Journal of Methods and Measurement in the Social Sciences,
Vol.15, No. 1, 14-52, 2024

Department of Education Rehabilitation Services Administration (RSA)-911 Data: Research Study Concerns and Recommendations

Sonia Peterson
National University

Julie Chronister
San Francisco State University

Sapna Singh
San Francisco State University

The Rehabilitation Services Administration (RSA)-911 is a potent dataset. The purpose of this study is to improve the veracity of research using the RSA-911 dataset. To achieve this, 43 research studies that were published between 2018 and 2022 that used Rehabilitation Services Administration (RSA)-911 data were evaluated in a scoping review. The articles were assessed on several characteristics--reporting of data cleaning strategies utilized, discussion of variable definitions, and the methodological rigor of the statistical analyses that were reported. Opportunities for improvement in data cleaning strategies, reporting accurate definitions of the variables that were selected for the studies, improving the rigor of study methodologies, and recommendations for practice in State Vocational Rehabilitation (VR) agencies were found. Recommendations are provided that may improve research studies that are conducted with the RSA-911 data which may ultimately improve services for participants with disabilities served in State VR agencies.

Keywords: big data, data cleaning, RSA-911, research methods

Big data mining is the treatment of large data sets to uncover unknown patterns, correlations, participant demographics. service-delivery characteristics, and other hidden information (Hariri et al., 2019). The Rehabilitation Services Administration (RSA)-911 data is a large administrative dataset that has been used by researchers to assess and inform vocational rehabilitation (VR) practice (Cornell University, 2023; Dutta et al., 2008). The RSA has collected data from all State VR agencies on an annual basis since 1978, and this RSA-911 data has no relationship with or connection to the emergency phone number 911. The RSA-911 data is available in datasets compiled by each federal fiscal year to researchers upon request. An RSA-911 code book is available (RSA, 2017; RSA, 2021). Nearly 400 variables capture participant demographics and the VR services provided, including disability status, funding sources, dates for all case activity, movement through service-delivery stages, employment outcomes, and collaboration with other community resources (Peterson & Olney, 2021; RSA, 2017; RSA, 2021).

The purpose of this study is to improve the veracity of research using RSA-911 data. To achieve this, 43 research studies that were published between 2018 and 2022 that used RSA-911 data were evaluated in a scoping review. The articles were assessed on several characteristics--reporting of data cleaning strategies utilized, discussion of variable definitions, and the methodological rigor of the statistical analyses that were reported.

The State Vocational Rehabilitation Service-Delivery System

The State VR service-delivery system is funded by the RSA and assists individuals with disabilities to obtain employment (U.S. Department of Education [USDOE], 2021). Over $3 billion is spent to provide services to over 1 million active VR clients annually (Leahy et al., 2018; Peterson & Olney, 2021; USDOE, 2021). All State VR agencies report information to RSA on the nearly 500,000 participants who exit the State VR service-delivery system each federal fiscal year, including their demographics, disability status, VR services provided, funding sources, dates, movement through case management stages, employment outcomes, and collaboration with other community resources (Peterson & Olney, 2021; RSA, 2017; RSA, 2021). This dataset is called the RSA-911 data, is organized by each federal fiscal year, and is available to researchers. Researchers can contact RSA directly to request data from one or more federal fiscal years at RSAData@ed.gov (RSA, 2023). Researchers may use data from a specific federal fiscal year, or they may merge data from two or more federal fiscal years when creating a dataset for their specific studies.

The State VR system is highly structured. Generally, applicants are guided through an orderly service-delivery process that includes: 1) an intake interview with a VR counselor; 2) an assessment process to determine eligibility for services, priority for services, and to develop an Individualized Plan for Employment (IPE); 3) participation in the VR services listed in the IPE; and 4) termination of services and case closure (RSA, 2021; Roessler et al., 2018; Hartley & Tarvydas, 2022; Wilson et al., 2018). Applicants are eligible for services if they have a disability and a desire to work. When a State VR agency does not have enough funds to serve all applicants who are deemed eligible for services, the state VR agency must establish an order of selection process so that those individuals with the most significant disabilities have priority for services (Federal Code of Regulations, 2024). State VR agencies generally determine the significance of an applicant's disability based on how the physical, sensory, or mental impairment(s) of the individual limit their functional capacities (e.g., cognitive, visual/mobility, communication, self-care, self-direction, interpersonal skills, motor skills, work tolerance, work skills) and how many services are needed for the individual to achieve an employment outcome. Individuals who have a greater number of functional limitations and need a higher number of VR services are considered more significantly disabled and a higher priority for services.

State VR counselors and participants work together to establish an IPE that takes the participant's interests and abilities into account, identifies the employment goal, and outlines the services and supports needed to secure employment. A participant may exit services at any time during the service-delivery process at the participant's request, if the participant is unable to participate in services, or once the participant has been working in a competitive job for a minimum of 90 days. (Federal Code of Regulations, 2021; Hartley & Tarvydas, 2022; Wilson et al., 2018). The caseload size for a State VR counselor is large, with an

estimated average size of approximately 150 clients (Dew et al., 2008; Wilson et al., 2018). Cases remain on VR counselor caseloads an average of 2.5 years, and cases are continuously added and closed out so that the average caseload remains approximately 150 cases (Peterson & Olney, 2021).

Benefits of Using the RSA-911 Dataset for Research

The benefits of using RSA-911 data for research include utilization of an established large dataset, improved accuracy of statistical analyses, and the speed in which research can be conducted. The RSA-911 data is a large dataset and is considered "big data". Big data allows for the collection and analysis of large amounts of data from multiple sources. Multiple sources in the case of RSA-911 data include all states and U.S. territories that offer state-federal VR services. This has resulted in a large and robust sample size for research purposes in the field of VR. Approximately 500,000 cases in which participants in state VR agencies have exited services are captured each year in the RSA-911 data.

Researchers can analyze vast amounts of information in the RSA-911 data to uncover patterns and trends that might not be easily visible with smaller datasets. This can lead to more accurate results and better decision-making. Researchers can use RSA-911 data to examine trends that can inform further research and state VR policies. The Federal Department of Education, RSA in collaboration with all state-federal VR agencies facilitate the automation of many data collection and analysis tasks, which can save time compared to traditional data collection methods. Researchers can easily access RSA-911 data from any and all federal fiscal years since 1978, including all demographic and service data, immediately after participants exit the state VR service-delivery system.

Challenges with Using the RSA-911 Dataset for Research

Assessing the quality of data, protecting the privacy of participants, managing variables, and costs are important when utilizing big data such as the RSA-911 data. Ensuring the quality and accuracy of the data is critical in big data research. The RSA-911 case file data rely heavily on VR counselors' assessment and recording of information; the extent to which VR counselors carefully and consistently collect the information for each case is not available (Shenk et al., 2023). RSA-911 data may contain missing values, errors, inconsistent data, or outliers that need to be addressed. RSA periodically adds, deletes, and/or changes the codes for over 400 variables which must be addressed by researchers when merging RSA-911 datasets from two or more federal fiscal years (RSA, 2017; RSA, 2021).

Although identifying information (e.g., name, date of birth, social security number) about individual participants is suppressed, the RSA-911 dataset contains sensitive demographic trait information and details about services provided in specific state and Commission for the Blind VR agencies. Protecting that information is a significant concern when using RSA-911 data for research purposes and in small

states where participants may be able to be identified based on the information captured in the dataset (e.g., disability type, ethnicity, gender, services received, employment status, job title at exit, wages, receipt of financial benefits).

Working with RSA-911 big data requires specialized skills and expertise in data management, analysis, and interpretation. This can make it challenging for researchers who are not familiar with these technologies or with the descriptions of the variables in the RSA-911 data (Che et al., 2013; Friedman, 1998; Nazarenko & Khronusova, 2017; Robert, 2020; Smith, 2020; Smith, & Cordes, 2019). Implementing and maintaining big data infrastructure can be expensive, and there may also be additional costs associated with cleaning and transforming the data in appropriate software programs to make it usable for research purposes. Despite these challenges, the benefits of using RSA-911 big data are significant, and many researchers are exploring new and innovative ways to leverage this data to improve rehabilitation services for individuals with disabilities.

Data Cleaning

Researchers familiar with analyzing large administrative datasets have stressed the importance of cleaning these types of data to check for accuracy, completeness and consistency (Bhadani & Jothimani, 2016). During this process, data may be deleted and modified to improve the data quality. Maletic and Marcus (2000) have recommended the following process: 1) error types are defined and determined, 2) errors are identified from the data, 3) errors are corrected, 4) error types and corresponding examples are documented, and 5) data entry procedure may be modified to avoid future errors.

Variables in RSA-911 Data

Over 400 variables are captured in the RSA-911 data. Clear definitions of all variables are available in the *RSA-911 Aggregate Data and Reporting Manual* (RSA, 2017). A range of variables capture participant characteristics including race/ethnicity, age, sex, financial benefit programs, veteran status, criminal/juvenile legal involvement, the source of referral to state VR, and participation in other community partner programs. Disability types are coded with both "type of disability" and "cause of disability" variables for both primary and secondary disabilities of the participants. Variables indicate the number of days the case was open, and dates of status changes (e.g., eligibility determination, signed IPE, date of employment, exit from services). Variables indicate the date the participant became employed, the wages they were earning, and the number of hours they were working each week. Variables capture all the services that the participant received, the provider, and the funding source for the services.

Reporting Participant Characteristics in Research Study Publications

Flanagin et al. (2021) have offered extensive guidance and resources regarding the reporting of participant

race/ethnicity. These experts recommend that the Methods section of a research paper should include an explanation of how the race/ethnicity of the participants was identified (e.g., self-report, investigator observed, database, electronic health record, survey instrument) and the reasons why race/ethnicity was assessed (e.g., required by the funding agency) (Flanagin et al., 2021).

