Evaluation Design Options for Programs to Improve Employment Outcomes for Young Adults on the Autism Spectrum

Report

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Disclaimer

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Acronyms

AJC	American Job Center
CIE	competitive integrated employment
CLEAR	Clearinghouse for Labor Evaluation and Research
DOL	U.S. Department of Labor
ETS	employment transition services
IPE	individualized plan for employment
IT	information technology
NDNH	National Directory of New Hires
ODEP	Office of Disability Employment Policy
PIA	Partnership on Inclusive Apprenticeship
RAPIDS	Registered Apprenticeship Partners Information Database System
REYAAS	Research Support Services for Employment of Young Adults on the Autism Spectrum
RSA	Rehabilitation Services Administration
SSDI	Social Security Disability Insurance
SSI	Supplemental Security Income
UI	unemployment insurance
VIT-TAY	Virtual Interview Training for Autistic Transition Age Youth
VR	Vocational Rehabilitation
WIOA	Workforce Innovation and Opportunity Act
WIPS	Workforce Integrated Performance System

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Executive Summary

The Office of Disability Employment Policy (ODEP) in the U.S. Department of Labor seeks to advance the employment and careers of young adults on the autism spectrum. The transition from school to employment is challenging for the growing number of autistic young adults, who often struggle to engage in competitive integrated employment (CIE) or in appropriate education or employment training programs that will prepare them for CIE (Shattuck et al. 2012; Roux et al. 2015; Coleman and Adams 2018; Roux et al. 2021). The objective of the Research Support Services for Employment of Young Adults on the Autism Spectrum (REYAAS) project is to examine barriers to, and catalysts for, improving employment and career development outcomes for autistic young adults. As part of the REYAAS project, this report presents evaluation design options for future evidence-building activities around four programs that aim to improve employment outcomes for young adults on the autism spectrum.[1]

The evaluation design options in this report build on literature reviews and listening sessions the project team conducted in the knowledge development phase of the REYAAS project. Given the dearth of rigorous evidence on promising programs that have improved employment outcomes of young adults with autism, and the challenges to scaling them, this report offers evaluation design options for two types of programs. One program type has promising rigorous evidence on employment-related outcomes for autistic young adults or youth with intellectual or developmental disabilities more broadly. Another type draws on the success of large, already-scaled programs that have shown promise in improving employment-related outcomes for other groups of youth and young adults. Specifically, we present evaluation design options for the following interventions to improve employment outcomes for autistic young adults:

- Enhanced access to Registered Apprenticeship and related support services
- YouthBuild program tailored to the needs of autistic young adults
- Enhanced access to supported employment in Vocational Rehabilitation
- Incorporation of Virtual Interview Training for Transition Age Youth in Job Corps

The main research questions are generally similar across the four evaluation design options:

1. Who enrolls in the intervention and how is it operated?
2. What is the intervention's impact on employment and related outcomes (such as earnings, retention, access to inclusive career paths and self-determination, mental health and well-being, and receipt of disability benefits) of autistic young adults?
3. Do these impacts vary for subgroups of autistic young adults, such as those defined by age, gender, or race and ethnicity, or household income?
4. Do the intervention's benefits exceed its costs?

For each evaluation design option, we summarize the relevant program and existing evidence on its impact on employment outcomes; the intended intervention; an evaluation design to address the research questions above; likely partners and recruiting pipeline, existing data sources available for the evaluation; and practical considerations including timeline, cost drivers, geographic considerations, and external

[1] Throughout this report, we alternate between person-first phrasing ("young adults on the autism spectrum") and identity-first phrasing ("autistic young adults") because some parts of the autism community prefer the latter.

validity. Although we propose a specific setting for each evaluation and offer a high-level description of intervention components, the details of the intervention design are beyond the scope of this report.

I. Introduction

The Office of Disability Employment Policy (ODEP) in the U.S. Department of Labor (DOL) seeks to advance the number and quality of employment opportunities for individuals with disabilities, including young adults on the autism spectrum. The transition from school to employment is challenging for the growing number of autistic young adults, who often struggle to engage in competitive integrated employment (CIE) or in appropriate education or employment training programs that will prepare them for CIE (Shattuck et al. 2012; Roux et al. 2015 Coleman and Adams 2018; Roux et al. 2021).[2] The objective of the Research Support Services for Employment of Young Adults on the Autism Spectrum (REYAAS) project is to examine barriers to and catalysts for improving employment and career development outcomes for autistic young adults. As part of the REYAAS project, this report presents evaluation design options for future evidence-building activities around four programs that aim to improve employment outcomes for young adults on the autism spectrum.[3]

