a high school diploma (Baker, Mixner, & Harris, 2007).

Approximately 30 percent of all applicants to state VR agencies are transition-age youth with disabilities who seek services to improve their human capital (Honeycutt, Thompkins, Bardos, & Stern, 2017). The state VR services program is the largest publicly funded program designed to provide services for individuals with disabilities who are interested in preparing for and engaging in competitive employment. To be eligible for VR, an individual must have a physical or mental impairment, the physical or mental impairment must constitute or result in a substantial impediment to employment, and the individual must require VR services to prepare for, secure, retain, advance in, or regain employment. For eligible clients, VR agency services may include, but are not limited to, rehabilitation counseling, assistive technology, job accommodations, job search and placement assistance, education and training, and other services and supports needed to achieve an employment goal. Before receiving VR services, eligible VR clients are required to sign a mutually agreed upon individualized plan for employment (IPE) that specifies the services to be provided to the individual by the VR agency.

The roles of VR agencies in serving youth are changing because of WIOA legislation enacted in July 2014 that consolidates and strengthens job training programs. Under WIOA, agencies must allocate at least 15 percent of their federal matching grant funds to provide pre-employment transition services to students with disabilities (RSA, 2016). WIOA allows agencies to provide pre-employment tran-

sition services to students with a disability who are potentially eligible for VR services. Additional WIOA requirements for VR agencies include an emphasis on collaboration with other state-level organizations and changes in the data they collect and provide to the RSA, including outcomes for those who receive VR services.

Many youth with disabilities who apply for VR rely on SSI or SSDI for income support, and such youth might have characteristics and outcomes that substantially differ from those who do not receive SSA benefits. SSI is a means-tested program that provides cash payments to low-income people with disabilities, with different disability eligibility rules for those younger than 18 and those 18 and older (Hemmeter, Kauff, & Wittenburg, 2009; Hemmeter, Mann, & Wittenburg, 2017). A substantial proportion of individuals continue to receive SSI into adulthood, particularly those with functional limitations (Davies, Rupp, & Wittenburg, 2009). Under SSI program rules, individuals are limited in the amount of income they can obtain through employment or savings before losing all or part of their benefits. SSDI benefits are awarded to qualified disability-insured workers (that is, those who have attained a certain work history experience and who have a medical condition that impedes work at a substantial level) (SSA, 2014). Younger workers can become eligible for SSDI with fewer quarters of coverage relative to older workers. Because of their work experience, SSDI beneficiaries may be at a relative advantage for returning to work when compared to SSI recipients, who might have little or no work history. Though most SSDI beneficiaries receive benefits through their own work record, some might receive benefits as disabled adult children if they had a disability onset before age 22 and one of their parents received some type of Social Security benefits (SSA, 2015). As such, these beneficiaries might be more similar to SSI recipients than SSDI beneficiaries in their involvement with VR services and with their employment outcomes.

SSA disability benefit status is likely to correlate with short- and long-term outcomes because benefit status corresponds to having significant, work-limiting health conditions along with other potential challenges. Youth with SSI benefits have lower rates of job placement, competitive employment, or wages, even after controlling for other background characteristics, whether for the general population of youth (Honeycutt, Thompkins, Bardos, & Stern, 2017; Honeycutt, Martin, & Wittenburg, 2017); youth-specific employment programs, such as

Bridges (Fabian, 2007; Hemmeter et al., 2015); or specific youth VR populations, such as those with blindness (Giesen & Cavanaugh, 2012) or autism (Kaya et al., 2016). However, results for youth SSDI beneficiaries are not as consistent; for instance, Giesen and Cavanaugh (2012) found no differences in employment for SSDI beneficiaries compared to non-SSA beneficiaries. One emergent finding across studies is that VR service receipt can be a more important influence than SSA benefit receipt, underscoring the potential value of VR services on employment outcomes (Kaya et al., 2016). Research on youth with disabilities outside of the youth VR population, such as youth who receive special secondary education services, also find that family- or individual-level SSA and other public benefit receipt is negatively correlated with competitive employment (Wehman et al., 2015; Sima, Wehman, Chan, West, & Leucking, 2015). Hence, disaggregating VR clients by their SSA benefit status might be important for assessing the potential influence of individual, social, and VR agency characteristics on long-term earnings and SSA outcomes.

The current study provides new information on the long-term earnings and SSA outcomes of VR-involved transition-age youth by their human capital characteristics. The key contributions of the study to the literature are: (1) assessing outcomes up to six years after VR application, (2) looking at outcomes outside the context of what VR administrative data offers, and (3) considering outcomes in the context of a youth's human capital characteristics.

## 1.2. Study purpose

We answer two research questions:

- (1) What are the long-term earnings and SSA disability benefit outcomes for youth who are eligible for VR services?
- (2) How do these outcomes differ according to a youth's SSA disability benefit and human capital statuses?