The Institutional Review Board for the Protection of Human Subjects (IRB) at the University of Maine (2023) encourages researchers to be sensitive to and inclusive of differences when collecting data about identities of participants' sex and gender. Detailed sample questions and response options have been created that have been designed to capture research participants' internal held sense of their gender, regardless of biology (i.e., Gender/Gender Identity); the biological differences between males and females that are assigned at birth (i.e., Sex); and the terms participants use to describe their pattern of emotional, romantic and/or sexual attraction (i.e., Sexual Orientation) (University of Maine, 2023).

The ADA National Network (2023) has shared guidelines for writing about people with disabilities that may be incorporated into research data collection and reporting which can include 1) using the language preferred by research participants when referring to their disability, 2) using neutral terms that are not offensive, and 3) avoiding language that perpetuates negative stereotypes (ADA National Network, 2023).

Publications Based on RSA-911 Data Included in the Present Study

Method

A scoping review was used to conduct this study. A scoping review is a method of knowledge synthesis that identifies gaps and patterns within an existent knowledge base for the purpose of informing research, practice and policy (Levac, Colquhoun & O'Brian, 2010). To conduct this study, we followed Arksey and O'Malley's scoping review stages including a) specifying the research question, b) identifying relevant literature, c) selecting studies, and d) summarizing, synthesizing, and reporting the results (Daudt et al., 2013). In regards to stage one, our specific research questions included: a) Are researchers using RSA-911 data reporting their data cleaning strategies? b) Are researchers using RSA-911 data clearly describing their definitions of the variables that were selected for the study? and c) Are researchers using RSA-911 data utilizing rigorous statistical analysis methods? To identify the relevant literature (stage two), a team approach was used to ensure that diverse perspectives enhanced our scoping review process and findings (Daudt, Van Mossel & Stout, 2013). Our team consisted of three members with appropriate knowledge and expertise including two doctoral level rehabilitation counseling educators and researchers and one graduate-level counseling student. All team members identified relevant literature using the online research platform EBSCOhost through two university library systems. EBSCOhost provided access to a variety of databases

including Academic Search Ultimate which at the time of our search was comprised of 71 smaller databases (e.g., CINAHL Plus, ERIC, APA PsychInfo, MEDLINE complete, E-Journals, EconLit). In addition, team members identified relevant literature through Google Scholar. Google Scholar is a free academic search engine that indexes scholarly material by searching archives of scholarly websites, publishers and universities across diverse academic disciplines (Durgumahanthi, 2024). Such search terms as RSA-911, vocational rehabilitation, employment, predictors of employment, employment outcomes, public VR, and disability were used to conduct the search.

To select studies appropriate for this scoping review (stage three), each team member worked independently between July 1st and July 31st, 2022 to identify studies that were a) peer-reviewed; b) quantitative and employed inferential statistics; c) analyzed RSA-911 data; and d) published between 2018 and 2022. The latter inclusion criterium was determined to capture studies that were based on the most current RSA-911 variables. Specifically, variables in the RSA-911 dataset were changed in 2017 to align with WIOA priorities focused on capturing youth data (U.S. Department of Education, 2017; U.S. Department of Education, 2023). Using these parameters, each team member independently reviewed between 115 – 123 (depending on the team member) articles for inclusion and input the articles that met the inclusion criteria into an excel spreadsheet. The spreadsheet included the full citation, research question(s), sample population and analytic method employed. The individual reviews resulted in three individual team member lists that included 57 (team member 1), 63 (team member 2), and 71 (team member 3) articles that met the basic inclusion criteria. Upon completion of the independent reviews, a final spreadsheet was developed based on three team member meetings focused on cross-checking each team members list and decisions regarding retaining and removing articles. Decision regarding the retention and removal of article were based on the research questions guiding this scoping review. Specifically, articles were removed if the research team was unable to ascertain an answer to the research questions based on the information in the study. The final list of articles that met our inclusion criteria and provided enough information to answer our research questions was 43.

To summarize, synthesize and report the results (stage four), each study was evaluated against the three research questions focused on examining the degree to which a study reported data cleaning strategies, defined study variables, and utilized rigorous statistical analysis methods. To do this, all research team members reviewed each article independently and narrated their findings in an excel spreadsheet. Upon completion of the independent analyses, three meetings occurred to synthesize the findings, clarify and resolve any inconsistent findings amongst team member findings, and identify additional notable characteristics of the articles including overarching strengths and limitations of each study and the study's impact within the context of future research, policy and practice.

Results

A total of 43 articles published in peer-reviewed scholarly journals that included research utilizing RSA-911 data were found and were included in the study. A brief citation, RSA-911 data year(s) used in the study, purpose of the study, the population, sample size, and statistical analysis utilized have been provided in Table 1. Brief comments regarding study limitations and methodological rigor have been shared in Table 2.

Table 1
Articles Included in the Review, N=43

Authors, year	RSA-911 data years	Purpose	Population, Sample Size	Analysis
Ahonle et al. (2020)	2012	To investigate the factors that predict successful employment in individuals with Traumatic Brain Injury (TBI)-related disabilities	Primary cause of impairment was TBI, *N*= 4,923	Multiple logistic regression
Akinola & Doabler (2022)	2015	To explore demographic characteristics and VR services on successful employment and earnings of transition-aged youth (TAY) with depressive disorders	TAY with depressive disorders, *N*=4,772	Descriptive analyses; logistic regression
Chan et al. (2020)	2014	To evaluate the effect of college and university training on employment outcomes and earnings	Young adults who had a primary diagnosis of TBI, *N*=556	Non-experimental causal comparative study using propensity score matching
Chun et al. (2018)	2013	To investigate the associations between demographic characteristics, VR service patterns, and employment outcomes of Asian Americans	Asian Americans who exited the VR agency with VR services initiated based on their IPEs, *N*=4,332	A series of chi-squared tests for categorical (e.g., gender, race) and one-way analysis of variance (ANOVA); logistic regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Clapp et al. (2020)	2007	To describe the characteristics of services received by, and labor market outcomes of applicants with visual impairments in three state VR programs and to assess the returns to VR services for this population	All VR clients recorded as having a primary or secondary visual impairment disability from Maryland, Oklahoma, and Virginia, *N*=1,964	Frequency distribution; reporting mean averages; longitudinal statistics
Crudden et al. (2020)	2015	To investigate time from VR application to a signed IPE for employed applicants with visual disabilities	Competitively employed VR applicants, *N*=5,096	Multilevel modeling
Crudden, Giesen et al. (2018)	2015	To identify and contrast characteristics and services received by VR consumers with visual disabilities based on employment status at application	4,586 competitively employed applicants and 9,643 unemployed applicants, *N*=14,229	Logistic regression
Crudden, McDonnall et al. (2018)	2015	To investigate characteristics of employed persons with visual disabilities who applied for VR services	Competitively employed VR applicants, *N*=4,499	Logistic regression
Cuevas et al. (2021)	2014	To investigate the impact of demographic variables and the use of VR services on employment outcomes among hard-of-hearing consumers	Consumers who were hard-of-hearing, including individuals with both successful and unsuccessful employment outcomes, *N*=24,983	Binary logistic regression, Chi-square, and Chi-square Automatic Interaction Detector analyses
Degeneffe et al. (2022)	2014-2016	To understand the level of participation among TAY with TBI in the state/federal VR system in the context of the WIOA	State VR clients with TBI, ID, and ASD below the age of 22 at the time of application, *N*=88,467	Descriptive Statistics and Analysis