A. Development of evaluation design options

1. Implications of previous literature and project listening sessions for evaluation design options

The evaluation design options in this report build on literature reviews and listening sessions the project team conducted in the knowledge development phase of the REYAAS project. An initial literature review summarized programs, models, and strategies that support the transition to CIE for young adults with developmental disabilities, including autism (Wissel at al. 2022). A subsequent report summarized the evidence on the effectiveness of those approaches (Shenk et al. 2022). A series of listening sessions with autistic young adults, advocates and policymakers, direct service providers, educators, employers, and researchers provided input from multiple perspectives on factors that influence the employment experiences of young adults on the autism spectrum (Shenk and Aguillard 2022). This report is also informed by a review of data sources on employment outcomes of autistic young adults (Musse et al. 2022) and an analysis of the characteristics, service use, and employment outcomes of young adults on the autism spectrum who engage with Vocational Rehabilitation (VR) services from 2017 to 2020 (Shenk et al. 2023). All these activities, as well as the development of this report, have benefited from conversations with and input from the project's technical working group of researchers, advocates, policy experts, and employers, including some with lived experience of autism.

Findings from earlier project activities suggest many community- and employer-based efforts around the nation aim to improve employment outcomes for young adults on the autism spectrum. However, Shenk et al. (2022) found only three programs with rigorous evidence of effectiveness in improving employment outcomes for autistic young adults or young adults with intellectual or developmental disabilities more broadly. Specifically, Wehman et al. (2014a, 2014b, 2017, 2020) identified a program called Project Search plus Autism Spectrum Disorder Supports to be effective in improving employment outcomes for autistic young adults ages 18 to 21. In other research, supported employment improved employment

[2] The Rehabilitation Act as amended by the Workforce Innovation and Opportunity Act defines CIE as full-time or part-time work for which a person (1) is paid at least minimum wage at a rate comparable to other employees who do not have disabilities and who have similar training, experience, and skills and at least minimum wage; (2) works in a location where the person interacts with people who do not have disabilities to the same extent that other employees who do not have disabilities and who have similar positions do; and (3) has opportunities for advancement similar to those for other employees who do not have disabilities and who have similar disabilities.

[3] Throughout this report, we alternate between person-first phrasing ("young adults on the autism spectrum") and identity-first phrasing ("autistic young adults") because some parts of the autism community prefer the latter.

outcomes among youth ages 16 to 25 with intellectual and developmental disabilities receiving VR services (Wehman et al. 2014a). Finally, an intervention called Virtual Interview Training for Autistic Transition Age Youth (VIT-TAY) improved employment outcomes for autistic young adults ages 16 to 26 (Smith et al. 2021). Although they have shown some success, these programs have been implemented on a small scale and could benefit from broader evaluations on a larger scale. Our earlier findings also suggest that replicating and scaling potentially promising programs has been a challenge due to stringent selection criteria, the logistics of coordinating among multiple partners, funding considerations, and other factors

Given the dearth of rigorous evidence on promising programs that have been found to improve employment outcomes of young adults with autism, and the challenges to scaling them, this report offers evaluation design options for two types of programs. One type is programs with promising rigorous evidence on employment-related outcomes for autistic young adults or youth with intellectual or developmental disabilities more broadly (specifically, supported employment and VIT-TAY). Another type is programs that draw on the success of large, already-scaled programs that have shown promise in improving employment-related outcomes for other groups of youth and young adults (specifically, Registered Apprenticeship and YouthBuild). Registered Apprenticeship and YouthBuild likely include some autistic young adults as participants, but there has been no rigorous assessment of their effectiveness for this population. Furthermore, improvement in outcomes for autistic participants is possible if these programs were enhanced to better serve this population. To inform the evaluation design options we developed for these programs, we reviewed program documents and past evaluation studies and conducted background interviews with implementers and past evaluators. These conversations helped us understand the feasibility of and challenges associated with evaluating existing, expanded, or adapted versions of these programs.

2. Analytic and design considerations for evaluation design options

The main research questions are generally similar across the four evaluation design options:

1. Who enrolls in the intervention and how is it operated?
2. What is the intervention's impact on employment and related outcomes (such as earnings, retention, access to inclusive career paths and self-determination, mental health and well-being, and receipt of disability benefits) of autistic young adults?
3. Do these impacts vary for subgroups of autistic young adults, such as those defined by age, gender, race and ethnicity, or household income?
4. Do the intervention's benefits exceed its costs?

