Employment Support Services as a Function of Transition-Age Young Adults with Intellectual Disability: Preliminary Findings

Cristina C. Parsons, MOT, OTR/L

Andrew C. Persch, PhD, OTR/L, BCP

Colorado State University

Abstract

The number of young adults with intellectual disabilities (ID) requiring Social Security assistance is growing, but there is a paucity of research on where youth transitioning to employment receive support services and how they become connected with those services. This project seeks to answer the research question: "What characteristics of transition-age young adults with intellectual disabilities are predictive of employment support services?" By understanding the relationship between key features of this population and the employment services that support them, the Social Security Administration (SSA) can make policy and program decisions that work to close the gap of connecting beneficiaries in transition to the training, education, and rehabilitation services individuals with ID need to successfully obtain and maintain employment. Situated within a currently funded National Institutes of Health (NIH) project, this study presents a unique opportunity to analyze self-reported data of transition-age young adults with ID's employment skills using the Vocational Fit Assessment (VFA). We use multinomial logistic regression analysis to predict the probability of employment support service group as a function of the young adults' personal information, job characteristics, employment skills and Social Security benefits. The result is a preliminary predictive model that offers an innovative and fresh perspective to address current priorities of the SSA.

Acronyms
ID = Intellectual Disability
SSA = Social Security Administration
NIH = National Institutes of Health
VFA = Vocational Fit Assessment
SPED = Special Education
VR = Vocational Rehabilitation
SSI = Supplemental Security Income
SSDI = Social Security Disability Insurance
SGA = Substantial Gainful Activity
SEIE = Student Earned Income Exclusion
PASS = Plan to Achieve Self-Support
TTW= Ticket to Work
TWP = Trial Work Period
IRWE = Impairment-Related Work Expense
EXR = Expedited Reinstatement of Benefits
IDEA = Individuals with Disabilities Education Act
CAB = Comprehensive Assessment Battery
REDCap = Research Electronic Data Capture
WIPA = Work Incentives Planning and Assistance
WIL = Work Incentive Liaison
ABLE = Achieving a Better Life Experience
IDD = Intellectual and Developmental Disabilities

Employment Support Services as a Function of Transition-Age Young Adults with Intellectual Disability: Preliminary Findings

American citizens with disabilities are employed at significantly lower rates compared to non-disabled peers (U.S. Census Bureau, 2018). People with intellectual disabilities (ID) experience even greater employment disparity than the general population of persons with disabilities (Dutta et al., 2008) and at a greater social cost. In the United States, the Centers for Disease Control and Prevention (2006) estimated that lifetime costs associated with ID, including Social Security benefits, were over $1 million per person in 2003 dollars, now considered a low estimate. Similarly in 2003, Honeycutt et al. suggested that the lifetime cost of ID for persons born in the year 2000 will be $51.2 billion. More recently in a study of the social cost of autism spectrum disorders (ASD), Buescher et al. (2014) report the lifetime cost of supporting an individual with an ASD and co-occurring ID during their lifetime to be $2.4 million, about 40% higher than the estimate for an individual with a milder ASD (i.e., without ID). Research from other countries also predicts high social cost of ID. In Australia, (Doran et al., 2012) found the cost of ID to be $14,720 billion annually and suggests that families suffer considerable loss when examining expense compared to social welfare benefits.

Recent cost-efficiency literature indicates that individuals with ID engaged in supported employment generate more monetary benefits (i.e., wages earned) than costs (i.e., taxes paid, reduction in government subsidies, forgone wages) (Cimera, 2010). Numerous supports exist for people with disabilities seeking to enter the workforce, but job matching practices within special education (SPED) and vocational rehabilitation (VR) are highly variable (Persch, Cleary, et al., 2015) and most employment services fail to meet the needs of persons in transition to employment (Wehman & Scott, 2013). The number of young adults with disabilities requiring Social Security support continues to rise dramatically, as evidenced by a 44% increase in individuals under age 18 receiving Supplemental Security Income (SSI) benefits from 2000 to 2016 (U.S. Government Accountability Office, 2017). This increase may be partially explained by efforts to improve access of Social Security services for young adults, but nevertheless, the effort to improve entry into Social Security services needs to be met with a comparable effort to assist young adults in decreasing their reliance on Social Security services as they enter adulthood.

When disabled youth are unable to participate in substantial gainful activity (SGA), they rely on Social Security benefits into adulthood. The Social Security Administration (SSA) has no systematic way of connecting transition age youth to employment support services and existing research on where people with ID obtain employment support services is limited. As such, this proposal seeks to answer the following research question: "What characteristics of transition-age young adults with intellectual disabilities are predictive of employment support services?" By understanding the relationship between key features of this population and the employment services that support them, the proposed research will inform policy and program decisions to close the connection gap between beneficiaries in transition and employment support services.

Background

Intellectual Disability and Social Security

Almost all cases of ID are diagnosed before a child turns 18 (Wehman and Scott, 2013). If a child's ID results in "marked and severe functional limitations," they may qualify for

monthly payments through SSI (Social Security Administration, 2020a). Similarly, a young person with ID may qualify for a "child's" benefit through the Social Security Disability Insurance program (SSDI) and continue receiving those benefits on their parent's record once they reach 18 years old if they are determined disabled using the same disability rules for adults (Social Security Administration, 2020a). The population of people with ID in transition to secondary employment may be eligible for both SSI and SSDI support if they meet the appropriate family income and resources eligibility (Social Security Administration, 2020b).

SSA offers several formal ways of encouraging young beneficiaries to enter the workforce, including exclusion of monthly earnings and the Student Earned Income Exclusion (SEIE), the Plan to Achieve Self-Support (PASS) program, the Ticket to Work (TTW) program, Trial Work Period (TWP), extended period of eligibility, subsidy and impairment-related work expense considerations (IRWE), as well as expedited reinstatement of benefits (EXR) (Social Security Administration, 2020b). Unfortunately, few transition-age youth access these incentive programs (U.S. Government Accountability Office, 2017) and additional employment support services are essential to successfully transition people with ID to employment.