## 2. Methods

To answer the research questions, we followed youth in the six years after their VR applications using matched federal administrative data. As a starting point, we stratified our sample based on SSA status at application, given the differences in out-

comes between SSA and non-SSA recipients cited above. For each group, we tracked earnings and SSA program outcomes for six years following VR application. Finally, we used multivariate techniques to assess how variations in outcomes relate to youths' education and employment status at VR application and their VR case closure status.

### 2.1. Data sources

The analysis uses data from RSA's Case Service Report (RSA-911) matched to SSA's Disability Analysis File (DAF) and the Master Earnings File (MEF). RSA-911 files used in this analysis contain administrative data compiled annually for all individuals who exited from a VR agency in a given fiscal year and include information on their demographic characteristics, disability information, service descriptions, and closure status outcomes. The DAF aims to support longitudinal research on SSA's disability programs. The DAF includes a record for every individual ages 18 to 65 who received a SSI or SSDI benefit in at least one month since 1996, as well as all youth ages 10 to 17 who received benefits in any month since 2005. Among other data, the DAF includes variables about monthly benefit receipt and amounts (Bronnikov et al., 2016). By matching these two data sets, we can determine SSA benefit status information at the time of VR application, calculate SSA BFW, and track episodes of new SSA benefit enrollment after VR application. Finally, we matched the DAF and RSA-911 records to longitudinal Internal Revenue Service (IRS) data in SSA's MEF, which includes earnings records for 96 percent of the U.S. workforce (Olsen & Hudson, 2009). By matching the DAF and RSA-911 records to the MEF, we obtained annual earnings from the MEF for each record in the analysis file from 2001 through 2014. Access to the MEF data is restricted to those meeting IRS code requirements; one of the study authors, a qualified SSA employee, served in this role. See Stapleton and Martin (2017) for more information on using SSA data.

Matched data are particularly useful for conducting longitudinal research; however, the RSA-911 and DAF data have two limitations that do not significantly affect our results but should be noted. First, the RSA-911 data are collected and intended for administrative—not research—purposes. They therefore do not include variables (such as motivation and social networks) that might have been included had the data been developed as part of a research study.

Second, the DAF age restriction means that we are unable to identify a very small number of 2004 youth VR applicants who had SSA benefits in 2004 but not in subsequent years. Despite these limitations, the administrative data sets together provide a beneficial composite of youth's experiences into adulthood after VR application.

### 2.2. Study sample

We identified 570,146 youth VR applicants who met the study's inclusion and exclusion criteria. Starting with RSA-911 data from fiscal years 2004 through 2013, we selected youth ages 14 to 24 years who applied for VR services from fiscal years 2004 to 2007. We required multiple years of data because RSA-911 files consist of individual closure records, and youths' VR application year is unknown until VR closure. Although the RSA-911 data cover a longer period, we limited our analyses to VR applicants through 2007 because of the time lags between application and case closure.

To narrow the sample, we used additional criteria that are consistent with previous SSA-RSA matched data studies. We excluded VR agencies in the U.S. territories (American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands). We also excluded all clients whose reason for case closure was death (less than 1 percent) or who closed as an applicant (for example, they were found ineligible for VR services because they did not have a disability or they had no impediment to employment, did not return for services, or did not cooperate with agency staff; 15 percent of all youth applicants). We made the latter exclusion because of our interest in focusing on those who were potentially likely to receive services. Finally, for the current analysis, we include results only for general VR agencies serving non-blind populations and combined VR agencies that offer services to eligible clients of all disability types.

### 2.3. Measures

Youths' SSA status at the time of VR application, education and employment status at the time of VR application, and their VR case closure status are the primary independent variables considered in this study, given our focus on human capital development and WIOA's emphasis on outreach to youth in and out of secondary school.

### 2.3.1. SSI or SSDI benefit receipt

We stratified the sample into three groups based on their SSA beneficiary status at the time of VR application. We stratified by SSA benefit receipt because 1) beneficiaries who receive these benefits may face important programmatic decisions about whether to continue to participate in long-term disability benefits as adults that differ from VR applicants who do not receive these services and 2) beneficiaries might have more severe disabilities—and, for SSI, lower access to resources—than non-beneficiaries. Youth who received neither SSI nor SSDI benefits at application were flagged as non-SSA beneficiaries (referred to hereafter as “non-SSA youth;”  $N=420,615$  across the four applicant years, or about 105,000 youth annually). Youth receiving SSA benefits at application were categorized as either receiving SSI benefits (“SSI youth;”  $N=130,417$ ) or SSDI benefits (“SSDI youth;”  $N=42,035$ ). The 22,921 youth who were concurrent SSA beneficiaries, meaning that they received both SSI and SSDI benefits when they applied for VR services, are counted in both the SSI and SSDI samples. These proportions are similar to those reported elsewhere on youth VR populations (Honeycutt, Thompkins, et al., 2017). Using U.S. Census data and SSA reports, we estimate that annually, the VR youth in our sample accounted for about 5 percent of all youth with disabilities, SSI youth VR applicants accounted for about 4 percent of SSI recipients in the age range, and SSDI youth VR applicants accounted for about 8 percent of SSDI beneficiaries in the age range (Honeycutt and Wittenburg 2012, SSA 2004a, SSA 2004b, U.S. Census Bureau 2004).