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Ditchman et al. (2018)	2009	To examine the relations between VR services and young adults with ASD to predict employment status	Individuals with ASD between the ages of 16 and 24 closed as either competitively employed or not employed, *N*=2,219	Social network analysis
Dondorf-Brooks et al. (2020)	2015-2016	To better understand the circumstances in which women resume their parenting role in the context of VR	Women that self-reported receipt of TANF and received VR services, *N*=13,993	Frequency distribution, reporting of mean averages, and chi-square analysis
Duncan et al. (2020)	2007-2012	To define the effect of receiving rehabilitation technology through VR services on employment outcomes	Individuals that had amputation listed as the primary impairment and whose VR case was started and closed within 2007 and 2012, *N*=10,107	Forward model logistic regression
Ethridge et al. (2020)	2004-2013	To discuss barriers to employment for ex-offenders with disabilities and to identify how racial/ethnically marginalized ex-offenders are dis-proportionately unemployed and earn less than their White counterparts	Persons who were ex-offenders and sought state VR services, *N*=32,825	Descriptive statistics, one-way ANOVA, chi-square, logistic regression, and OLS regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Giesen & Hierholzer Lang (2018).	2011	To examine individual, socioeconomic, disability, service, and state-level factors predicting VR closure earnings exceeding substantial gainful activity for Social Security Disability Insurance (DI) beneficiaries in VR who were blind or visually impaired (BVI)	Selected cases were legally blind or had other visual impairments, were DI beneficiaries only at application, and excluded those ever receiving SSI. All cases had received services (closed with or without a VR employment outcome status at closure), were aged 18 to 65 years at application, and received services in either a blind or a combined agency (no general agencies), *N*=3,505	Multilevel modeling
Hill et al. (2022)	2014	To explore how customer characteristics and VR services predict customer participation in services and employment outcomes.	Customers who applied and were found eligible for VR services at general or combined agencies in 2014 and closed no later than June 2019, *N*=490,225	Two Machine Learning (ML) modeling approaches, classification and regression trees (CART), and random forests (RF)
Iwanaga et al. (2021)	2018	To evaluate the effect of WIBC as a VR intervention to improve on employment outcomes and earnings	TAY and young adults with ID who are Supplemental Security Income benefits recipients, *N*=19,383	Propensity score matching using logistic regression analysis and the nearest neighbor method
Kang et al. (2019)	2014	To explore characteristics of individuals with Intellectual and Developmental Disabilities that are associated with their wages	Individuals with Intellectual and Developmental Disabilities, *N*=26,813	Ordinary Least Square (OLS) and quantile regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Kaya et al. (2020)	2014	To investigate the demographic characteristics, receipt of Social Security benefits, VR services, and employment outcomes for people with Parkinson's Disease	Individuals with Parkinson's Disease who were unemployed at the time they enrolled in the state-federal VR program, *N*=673	Purposeful selection logistic regression
Kaya et al. (2021)	2013	To examine the relationships among individual characteristics, VR services, and employment outcomes of transition-age youth with SLD	Young adult VR consumers with SLD, *N*=9,114	Chi-squared automatic interaction detector (CHAID) analysis and multivariate logistic regression analysis
Kaya et al. (2022)	2018	To investigate the relationships between demographic covariates, VR services, and employment outcomes of individuals with anxiety disorders.	Individuals with anxiety disorders who received VR services, *N*=9,266	Multivariate logistic regression analysis
Lee et al. (2020)	2013	To investigate which individual characteristics, work disincentives, and VR service types were related to competitive employment outcomes among Asian Americans with psychiatric disabilities and compare the findings to other racial/ethnic groups	Clients who (a) reported having psychosocial and other mental impairments as primary disability impairments; and (b) exited the system after receiving services under an approved IPE, *N*=110,924	Logistic regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Lusk & Veale (2018)	2010-2014	To replicate and determine if the results of the McAweeney et al. study hold true over 10 years later and to determine if successful case closures for this population have increased	Individuals who had a primary or secondary diagnosis of a substance or alcohol use disorder and were closed either successfully employed or not employed at exit, *N*=4,700	Random selection of 940 cases from each data set; chi square analyses with Bonferroni correction calculations to adjust the alpha level
Mann & Croake (2018)	2014	To examine state variation in outcomes for applicants in four different employment statuses at application similar to the subpopulations affected by WIOA	All VR cases that closed for any reason (other than death) during the 2014 federal fiscal year, *N*=537,734	Regression
Mann & Hock (2020)	2006–2014	To examine how early milestones in the VR process (e.g., eligibility determinations, determinations of disability significance, and signings of IPEs) vary around an order of selection (OOS) status change	People who applied for State VR in 2006-2008, *N*=99,465	Frequency distributions; logistic regression and linear probability models
McDonnall & Cmar (2019)	2013-2015	To investigate employment outcomes for VR consumers with deaf-blindness	Clients with deaf-blindness aged 18 to 67 at case closure who received services, *N*=1,382	Multiple Regression Analysis to explore factors associated with quality employment outcomes
McDonnall & Cmar (2019)	2013-2015	To investigate employment outcomes for VR consumers with deaf-blindness	Consumers with deaf-blindness identified as their primary or secondary disability whose cases were closed during fiscal years 2013, 2014, and 2015, *N*=1,382	Descriptive statistics, logistic regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
McDonnall et al. (2020)	2013-2015	To investigate how services are provided to state–federal VR consumers with comorbid traumatic brain injury (TBI) and visual impairment and the prevalence of and competitive employment rates for this population	Consumers who had a primary or secondary disability of blindness (Code 01) or visual impairment (Code 02) and a cause of TBI (Code 37) for either their primary or secondary disability and who were accepted for and received services (Closure Codes 3 and 4), *N*=51	Mixed methods including interviews with State VR agency administrators; descriptive statistics and Analysis of variance (ANOVA) with the RSA-911 data
McDonnall et al. (2022)	2010-2015, 2017-2019	To evaluate the impact of the Workforce Innovation and Opportunity Act (WIOA) on outcomes (competitive employment rates and median earnings) for adult and youth VR consumers with blindness or low vision (B/LV) and to determine whether impacts differed by agency type.	Two agency-level samples comprised of (a) youth aged 21 or younger at the time of application with B/LV as their primary disability and (b) adults 22 years of age or older at the time of application with B/LV as their primary disability, *N*= not reported	Discontinuous growth models
Moore et al. (2022)	2019	To examine, identify and describe national and RSA regional service patterns and disparities in employment outcome rates based on race/ethnicity, gender, and level of educational attainment at closure among SVRA consumers who were marginalized persons of color with disabilities and who had a signed IPE	VR consumers who were served by the 56 state and territorial VR agencies and (a) identified as African American, Asian American, Latinx, Native American or Alaska Native; Native Hawaiian/Pacific Islander, or White; and (b) reported as having a developed signed IPE, *N*=114,229	Stratified bootstrap data expansion approach with logistic regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Peterson et al. (2021)	2015-2016	To show that outcomes for individuals with serious psychiatric disabilities who received the On-the-Job Training (OJT) service in a state VR system are very similar to outcomes for individuals with serious mental illness served with Individual Placement and Support (IPS) supported employment model services	Individuals with psychiatric disabilities who received IPE services, were receiving SSA disability benefits at application, and whose total cost of Title I services was $5,000 or less, *N*=53	Logistic regression
Rast et al. (2020)	2015	To describe rates of Postsecondary Education training services among transition-aged-youth on the autism spectrum	TAY ages 14–24 at the time of application who received services, *N*=119,147	Frequency distribution; estimated proportions and means of the covariates; logistic regression; generalized boosted regression modeling (GBM)
Roux et al. (2021)	2015–2017	To determine patterns of VR service receipt and employment outcomes for youth with ASD who entered VR as secondary students (ages 16–21 years)	Working age individuals who met the following criteria: (a) ages 16–39 years at the time of application to VR, (b) had autism as the primary or secondary cause of their work impairment, (c) received VR services after being found eligible, and (d) case closed in FFY 2015, FFY 2016, or the first three quarters of FFY 2017, *N*=44,094	Multivariate Logistic Regression

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Sánchez (2018)	2011	To examine the demographic and rehabilitation service variables affecting employment outcomes of people with affective disorders	Individuals with affective disorders who were accepted for services and were either successfully or unsuccessfully closed during FY 2011, *N*=44,960	Chi-square automatic interaction detector (CHAID) data mining analysis
Sánchez et al. (2022)	2011-2013 and 2017-2019	To determine trends in self-employment among PWDs within the VR program	All cases of PWDs closed as self-employment, *N*=21,260	Frequency distribution and reporting of mean averages
Sannicandro et al. (2018)	2008-2013	To examine the effect of postsecondary education on employment and earnings for individuals with ID and the effect of state variation on those outcomes.	Individuals with ID between the ages of 16 and 30 who lived in the 50 states or the District of Columbia and who received services from state VR agencies, *N*=11,280	Multilevel logistic regressions and multilevel linear regressions
Shadrick (2019)	2016	To examine employment outcomes for adult VR clients with deaf-blindness	Individuals who were deaf-blind and had their case closed in FY2016, *N*=135	Logistic regression
Sprong et al. (2019)	2014	To evaluate how the use of rehabilitation technology impacted closure status for consumers receiving services	Consumers who were closed in fiscal year 2014, *N*=429,077	Multiple logistic regression
Stapleton & Martin (2020)	1998-2009	To address the gap in the research literature on characteristics and traits related to Social Security Disability entry after application for VR services	VR applicants, *N*=3,656,105	Frequency distribution; longitudinal statistics

Table 1 (continued)

Authors, year	RSA-911	Purpose	Population, Sample Size	Analysis
Trenz et al. (2020)	2015-2016	To explore specific variables as predictors of employment outcomes among women of lower socioeconomic status, with a special focus on women with children that have completed VR services	Women receiving TANF who completed VR services, *N*=8,350	Multivariate logistic regression
Wang & Ethridge (2022)	2015-2017	To examine predictors of employment outcomes at case closure	Cases of African American and White participants from the 50 U.S. states plus the District of Columbia that had an IPE initiated and were closed by 12/31/2017, *N*=1,202,067	Frequency distribution; logistic regression model with Generalized Estimating Equations
Whittenburg et al. (2020)	2015	To compare differences in employment outcomes, cost-effectiveness, and cost-efficiency of VR services for youth with SLD and different education levels.	Participants between the ages of 17 and 26 when their VR cases were closed; SLD was listed as the primary disability; and no other secondary disabilities were coded, *N*=24,486	Descriptive statistics
Yin et al. (2022)	2017	To investigate potential racial differences in each step (I.e., application, eligibility determination, IPE development, case closure) of the VR service process	All clients between ages 15 and 64 years residing in 50 states and Washington, D.C. who exited VR with a closed case in the 2017 fiscal year, *N*=460,977	Frequency distributions and correlation analysis

Table 2
Summary of Limitations and Methodological Rigor in the Articles Included in the Review, N=43

Authors, year	Limitations	Methodological Rigor
Ahonle et al. (2020)	No detailed methods of how data was cleaned were reported	Cases with missing data were excluded from the analyses; goodness-of-fit findings for the variables included in the logistic regression analyses were reported
Akinola & Doabler (2022)		Goodness-of-fit and multicollinearity findings for the variables included in the logistic regression analyses were reported
Chan et al. (2020)	Limited recommendations for practice for State VR administrators, counselors, and their clients with TBI	
Chun et al. (2018)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Clapp et al. (2020)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Crudden et al. (2020)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Crudden, Giesen et al. (2018)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Crudden, McDonnall et al. (2018)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Cuevas et al. (2021)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	

Table 2 (continued)

Authors, year	Limitations	Methodological Rigor
Degeneffe et al. (2022)	Large sample size with limited discussion of variable selection in the methods section; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported; RSA-911 data set was dated; no recommendations for practice for State VR administrators, counselors, and their clients were provided	
Ditchman et al. (2018)	RSA-911 data set was dated	
Dondorf-Brooks et al. (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section; validity of selected variables was limited	Limitations of the validity of variables was reported
Duncan et al. (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section; large numbers of predictor variables were used in the regression analyses	
Ethridge et al. (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section	
Giesen & Hierholzer Lang (2018).	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Hill et al. (2022)	Large sample size with limited discussion of variable selection and statistical power in the methods section; validity of selected variables was limited	
Iwanaga et al. (2021)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	

Table 2 (continued)

Authors, year	Limitations	Methodological Rigor
Kang et al. (2019)	Large sample size with limited discussion of variable selection and statistical power in the methods section; validity of selected variables was limited	
Kaya et al. (2020)	Validity of selected variables was limited	
Kaya et al. (2021)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Kaya et al. (2022)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Lee et al. (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported; reporting of goodness of fit for the statistical model was in error	
Lusk & Veale (2018)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Mann & Croake (2018)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how data was cleaned and how missing variables were managed were reported
Mann & Hock (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how data was cleaned and how missing variables were managed were reported
McDonnall & Cmar (2019)	Validity of selected variables was limited	
McDonnall & Cmar (2019)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
McDonnall et al. (2020)	No detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	