We do not address measurement strategies beyond examining existing data sources that might be available for each design option.[4] The components of the evaluation design we focus on are the general setting and focal population, the treatment and control or comparison groups, intervention partners and recruiting pipeline, existing data sources, and practical considerations including timeline, cost drivers,

[4] There are conceptual and measurement challenges of measuring "outcomes" of any sort for the autistic population, given the heterogenous diversity in the strengths and challenges each person on the autism spectrum has. Lounds Taylor has written extensively about the importance of "fit" for thinking about and measuring a "successful" employment outcome (see, for example, Lounds Taylor 2017). For example, having a job that entails two 4-hour shifts per week might represent successful employment for one autistic young adult while representing underemployment for another. Similarly, earning $100 per week might represent substantial earnings for a person who lives with their parents or in a group home, but not for a person who is trying to live independently.

geographic considerations, and external validity. Our examination of data sources focuses on existing sources such as administrative program data and unemployment insurance (UI) wage records. However, a comprehensive mixed-methods evaluation including both quantitative and qualitative data collection is essential to ensure findings can help inform policy and practice. Such an evaluation could include one or more surveys as well as qualitative data collection such as interviews and focus groups. A survey would provide information not captured in the administrative data, such as employment in competitive integrated settings, job quality, job satisfaction, and underemployment. Qualitative data would provide insights into the implementation and mechanisms in the causal pathway that connects the intervention to outcomes.

In planning for any data collection activity, evaluators should keep in mind autism-specific methodological and practical considerations (see box on this page). By incorporating these considerations into the evaluation study, researchers can ensure the data collection process is inclusive, accessible, respectful, and meaningful for autistic individuals, fostering their active participation and capturing their experiences accurately.

Although we propose a specific setting for each evaluation and offer a high-level description of intervention components, the details of the intervention design are beyond the scope of this report. An important consideration in developing the actual interventions to be evaluated is how they could address the barriers to employment that autistic young people, their families, and other interested parties raised at the listening sessions we conducted earlier in the project (Shenk and Aguillard 2022). These barriers include biases in the recruitment and interview process, inequities in access to enhanced supports, employer challenges in hiring and retention, and the complexity of a fractured landscape of services and interventions (see box on next page).

Recommendations for data collection specific to autism

- Ensure data collection instruments are accessible and designed with considerations for diverse communication styles and sensory preferences.
- Offer flexible data collection methods to accommodate individual preferences and needs (face-to-face interviews, online surveys, written responses, or assistive technologies).
- Use a structured and predictable format for data collection activities to provide clarity and reduce anxiety.
- Account for sensory sensitivities during data collection (minimize environmental distractions and offer options for breaks, quiet spaces, or adjustments to sensory stimuli).
- Offer communication supports, such as visual supports, augmentative and alternative communication devices, or communication boards, to facilitate effective and meaningful communication with autistic individuals who may have challenges with verbal or written communication.
- Use supportive interview techniques, such as open-ended questions, active listening, and reassurance statements, to foster trust, rapport, and open communication.
- Engage and seek input from autistic individuals, advocates, and organizations during the design and implementation of the evaluation study.
- Obtain informed consent from participants using accessible and understandable consent forms.

Barriers to employment for young adults on the autism spectrum

- **Biases in the recruitment and interview process.** Automated hiring technology (such as chatbot interviewers and gamified personality tests) can inadvertently screen out those who are fully qualified for the positions they are seeking. Interviewing techniques often rely heavily on a candidate's ability to articulate, self-promote, process, and respond to questions quickly and expressively, which is frequently a challenge for autistic young adults.
- **Inequities in access to enhanced supports.** Inequitable access to transportation, technology, and other resources creates additional barriers to programs, services, and job training opportunities.
- **Employer challenges in hiring and retention.** Employers seeking to hire neurodiverse workers must liaise with a substantial number of different organizations, such as VR, workforce boards, and nonprofits. Additionally, smaller employers might lack the resources to ensure welcoming workplaces and policies to hire and retain such workers.
- **Generalizing, scaling, and funding services.** Researchers have identified promising evidence-based interventions, but they have trouble scaling them in a fractured landscape of services and interventions. Potential community partners do not want to participate if there is no back-end support for sustainability. ◢

Finally, DOL's Clearinghouse for Labor Evaluation and Research (CLEAR) guidelines (DOL 2022) provide a useful approach for considering credible design options for each program. The guidelines focus on the strength of the causal evidence generated by the evaluation's impact analysis, or how well the results can be considered to have occurred due to the intervention. To the extent possible, the evaluation design options we describe in this report aim to achieve CLEAR's *high rating* of causal evidence, meaning the estimated effects can be solely attributed to the intervention. Only evaluations that use well-executed randomized controlled trials or interrupted time series can achieve this rating. Other designs that control for some but not all confounding factors can receive a *moderate rating*, meaning it remains a question whether one or more factors other than the intervention led to the observed effects.