Employment Support Services

Employment support services are typically offered in the arenas of special education (SPED) and/or vocational rehabilitation (VR). SPED services are provided under the authority of The Individuals with Disabilities Education Act, (IDEA, 2004), a federal law that makes free, appropriate public education, special education, and related services available to children with disabilities throughout the nation. VR services are federal-state programs that provide individuals with disabling conditions including ID the services necessary to help them attain and maintain employment. VR agencies promote the transition of people with ID into postsecondary employment through interagency team processes, person-centered planning, and provision of essential supports (Yamamoto, Stodden, & Folk, 2014). State VR agencies may provide services to beneficiaries in the Ticket to Work program.

In addition to traditional, publicly funded SPED and VR services, innovative work-based learning programs have become an increasingly prevalent avenue for young adults to receive employment support. Project SEARCH (PS) is a collaborative, business-led internship program for students with ID in transition to employment (Daston, Riehle, & Rutkowski, 2012). Students with mild-to-moderate ID complete three, ten-week internships at host businesses. They receive on-the-job training, participate in a functional academic curriculum, and learn the skills necessary to become competitively employed, which they do at a rate of 73% nationally (Project SEARCH, 2016). Project SEARCH uses supports and funding from VR and Ticket to Work for eligible students.

Vocational Fit Assessment

The Vocational Fit Assessment (VFA) was designed to assist with the transition to postsecondary employment for people with mild-to-moderate ID (Persch, Gugiu, et al., 2015). The VFA is an algorithm-driven, web-based assessment tool used by transition-to-employment programs to support job matching decisions during the collaborative employment support process. The VFA identifies an individual's preferences and abilities as well as job demands to determine the best fit. Using a simplified rating scale (Low=0; Some=1; High=2) in subscale domains of Physical Abilities, Self-Determination, Work Structure, Cognitive Abilities, Computer Skills, High Task-Related Abilities, Lower Task-Related Abilities, Communication

Skills, Interpersonal Skills, Safety, and General Work Attributes the VFA is particularly well-aligned for use in special education, vocational rehabilitation, and Project SEARCH settings.

Employment Predictors

Multiple personal factors interact to influence employment outcomes of young adults with intellectual disabilities. Four categories emerged as important constructs to include as predictive factors: personal information, job characteristics, employment skills and receipt of Social Security benefits. Traditional personal information includes demographic information such as age, gender, and race. Of additional importance are personal descriptors relevant to the population of young adults with intellectual disabilities including guardianship status, primary disability type and disability severity, as well as location and socio-economic status. Job characteristics such as wages and hours worked will be considered. Notably, we will use two VFA subscales (VFA–General and VFA–Self-Determination) as proxy measures of employment skills. Complete screen captures of the items associated with the VFA–General and VFA–Self-Determination subscales are shown in Figures 1 and 2, respectively. Finally, the predictive value of Social Security benefits status (recipients of SSI and/or SSDI) will be tested.

Figure 1

Screen capture of example VFA–General subscale

General

To what degree does the Student/Intern/Worker demonstrate the ability to:

	Highs	Some	Low
HANDLES STRESS?		●	
MAKES EYE CONTACT?	●		
REFRAINS FROM UNNECESSARY SOCIAL INTERACTION (TALKING)?		●	
ADMITS MISTAKES?	●		
ACCEPTS PRAISE?	●		
COOPERATIVE AND COURTEOUS?	●		
LISTENS AND PAYS ATTENTION?	●		
EXPRESSES PERSONAL NEEDS (RESTROOM BREAKS, DOCTOR VISITS)?		●	
RESPECTS RIGHTS AND PRIVACY OF OTHERS?		●	
ASKS FOR HELP AND CLARIFICATION WHEN NEEDED?			●
COMMUNICATES ADEQUATELY (INITIATES CONVERSATION, DOES NOT INTERRUPT)?		●	
MAINTAINS CLEAN APPEARANCE?	●		
DRESSES APPROPRIATELY FOR JOB?	●		
BODY HYGIENE?		●	
FOLLOWS DIRECTIONS?		●	
ACCEPTS CONSTRUCTIVE CRITICISM/ FEEDBACK?	●		
FOLLOWS RULES AND REGULATIONS?		●	
MAINTAINS GOOD ATTENDANCE?		●	
ARRIVES ON TIME FOR WORK AND LEAVES ON TIME?	●		
ATTENDS TO JOB TASKS CONSISTENTLY?		●	
COMPLETES TASKS ACCURATELY?	●		
WORKS AT AN APPROPRIATE RATE?		●	
INITIATES NEW TASKS?	●		
WORKS WELL WITH CO-WORKERS?		●	
FOLLOWS THE PROPER CHAIN OF COMMAND?		●	

Figure 2

Screen capture of example VFA–Self-Determination subscale

Self-Determination

To what degree does the Student/Intern/Worker demonstrate the ability to:

	Highs	Some	Low
MAKE CHOICES, DECISIONS, AND PLANS TO MEET OWN GOALS?	●	○	○
TAKE ACTION TO COMPLETE OWN PLANS SUCCESSFULLY?	○	●	○
DETERMINE PRIORITIES?	○	○	●
SET PERSONAL GOALS THAT SATISFY OWN INTERESTS AND NEEDS?	○	●	○
EVALUATE THE RESULTS OF OWN ACTIONS TO DETERMINE EFFECTIVENESS?	○	●	○
CHANGE ACTIONS OR PLANS TO MEET WORK GOALS?	○	●	○
MAKE DECISIONS INDEPENDENTLY?	○	○	●
DETERMINE CUSTOMERS' NEEDS?	○	●	○
DETERMINE WORK ACTIVITIES?	○	○	●
IDENTIFY AND EXPRESS OWN STRENGTHS AND WEAKNESSES?	○	●	○
ANTICIPATE THE THOUGHTS/ACTIONS OF OTHERS?	●	○	○

Research Question and Hypothesis

This study seeks to answer the research question: "What characteristics of transition-age young adults with intellectual disabilities are predictive of employment support services, specifically special education, vocational rehabilitation and Project SEARCH?" We hypothesize that demographic personal information (age, gender, race) will act as primary predictors of employment support services, while additional contextual information (descriptive personal information, job characteristics, employment skills, and Social Security benefits) will act as secondary predictors of employment support services.