### 2.3.2. Education and employment status

We assigned youth to one of eight mutually exclusive categories that indicate their education and employment status when they applied for VR services. Education and work experience represent two important forms of human capital. We used two RSA-911 data elements (level of education attained at application and employment status at application) to assign youth to the following categories:

1. Enrolled in high school, without a high school diploma, and not working (referred to hereafter as “high school enrolled youth”)
2. Had no high school diploma or special education certificate and were either working or in training or school, ages 18 or younger
3. Had no high school diploma or special education certificate and were either working or in training or school, ages 19 or older
4. Had no high school diploma or special education certificate and were not working or in school
5. Had at least a high school diploma or special education certificate and were working
6. Had at least a high school diploma or special education certificate and were enrolled in postsecondary school or training
7. Had at least a high school diploma or special education certificate and were neither working nor in postsecondary school or training
8. Had missing or inconsistent information on school enrollment and/or employment.

Our approach to using these education and employment status categories to measure human capital development makes two key assumptions. First, the RSA-911 data for this period did not contain an explicit measure of either secondary or postsecondary school enrollment (recent updates to the RSA-911 include such information). The employment at application variable first lists a person as employed; if he or she is not employed, the person is then categorized as either in school or not otherwise working. A youth who is both working and either enrolled in high school or postsecondary school might therefore likely be identified only as working and not as enrolled in school. Because of this issue, we subdivided the group of youth who were working but who did not have a high school diploma into two categories by age (age 18 and younger, age 19 and older) on the assumption that many of the younger youth likely both worked and were enrolled in high school. Second, the special education certificate category for education attainment at application does not distinguish individuals who had completed that certificate from those who were currently attending school on a special education certificate track. We cannot therefore identify whether a youth had obtained the certificate or was still in secondary school working toward a certificate. When a special education certificate youth was identified as not working because he or she was a student, we classified the individual as enrolled in high school; otherwise, we classified the youth as having obtained a high school diploma or certificate, along with his or her employment status variable (working; in postsecondary school; or neither working nor in postsecondary school).

### 2.3.3. VR case closure status

We included three VR case closure status categories to indicate how eligible clients exited from the VR program. VR case closure status provides a measure of human capital development that might be associated with future earnings. To construct this measure, we identified those who *exited before IPE* (individuals who did not receive services, meaning they exited from VR before signing an IPE despite being eligible to receive services); *exited after IPE without employment* (individuals who developed and signed an IPE and received VR services, but were not working when they exited from the VR program); and *exited after IPE with employment* (youth who signed an IPE who exited with an employment outcome, meaning they were employed for at least 90 days when they exited from the VR program).

### 2.3.4. Other characteristics

Table 1 lists other demographic (such as race, sex, and age) and agency characteristics included in the analysis. These variables are potentially correlated with the long-term outcomes of interest, similar to the other independent variables mentioned above. For disability type, we recoded RSA-911 codes for primary cause of impairment into six categories: learning/cognitive disability (those with specific learning disabilities, attention deficit hyperactivity disorder, or traumatic brain injury); intellectual/developmental (autism, congenital condition or birth injury, or mental retardation); mental health; other physical disability; and unknown. More details about these variables are available in Honeycutt, Martin, and Wittenburg (2017).

### 2.3.5. Outcome measures

Our analysis examined the association between the aforementioned human capital variables with outcome measures involving earnings and SSA disability program participation.

### 2.3.6. Earnings

For each of the three SSA groups of youth, we measured the amount of earnings in the sixth calendar year after VR application using the MEF. We also used the MEF to derive a binary measure of any substantive earnings (earnings greater than \$1,200—one quarter of coverage needed to qualify for SSDI benefits) in that same year. We indexed BFW to 2014 dollars using SSA's listing of the annual Consumer Price Index for Urban Wage Earners and Clerical Workers because that index is used by SSA for annual

cost of living adjustments and is meaningful with respect to the value of the benefits to the individual. We indexed earnings to 2014 dollars using the National Average Wage Index because that index is used by SSA to index program amounts, such as the amount of earnings need to earn a quarter of coverage, which is our binary measure of substantive earnings.

### 2.3.7. SSA disability program participation

We constructed different SSA outcome measures for non-SSA and SSA youth. For youth without any SSA benefits at application, we assessed whether they received SSI or SSDI at any time within six years of their VR applications, which could reflect both VR success (in promoting employment over benefit receipt) and the severity of a VR youth's disability. For youth who received SSI or SSDI when they applied to VR, we identified the proportion who had any BFW throughout the six years after their VR applications and the amount of BFW during that period (a cumulative measure across all six years), regardless of other reasons for benefit loss.