Table 2 (continued)

Authors, year	Limitations	Methodological Rigor
McDonnall et al. (2022)	Sample sizes were not reported; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	Average means were reported
Moore et al. (2022)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Peterson et al. (2021)		Methods of how data was cleaned and how missing variables were managed was reported; goodness-of-fit findings for the variables included in the logistic regression analyses were reported; detailed recommendations for practice for State VR administrators, counselors, and their clients were provided
Rast et al. (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section; detailed recommendations for practice for State VR administrators, counselors, and their clients were not provided	
Roux et al. (2021)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how data was cleaned and how missing variables were managed were reported
Sánchez (2018)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned for inconsistent data or how missing variables were managed were reported	
Sánchez et al. (2022)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned or how missing variables were managed were reported	

Table 2 (continued)

Authors, year	Limitations	Methodological Rigor
Sannicandro et al. (2018)	No detailed methods of how data was cleaned or how missing variables were managed were reported	
Shadrick (2019)		Methods of how missing variables were managed were reported
Sprong et al. (2019)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how missing variables were managed were reported
Stapleton & Martin (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how data was cleaned and limitations in the data were reported
Trenz et al. (2020)	Validity of selected variables was limited	
Wang & Ethridge (2022)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how data was cleaned and how missing variables were managed were reported
Whittenburg et al. (2020)	Large sample size with limited discussion of variable selection and statistical power in the methods section; no detailed methods of how data was cleaned or how missing variables were managed were reported	
Yin et al. (2022)	Large sample size with limited discussion of variable selection and statistical power in the methods section	Methods of how data was cleaned and how missing variables were managed were reported

Data Cleaning Strategies

In all 43 articles, researchers reported details on how the chosen variables were selected for the study. Six articles included explanations of how cases with missing variables were managed or excluded (Mann & Hock, 2020; Peterson et al., 2021; Roux et al., 2021; Shadrick & Etlen, 2019; Sprong et al., 2019; Yin et al., 2022). Most studies did not include a discussion of limitations regarding variable definitions in a limitation section. Generally, the limitation sections in the articles were sparse, if they were included at all (see table 2).

Methodological Rigor

The most popular statistical analysis used in the studies was logistic regression. Over half the studies included some type of regression analysis (see table 1). Several of the studies utilized samples in the thousands of cases, and two studies included samples sizes in the millions. Goodness of fit and effect sizes were reported inconsistently, and several studies did not report this information (see table 2).

Discussion

Studies utilizing RSA-911 data abound. On average, 10 studies per year are being published, and the dataset is also utilized in dissertation studies, policy briefs, and other publications that are available to scholars, administrators, and researchers. Authors rely on previous publications for guidance when choosing the sample of participant cases, the statistical analysis used, how to report their research results, and the recommendations that are provided. Opportunities exist for researchers to integrate data cleaning strategies, more complex variable selection strategies, and statistical analysis reporting techniques that may increase the quality of publications that are based on research using RSA-911 data. Increasing the quality of the variable selection and analyses may lead to more effective recommendations for counselors and administrators in state VR agencies. Additional opportunities for improvement were found in the review of the articles selected for this scoping review study regarding the recommendations sections of the articles, variable selection, and language that supports social justice for individuals with disabilities who have additional underrepresented identities.

Cleaning the RSA-911 Data and Methodological Rigor

Reporting of the methods of cleaning the data (e.g., addressing missing and inconsistent variables and data), utilization of strategies to maximize statistical power of the analyses, goodness of fit tests, and the reporting of statistically significant study results, effect sizes, and confidence intervals were inconsistent in the review of the selected articles. The number of cases selected for the study and selection of predictor variables in order to maximize statistical power was generally not noted or discussed in any detail in the studies (Cooper et al., 2023; Maxwell, 2000; VanVoorhis & Morgan, 2007). The frequencies of participant cases associated with each of the predictor variables were quite small in one study (Duncan et al., 2020). Mann & Croake (2018) reported that their sample included all VR cases from 49 states with complete records "(i.e., had no missing values for demographic variables)" (p. 376). Yin et al. (2022) discussed how cases that did not have a date of eligibility determination were excluded in their study. Wang & Ethridge (2022) reported, "to correct for data irregularities (e.g., negative number of days from application to closure), we removed cases for whom the number of days from application to closure and the number of days from IPE to closure were at the bottom 1st percentile and the top 1st percentile." (p. 141). Peterson et al. (2021) reported appropriate goodness of fit tests, confidence intervals, how outlier cases were excluded, and how missing data were managed. In contrast, Sannicandro et al. (2018) included cases with missing variables in their sample. Researchers reported findings from a regression analysis despite a Hosmer and Lemeshow test that indicated a significant result, which means the data was not a good fit for the regression model (Lee et al., 2020).

Choosing Appropriate Timeframes for a Dataset

In the study by Degeneffe et al. (2022), the RSA-911 cases chosen for the study were somewhat dated considering the purpose of the study was to examine State VR client participation in the context of WIOA. The study was published in 2022, and WIOA was signed into law in 2014. The cases selected from 2014, 2015, and 2016 would likely have had little impact from the then recent WIOA legislation and would not have included updated variables added by RSA in 2017. Examining more current cases utilizing the 2017 RSA-911 data or later may have illustrated the impacts of WIOA more clearly.

The study by McDonnall et al. (2022) also focused on the impacts of WIOA. The authors did not report sample sizes. The RSA-911 dataset created for the study included the complex establishment of samples gathered from multiple years for all State VR agencies from 2010-2015 and 2017-2019. Replication of this study would be problematic.

Reporting RSA-911 Definitions of the Variables Used

Most of the studies reviewed did not include a citation for the RSA-911 codebook and did not provide the definitions of the variables listed in the codebook. Kaya et al. (2020) stated that study participants self-reported having a diagnosis of Parkinson's Disease, however the variable in the RSA-911 data captures "Parkinson's Disease and Other Neurological Disorders" (RSA, 2017, p. 27). The study that was focused on participants with psychiatric disabilities published by Lee et al. (2020) indicated that participants who had either a psychosocial or mental impairment as their primary disability were selected. At least 10% of the cases listed in table 1 of this article had "other disabilities," and not a psychiatric disability (i.e., anxiety, depression/mood disorder, schizophrenia, personality disorder, SUD, other mental illness). Most studies contained minor inconsistencies with variable definitions in the RSA-911 code book. Of all the studies, one included definitions of variables and cited the RSA-911 code book (Peterson et al., 2021).

Inaccuracies Regarding Variables

The RSA counseling and guidance service is often included in research studies conducted with RSA-911 data. However, the definition of the counseling and guidance service is generally not provided in the scholarly article: "Vocational rehabilitation counseling and guidance includes information and support services to assist an individual in exercising informed choice and is distinct from the case management relationship that exists between the counselor and the individual during the VR process." (RSA, 2017, p. 78). Researchers using RSA-911 data oftentimes comment on the "effectiveness" of state VR counseling and guidance services: "Clients who received vocational rehabilitation counseling and guidance services were more likely to obtain competitive employment than clients who did not receive those services" (Kaya et al., 2022, p. 749). However, these researchers neglected to provide the detailed RSA-911 definition of the

service in their discussion of the benefits of counseling and psychotherapy for individuals with an anxiety disorder: "The State VR Counseling and Guidance and Information and Referral services captured in the RSA-911 data describe information and support services to assist the VR participant in exercising informed choice during this VR process and is different from mental health counseling services, psychotherapy, recovery-oriented peer counseling, or other similar services (RSA, 2017). All participants served in state VR agencies receive information, support, and informed choice from a VR counselor, so the frequency of this service is high in the data. Many studies that use the RSA-911 data include the counseling and guidance service variable, but researchers generally do not list the full definition of the service from the RSA-911 code book or clarify that this service is different from mental health counseling services.

Researchers have commented on the need for a "criminal history" variable in the RSA-911 data to assist in better tracking, recording, and supporting the specific needs of African American and Latino ex-offenders with disabilities (Dowden et al., 2016; Ethridge et al., 2020). Variables that capture this information have been available in the RSA-911 data. As of 2017, there is an "ex-offender" variable. Previous to 2017 and currently, there have been variables that capture if the participant was referred by State Department of Correction/Juvenile Justice and another variable that captures if the participant's living situation was in a Correctional Facility. Dowden et al. (2016) recommended that the new ex-offender variable be included, but they didn't cite the RSA data or coding manual which would have better informed their article, "This study used data from 2004–2013 and a variable that indicated 'Living Arrangement at Application' was 'Adult Correctional Facility'." Use of the living arrangement variable is problematic because state VR administrators and counselors may not encourage participants who are incarcerated to apply for state VR services. Furthermore, the terms "ex-inmates," "ex-prisoners," "ex-convicts," "ex-felons," and "ex-offenders" categorize and stigmatize people affected by the criminal justice system. Researchers are encouraged to use alternative terms such as "individuals with criminal legal involvement."

Reporting of Limitations in the Studies

The reporting of limitations in the RSA-911 data were generally inconsistent and incomplete. Mann & Hock (2020) explained that individuals in a sample of RSA-911 data from any given fiscal year may have multiple records in the data in their limitation section. Additional limitations that should be noted by researchers include self-reporting of data.

Self-Reporting of Public Assistance Programs and Wages

Public assistance program types, amounts, and wages earned by State VR clients are entered by State VR staff and are generally not cross-referenced with information provided by other reliable sources. The recommendations offered by Dondorf-Brooks et al. (2020) regarding the provision of State

VR services for food, clothing, and housing services conflict somewhat with federal regulations that require State VR services to focus on services to support job training, job placement, and other services to accommodate disabilities. Another limitation that should be acknowledged by researchers is that the wages a State VR client was earning when they applied for State VR services and at the time their case was closed are entered by State VR staff and are not cross-checked with information provided by Department of Labor, state employment agencies, or other reliable sources (Hill et al, 2022; Kang et al., 2019). Client receipt and amounts of Social Security Administration (SSA) disability benefits are entered by State VR staff and are generally not cross-checked with information provided by SSA or other reliable sources (Kaya et al., 2020).