Methods

Research Design

This project leverages multinomial logistic regression analysis to predict the probability of employment support service group as a function of young adults with ID's personal information, job characteristics, employment skills and Social Security benefit status. It is a sub-analysis of data from a larger funded project entitled "*Vocational Fit Assessment and Employment Status in People with Intellectual Disabilities*" (NIH 5R01HD092474-02; PI: Persch) in which transition-age young adults participated in structured, dyadic interviews with someone who knows them well, deemed a "partner reporter". Dyadic interviews mitigate some of the difficulties that occur when conducting research with intellectually disabled young adults

by providing a support person as an accommodation to promote self-determination in the research process (Caldwell, 2014). These interviews were designed to collect detailed information about the young adults' demographic, disability-related, and support systems variables pertinent to their employment goals. A comprehensive assessment battery (CAB) including the VFA and criterion measures was also administered. Quantitative data from the structured interviews and CAB were analyzed to determine the relationship between transition-age young adults with ID and employment support services. Some narrative information from comments within the CAB is used to highlight responses relevant to SSA work incentive program participation. This study was approved by Colorado State University's Institutional Review Board (IRB).

Sample

Participants for this study (*N*= 70) were recruited in dyads to include people with intellectual disabilities (ID) aged 18-22 and their chosen partner reporter. To be included, young adults must self-identify as having an ID, be eligible for employment supports in one setting (SPED, VR, Project SEARCH), and engage in 10 or more hours a week of work-related activity (including internships, career readiness, job exploration, etc.). Individuals who know the person with ID well, such as parents, caregivers, teachers, and job coaches qualified as partner reporters for this study if they had a knowledge of the person with ID's employment-related interests and abilities.

Recruitment

Recruitment for this study was delayed due to the COVID-19 pandemic and occurred between January and November 2021. Of 98 potential participants screened, 92.86% were found eligible.

Informed Consent

As this study includes samples of people with intellectual disabilities and students enrolled in secondary or postsecondary programs, it was imperative to assess and document potential participants' capacity to provide informed consent (Horner-Johnson & Bailey, 2013). Thus, we developed a robust informed consent procedure including: (1) multiple methods to assess capacity to consent, (2) multiple means of providing informed consent or assent, (3) repeating informed consent at each participant encounter, and (4) training junior research staff during participant encounters to ensure fidelity.

Measures

The CAB was administered to young adults with ID and their partner reporters using a standardized administration protocol. By design, the CAB included both the VFA and criterion measures (e.g., weekly wages, weekly hours) needed to perform analysis. A draft version of the CAB was shared with SSA personnel for feedback specific to this project. Based on this feedback, we added several questions related to participants involvement with state vocational rehabilitation, Medicaid/Medicare, SSI/SSDI, and work incentive programs (Figure 3).

Figure 3

Questions added to the Comprehensive Assessment Battery (CAB) at the suggestion of SSA

---

o Are you receiving services from the State Vocational Rehabilitation organization? If so, what services are you receiving?

o If you are receiving Medicaid or Medicare, are you receiving any community services through Medicaid or Medicare?

- ☐ Advocacy organizations/coalitions
- ☐ Caregiver organizations/coalitions
- ☐ Disability organizations/coalitions
- ☐ Employer & union organizations/ coalitions
- ☐ Faith-Based organizations/coalitions
- ☐ Federal & State organizations/ coalitions
- ☐ Health organizations/coalitions
- ☐ National Medicare Education Program Partnerships
- ☐ Pharmacy organizations and workgroups
- ☐ Provider organizations and coalitions
- ☐ Racial, ethnic, and cultural organizations and coalitions
- ☐ Rural Health organizations and coalitions
- ☐ Financial Planners
- ☐ State Health Insurance Programs (SHIPs)
- ☐ Other

o If you are receiving SSI or SSDI, are you taking part in work incentive programs? Please select all that apply.

- ☐ Blind Work Expenses (BWE)
- ☐ Continued Payment Under a Vocational Rehabilitation or Similar Program (Section 301)
- ☐ Earned Income Exclusion
- ☐ Expedited Reinstatement (EXR)
- ☐ Extended Period of Eligibility (EPE)
- ☐ Impairment-Related Work Expenses (IRWE)
- ☐ Medicaid While Working – Section 1619(b)
- ☐ Medicare Continuation
- ☐ Medicare for People with Disabilities Who Work
- ☐ Plan to Achieve Self-Support (PASS)
- ☐ Reinstating SSI Eligibility Without a New Application
- ☐ Special SSI Payments for People Who Work – Section 1619(a)
- ☐ Special SSI Payments for People Eligible Under Section 1619 Who Enter a Medical Treatment Facility
- ☐ Subsidy and Special Conditions
- ☐ Ticket to Work (Ticket or TTW)
- ☐ Trial Work Period (TWP)
- ☐ Unincurred Business Expenses
- ☐ Unsuccessful Work Attempt (UWA)
- ☐ Work Incentive Liaison (WIL)
- ☐ Area Work Incentives Coordinator (AWIC)
- ☐ Benefits Planning Query (BPQY)
- ☐ Work Incentives Planning and Assistance (W Projects
- ☐ Work Incentives Seminar Events (WISE)
- ☐ Employment Network and State Vocational Rehabilitation Providers
- ☐ Protection and Advocacy for Beneficiaries of Security (PABSS)
- ☐ Individual Development Accounts (IDA)
- ☐ Achieving a Better Life Experience (ABLE)
- ☐ American Job Centers
- ☐ Job Accommodation Network (JAN)
- ☐ The Guidepost to Success
- ☐ Financial Literacy Information for Young Peo Disabilities
- ☐ Federal Employment of People with Disabili
- ☐ AmeriCorps

o If you are taking part in/receiving any of these services (through the State, Medicare/Medicaid, or SSA), how did you hear about them? If you are not taking part in them, why not?

o If you are receiving SSI or SSDI, are you aware of SSA programs that assist with the transition to work?

If you are receiving SSI or SSDI, are you concerned about losing benefits if you start working?