## 2.4. Analytical approaches

We used both descriptive statistics and multivariate models to answer the study's research questions. Descriptive analyses depict the general characteristics of our sample and track outcomes following application using counts, means, and percentages for dependent and independent variables across the three SSA groups. We supplement this analysis with multivariate methods to examine how individual and agency characteristics correlate with six-year outcomes of interests across our SSA receipt groups. In the following model:

$$y_{is} = \alpha_{is} + \beta_1 EDEM_i + \beta_2 VR_i + \beta_3 X_{is} + \varepsilon_{is}$$

$y_{is}$  is the outcome of interest,  $EDEM$  is the youth's education and employment status at application (one of eight mutually exclusive categories),  $VR$  is the youth's VR case closure status, and  $X$  represents additional individual- and agency-level variables associated with the youth and agency at the time of VR application for each individual  $i$  in agency  $s$ . For binary outcomes (any BFW, new SSI or SSDI receipt, any substantive earnings in the sixth year after application), we used logistic regression models and report key findings as odds ratios. Odds ratios greater than 1.0 (and whose confidence intervals do not include 1.0) indicate a greater likelihood

Table 1  
Demographic statistics for youth VR clients, by SSA benefit status at VR application (percentages unless otherwise noted)

	Youth without SSA benefits at application ( <i>N</i> = 420,615)	Youth with SSI benefits at application ( <i>N</i> = 130,417)	Youth with SSDI benefits at application ( <i>N</i> = 42,035)
<b>Education and employment status</b>			
Enrolled in high school, not working	29.5	24.4	16.4
No high school diploma, working or in school, age 18 or younger	10.8	5.2	3.4
No high school diploma, working or in school, age 19 or older	2.5	2.8	2.3
No high school diploma, neither working nor in school	15.8	17.5	15.7
High school diploma, working	9.4	4.0	7.4
High school diploma, in postsecondary school	4.7	4.3	3.6
High school diploma, neither working nor in school	25.2	40.4	50.0
Missing education and/or employment data	2.0	1.3	1.2
<b>VR case closure status</b>			
Exited after IPE without employment	27.9	36.5	35.7
Exited before IPE	32.2	34.8	34.5
Exited after IPE with employment	39.9	28.7	29.8
<b>Sex</b>			
Male	60.0	59.7	59.7
Female	40.0	40.3	40.3
<b>Race</b>			
White	75.5	63.9	71.7
Black	20.4	31.8	24.3
Asian	1.2	1.4	1.1
American Indian	1.3	1.3	1.1
Pacific Islander	0.4	0.3	0.4
Multiple race	1.1	1.3	1.4
Missing	0.1	0.1	0.0
Hispanic	10.8	9.9	7.5
<b>Age at application</b>			
14 to younger than 19	58.5	37.9	24.9
19 to younger than 22	25.7	38.1	32.5
22 to younger than 25	15.7	23.9	42.7
<b>Disability</b>			
Learning/cognitive disability	46.6	17.5	15.8
Mental health	16.4	18.4	25.7
Developmental/intellectual disability	17.0	45.5	37.9
Other physical disability	9.9	12.9	15.2
Alcohol, substance, or other drug abuse	4.6	0.4	0.6
Unknown	5.5	5.3	4.8
<b>Public support at application</b>			
Public benefit receipt	8.2	6.8	10.5
SSI benefits	na	82.4	na
SSDI benefits	na	na	45.5
Both SSI and SSDI benefits	na	17.6	54.5
Agency in order of selection	57.3	60.4	61.0
Proportion of youth applicants	33.6	33.1	32.8
Proportion of youth who received services	58.1	56.9	56.5
Average time from application to eligibility for youth (in months)	1.3	1.4	1.4
Average time from eligibility to IPE (in months)	4.2	4.3	4.4
Average cost of purchased services for youth	\$2,534	\$2,569	\$2,572

Source: RSA-911 fiscal years 2004–2014. Note: *N* = 570,146 youth ages 14 to 24 at application and eligible for VR services. IPE = individual plan for employment; na = not applicable; RSA = Rehabilitation Services Administration; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; VR = vocational rehabilitation.

for the outcome, whereas odds ratios less than 1.0 (and whose confidence intervals do not include 1.0) indicate a lower likelihood. For continuous outcome variables (BFW amount within six years of application and earnings in the sixth year after application),

we used ordinary least squares regression models. All regression models included state and year fixed effects, which we calculated for the entire sample. In the results section, we focus on the two individual characteristics of most interest (education and

employment at application, VR case closure status). Complete regression results are available from the corresponding author.

### 3. Results

#### 3.1. Descriptive statistics

Non-SSA youth tended to be more involved in the combination of work and school activities in comparison to youth who received SSA benefits (Table 1). Greater proportions of non-SSA youth were enrolled in high school and not working, had a high school diploma and were working, or had no high school diploma and were working, compared to SSI or SSDI youth. Alternatively, 50 percent of SSDI youth and 40 percent of SSI youth had attained a high school diploma but were not working at the time of VR application, compared to 25 percent of non-SSA youth.