One exception was a study that did include cross-referenced data that was provided by another government entity. The study by Stapleton & Martin (2020) matched RSA-911 participant data to records from the Social Security Administration (SSA) which are restricted-use data sets. This study was supported by a grant from SSA through the Michigan Retirement Research Center.

Providing Recommendations for State VR Administrators

Sanchez et al. (2022, p. 8) offered several detailed recommendations for readers of their study, but suggestions for state VR administrators on how to effectively implement the strategies were missing:

> VR professionals may find the following resources useful: (a) for VR agencies, a 16-step self- employment process (Arnold et al., 2003); (b) for VR counselors and consumers, a 12-step self- employment manual (Wisconsin Division of Vocational Rehabilitation, 2013); and (c) for VR counselors and students, an eight-step self-employment planning manual (Condon & Brown, 2007). VR counselors could benefit with specialized training in self-employment. VR counseling programs should include self-employment in (a) curricula to provide an overview (lecture), lay a foundation (elective), or refine skills (advanced course); (b) professional development for field supervisors (to meet accreditation requirements) or continuing education for practicing professionals; and (c) coordination with other programs (business) as interprofessional education (business + VR) for “fast track” (undergrad-grad) degrees, specialized certificates, or dual master’s degrees

Kaya et al. (2022, p. 750) shared a somewhat confusing comment regarding connections between state VR services, employment, and the significance of having a disability in their paper that had a psychiatric disability focus: “The findings of the present study indicated that cash benefits, transportation services, and supported employment are negatively associated with competitive employment. These

services can be viewed as a proxy of severity of disability." Supported employment is an evidence-based practice that has been well-researched and has been found to increase competitive employment with individuals with psychiatric disabilities (IPS Employment Center, 2023). A limitation in the RSA data is that there are no details captured in the variables that indicate if a client received IPS model or any other evidence-based model of supported employment services with fidelity. The RSA (2017) definition of "supported employment" is "ongoing support services, including customized employment, and other appropriate services needed to support and maintain an individual with a most significant disability…" (p. 84). Although self-reported in the RSA-911 data, a better proxy for severity of disability is the receipt of Social Security Administration disability benefits (i.e., SSI, SSDI) (Peterson et al., 2021).

Degeneffe et al. (2022) stated that the purpose of their brief report was to examine the level of participation among transition-aged youth with TBI in the state VR system, however there were no recommendations or suggestions provided for state VR administrators and counselors. Rast et al. (2020) connected employment of youth with Autism with receipt of post-secondary education services, however there were no recommendations for specific strategies that can be used by State VR administrators and counselors to increase the provision of these education services for this population.

Perpetuation of Social Justice Barriers

Participants served in state VR agencies belong to at least one underrepresented and vulnerable group—all participants who are found eligible to receive services have at least one disability. Most participants have additional underrepresented identities that may increase the perception of stigma and vulnerability they are exposed to in research studies. Nearly half of state VR participants are women, many participants belong to underrepresented racial/ethnic groups, and additional variables in the data indicate if participants have involvement with the criminal legal system, are receiving some kind of government financial assistance, are disabled veterans, have an SUD, have a psychiatric disability, or have other stigmatizing identities. Some variables in the RSA-911 data are labeled and/or have definitions that may be interpreted as stigmatizing such as "ex-offender" and "homeless." Options for coding gender and race/ethnicity identities are very limited in the RSA-911 data. Since state VR staff are responsible for entering data, an important limitation exists in how participants actually self-identify.

Trenz et al. (2020) created a study in which the final sample size consisted of 8,350 White, Black, or Hispanic females with a disability that received TANF benefits at application and completed VR services. These researchers did not include a limitations section in the article, and there was no discussion of how data was cleaned. All data in the RSA-911 dataset is self-reported by participants and coded by state VR staff. All demographic variables are coded by State VR workers and are not connected/verified with other data tracking systems (e.g., TANF, SSA, DOE, DOL, US Census, Medicare). Trenz et al. (2020) reported that having a high

school education or GED predicted positive employment outcomes for women receiving TANF. These researchers recommended that the provision of services related to the area of maintenance services, including support for food, clothing, and shelter are important features to address in VR when supporting successful vocational outcomes for women with children and low socioeconomic status (Trenz et al., 2020). However, services not directly related to a participant's vocational objective (i.e., food, shelter) are not typically allowed to be funded by State VR per federal and state regulations, so these recommendations may not be helpful to state VR administrators or staff.

Some researchers reported inaccurate information regarding vulnerable populations. "From 2004–2013, 5,612,846 persons sought state vocational rehabilitation services. Of these persons, 32,825 (59%) were ex-offenders seeking vocational rehabilitation services," is incorrect (Ethridge et al., 2020, p. 283). In fact, 32,825/5,612,846 = 0.6%.

Limitations in this Study

There have been many publications based on RSA-911 data. Because of existing limitations for search engines to capture all available articles found in scholarly journals, some studies may not have been identified. The intention was to review articles that were most likely to be found by other scholars interested in research conducted with RSA-911 data. The reviews of the articles were based on the researchers' experience with state VR service-delivery and knowledge of research methods. A large number of articles were reviewed, and some details may not have been addressed due to restrictions in page space for publication. Authors of the articles that were included in this study spent a great deal of time gathering information, writing results, and editing their papers for publication. There was a wealth of helpful information in these articles that will inform the practice of VR. The intention of this paper is not to criticize past studies, but to create a discussion of considerations going forward that can be used to improve the quality of research and recommendations for practice that are developed with the RSA-911 dataset.

Recommendations

Published studies should be vigilant in avoiding disparaging or inaccurate reporting of results, discussion, and recommendations—especially regarding vulnerable populations. Participants served in State VR agencies typically belong to vulnerable, highly stigmatized, and underserved groups of individuals. Authors should be mindful of the language used to describe their population of focus for their empirical study and the interpretation of State VR services so that they support the social justice aspects of VR. Published studies should describe how to integrate current evidence-based strategies in compliance with the Federal Code of Regulations into State VR service-delivery and not merely report findings. Authors should provide specific, thoughtful, and attainable recommendations for RCs who work with the

population who the researchers are choosing to focus on in the data analyses. The recommendations that result from the analyses of the RSA-911 data should build on current evidence-based practices for the population of focus.

The Research Team

It is recommended that research teams include members who have expertise in the services provided in the State VR service-delivery system and how the demographic characteristics of participants, services, and employment outcomes are captured in the RSA-911 data. Research teams should include members or consultants that can develop high quality research methods with this specific data. State VR counselors or others that understand the service-delivery system as authors/researchers can be an asset on a research project that utilizes RSA-911 data. Variables used in the analyses should be clearly defined and relate back to a review of current literature or recommendations for rehabilitation counselors working with this population in this specific service-delivery system, and individuals with experience in state VR service-delivery can be used as experts on the research team.

Reporting Demographic Information

Authors are encouraged to please be consistent in the body of the paper and in the tables regarding the terms they are using for race/ethnicity. For example, not all individuals who are Black identify as African American.

Flanagin et al. (2021) have offered extensive guidance and resources regarding the reporting of participant race/ethnicity. These experts recommend that the Methods section of a research paper should include an explanation of how the race/ethnicity of the participants was identified (e.g., self-report, investigator observed, database, electronic health record, survey instrument) and the reasons why race/ethnicity was assessed (e.g., required by the funding agency) (Flanagin et al., 2021).

Additional resources provide guidance on recommended language to collect and describe the sex, gender, sexual orientation, and disability characteristics of research participants. The IRB at the University of Maine (2023) encourages researchers to be sensitive to and inclusive of differences when collecting data about identities of participants' sex and gender. Detailed sample questions and response options have been created that have been designed to capture research participants' internal held sense of their gender, regardless of biology (i.e., Gender/Gender Identity); the biological differences between males and females that are assigned at birth (i.e., Sex); and the terms participants use to describe their pattern of emotional, romantic and/or sexual attraction (i.e., Sexual Orientation) (University of Maine, 2023). The ADA National Network (2023) has shared guidelines for writing about people with disabilities that may be incorporated into research data collection and reporting which can include 1) using the language preferred by research participants when referring to their disability, 2) using neutral terms that are not offensive, and 3) avoiding language that

perpetuates negative stereotypes (ADA National Network, 2023).

Literature Review Section

Papers should contain a literature review section that discusses current (published within the past five years) evidence-based strategies related to the population and services being analyzed. Chosen variables should relate back to the literature review and the resulting discussion and recommendations for practice and additional research.

Receipt of VR services is predictive of employment and should be discussed in the literature review of the paper. Authors are encouraged to use current literature on evidence-based practices and models to frame the paper and the empirical study. There are many rehabilitation technology, vocational training, educational, and wellness strategies that are being studied and utilized with individuals with a wide variety of disabilities and additional intersecting barriers to employment. Authors are encouraged to please relate the literature, research methods, population of focus, and VR strategies utilized to State VR service-delivery and the variables in the RSA-911 data. The RSA-911 data is specific to a unique service-delivery system. Authors should explain in detail when and if the recommendations for practice and research are intended for VR services outside of State VR agencies.

If participants with certain disability types or other demographic characteristics are underserved and are a topic of the study, then this should relate back to what is included in the section on current literature related to the topic of the study. Researchers should provide details on how they created a clean data set and the justification for the variables that were chosen to measure the specific VR approaches for their specific population. The analyses will be more valid and impactful once a clean and focused data set is established based on an intentional and current literature review that relates to the chosen research topic and research questions.