B. High-level summary of the evaluation design options in this report

Each of the next four chapters of this report describes an evaluation design option for assessing the impacts of an intervention to improve employment outcomes for autistic young adults. Chapters II, III, and IV describe options for assessing the impact of enhanced access to Registered Apprenticeship programs, to a DOL-sponsored YouthBuild program, and to supported employment within state VR. Chapter V describes an option for assessing the impact of using VIT-TAY in DOL's Job Corps program.

In each chapter, we summarize the relevant program and existing evidence on its impact on employment outcomes; the intended intervention; an evaluation design to address the research questions above; likely partners and recruiting pipeline, existing data sources available for the evaluation; and practical considerations including timeline, cost drivers, geographic considerations, and external validity. Table 1 contains, at a high level, the key features of each design.

Table 1. Key features of evaluation design options in this report

Feature	Registered Apprenticeship	YouthBuild	Supported employment in VR	VIT-TAY
Intervention overview	Enhanced access to Registered Apprenticeship programs and related support services tailored to the needs of young adults on the autism spectrum, through the involvement of AJCs	YouthBuild, a community-based pre-apprenticeship program, tailored to the needs of young adults on the autism spectrum	Enhanced access to supported employment services in VR, a variety of practices that can include onsite job coaching, strategies designed to teach or reinforce appropriate behaviors, skill training beyond what employers offer, and more	Incorporation of VIT-TAY in Job Corps centers to provide on-site opportunities for interview training to autistic participants
Evaluation design	Clustered random assignment of AJCs in one or more states: AJCs in the treatment group offer enhanced access to Registered Apprenticeship programs to young adults on the autism spectrum	Cohort study: the first cohort will participate in a regular YouthBuild program, and the second cohort will participate in an enhanced version tailored to the needs of young adults on the autism spectrum	Clustered random assignment of VR offices in one or more states: VR offices in the treatment group offer enhanced access to supported employment services for both autistic and non-autistic young adults	Clustered random assignment of Job Corps centers in one or more Job Corps region: Job Corps centers in the treatment group implement VIT-TAY for both autistic and non-autistic participants
Intervention partners	AJCs, employers, and intermediary organizations with expertise in providing technical assistance to both employers and autistic young adults	One or more YouthBuild programs, and intermediary organizations with expertise in providing employment support services to autistic young adults	VR agency or agencies and local employers	Job Corps centers and VIT-TAY trainers
Recruiting pipeline	A targeted outreach and marketing campaign (online and in high schools, VR offices, and postsecondary institutions) encouraging autistic adults ages 18–28 to seek Registered Apprenticeship opportunities at their local AJC	A targeted outreach and marketing campaign (online and in high schools, school districts, and VR offices) encouraging autistic adults ages 16–24 to apply to the YouthBuild program	Expanded outreach by VR agencies to schools, service providers, DOL-related programs, and postsecondary institutions to encourage autistic young adults ages 16–28 to seek VR services	A targeted outreach and marketing campaign (online and in high schools, welfare offices, AJCs, and VR offices) encouraging autistic young adults ages 16–24 to participate in Job Corps
Available data sources	WIPS, RAPIDS, NDNH	WIPS	State VR data, state UI data	Job Corps Information System, NDNH

AJC = American Job Center; DOL = U.S. Department of Labor; NDNH = National Directory of New Hires; RAPIDS = Registered Apprenticeship Partners Information Database System; UI = unemployment insurance; VIT-TAY = Virtual Interview Training for Transition Age Youth; VR = Vocational Rehabilitation; WIPS = Workforce Integrated Performance System.

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II. Registered Apprenticeship

In this chapter, we present an evaluation design option to examine the effects of an intervention providing enhanced access to Registered Apprenticeship programs. The proposed evaluation design is a clustered random assignment of American Job Centers (AJCs) in one or more states that use the Registered Apprenticeship Partners Information Database System (RAPIDS). Drawn by a targeted outreach and marketing campaign specifically to increase the participation of autistic young adults in Registered Apprenticeship, clients of AJCs in the treatment group would have access to an enhanced version of Registered Apprenticeship, as described below, and clients of AJCs in the comparison group would receive usual AJC services. This design could achieve a high rating of causal evidence (according to CLEAR guidance) on the impact of enhanced access to Registered Apprenticeship on the employment and earnings outcomes of young adults on the autism spectrum.