Procedures

Research staff screened potential participants using inclusion and exclusion criteria. If participants were appropriate for and interested in the study, researchers presented informed consent materials for participants to review prior to going through the informed consent process

during the dyadic interview. This often occurred as a presentation over teleconferencing software. Potential participants that (1) were able to consent or assent using IRB approved tools and (2) met eligibility criteria were enrolled in the study and provided with instructions and materials to review with partner reporters before their scheduled data collection interview. Partner reporters completed their informed consent form at this time.

In most instances, the same research team member engaged one or two scheduled synchronous teleconference meetings with the participant with ID prior to the dyadic interview. During these meetings, the researcher introduced the study, learned about the participant, and reviewed informed consent procedures. This helped to ease anxiety around the interview process and establish rapport between researcher and participant. At the interview, research team members conducted structured interviews with questions linked to CAB measures. Researchers asked interview questions, one at a time, with accompanying visual support (PowerPoint screen share). The researcher recorded responses using Research Electronic Data Capture (REDCap), a secure web application for building and maintaining online surveys and databases. Each interview took between one and two hours, and the dyad was encouraged to ask for breaks or separate interviews into multiple meetings where appropriate.

Specifically, with the support of their partner reporter, the participant with ID answered questions about health, social connectedness, transportation, and COVID-19. The dyad worked together to answer demographic and descriptive questions about the participant with ID as well as measures of current and past employment. Partner reporters completed the VFA and proxy measures independently. The dyad was given the option to complete some surveys on their own, outside of the synchronous interview. Both members of the dyad were provided with gift card incentives following their participation.

Analytic Plan

A forward, stepwise multinomial logistic regression analysis was performed to determine which variables or set of variables were associated with employment support service. Multinomial regression is a predictive analysis in which there are multiple, discrete or continuous independent variables (i.e., predictors) and the dependent variable (i.e., response variable) is categorical, in this instance, one of three employment support services (SPED, VR, or Project SEARCH). Rather than using the categorical responses, logistic regression transforms the response variable and uses the log of the odds ratio of being in a particular category for each combination of the independent variables (Hosmer et al, 2013). In other words, the log odds of the different outcomes are modeled as a linear combination of the predictor variables. In this study, special education was selected as the referent outcome category.

As an extension of logistic regression, the procedures for conducting and interpreting multinomial logistic regression are similar to binary logistic linear regression in that the goal is to find an equation that best predicts the probability of the response variable as a function of the predictor variables. Multinomial logistic regression uses a maximum likelihood approach where values of coefficients are selected that increase the likelihood of observed results (Cizek & Fitzgerald, 1999). Coefficients in multinomial logistic regression are expressed as odds ratios (i.e., "*ExpB*") which indicate change in likelihood of an outcome category relevant to the reference outcome category for a one unit change in value of a predictor variable. The data were analyzed using IBM SPSS Statistics (Version 27). All tests were conducted using a .05 level of significance.

Results

Demographic and descriptive data related to the characteristics of the participants are presented first, including a deeper analysis into SSA questions of work incentive program involvement, followed by testing of assumptions for multinomial logistic regression and finally the preliminary results of the multinomial logistic regression analysis for predicting employment support service group from the set of predictor variables.

Demographic Data

The sample of young adults with intellectual disabilities included 50 males (71.43%) and 18 females (25.71%; 2 participants did not identify their gender) from across the country with an average age of 19.79 (SD=1.05). Most respondents were Black/African American (47.14%); other racial/ethnic groups were represented with 30% White/Caucasian, 10% Hispanic/Latinx, 4.29% Asian/Asian American. Intellectual Disability (ID) was the highest reported primary disability (51.43%) followed by Autism (35.71%), Specific Learning Disability (SLD; 5.71%), Other Health Impairment (OHI; 1.43%), Speech/Language Impairment (SLI; 1.43%), Traumatic Brain Injury (TBI; 1.43%), and Multiple Disabilities (MD; 1.43%). Most of the participants with ID were their own guardians (77.14%) and lived with their parents (88.57%). Though approximately 20% of the data on severity of disability are missing ($n=$ 13), participants with intellectual disabilities classified themselves as having mild (52.6%), moderate (40%), and severe (5.7%) impairments of function. Table 1 presents statistics related to demographic and descriptive variables of interest by employment support service group.

Table 1

Characteristics of participants by employment support service category (N=70)

Characteristic	SPED		VR		PS	
	N	%	N	%	N	%
Gender						
Male	7	10	5	7.14	38	54.29
Female	1	1.43	5	7.14	12	17.14
Other	1	1.43	-	-	1	1.43
Age						
18	-	-	-	-	6	8.57
19	6	8.57	4	5.71	16	22.86
20	-	-	2	2.86	16	22.86
21	2	2.86	2	2.86	13	18.57
22	1	1.43	2	2.86	-	-
Race						
White	-	-	5	7.14	16	22.86
Hispanic	-	-	-	-	7	10
Black	7	10	4	5.71	22	31.43
Asian	-	-	-	-	3	4.29
Other	2	2.86	1	1.43	3	4.29

Characteristic	SPED		VR		PS	
	N	%	N	%	N	%
Disability						
SLD	1	1.43	1	1.43	2	2.86
OHI	-	-	-	-	1	1.43
Autism	-	-	2	2.86	23	32.86
SLI	-	-	-	-	1	1.43
ID	7	10	7	10	22	31.43
TBI	-	-	-	-	1	1.43
Multiple Disabilities	-	-	-	-	1	1.43
Other	1	1.43	-	-	-	-
Guardianship						
No Guardian	3	4.29	3	4.29	22	31.43
Limited Guardianship	2	2.86	1	1.43	5	7.14
Full Guardianship	3	4.29	4	5.71	16	22.86
Other	1	1.43	2	2.86	8	11.43
Disability Severity						
Mild	1	1.43	2	2.86	27	38.57
Moderate	4	5.71	4	5.71	15	21.43
Severe	-	-	2	2.86	2	2.86
Missing	4	5.71	2	2.86	7	10
Social Security Benefits						
SSI						
yes	3	4.29	4	5.71	6	8.57
no	3	4.29	2	2.86	11	15.71
unsure	3	4.29	4	5.71	34	48.57
SSDI						
yes	3	4.29	1	1.43	11	15.71
no	2	2.86	6	8.57	14	20
unsure	4	5.71	3	4.29	26	37.14

Descriptive Data

To measure relevant job characteristics, we asked participants "How much do you make per hour?" and "How many hours do you work in a week?" Twenty-nine Project SEARCH participants and one VR participant reported earning zero wages. Other participants ($n= 13$) made between $8.00-$15.00 per hour, with all employment support service groups being represented. Participants across all employment support service groups ($n= 27$) had missing data for current wages and weekly hours. As such, job characteristic variables were not included in the model.