Merging Datasets and Research Methods

An RSA-911 data set is produced each federal fiscal year and contains over 400 variables. Data sets may be merged from two or more fiscal years, and researchers should be mindful of changes in data reporting and coding by checking the appropriate coding manual if they choose to merge data sets. So that the study is replicable, authors are encouraged to please include brief details on how they merged data sets (if applicable), how they chose variables, and the definitions of the variables. Authors should also cite the resources used in this process and include them in the reference list. Authors are encouraged to provide a comprehensive frequency distribution table regarding demographic characteristics, VR services received, and employment outcomes for the clean data set that is created for their analyses.

Authors are encouraged to relate the variables chosen to current literature and to include research methods that indicate that the research methods utilized were a good fit for

the data being analyzed. For example, when conducting regression analyses, the appropriate results of the "goodness of fit" tests should be provided. For example, the results of the Hosmer-Lemeshow goodness of fit test should be reported when using a logistic regression, and the regression should not be conducted if the Hosmer-Lemeshow goodness of fit test indicates the regression model is not a good fit for the data.

Variables Describing VR Services

The variables in the RSA-911 dataset will identify what happened to participants relative to the services received, the date if and when the participant began receiving services under an Individualized Plan for Employment (IPE), and the reason the participant exited VR services. It's recommended that authors create a data set that is cleaned of inconsistent variables so that they can more accurately define the population being studied, measure the effect of the services, report on the services that were or were not received, and clearly define the employment outcome. Cases with inconsistent dates for services should be removed from the dataset (e.g., cases with inconsistent dates for intake, eligibility, IPE services, case closure).

The main point of State VR service-delivery is to provide VR services that ideally lead to competitive and integrated employment. WIOA legislation has defined competitive, integrated employment. This is why the variables in the RSA-911 data clearly define the employment outcomes (type of exit/reason for exit). Analyses are not valid or meaningful without incorporating these important aspects of State VR service-delivery. Authors are encouraged to please focus research on evidence-based strategies and VR services rather than strictly on the demographic characteristics of the participants.

Variables Describing Wages Earned from Employment

The reporting of wages for such a large group of participants spread out over the whole country is questionable due to all the additional factors (e.g., disability type, the individual biopsychosocial impacts of a disability and additional intersecting barriers to employment, gender, geographic location, education, age, services included in the IPE, services received, length of incarceration, length of VR services, financial benefits, relationship status, family history, personality traits, type of work, minimum wage in the participants' geographic locations) that impact employment outcomes and wages earned for such a large and diverse group of participants. Wages are also self-reported.

The standard deviations reported are typically quite large, so the averages that are reported are not very meaningful or helpful. It is well known that vulnerable and stigmatized individuals from underserved cultural groups have poorer employment outcomes. Authors are encouraged to please include a comprehensive discussion of evidence-based practices that can be incorporated into State VR service delivery so that the population of focus benefits from the research study. Published studies should include citations and

references for the RSA-911 data and coding manual.

Avoiding the Use of Stigmatizing Variable Labels

The names of some of the variables in RSA-911 data are stigmatizing. For example, “ex-offender” is the name of the variable in the RSA-911 data, and this term is stigmatizing. Researchers should advocate for changes to the names of the variables in the RSA-911 data that are stigmatizing. Researchers should use another term in their research publications such as “individual with criminal legal system involvement,” that is based on the definition available in the RSA-911 code book in order to avoid perpetuating stigmatizing language. Experts have developed a wealth of resources on this topic that researchers can use to create publications that are less stigmatizing of disability issues and more inclusive of individuals from all experiences (The Fortune Society, 2023).

Disability Types

Researchers may want to consider focusing on a specific disability type or include a more comprehensive examination of the disability types captured in the RSA-911 data. This information is available in the RSA-911 data in the primary and secondary disability type and cause of disability variables. To only report three broad categories of disabilities (mental, physical, and sensory) and not provide information on how the lived experience of different disabilities impacts employment outcomes is doing a disservice to the population studied and the RCs that need to develop IPEs that serve a participant’s unique and specific VR needs. The “type of disability” and “cause of disability” variables are available in the RSA-911 data to help researchers identify the primary and secondary disabilities of the participants that were coded by VR staff.

Employment Outcomes

Authors are encouraged to include a rationale for and definition of the variables that are chosen to include in the analyses regarding employment outcomes. Regarding the Workforce Innovation and Opportunities Act (WIOA) and the variable the authors chose to measure “employment”: two of the RSA-911 data variables (exit type and reason for exit) clearly indicate employment outcomes at exit that were “competitive and integrated employment”. Authors are suggested to use this variable and definition because it is in line with the new WIOA legislation and what is now considered a successful employment outcome in the State VR system.

Choosing Variables for Analysis

1. All variables captured are based on participant or VR staff self-report. Variables are not cross validated with any other systems such as the Internal Revenue Service, Social Security Administration, state employment systems, the census, medical record systems, workers compensation systems,

financial benefits systems, education systems, criminal justice systems, or any other similar systems. This is a major limitation when researchers target variables that report participation in financial benefit systems, wages, or other demographic information in the study.

2. Some state VR agencies utilize the Aware case management system that may improve the accuracy of the dates and services that are captured in the RSA-911 data (Aware Enterprise, 2023). Researchers may want to target states that use the Aware system to improve the accuracy of the results that are reported with RSA-911 data analyses.
3. Variables identifying disabilities in the RSA data do not correspond directly to specific disorders in the International Classification of Diseases, Tenth Revision, Clinical Modification (World Health Organization, 2023; RSA, 2017).
4. For research regarding the IPS model, researchers are unable to ascertain if supported employment services were provided with fidelity given the limited details that are captured in the RSA 911 data set. Supported employment services are not specific to the IPS model and include any support service not to exceed 24 months (except in special circumstances), that assist the participant to achieve competitive integrated employment, such as a job coach (RSA, 2017). Job placement services are not specific to the IPS model and are defined as "a referral to a specific job resulting in an interview, regardless of whether or not the individual obtained the job" (RSA, 2017, p. 81).
5. Although a variable exists that indicates that a State VR participant was also receiving treatment from a mental health provider, the RSA data does not include specific details on the treatments that participants were receiving, including information on SUD treatment.
6. Nationally, many job placement programs incorporate evidence-based approaches in their services (IPS Employment Center, 2023). Evidence-based practices including the IPS model approach are not captured in RSA-911 data if these community partner programs are not providing services in collaboration with State VR agencies.
7. Although the RSA variable that indicates the significance of disability is based on the VR counselor's subjective assessment of the participant's functional limitations, details regarding the specific functional limitations the VR counselor identified are not available in the data. The effect of VR services might vary depending on the functional level of participants and the intensity of the VR services.
8. VR service-delivery varies substantially from state to state, and state regulations regarding specific services and how staff may code items are inconsistent from state to state.

Recommendations for Data Cleaning and Reporting Results

There are some general limitations with the RSA-911 data set that are recommended to be included in the limitations section of research papers that have used the RSA-911 data. Authors are encouraged to please include clear recommendations for RCs that are based on established evidence-based practices.

1. Clear definitions of all variables are available in the RSA-911 code book. Researchers and authors should use terminology and definitions consistent with the *RSA-911 Aggregate Data and Reporting Manual* when using the RSA-911 data in research (RSA, 2017).
2. Over 400 variables are captured in the RSA-911 dataset. Researchers should be transparent about how the variables were selected for the study, include the definitions of the variables available in the RSA-911 code book, and describe how the data was cleaned before conducting their analyses.
3. Disability types are coded with both "type of disability" and "cause of disability" variables for both primary and secondary disabilities of the participants. Cases that have incongruencies between "type" and "cause" variables should be excluded from the sample (e.g., hearing loss caused by cystic fibrosis, respiratory impairment caused by epilepsy, orthopedic impairment caused by personality disorder)
4. Researchers should consider excluding cases that are outlier cases in terms of the length the case was open, either excessively long or excessively short.
5. Researchers should consider excluding cases that have inconsistencies or missing dates for status changes (e.g., eligibility determination, signed IPE, date of employment, exit from services)
6. Researchers should consider excluding cases that have incongruent employment information reported (e.g., variables indicate the participant exited services employed, while other variables in the same participant case indicate zero hours worked and/or earning less than minimum wage)

Using data cleaning techniques, improving the accuracy in reporting the information available from the variables, ensuring the quality of study design, reporting accurate effect sizes, collaborating with researchers who have experience coding the RSA-911 data, and providing clear and realistic recommendations for state VR administrators has the potential to improve state VR service-delivery.

Author Note. Correspondence regarding this article can be sent to Sonia Peterson speterson2@nu.edu

References

ADA National Network. (2023). Guidelines for writing about people with disabilities. https://adata.org/factsheet/ADANN-writing

*Ahonle, Z. J., Barnes, M., Romero, S., Sorrells, A. M., & Brooks, G. I. (2020). State-Federal Vocational Rehabilitation in Traumatic Brain Injury: What Predictors Are Associated With Employment Outcomes?. *Rehabilitation Counseling Bulletin*, *63*(3), 143-155. https://doi.org/10.1177/0034355219864684

*Akinola, O. A., & Doabler, C. T. (2022). Determinants of employment outcomes of transition-age youth with depressive disorders. *Journal of Vocational Rehabilitation, 56*(1), 55-68. http://dx.doi.org/10.3233/JVR-211172

Aware Enterprise. (2023). *Aware Vocational Rehabilitation.* https://getaware.com/aware-products/aware-enterprise/aware-vr/

Bhadani, A. K., & Jothimani, D. (2016). Big data: challenges, opportunities, and realities. *Effective big data management and*

opportunities for implementation, 1-24. https://doi.org/10.48550/arXiv.1705.04928

*Chan, F., Rumrill, P., Wehman, P., Iwanaga, K., Wu, J. R., Rumrill, S., Chen, X., & Lee, B. (2020). Effects of postsecondary education on employment outcomes and earnings of young adults with traumatic brain injuries. *Journal of Vocational Rehabilitation, 53*(2), 159-166.http://dx.doi.org/10.3233/JVR-201093

Che, D., Safran, M., & Peng, Z. (2013). From Big Data to Big Data Mining: Challenges, Issues, and Opportunities. In: Hong, B., Meng, X., Chen, L., Winiwarter, W., & Song, W. (eds) Database Systems for Advanced Applications. DASFAA 2013. Lecture Notes in Computer Science, vol 7827. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642- 40270-8_1

Chun, J., Pi, S., Lee, E. J., & Park, J. (2018). An exploration of Asian Americans in the state vocational rehabilitation system by disability type. *Work, 60*(2), 281-294. https://doi.org/10.3233/wor-182729

*Clapp, C. M., Pepper, J. V., Schmidt, R., & Stern, S. (2020). Overview of vocational rehabilitation data about people with visual impairments: Demographics, services, and long-run labor market trends. *Journal of Visual Impairment & Blindness, 114*(1), 43-56. https://doi.org/10.1177/0145482X20901380

Cooper, H., Coutanche, M. N., McMullen, L. M., Panter, A. T., Rindskopf, D., & Sher, K. J. (Eds.). (2023). *APA handbook of research methods in psychology: Volumes 1-3* (2nd ed.). American Psychological Association. https://doi.org/10.1037/0000318-000

Cornell University. (2023). *Rehabilitation Dataset Directory: Dataset Profile: Case Service Report (RSA-911).* Center for Large Data Research and Data Sharing in Rehabilitation.