A. Overview of Registered Apprenticeship

Registered Apprenticeship is a career-training program that serves over half a million people annually (DOL 2021). Registered Apprenticeship programs include (1) on-the-job learning, (2) related technical instruction, (3) a progressive wage schedule that increases compensation with improving skills and experience, and (4) certification upon completion. As of 2021, 27,000 Registered Apprenticeship programs ranging from one to six years exist and are offered in approximately 1,000 occupations.

The National Apprenticeship Act of 1937 established the Registered Apprenticeship program under the leadership of DOL. Part of DOL's Employment and Training Administration, the Office of Apprenticeship (OA), in conjunction with State Apprenticeship Agencies, administers Registered Apprenticeship programs that meet both federal and state requirements and award apprentices their certificates upon completion. Currently, 27 states, the District of Columbia, Guam, and the Virgin Islands have State Apprenticeship Agencies; all other states are overseen by the OA (Office of Apprenticeship 2023).

Registered Apprenticeship program participant characteristics

- In 2021, there were over 593,000 active apprentices, and demographic information was available for about 550,000 of them (DOL 2021).
- 13 percent of active apprentices were female, 86 percent were male, and 0.4 percent did not self-identify.
- Thirty-eight percent were age 24 or younger, 40 percent were ages 25 to 34, 20 percent were 35 and older, and 2 percent did not self-identify.
- Forty-six percent were White, 24 percent identified with two or more races, 8 percent were Black, 1 percent were American Indian or Alaska Native, 2 percent were Asian, 1 percent were Native Hawaiian or Other Pacific Islander, and 19 percent did not identify their race; separately from racial classification, 21 percent were of Hispanic origin, 59 percent were not of Hispanic origin, and 20 percent did not identify on this question.
- The three industries with the highest numbers of apprentices were construction (197,421), public administration (135,269), and educational services (67,202).

To encourage participation by individuals with disabilities, Registered Apprenticeship programs with more than four apprentices must develop Affirmative Action Programs to support equal opportunity in recruitment and hiring of all qualified individuals. However, less than 1 percent of apprentices in 2023 self-identified as having a disability

(Office of Apprenticeship 2024), so the actual prevalence of people with disabilities in Registered Apprenticeship programs is unclear. Moreover, the programs do not currently collect data on the different types of disabilities program participants have, including autism.

Recognizing the potential for apprenticeship programs to improve employment outcomes for people with disabilities, ODEP's Partnership on Inclusive Apprenticeship (PIA) fosters apprenticeship programs that are open and accessible to everyone, including individuals with disabilities. PIA partners with employers and apprenticeship intermediaries to develop inclusive apprenticeship programs that widen the talent pipeline for employers and provide people with disabilities access to gainful career paths in high-growth, high-demand fields such as information technology (IT) or health care. An enhanced version of Registered Apprenticeship tailored to autistic young adults can benefit from the knowledge ODEP has gained through PIA.

B. Existing evidence on the impact of Registered Apprenticeship on employment outcomes

Two rigorous studies have found evidence that Registered Apprenticeship programs can improve employment outcomes and increase participants' earnings. Using program data and state UI wage records for 10 states, Reed et al. (2012) found that employment rates of Registered Apprenticeship participants were 8.6 percentage points and annual earnings $5,829 higher than for similar nonparticipants in the ninth year after program enrollment. They estimated that these differences accumulate to $98,718 higher earnings for Registered Apprenticeship participants over an entire career. For those participants who completed Registered Apprenticeship successfully, the net gain was even higher ($240,037). In a more recent quasi-experimental study (Hollenbeck and Huang 2016) on apprentices in the state of Washington, an increase in hourly wages was evident one and three years after exiting the program. In a comparison between Registered Apprenticeship participants and non-apprentices served by the Wagner-Peyser Employment Services program, apprentices earned nearly $3,500 more in quarterly earnings. Over the entire career, the authors estimated that this gap adds up to $235,000 more in earnings for apprentices compared to similar nonparticipants.

Apprenticeship programs also provide benefits to employers, such as a sustainable talent pipeline and reduced turnover. For example, Helper et al. (2016) found that the benefits of apprenticeships for employers overweigh the costs, with internal rates of return of 40 percent for one health care program and 50 percent for Siemens USA, compared to hiring non-apprentices.