Two VFA subscales, VFA–General and VFA–Self-Determination, were used in this analysis as employment skills. VFA–General has 25 items, with possible subscale cumulative scores from 0-50. VFA–Self-Determination has 11 items, and possible subscale cumulative scores from 0-22. Visual inspection of the data and further examination of residuals identified four outliers with a VFA–General sum score of "zero". These cases were removed from the analysis and the subsequent mean score for the VFA–General was 40.17 ($n= 64$). The mean score for the VFA–Self-Determination was 12.76 ($n= 68$).

Federal and State Benefits Programs

When asked about their eligibility for federal benefits programs and resources, most participants were unsure of or did not know their benefits status. A minority of participants confirmed their eligibility for programs such as SSI (18.57%), SSDI (21.43%), Medicare (11.43%), and Medicaid (21.43%). For recipients of SSI or SSDI, the CAB included thirty-three different work incentive programs and respondents were asked to select all that apply to them. Four participants reported participating in Ticket to Work (TTW). Two other participants reported accessing Work Incentives Planning and Assistance (WIPA) projects. A different participant reported working with a Work Incentive Liaison (WIL). Another participant reported participating in Medicare for People with Disabilities Who Work. One other participant reported participating in the Earned Income Exclusion and one more participant reported receiving Continued Payment under Vocational Rehabilitation or Similar Program (Section 301).

An SSDI recipient reported participating in both AmeriCorps and Achieving a Better Life Experience (ABLE). When asked if they were concerned about losing benefits, their partner reporter said "Yes, However, he would have to make over $1,700 a month to lose all benefits and I don't think he will make over that amount. He needs to keep it as once he ages out of our health insurance he will need some of his own and we all know health insurance is expensive." Another respondent shared that they were "willing to work part time" to keep their benefits.

If a participant with ID was receiving SSI or SSDI, they were asked, "Are you aware of Social Security Administration programs that assist with the transition to work?" (No= 16; Yes= eight) and "Are you concerned about losing benefits if you start working?" (No=13; Yes=11).

Testing the Assumptions for Multinomial Logistic Regression

Distribution assumptions of predictor variables do not apply to logistic regression and our data collection procedures ensure that the categories of the outcome variable are mutually exclusive and observations are independent. However, this preliminary analysis is underpowered to produce a stable model due current sample size.

To attain stability in multinomial logistic regression analysis, a standard cases-to-variables ratio is a minimum of 10 cases to every one variable. Our sample size of 70 theoretically permits for models with up to seven predictor variables. However, this is dependent upon how cases are distributed across all the variables. In this preliminary analysis, the outcome variable (employment support service) is nominal and has three categories (SPED, VR, PS). These data include 9 cases from SPED (12.9%), 10 cases from VR (14.3%), and 51 cases from PS (72.9%). Current data is skewed towards Project SEARCH, making the stability of the current model questionable.

A large sample size is also necessary in ensuring the adequacy of expected frequencies and power. To run goodness-of-fit tests to compare observed and expected frequencies in cells formed by combinations of variables with adequate power it is best to have all expected frequencies greater than one, with no more than 20% being less than 5. The current model has only one value observed in 65 subpopulations of the outcome variable which further compromises the integrity of the model.

The multiple independent variables are nominal, ordinal, or continuous. In the current analysis, we have treated age, socioeconomic status, wages, weekly hours and VFA scores as continuous variables. Zip codes were transformed into proxy measures of socioeconomic status reflecting median household income. Data on wages and weekly hours are missing >30% of values and not included in further analyses. The severity of disability is ordinal ("Mild,"

"Moderate", or "Severe") but missing data (approximately 20% of values) also warrants caution when entering the model. Gender ("Male," "Female," or "Other"), race/ethnicity ("White," "Hispanic," "Black," "Asian," or "Other"), guardianship status ("No Guardian," "Limited Guardianship," "Full Guardianship," or "Other"), primary disability type ("Specific Learning Disability," "Other Health Impairment.," "Autism," "Speech/Language Impairment," "Intellectual Disability," "Traumatic Brain Injury," and "Multiple Disabilities"), SSI benefits status ("yes," "no," or "unsure") and SSDI benefits status ("yes," "no," or "unsure") are nominal variables.

Analysis of multicollinearity was accomplished through Pearson's (continuous variables) and Spearman's (categorical variables) correlation matrices. No significant correlations were found amongst continuous variables in Pearson's correlations and the matrix is not presented here. Several categorical predictor variables were found to be significantly correlated via Spearman's rho and are presented in Table 2. Where predictor variables were highly correlated and conceptually similar, one predictor variable was eliminated from entering the model based on missing data and maximum likelihood prediction (Hosmer et al., 2013; Tabatchnick & Fidell, 2007).

Finally, continuous variables included in the model (age and VFA–SD sum score) were tested for linearity of the logit, the assumption that there is a linear relationship between continuous predictors and the logit transformation of the outcome variable (Hosmer et al., 2013). This assumption was upheld in the current model.