*Crudden, A., Sui, Z., & Lund, E. (2020). Employed vocational rehabilitation applicants with visual disabilities: Factors associated with timely service delivery. *Journal of Visual Impairment & Blindness, 114*(1), 31-42. https://doi.org/10.1177/0145482X19900

*Crudden, A., Giesen, J. M., & Sui, Z. (2018). Contrasting competitively employed and unemployed VR applicants with visual disabilities: Characteristics and VR service delivery patterns. *Journal of Vocational Rehabilitation, 49*(1), 117-126. http://dx.doi.org/10.3233/JVR-180958

*Crudden, A., McDonnall, M. C., & Sui, Z. (2018). Losing employment: At-risk employed vocational rehabilitation applicants with vision loss. Journal of Visual Impairment & Blindness, 112(5), 461-474. https://doi.org/10.1177/0145482X1811200504

*Cuevas, S., Hansmann, S., Rodrigo, H., Saladin, S. P., & Schoen, B. (2021). Factors contributing to successful employment outcomes for individuals who are hard-of-hearing. Journal of Vocational Rehabilitation, 55(1), 43- 60. https://doi.org/10.3233/JVR-211145

Daudt, H. M., Van Mossel, C., & Scott, S. J. (2013). Enhancing the scoping study methodology: a large, inter-professional team's experience with Arksey and O'Malley's framework. *BMC medical research methodology*, *13*, 1-9.

*Degeneffe, C. E., Tucker, M. S., & Ahonle, Z. J. (2022). Brief report: Participation among transition-aged youth with traumatic brain injury in the State/Federal Vocational Rehabilitation System. *Rehabilitation Counseling Bulletin*, *65*(2), 161-165. https://doi.org/10.1177/0034355220967109

Dew, D. W., Alan, G. M., & Tomlinson, P. (Eds.). (2008). *Recruitment and retention of vocational rehabilitation counselors* (Institute on Rehabilitation Issues Monograph No. 33). Washington, DC: The George Washington University, Center for Rehabilitation Counseling Research and Education.

*Ditchman, N. M., Miller, J. L., & Easton, A. B. (2018). Vocational rehabilitation service patterns: An application of social network analysis to examine employment outcomes of transition-age individuals with autism. *Rehabilitation Counseling Bulletin, 61*(3),

143-153.https://doi.org/10.1177/0034355217709455

*Dondorf-Brooks, K., Seruya, F. M., Trenz, R. C., & Stanton-Koko, M. (2020). Parenting with a disability: A descriptive analysis of socioeconomically disadvantaged women in vocational rehabilitation. *Journal of Applied Rehabilitation Counseling*, *51*(2), 134-145. https://doi.org/10.1891/JARC-D-19-00014

Dowden, A. R., Ethridge, G., & Brooks, M. (2016). The impact criminal history has on the employability of African American and Latino populations with disabilities receiving state vocational rehabilitation services: Implications for adding a criminal history variable to the RSA-911 data. *Journal of Vocational Rehabilitation, 45*(2), 213-224. https://psycnet.apa.org/doi/10.3233/JVR-160824

*Duncan, J. C., Childers, W. L., & Pete, J. (2020). The Effect of Providing Rehabilitation Technology Services through Vocational Rehabilitation in Persons with Amputation. *Journal of Physical Medicine, Rehabilitation and Disabilities*, *6*(4), 1-7. http://dx.doi.org/10.24966/PMRD-8670/100060

Durgumahanthi, S. (2024). What is Google Scholar and How to Use it for Research? *Researcher Life*. https://researcher.life/blog/article/what-is-google-scholar-and-how-to-use-it-for-research/

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*(4), 326-334.

*Ethridge, G., Dowden, A. R., Brooks, M., Kwan, N., & Harley, D. (2020). Employment and earnings among ex-offenders with disabilities: A multivariate analysis of RSA-911 data. *Journal of Vocational Rehabilitation, 52*(3), 279-289. http://dx.doi.org/10.3233/JVR-201077

Federal Code of Regulations. (2024). Assessment for determining eligibility and priority for services, 34 CFR § 361.42. Cornell Law School: Legal Information Institute https://www.law.cornell.edu/cfr/text/34/361.42

Federal Code of Regulations. (2021). Development of the individualized plan for employment, 34 CFR § 361.45. Cornell Law School: Legal Information Institute https://www.law.cornell.edu/cfr/text/34/361.45

Flanagin, A., Frey, T., Christiansen, S. L., & Bauchner, H. (2021). The reporting of race and ethnicity in medical and science journals: Comments invited. *Jama, 325*(11), 1049-1052. https://doi.org/10.1001/jama.2021.2104

Friedman, J. H. (1998). Data mining and statistics: What's the connection?. *Computing science and statistics, 29*(1), 3-9.

*Giesen, J. M., & Lang, A. H. (2018). Predictors of earnings enabling likely roll departure for SSDI beneficiaries with visual impairments in vocational rehabilitation. *Journal of Disability Policy Studies*, *29*(3), 166-177. https://doi.org/10.1177/1044207318780363

Hariri, R. H., Fredericks, E. M., & Bowers, K. M. (2019). Uncertainty in big data analytics: Survey, opportunities, and challenges. *Journal of Big Data, 6*(1), 1-16. https://doi.org/10.1186/s40537-019-0206-3

Hartley, M. T., & Tarvydas, V. M. (Eds.). (2022). The professional practice of rehabilitation counseling. Springer Publishing Company.

*Hill, A., Mann, D. R., & Gellar, J. (2022). Predicting program outcomes for vocational rehabilitation customers: A machine learning approach. *Journal of Vocational Rehabilitation, 56*(2), 107-121.http://dx.doi.org/10.3233/JVR-221176

IPS Employment Center. (2023). *Research, Dissemination, Training, and Consultation*. https://ipsworks.org/

*Iwanaga, K., Wehman, P., Brooke, V., Avellone, L., & Taylor, J. (2021).

Evaluating the effect of work incentives benefits counseling on employment outcomes of transition-age and young adult Supplemental Security Income recipients with intellectual disabilities: A case control study. *Journal of Occupational Rehabilitation, 31*(3), 581-591. https://doi.org/10.1007/s10926-020-09950-7

*Kang, Y., Nord, D. K., & Nye-Lengerman, K. M. (2019). Weekly wage exploration of vocational rehabilitation service recipients: A quantile regression approach. *Journal of Rehabilitation, 85*(1), 4-14.

*Kaya, C., Hsu, S., Rumrill, P. D., Hanley-Maxwell, C., & Chan, F. (2021). Differential vocational rehabilitation service patterns and outcomes for transition-age youth with specific learning disabilities: Implications in the COVID-19 era. *Journal of Vocational Rehabilitation, 54*(1), 59-70. https://doi.org/10.3233/JVR-201118

*Kaya, C., Iwanaga, K., Hsu, S., Akpinar, E. N., Bezyak, J., Chen, X., & Chan, F. (2022). Demographic covariates, vocational rehabilitation services, and employment outcomes of working-age adults with anxiety disorders: a multivariate logistic regression analysis. *Journal of Occupational Rehabilitation, 32*(4), 743-752. https://doi.org/10.1007/s10926-022-10038-7

*Kaya, C., Leslie, M., McDaniels, B., Cuevas, S., Wu, H., Rumrill, P., Wehman, P., & Chan, F. (2020). Vocational rehabilitation factors associated with successful return to work outcomes for clients with Parkinson's disease. *Journal of Vocational Rehabilitation, 52*(2), 145-156. http://dx.doi.org/10.3233/JVR-191065

Leahy, M. J., Del Valle, R. J., Landon, T. J., Iwanaga, K., Sherman, S. G., Reyes, A., & Chan, F. (2018). Promising and evidence-based practices in vocational rehabilitation: Results of a national Delphi study. *Journal of Vocational Rehabilitation*, *48*(1), 37-48. https://psycnet.apa.org/doi/10.3233/JVR-170914

*Lee, E. J., Park, J., Chun, J., & Pi, S. (2020). State vocational rehabilitation services and employment outcomes for Asian Americans with psychiatric disabilities. *Community Mental Health Journal*, *56*(5), 854-866.https://doi.org/10.1007/s10597-020-00547-1

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation science*, *5*, 1-9.

*Lusk, S. L., & Veale, F. R. (2018). Increasing successful vocational rehabilitation outcomes for individuals with substance use disorders. *Journal of Applied Rehabilitation Counseling, 49*(1), 4-10. http://dx.doi.org/10.1891/0047-2220.49.1.4

Madupu, V. K. K. S. (2015). Opportunities and challenges towards data mining with big data. *International Journal of Scientific Research in Science and Technology (IJSRST),* Online ISSN, 207-214.