A higher proportion of non-SSA youth closed from VR with employment (40 percent), than did youth with SSI or SSDI benefits (less than 30 percent) (Table 1). Higher proportions of youth with SSA benefits either exited before signing an IPE or exited from VR after receiving services but without employment, compared to non-SSA youth. These patterns could reflect greater disability severity and challenges to employment on the part of SSA youth relative to non-SSA youth, along with program disincentives to earnings for the former.

Non-SSA youth tended to be younger or have a learning/cognitive disability relative to their SSI and SSDI counterparts (Table 1). Youth in the SSI group (46 percent) and SSDI groups (38 percent) had higher proportions with developmental/intellectual disabilities, whereas youth in the non-SSA group (47 percent) more frequently had learning/cognitive disabilities. SSDI youth (43 percent) were more frequently in the oldest age category at the time of VR application than SSI or non-SSA youth, whereas a larger proportion of non-SSA youth (59 percent) was in the youngest age category.

Turning to outcomes, non-SSA youth had two to three times the earnings levels of SSI or SSDI youth, likely for similar reasons as noted earlier for VR case closure with employment (Table 2). About two-thirds of non-SSA youth had earnings greater than \$1,200 in the sixth calendar year after application, and their mean annual earnings in the sixth calendar year after application were about \$11,100 (inclusive of those without any earnings). Just less than one-third of SSI and SSDI youth had earnings at a similar level,

and their mean annual earnings were about \$3,200 to \$3,400.

Few non-SSA youth obtained benefits during the six years after their VR applications (Table 2). Among non-SSA youth, 7 percent entered the SSI program within six years and just under 7 percent entered the SSDI program.

Substantially more SSI youth (46 percent) had earnings that affected their benefits (either SSI or SSDI) across the six years after VR application compared to SSDI youth (12 percent) (Table 2). Despite the different proportion with BFW, the average BFW amounts across all SSI or SSDI recipients during the six years after VR application were similar for the two groups: just more than \$2,300. These results may reflect differences in program rules and work incentives between the two types of benefits (SSA, 2014). With SSI, monthly benefits decline at roughly \$1 for every \$2 in earnings, and so even a small amount of earnings can result in BFW. However, SSI recipients under age 22 are eligible for the student earned income exclusion if they are in school. In 2014 (the final year of our follow-up period), SSA excluded earnings up to \$1,750 a month (capped at \$7,060 a year) from SSI payment calculations. A recent U.S. GAO report, however, found that this work incentive is not always applied to youth correctly, which would mitigate its effect (U.S. GAO, 2017). With SSDI, all cash benefits cease after meeting certain earnings and duration thresholds, and so BFW only occurs with substantive and persistent earnings. When we examine BFW among those with any BFW, the mean amount for SSDI beneficiaries is four times that of SSI recipients.

#### 3.2. Multivariate analyses

Given the large differences in both background characteristics and outcomes between SSA and non-SSA youth, we used multivariate analyses to examine the correlation between the two for each of our three subgroups after controlling for other characteristics. We begin by first considering outcomes for non-SSA youth and then turn to outcomes for SSI and SSDI youth.

##### 3.2.1. Outcomes for non-SSA youth

Education and employment status at application for non-SSA youth predicted their long-term earnings. Among non-SSA youth with a high school diploma who were working at the time of their VR application, the odds of having any substantive earn-

Table 2  
SSA benefit and earnings outcomes of youth VR clients, by SSA benefit status at VR application

	Youth without SSA benefits at application (N = 420,615)	Youth with SSI benefits at application (N = 130,417)	Youth with SSDI benefits at application (N = 42,035)
<b>Earnings outcomes</b>			
Earnings greater than \$1,200 in the sixth calendar year after VR application (%)	66.1	31.6	32.0
Mean earnings in the sixth calendar year after VR application	\$11,123	\$3,220	\$3,405
<b>SSA outcomes</b>			
Receipt of SSI during 6 years after VR application (%)	7.2	na	na
Receipt of SSDI during 6 years after VR application (%)	6.8	na	na
Any benefits foregone due to work during 6 years after VR application (%)	na	45.9	11.7
Cumulative amount of benefits foregone due to work during 6 years after VR application	na	\$2,349	\$2,323
Cumulative amount of benefits foregone due to work during 6 years after VR application for those with any benefits foregone	na	\$5,114	\$19,924

Sources: RSA-911 fiscal years 2004–2014; 2013 Disability Analysis File; Master Earnings File. Note: N=570,146 youth ages 14 to 24 at application and eligible for VR services. na = not applicable; RSA = Rehabilitation Services Administration; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; VR = vocational rehabilitation.