Table 2

Spearman's rho correlation matrix for predictor variables of interest

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	1										
2. Guardianship	-.043	1									
3. Gender	.085	.002	1								
4. Race	-.056	-.310*	-.212	1							
5. SSDI	.061	.063	.111	.125	1						
6. SSI	-.036	.067	.054	.089	.508**	1					
7. Setting	-.060	.149	-.038	-.132	.121	.334**	1				
8. VFA–General	.045	.107	.125	-.265*	-.174	-.220	.167	1			
9. VFA–SD	-.039	.209	.098	-.303*	-.179	-.065	.272*	.719**	1		
10. SES	- .080	.169	.269*	-.291*	-.227	-.316**	.111	.144	.162	1	
11. Disability	-.042	-.032	.300*	-.063	.054	-.013	-.200	-.190	-.194	.042	1

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Multinomial Logistic Regression

A forward, stepwise multinomial logistic regression analysis was used to determine the set of variables that best explained employment support service group, either special education, vocational rehabilitation, or Project SEARCH. Traditional demographic variables not in violation of model assumptions were added to the model first to align with the researcher's hypothesis that

they act as primary predictors. Variables were added to the model one at a time until none of the remaining variables made a significant improvement in overall model fit. Variables that did not add to the explanatory power or improve captured variance of the model were not considered.

It was revealed that (a) gender, (b) age, (c) race, (d), VFA–Self-Determination subscale score, and (e) SSI benefit status did significantly contribute to the explanatory power of the model, $x^2 = 90.297$, $p < 0.05$, df=62. Results of the current model are presented in Table 3 (i.e., the comparison between vocational rehabilitation and special education groups) and Table 4 (i.e., the comparison between Project SEARCH and special education groups) in the last pages of the manuscript. Data presented under "*B*" represent the estimated regression coefficients that predict employment support service group for each variable included in the model. The *Wald* statistic provides a test of each individual predictor variable. The *Exp(B)* is the exponentiated beta coefficient or the odds ratio which provides information related to the change in odds of being in one employment support service group associated with a one-unit change in the predictor variable.

Model Fit

There are several ways to address model fit in multinomial logistic regression. First, the likelihood ratio test, in which the amount of change in the -2 log likelihood for the final model is subtracted from the intercept only model to produce the chi-square (90.937–.640 = 90.297). A greater model fit is suggested by a greater amount of change between the two models. Additionally, we've found that our current model is significantly different than the intercept only model ($p < 0.05$). Therefore, as a group, the predictor variables significantly contribute to prediction of employment support service group.

Goodness-of-fit statistics are generated in SPSS using Pearson chi-square and deviance statistics, wherein a large chi-square value and statistical significance is indicative that the model does not fit the data well (Tabatchnick & Fidell, 2007). Our final model SPSS output shows Pearson chi-square value of .324 and nonsignificance, indicating appropriate model fit.

Effect Size

Pseudo R^2 values in multinomial logistic regression are not comparable to R^2 statistics in ordinary lease squares (OLS) regression (the coefficient of determination) and must be interpreted with caution. Three different pseudo R^2 statistics are produced by SPSS and were as follows for this analysis: Cox and Snell, .745; Nagelkerke, .997; and McFadden, .993. If interpreted similarly to R^2 in linear regression, as proposed by Tabatchnick and Fidell (2007), our pseudo R^2 values indicate that the current model explains a large proportion of the variance in the outcome variable.

Discussion

This study makes several key contributions to the literature of young adults with intellectual disabilities transitioning into employment. First, we hope the descriptions of the research design in regard to recruiting, consenting, and interviewing young adults with intellectual disabilities will be of use in future research with this population. Much of the literature in this arena is secondary analysis of existing datasets and not self-report. In a recent scoping review, Chico-Jarillo et al. (2021) highlighted missed opportunities to collect self-reported data from individuals with intellectual and developmental disabilities (IDD) and called

for the intentional inclusion of racial and ethnic minorities in IDD research. We have experienced success in empowering young adults with intellectual disabilities to participate in research as well as attracting individuals from minority backgrounds.

Secondly, because this research is based on self-report, it has highlighted the urgent need to educate young adults with intellectual disabilities about their participation in federal and state benefit programs. The high percentage of participants in our study who were unsure of their participation in Medicaid, Medicare, SSI, or SSDI programs even with the support of a partner reporter who knows them well was an unexpected and disappointing finding. Existing literature documents a lack of basic knowledge and reporting on services for individuals with intellectual and developmental disabilities at the systems level. For example, in a recent Data Note, (Zalewska & Winsor, 2021) reported variability in states abilities to report both services and allocation of funds for individuals with IDD nationwide, with data only available in 46 states. This study elaborates on the notion of a lack of systematic data collection by affirming a lack of understanding at the level of the person of interest. Further, recent public policy literature suggests that a "bottom-up" approach to Social Security policy in which beneficiaries' experiences generate guiding principles for policy change is a substantive way to ensure accessible and human-rights based systems (Orton et al., 2021).

SSA Program Implications

Work incentive programs are the primary approach of the SSA to encourage young adults with disabilities to transition to employment, but SSA has been criticized for its insufficient procedures to communicate with youth and their families, lack of data collection for transition-age beneficiaries, and a subsequent inability to analyze why eligible youth and young adults are not taking advantage of work incentives (U.S. Government Accountability Office, 2017).

This preliminary analysis contributes to the literature by identifying that a significant percentage of transition-age young adults with intellectual disabilities are unsure of their SSI or SSDI beneficiary status when asked directly. Further, there was even less awareness of resources such as the Ticket to Work program, WIPA programs, PASS, IRWE, or the SEIE. Our findings imply that SSA must improve their communication with young adults with ID and their families at a very basic level. Providing materials with visual supports and simplified language for parents and caregivers to discuss beneficiary status with their young adults with intellectual disabilities may be one such approach. Another tactic to improve communication might occur at the level of employment support services. Collaborating with settings such as special education, vocational rehabilitation, and Project SEARCH to create accessible materials to educate youth and young adults about both SSI/SSDI and available work incentive programs may be a worthwhile starting point to improve participation in work incentive programs. Additionally, establishing more of a formal relationship and presence within employment support service settings may provide a basis for data collection and contribute to necessary continuous improvement efforts.

In addition to the contributions of the preliminary analysis, the completed project with a full dataset will provide an improved understanding of the relationship between transition-age young adults with intellectual disabilities' characteristics and the connection with employment support services. Specifically, findings from this study may be particularly fruitful in targeting efforts for the SEIE, Ticket to Work, and WIPA programs. Exploring where transition-age individuals with ID receive employment support services may present opportunities to further

promote work incentives, alleviate fears of losing benefits, and ultimately reduce dependence of transition-age youth on SSI/SSDI benefits.