Maletic, J., & Marcus, A. (2000). Data cleansing: Beyond integrity analysis. In: Proceedings of the Conference on Information Quality (IQ2000). http://mitiq.mit.edu/ICIQ/Documents/IQ%20Conference%202000/Papers/DataCleansingBeyondIntegrityAnalysis.pdf

*Mann, D. R., & Croake, S. (2018). Learning from state vocational rehabilitation agencies on the eve of WIOA: State differences in service receipt and employment outcomes by applicant employment status. *Journal of Vocational Rehabilitation, 48*(3), 369-386. http://dx.doi.org/10.3233/JVR-180945

*Mann, D. R., & Hock, H. (2020). How do early process milestones vary before a state vocational rehabilitation agency expands waitlist categories under order of selection? Evidence from Florida. *Journal of Vocational Rehabilitation, 53*(1), 55-65. https://doi.org/10.3233/JVR-201085

Maxwell, S. E. (2000). Sample size and multiple regression analysis. Psychological Methods, 5(4), 434–458. https://doi.org/10.1037/1082-989X.5.4.434

*McDonnall, M. C., & Cmar, J. (2019). Employment outcomes and job quality of vocational rehabilitation consumers with deaf-blindness. *Rehabilitation Counseling Bulletin*, *63*(1), 13-24. https://doi.org/10.1177/0034355218769461

*McDonnall, M. C., & Cmar, J. L. (2019). Services for consumers who are deafblind: Vocational rehabilitation agency service models utilized and their effectiveness. *Journal of Visual Impairment & Blindness*, *113*(1), 19-31. https://doi.org/10.1177/0145482X19828033

*McDonnall, M. C., Cmar, J. L., & Lund, E. M. (2020). Comorbid Traumatic Brain Injury and Visual Impairment: Vocational Rehabilitation Service Provision and Agency-Level Outcomes. *Journal of Visual Impairment & Blindness,* *114*(1), 6-17. https://doi.org/10.1177/0145482X19892033

*McDonnall, M. C., Cmar, J. L., & McKnight, Z. S. (2022). The Impact of the Workforce Innovation and Opportunity Act on Agency-Level Vocational Rehabilitation Outcomes for Adults and Youth With Blindness and Low Vision. *Journal of Disability Policy Studies*. https://doi.org/10.1177/10442073221135811

*Moore, C. L., Manyibe, E. O., Ward-Sutton, C., Webb, K., Wang, P., Washington, A. L., & Peterson, G. (2022). National Benchmark Study of Employment Equity Among Multiply Marginalized Persons of Color with Disabilities During the COVID-19 Pandemic: A Bootstrap Approach. *Journal of Rehabilitation*, *88*(1), 108-118.

Nazarenko, M. A., & Khronusova, T. V. (2017, September). Big data in modern higher education. Benefits and criticism. In 2017 International Conference" Quality Management, Transport and Information Security, Information Technologies"(IT&QM&IS) (pp. 676-679). IEEE.

*Peterson, S., Alkhadim, G. S., Davis, M., & Olney, M. (2021). Increasing successful employment outcomes for individuals with psychiatric disabilities with on-the-job training. *Rehabilitation Professional*, *29*(1),21-36.

Peterson, S. & Olney, M. (2021). Disparities between individuals with and without psychiatric disabilities: Vocational rehabilitation services and employment outcomes. *Journal of Rehabilitation, 87*(3), 36-46.

*Rast, J. E., Roux, A. M., & Shattuck, P. T. (2020). Use of vocational rehabilitation supports for postsecondary education among transition-age youth on the autism spectrum. *Journal of Autism and Developmental Disorders, 50*(6), 2164-2173. https://doi.org/10.1007/s10803-019-03972-8

Rehabilitation Services Administration. (2017). *BASIC VR RSA-911 Aggregate Data and Reporting Manual.* Washington, DC: Rehabilitation Services Administration. https://rsa.ed.gov/sites/default/files/subregulatory/pd-16-04.pdf

Rehabilitation Services Administration. (2021). *Case Service Report (RSA-911).* https://rsa.ed.gov/performance/rsa-911-policy-directive

Rehabilitation Services Administration. (2023). *View data*. https://rsa.ed.gov/data/view-data

Robert, C. (2020). The 9 Pitfalls of Data Science (Book Review). https://www.tandfonline.com/doi/full/10.1080/09332480.2020.1726119

Roessler, R. T., Rubin, S. E., & Rumrill, P. D. (2018). *Case management and rehabilitation counseling: Procedures and techniques*. Austin, TX: Pro-Ed.

*Roux, A. M., Rast, J. E., Anderson, K. A., Garfield, T., & Shattuck, P. T. (2021). Vocational rehabilitation service utilization and employment outcomes among secondary students on the autism spectrum. *Journal of Autism and Developmental Disorders*, *51*(1), 212-226. https://doi.org/10.1007/s10803-020-04533-0

*Sánchez, J. (2018). Employment predictors and outcomes of US state-federal vocational rehabilitation consumers with affective

disorders: A CHAID analysis. *Journal of Affective Disorders, 239*, 48-57. https://doi.org/10.1016/j.jad.2018.06.044

*Sánchez, J., Frain, M. P., Shirley, G., Rohack, D., & Pan, D. (2022). Persons With Disabilities in Self-Employment Served by the Federal/State Vocational Rehabilitation System: Differences Between 2011–2013 and 2017– 2019. *Rehabilitation Counseling Bulletin*. https://doi.org/10.1177/00343552221102396

*Sannicandro, T., Parish, S. L., Fournier, S., Mitra, M., & Paiewonsky, M. (2018). Employment, income, and SSI effects of postsecondary education for people with intellectual disability. *American Journal on Intellectual and Developmental Disabilities, 123*(5), 412-425. https://doi.org/10.1352/1944-7558-123.5.412

*Shadrick, I., & Etlen, C. (2019). Predictors of Competitive Employment of Adults With Deaf-Blindness Following Vocational Rehabilitation. *Journal of Applied Rehabilitation Counseling, 50*(2), 148-159. https://doi.org/10.1891/0047-2220.50.2.148

Shenk, M., Harnack-Eber, A., & Patnaik, A. (2023). Characteristics, Service use and employment outcomes of young adults on the autism spectrum who engaged with vocational rehabilitation services from 2017 to 2020. *U.S. Department of Labor, Office of Disability Employment Policy*. Mathematica.

Smith, G. (2020). Data mining fool's gold. *Journal of Information Technology,35*(3), 182- 194. https://doi.org/10.1177/0268396220915600

Smith, G., & Cordes, J. (2019). The 9 pitfalls of data science. Oxford University Press.

*Sprong, M. E., Dallas, B., Paul, E., & Xia, M. (2019). Rehabilitation technology services and employment outcomes among consumers using division of rehabilitation services. *Disability and Rehabilitation: Assistive Technology*, *14*(5), 445-452. https://doi.org/10.1080/17483107.2018.1463400

*Stapleton, D. C., & Martin, F. H. (2020). Vocational rehabilitation on the road to Social Security Disability. *Journal of Vocational Rehabilitation, 53*(3), 353-365. https://doi.org/10.3233/JVR-201111

The Fortune Society. (2023). Words matter: Using humanizing language https://fortunesociety.org/wordsmatter/

The University of Maine. (2023). Considerations when assessing sex and gender in research. *Office of Research Compliance*. https://umaine.edu/research-compliance/human-subjects/guidance-on-sex-and-gender/

*Trenz, R. C., Seruya, F. M., & Dondorf-Brooks, K. (2020). Predictors of employment among underrepresented women and TANF recipients that completed vocational rehabilitation services. *Journal of Vocational Rehabilitation*, *53*(2), 249-256. https://doi.org/10.3233/JVR-201101

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K., Colquhoun, H., Kastner, M., Levac, D., Ng, C., Pearson Sharpe, J., Wilson, K., Kenny, M., Warren, R., Wilson, C., Stelfox, H. T., & Straus, S. E. (2016). A scoping review on the conduct and reporting of scoping reviews. *BMC medical research methodology*, *16*, 1-10. https://doi.org/10.1186/s12874-016-0116-4

U.S. Department of Education. (2023). Case Service Report (RSA-911). *Rehabilitation Services Administration*. https://rsa.ed.gov/performance/rsa-911-policy-directive

U.S. Department of Education. (2021). *OSERS: Welcome to RSA*. https://www2.ed.gov/about/offices/list/osers/rsa/index.html

U.S. Department of Education. (2017). POLICY DIRECTIVE RSA-PD-16-04. *Rehabilitation Services Administration*. https://rsa.ed.gov/sites/default/files/subregulatory/pd-16-04.pdf

VanVoorhis, C. W., & Morgan, B. L. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods for Psychology, 3*(2), 43-50. http://dx.doi.org/10.20982/tqmp.03.2.p043

*Wang, Y. C., & Ethridge, G. (2022). Identifying factors that promote successful vocational rehabilitation case closure: Comparison of individual characteristics, VR experiences and state economic conditions. *Journal of Vocational Rehabilitation, 56*(2), 139-147.https://doi.org/10.3233/JVR-221178

*Whittenburg, H. N., Cimera, R. E., & Thoma, C. A. (2019). Comparing Employment Outcomes of Young Adults with Autism: Does Postsecondary Educational Experience Matter?. *Journal of Postsecondary Education and Disability, 32*(2), 159-172. http://dx.doi.org/10.3233/JVR-201079

Wilson, K., Acklin, C., Chao, S. (2018). *Case Management for the Health, Human, and Vocational Rehabilitation Services*. Aspen Professional Services.

Workforce Innovation Technical Assistance Center. (2020). Case Service Report (RSA-911) Training Series. http://www.wintac.org/topic-areas/transition-common-performance-accountability-system/training#case-service

World Health Organization (WHO). (2023). *The International Classification of Diseases, Tenth Revision, Clinical Modification*. World Health Organization. https://www.cdc.gov/nchs/icd/icd-10-cm.htm

*Yin, M., Pathak, A., Lin, D., & Dizdari, N. (2022). Identifying racial differences in vocational rehabilitation services. *Rehabilitation Counseling Bulletin, 66*(1), 13-24. https://doi.org/10.1177/00343552211048218

* Note. Asterisks (*) denote papers included in the review.