Table 3  
SSA and earnings outcomes for youth without SSA benefits at VR application

	Earnings greater than \$1,200 in the sixth calendar year after VR application (Odds ratio)	Amount of earnings in the sixth calendar year after VR application (\$)	Any SSI benefits during the six years after application (Odds ratio)	Any SSDI benefits during the six years after application (Odds ratio)
<b>Individual characteristics</b>				
<b>Education and employment status</b>				
Enrolled in high school, not working	Reference	Reference	Reference	Reference
No high school diploma, working or in school, age 18 or younger	1.34***	1,947.95***	0.74***	0.96*
No high school diploma, working or in school, age 19 or older	1.20***	837.71***	0.79***	1.07
No high school diploma, neither working nor in school	0.72***	-1,844.19***	1.05**	1.01
High school diploma, working	2.11***	4,903.76***	0.48***	0.98
High school diploma, in postsecondary school	1.34***	2,549.54***	0.80***	0.94
High school diploma, neither working nor in school	0.95***	-229.36***	0.98	1.24***
Missing education and/or employment data	1.35***	2,500.88***	0.66***	0.83***
<b>VR case closure status</b>				
Exited after IPE without employment	Reference	Reference	Reference	Reference
Exited before IPE	1.34***	1,771.51***	0.67***	0.74***
Exited after IPE with employment	2.87***	5,333.21***	0.60***	1.15***

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1. Sources: RSA-911 fiscal years 2004–2014; 2013 Disability Analysis File; Master Earnings File. Note: N = 420,615 youth without SSA benefits at VR application. IPE = individual plan for employment; RSA = Rehabilitation Services Administration; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; VR = vocational rehabilitation.

ings in the sixth calendar year after VR application were more than double those of their counterparts enrolled in high school, and their earnings were \$4,900 greater in that year (Table 3). Non-SSA youth who had a high school diploma and were enrolled in postsecondary school also had greater odds of having any substantive earnings, and their earnings were \$2,500 larger than for non-SSA high school enrolled youth. Conversely, non-SSA youth who were high

school dropouts, as well as non-SSA youth with a high school diploma but not working, both had lower odds of having any substantive earnings and had less earnings in the sixth calendar year after VR application, relative to the reference group.

Long-term earnings were also associated with a youth's VR case closure status. Among youth who exited from VR with employment, the odds of any substantive earnings were nearly three times as likely

as for the reference group of youth who exited after IPE without employment, and the earnings of the former were \$5,300 greater than the latter (Table 3). Non-SSA youth who exited before receiving services also had greater odds and amounts of earnings compared to the reference group, but at substantially lower levels than the outcomes for non-SSA youth who exited with employment.

The education and employment status of non-SSA youth were more strongly associated with later SSI benefit receipt than with SSDI benefit receipt. Compared to high school enrolled youth, non-SSA youth in most education and employment status categories were less likely to receive SSI benefits during the six years after VR application (Table 3). The odds among non-SSA youth with a high school diploma and working were 48 percent those of high school enrolled youth, whereas the odds of SSI benefit receipt among youth with most other education and employment statuses were also significantly lower, but to a lesser extent. Alternatively, among non-SSA youth without a high school diploma and neither working nor in school, the odds of SSI benefit receipt were 5 percent larger than for non-SSA high school enrolled youth, whereas among non-SSA youth with a high school diploma and not working, the odds of SSI benefit receipt were no different than for non-SSA high school enrolled youth. In contrast to SSI receipt, youth in most education and employment status categories were not significantly different in their receipt of SSDI compared to those with a high school diploma, with two exceptions. Compared to non-SSA high school enrolled youth, the odds of SSDI enrollment among non-SSA youth with a high school diploma and not working at time of VR application were 24 percent larger, and non-SSA youth ages 18 and younger without a high school diploma and who were working were 96 percent as likely to receive SSDI benefits (although included in our analysis, we do not include the “missing” category in our discussion of results).

The relationships between VR case closure status and SSA disability program enrollment for non-SSA youth differed by SSA disability program. Non-SSA youth who exited after IPE with employment were 60 percent as likely to enter the SSI program as non-SSA youth who exited after IPE without employment, but their odds of SSDI receipt within the same period were 15 percent higher than for non-SSA youth who exited after IPE without employment (Table 3). These findings might be explained by SSDI program rules; the earnings of those who exit with employment, even

if low, might qualify them for SSDI over SSI, should they apply. In contrast, the odds of receiving either SSI or SSDI among non-SSA youth who exited from the VR program before receiving services were lower compared to the same reference group.

### 3.2.2. *Outcomes for SSI youth*

SSI youth who had a high school diploma and worked at the time they applied to VR (a relatively small group) had the largest positive earnings outcomes. Relative to the reference group of SSI high school enrolled youth, this group was twice as likely to have any substantive earnings and had \$1,800 more in earnings in the sixth year after VR application (Table 4). These youth were also more than twice as likely as SSI high school enrolled youth to have had any BFW, and members of this group had the highest additional BFW amounts (\$1,600) during the six years after VR application of youth relative to any other education and employment status categories. SSI youth with a high school diploma and enrolled in postsecondary school at the time of their VR application, along with SSI youth ages 19 or older without a high school diploma but working or in school, also had better long-term earnings outcomes, compared to their counterparts enrolled in high school.