Strengths, Limitations and Next Steps

A strength of this research design is that young adults with intellectual disabilities are reporting for themselves with the support of a trusted adult who knows them well. This is a significant contribution to the body of literature because most research in this space is designed as secondary analysis of existing data that is not collected via self-report. Thus, we've been able to identify and report a lack of understanding of Social Security benefits and health care amongst transition age young adults with intellectual disabilities, even with the built-in support of a partner reporter.

Conversely, because most participants were unable to identify their benefit status, an important limitation of this preliminary analysis is being underpowered to analyze only young adults who receive Social Security benefits. Future research should focus on additional supports within the interview protocol to determine benefit status. For example, brief explanations of benefit programs or example indicators of participation in programs (e.g. "you may have SSDI if…") would be of benefit to helping individuals with intellectual disabilities self-report their benefit status.

Though we anticipate an ultimate sample size of 360 young adults with ID, the current model is built on available data of 70 participants and lacks stability due to violations in both ratio of cases to variables and adequacy of expected frequencies assumptions. To further address issues of power, we will explore how to transform VFA subscale scores from integer to categorical data. The preliminary findings presented in this paper, particularly the predictive value of the VFA–Self-Determination subscale sum score indicate this will be a worthwhile investment in building the final predictive model.

Conclusion

Overall, this research highlights the need to educate young adults with intellectual disabilities on their benefit status. The elementary knowledge of their own Social Security supports is a crucial step in being self-determined participants in their own journey to employment. Regardless of employment support service setting, we must work harder to ensure young adults with intellectual disabilities have a basic understanding of their Social Security status so that they may actively participate in employment-related decisions and plan for their future.

Disclaimer: Study data were collected and managed using REDCap electronic data capture tools hosted at Colorado State University. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

References

Buescher, A. V. S., Cidav, Z., Knapp, M., & Mandell, D. S. (2014). Costs of Autism Spectrum Disorders in the United Kingdom and the United States. *JAMA Pediatrics*, *168*(8), 721–728. https://doi.org/10.1001/jamapediatrics.2014.210

Caldwell, K. (2014). Dyadic interviewing: A technique valuing interdependence in interviews with individuals with intellectual disabilities. *Qualitative Research*, *14*(4), 488–507. https://doi.org/10.1177/1468794113490718

Centers for Disease Control and Prevention (2006). Economic costs associated with mental retardation, cerebral palsy, hearing loss, and vision impairment - united states, 2003. Morbidity and Mortality Weekly Report, 55, 881.

Chico-Jarillo, T., Sasse, S., Lelli, L., Howe, C. L., Etcitty, J., Lee, M., Williamson, H., & Armin, J. S. (2021). *A Scoping Review of Health Research with Racially/Ethnically Minoritized Adults with Intellectual and Developmental Disabilities (IDD)*. https://repository.arizona.edu/handle/10150/662069

Cimera, R. (2010). The national cost-efficiency of supported employees with intellectual disabilities: The worker's perspective. *Journal of Vocational Rehabilitation*, *33*, 123–131. https://doi.org/10.3233/JVR-2010-0521

Cizek, G., & Fitzgerald, S. (1999). An introduction to logistic regression analysis. Measurement and Evaluation in Counseling and Development, 31(4), 223-245.

Daston, M., Riehle, J. E., &Rutkowski, S. (2012). *High school transition that works!: Lessons learned from Project SEARCH*. Paul H. Brookes Publishing Co.

Doran, C., Einfeld, S., Madden, R., Otim, M., Horstead, S., Ellis, L., & Emerson, E. (2012). How much does intellectual disability really cost? First estimates for Australia. *Journal of Intellectual & Developmental Disability*, *37*, 42–49. https://doi.org/10.3109/13668250.2011.648609

Dutta, A., Gervey, R., Chan, F., Chou, C.-C., & Ditchman, N. (2008). Vocational Rehabilitation Services and Employment Outcomes for People with Disabilities: A United States Study. *Journal of Occupational Rehabilitation*, *18*, 326–334. https://doi.org/10.1007/s10926-008-9154-z

Honeycutt, A. A., Grosse, S. D., Dunlap, L. J., Schendel, D. E., Chen, H., Brann, E., & al, H. G. (2003). Economic costs of mental retardation, cerebral palsy, hearing loss, and vision impairment. In B. M. Altman, S. N. Barnartt, G. E. Hendershot, & S. A. Larson (Eds.), *Using Survey Data to Study Disability: Results from the National Health Survey on Disability* (Vol. 3, pp. 207–228). Emerald Group Publishing Limited. https://doi.org/10.1016/S1479-3547(03)03011-2

Horner-Johnson, W., & Bailey, D. (2013). Assessing Understanding and Obtaining Consent from Adults with Intellectual Disabilities for a Health Promotion Study. *Journal of Policy and Practice in Intellectual Disabilities*, *10*(3), 10.1111/jppi.12048. https://doi.org/10.1111/jppi.12048

Hosmer, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression* (3rd ed.). Hoboken, NJ: Wiley.

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004)

Orton, M., Summers, K., & Morris, R. (2021). Guiding principles for social security policy: Outcomes from a bottom-up approach. *Social Policy & Administration*, 1–17. https://doi.org/10.1111/spol.12782

Persch, A. C., Cleary, D. S., Rutkowski, S., Malone, H. C., Darragh, A. R., & Case-Smith, J. D. (2015). Current practices in job matching for individuals with intellectual and developmental disabilities. *Journal of Vocational Rehabilitation, 43*(3).

Persch, A. C., Gugiu, P. C., Onate, J. A., & Cleary, D. S. (2015). Development and psychometric evaluation of the Vocational Fit Assessment. *American Journal of Occupational Therapy, 69*(6).

Project SEARCH. (2016). High School Transition Program. Retrieved from: http://www.projectsearch.us/OurPROGRAM/HighSchoolTransition.aspx

Social Security Administration, (2020a). *Benefits for children with disabilities* (SSA Publication No. 05-10026). Retrieved from https://www.ssa.gov/pubs/EN-05-10026.pdf

Social Security Administration, (2020b). *Red book: A summary guide to employment supports for people with disabilities under the social security disability insurance (SSDI) and supplemental security income (SSI) programs* (SSA Publication No. 64-030). Retrieved from https://www.ssa.gov/pubs/EN-64-030.pdf

United States Census Bureau. (2018). *2018: American Community Survey 1-Year Estimates Subject Tables*. (Table S2301). Retrieved from https://data.census.gov/cedsci

United States Government Accountability Office, U. S. G. A. (2017). *SSA could strengthen its efforts to encourage employment for transition-age youth*. (GAO-17-485).

Tabatchnick, B. G., & Fidell, L. S. (2007). Using multivariate statistics (5th ed., pp. 481–498). Pearson Education, Inc.

Wehman, P., & Scott, L. (2013). Applications for youth with intellectual disabilities. *Life beyond the classroom. Transition strategies for young people with disabilities*, 379-400.

Yamamoto, K., Stodden, R. A., & Folk, E. D. R. (2014). *Inclusive postsecondary education: Reimagining the transition trajectories of vocational rehabilitation clients with intellectual disabilities.* Journal of Vocational Rehabilitation, 40, 59-71. doi: 10.3233/JVR-130662

Zalewska, A., & Winsor, J. (2021). State Intellectual and Developmental Disability Agencies' Funding for Employment Services, FY 2019. *Institute for Community Inclusion Publications*, *Data Note Series* (Data Note 65). https://scholarworks.umb.edu/ici_pubs/134

Table 3

Characteristics associated with Vocational Rehabilitation relative to Special Education in multinomial logistic regression analysis

Explanatory Variable	B	SE	Wald	df	p	Exp(B)
Intercept	-8.604	270.540	.001	1	.975	
Gender						
Male	3.401	639.434	.000	1	.996	29.992
Female	-4.250	601.150	.000	1	.994	.014
Other	0	-	-	0	-	-
Age						
18	14.044	72.500	.038	1	.846	1256970.100
19	17.965	57.349	.098	1	.754	63430482.82
20	1.662	131.166	.000	1	.990	5.270
21	16.865	84.583	.040	1	.842	21110827.17
22	0	-	-	0	-	-
Race						
White	-9.210	594.705	.000	1	.988	.000
Hispanic	-29.725	595.577	.002	1	.960	1.231E-13
Black	-19.386	586.269	.001	1	.974	3.808E-9
Asian	-58.198	640.934	.008	1	.928	5.310E-26
Other	-14.181	603.139	.001	1	.981	6.935E-7
VFA–SD						
0	43.463	204.876	.045	1	.832	7.513E+18
2	-21.155	2435.439	.000	1	.993	6.496E-10
4	-13.301	64.212	.043	1	.836	1.672E-6
5	10.951	106.559	.011	1	.918	57005.701
7	8.130	109.890	.005	1	.941	3394.204
8	8.501	49.917	.029	1	.865	4918.914
9	-14.251	73.050	.038	1	.845	6.472E-7
10	7.529	42.386	.032	1	.859	1861.160
11	5.605	46.175	.015	1	.903	271.672
12	-12.364	38.993	.101	1	.751	4.271E-6
13	10.298	146.876	.005	1	.944	29665.304
14	-8.956	239.521	.001	1	.970	.000
15	5.520	.000	-	1	-	249.581
16	-4.825	84.221	.003	1	.954	.008
17	-3.845	232.545	.000	1	.987	.021
18	8.904	71.097	.016	1	.900	7362.895
19	13.383	179.620	.006	1	.941	648582.535
20	38.329	213.588	.032	1	.858	4.045E+16
22	0	-	-	-	0	-
SSI						
yes	13.285	47.088	.080	1	.778	588184.289
no	8.080	98.090	.007	1	.934	3227.728
unsure	0	-	-	0	-	-

Table 4

Characteristics associated with Project SEARCH relative to Special Education in multinomial logistic regression analysis

Explanatory Variable	B	SE	Wald	df	p	Exp(B)
Intercept	-18.505	263.871	.005	1	.944	
Gender						
Male	7.039	668.014	.000	1	.992	1140.487
Female	5.326	632.757	.000	1	.993	205.651
Other	0	-	-	0	-	-
Age						
18	39.253	66.532	.348	1	.555	1.115E+17
19	28.162	62.091	.206	1	.650	1.701E+12
20	39.246	133.477	.086	1	.769	1.108E+17
21	33.331	88.085	.143	1	.705	2.989E+14
22	0	-	-	0	-	-
Race						
White	.701	628.531	.000	1	.999	2.015
Hispanic	-8.565	628.722	.000	1	.989	.000
Black	-9.611	620.459	.000	1	.988	6.700E-5
Asian	-11.074	669.611	.000	1	.987	1.552E-5
Other	2.667	734.047	.000	1	.997	14.401
VFA–SD						
0	-8.299	201.648	.002	1	.967	.000
2	-38.411	1090.508	.001	1	.972	2.082E-17
4	-6.017	51.225	.014	1	.906	.002
5	-9.619	80.062	.014	1	.904	6.643E-5
7	-3.697	88.360	.002	1	.967	.025
8	-.196	39.813	.000	1	.996	.822
9	-10.289	207.005	.002	1	.960	3.401E-5
10	-.507	36.277	.000	1	.989	.602
11	-1.696	28.561	.004	1	.953	.183
12	-12.037	27.200	.196	1	.658	5.923E-6
13	1.534	145.764	.000	1	.992	4.637
14	-1.100	237.875	.000	1	.996	.333
15	-14.272	377.212	.001	1	.970	6.335E-7
16	1.915	79.279	.001	1	.981	6.785
17	-10.551	174.016	.004	1	.952	2.616E-5
18	-1.031	51.761	.000	1	.984	.357
19	-1.408	1476.873	.000	1	.994	.245
20	23.000	211.539	.012	1	.913	9746813171
22	0	-	-	0	-	-
SSI						
yes	-8.539	44.929	.036	1	.849	.000
no	.018	97.361	.000	1	1.000	1.018
unsure	0	-	-	0	-	-