SSI youth who had dropped out of high school and were not working or in school had the poorest observed outcomes. Youth in this group were only 79 percent as likely to be employed during the sixth year after VR application as SSI high school enrolled youth and earned \$360 less. They were also slightly more likely to have had any BFW during the six years after VR application, but their cumulative BFW amounts were not significantly different from those observed for SSI high school enrolled youth.

As with non-SSA youth, exiting from VR with employment had stronger associations with the study's outcomes than other VR case closure statuses. Compared to SSI youth who exited after IPE but without employment, SSI youth who exited from VR with employment experienced the following outcomes: they were nearly five times more likely to have substantive earnings from employment during the sixth year after application, had \$4,100 more earnings during the sixth year after application, were almost six times more likely to have had any BFW during the six years after application, and had \$3,600 more in cumulative BFW. Outcomes among SSI youth who exited before receiving services trended similarly, but in lower magnitude, to those among youth who exited from VR with employment.

Table 4  
SSA and earnings outcomes for youth with SSI benefits at VR application

Individual characteristics	Earnings greater than \$1,200 in the sixth calendar year after VR application (Odds ratio)	Amount of earnings in the sixth calendar year after VR application (\$)	Any benefits foregone due to work during 6 years after VR application (Odds ratio)	Amount of benefits foregone due to work during 6 years after VR application (\$)
<b>Education and employment status</b>				
Enrolled in high school, not working	Reference	Reference	Reference	Reference
No high school diploma, working or in school, age 18 or younger	1.15***	641.94***	1.12***	181.86***
No high school diploma, working or in school, age 19 or older	1.32***	429.69***	1.50***	624.31***
No high school diploma, neither working nor in school	0.79***	-364.24***	1.07***	-17.71
High school diploma, working	2.07***	1,835.80***	2.27***	1,623.03***
High school diploma, in postsecondary school	1.18***	970.72***	1.12***	449.01***
High school diploma, neither working nor in school	0.99	228.84***	1.24***	404.33***
Missing education and/or employment data	1.13**	1,122.09***	1.09*	427.14***
<b>VR status</b>				
Exited after IPE without employment	Reference	Reference	Reference	Reference
Exited before IPE	1.17***	504.17***	1.28***	548.59***
Exited after IPE with employment	4.71***	4,097.84***	5.77***	3,562.01***

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . Sources: RSA-911 fiscal years 2004–2014; 2013 Disability Analysis File; Master Earnings File. Note:  $N = 130,417$  youth with SSI benefits at VR application. IPE = individual plan for employment; RSA = Rehabilitation Services Administration; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; VR = vocational rehabilitation.

Table 5  
SSA and earnings outcomes for youth with SSDI benefits at VR application

Individual characteristics	Earnings greater than \$1,200 in the sixth calendar year after VR application (Odds ratio)	Amount of earnings in the sixth calendar year after VR application (\$)	Any benefits foregone due to work during 6 years after VR application (Odds ratio)	Amount of benefits foregone due to work during 6 years after VR application (\$)
<b>Education and employment status</b>				
Enrolled in high school, not working	Reference	Reference	Reference	Reference
No high school diploma, working or in school, age 18 or younger	1.17**	610.11***	1.53***	571.60**
No high school diploma, working or in school, age 19 or older	1.34***	775.76***	1.61***	849.49***
No high school diploma, neither working nor in school	0.82***	-139.13	1.20**	12.04
High school diploma, working	2.51***	2,461.07***	2.47***	2,345.96***
High school diploma, in postsecondary school	1.36***	1,974.69***	2.26***	1,232.52***
High school diploma, neither working nor in school	1.16***	819.07***	1.70***	875.94***
Missing education and/or employment data	1.43***	1,950.45***	2.01***	870.84**
<b>VR case closure status</b>				
Exited after IPE without employment	Reference	Reference	Reference	Reference
Exited before IPE	1.19***	458.09***	1.59***	786.51***
Exited after IPE with employment	4.32***	4,112.41***	4.60***	3,259.70***

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . Sources: RSA-911 fiscal years 2004–2014; 2013 Disability Analysis File; Master Earnings File. Note:  $N = 42,035$  youth with SSDI benefits at VR application. IPE = individual plan for employment; RSA = Rehabilitation Services Administration; SSA = Social Security Administration; SSDI = Social Security Disability Insurance; SSI = Supplemental Security Income; VR = vocational rehabilitation.

### 3.2.3. Outcomes for SSDI youth

The pattern of long-term outcomes among SSDI youth were largely similar to those observed among SSI youth (Table 5). SSDI youth who had a high school diploma and worked or who exited with

employment had the largest associations with the outcomes of interest. The exception to the congruence in the results between SSI and SSDI youth occurred for youth enrolled in postsecondary school. Contrary to SSI youth, outcomes among SSDI youth who were

enrolled in postsecondary school were consistently second highest across the education and employment status groups, relative to SSDI high school enrolled youth. Moreover, for two outcomes (any BFW during the six years after application and amount of earnings during the sixth calendar year after application), the regression estimates for this population were more similar to the estimates for SSDI youth with a high school diploma and working.

#### 4. Discussion

This study is the first to provide quantitative evidence on the long-term earnings and SSA outcomes of transition-age youth with and without SSA benefits accepted for VR services across youth's human capital characteristics. In the sixth calendar year after VR application, 66 percent of non-SSA youth have more than \$1,200 in annual earnings, and, at some point during the six years after VR application, around 7 percent begin to receive either SSI or SSDI. Half as many SSI or SSDI youth had the same level of earnings, and although almost half (46 percent) of SSI youth experienced reduced benefits because of earnings, 12 percent of SSDI youth had reduced benefits due to earnings. Importantly, human capital in the form of education, work experience, and successful VR case closure were associated with these earnings and SSA program participation outcomes. Exiting from VR successfully—meaning that a youth received VR services and found a job—correlated positively with long-term earnings and SSA outcomes, no matter the youth's SSA status. Youth who worked at VR application—and to a lesser extent, those who were enrolled in postsecondary school—had better outcomes than their counterparts not so engaged. No matter their SSA benefit status, high school dropouts who were not working at the time they applied for VR services struggled in their transition efforts. Our findings are important for policymakers because human capital can be developed and because policies and practices related to WIOA could lead to important gains in human capital for youth with disabilities. They are also relevant for considering agency outcomes, which will differ in part because of the types of youth each agency serves, and year-to-year changes in outcomes will be influenced by WIOA as agencies serve more youth enrolled in high school.

Non-SSA youth who exited from the VR program before receiving services had higher earnings

than youth who received services but exited without employment and had lower odds of entering SSDI during the six years after VR application. One possible explanation for this finding is that youth who exited from the VR program before receiving services might differ in sizeable ways from youth who go on to receive services, such as having fewer functional limitations and less severe disabilities; greater social capital (that is, access to resources and supports); stronger engagement with other service providers or vocational activities; or higher motivation or resiliency. Alternatively, their expectations for employment, transition, or services might differ from those of their VR counselors, and they consequently choose not to proceed with services. Regardless, many are sufficiently motivated to seek employment without VR assistance.

##### 4.1. Limitations

Our results should be interpreted with regard to several important caveats. First, individuals self-select for VR services, so our results represent correlations, rather than causal pathways between human capital and outcomes. Specifically, we do not have information about what would happen to youth in the absence of VR, and we cannot disentangle the causal relationships of service receipt, disability, school achievement, employment, and SSA benefit receipt. In addition, the RSA and SSA data files do not have information that might help better understand youths' transition paths, such as their motivation, sense of self-efficacy or resiliency, school experiences, or employment barriers. A third limitation is that youth received VR services for different durations, with some exiting relatively soon after application and some potentially still receiving services throughout the six-year outcome observation period. Finally, disability severity, which is unmeasured in our study, could play a role in school, work, and SSA outcomes. VR applicants with more significant disabilities may be more likely to have poorer outcomes and be more likely to seek and receive benefits from SSA disability programs.

Despite these limitations, the study's findings on youth's education and employment status at the time of VR application—which reflects their human capital when they begin the VR process—along with the value of exiting from VR with employment adds to the evidence base indicating strong correlations between youth's early education and employment experiences and their outcomes into early adulthood.

## 5. Conclusion

The personal and environmental challenges to successful transition that youth without a high school diploma who neither worked nor were in school encounter are likely substantive and might require additional resources to overcome. VR agency changes in response to WIOA, particularly the provision of pre-employment transition services to students and the emphasis on skills or credential gains, might encourage fewer youth with disabilities from leaving high school without a diploma, but these same forces might result in fewer services to this population once they leave school.

New WIOA policies will offer many VR agencies with opportunities to increase their outreach to and investments in transition-age youth, particularly youth enrolled in high school. These investments could lead to gains in education and increased likelihood of successful VR experiences, along with increased independence into adulthood and potential effects on SSA disability and other public benefits. As administrators consider serving new populations, our findings provide some insight as to who might use services and what their potential outcomes might be when services are expanded, particularly those not traditionally served by an agency. However, VR agencies might not have the resources to serve all eligible youth and adult clients without additional support or collaborators. Youth without a high school diploma and neither working nor in school might be a group of particular risk of not receiving services. Interagency collaborations between VR, SSA, and schools represent one possible strategy to coordinate and support human capital investments for youth, but these collaborations are not easy. To help serve youth with disabilities, a common strategic plan that addresses the goals of several agencies, such as the one in development by the 2020 Federal Partners in Transition (FPT) Workgroup, might identify common outcome goals that multiple agencies can use to support efforts for youth with disabilities (FPT, 2015).

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## Conflict of interest

The authors declare that they have no conflicts of interest.

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