We are not aware of any studies on the impact of Registered Apprenticeship programs specifically on employment outcomes and earnings of people with disabilities, let alone those on the autism spectrum (Kuehn et al. 2021). Section 129 of the Workforce Innovation and Opportunity Act (WIOA) allows states to use allocated federal funds to conduct demonstrations of programs involving youth with disabilities that are not in school and are ages 16 to 24, with the objective of increasing career readiness and entry into early-career positions.

An evaluation to rigorously assess the impacts of enhanced access to Registered Apprenticeship on the employment outcomes of young adults with disabilities and specifically those on the autism spectrum would be valuable because a successful intervention would have high potential for full scaling. Registered Apprenticeship programs already operate nationwide. If found effective in improving employment outcomes for young adults with disabilities, including those with autism, the Registered Apprenticeship program could serve a large portion of the focal population.

C. Evaluation design to assess enhanced access to Registered Apprenticeship

Given the promising evidence on the potential of Registered Apprenticeship programs to improve employment outcomes for participants, we propose to assess the impact of enhanced access to such programs on the employment and related outcomes of young adults ages 18 to 28 on the autism spectrum. The evaluation would be part of a DOL grant program to states. In each grantee state, select AJCs will offer an enhanced version of Registered Apprenticeship that includes counseling and mentoring by dedicated AJC staff.[5] An outreach and marketing campaign will encourage autistic young adults to enroll in the program, and an expert organization will provide relevant technical assistance and other supports to both employers and apprentices. The evaluation design also offers the option to include young adults with disabilities other than autism. Under this scenario, evaluators could also compare the impacts for autistic young adults to those of young adults with other types of disabilities.

In the remainder of this section, we first describe our proposed evaluation design, then summarize components of that design including the pipeline, data needs, and practical considerations. Although we focus the evaluation design option on young adults on the autism spectrum, the key components of the design would not change if the intervention also included young adults with other types of disabilities.

1. Evaluation design

The evaluation design option involves clustered random assignment of AJCs in one or more states. All things equal, using clustered rather than individual random assignment increases the size of the minimum detectable impact for the evaluation; however, it minimizes the risk of spillovers from counselors who work with participants in both the treatment and control groups, as might occur under individual random assignment. The clustered random assignment also minimizes ethical concerns with regards to individuals at the same office having differential access to services. All AJCs in the participating state(s) would be sorted into groups based on the population size they serve and the economic conditions within their jurisdiction, and these groups would form strata for random assignment. Using stratified random assignment, the evaluation would randomly assign the AJCs within each group to either the treatment or control group.

AJCs in the treatment group would receive funding to hire additional staff that work exclusively with autistic young adults. The ultimate aim, if the intervention proves successful, would be to integrate additional supports for autistic young adults into apprenticeship programs generally, but the intervention itself would need to focus on recruiting pipelines for this specific population in order to obtain a sufficient sample size. These staff would inform clients about Registered Apprenticeship programs and their benefits and establish strategic partnerships with sponsors to facilitate improved access to Registered Apprenticeship programs for their clients. When clients are enrolled into a registered apprenticeship program, these staff also keep in contact with them and meet regularly with the apprentice and, if needed, their employer and specifically the mentor/trainer, since the mentor/trainer relationship with the apprentice is of primary importance, to ensure the apprentices' needs are addressed. In addition, employers can receive free technical assistance by the intermediary organization to support inclusive

[5] More than 2,300 AJCs are located across the United States (DOL n.d.[a]). Spanning across urban, suburban, and rural areas, they provide an accessible point of intake for people from different demographic backgrounds and socioeconomic statuses. Alternatively, the evaluation could be designed with community colleges, schools, or VR offices at the center of the intervention.

practices as employers often lack the resources to undertake this task on their own. In contrast, clients of AJCs in the comparison group will have access to the usual services available at the AJC.

The proposed design enables the evaluation to estimate the causal impact of improved access to an enhanced Registered Apprenticeship program with additional support services provided by AJCs on the employment outcomes of autistic young adults. It would not provide a causal impact estimate of simply participating in a usual (that is, non-enhanced) Registered Apprenticeship program. Still, it might be possible to benchmark some of the findings for the treatment group against other autistic young adults who use AJC services in a nonparticipating state.

If random assignment of AJCs is not feasible, an alternative (albeit less rigorous) evaluation design could implement a nonrandom assignment of AJCs into treatment and comparison groups. Under this scenario, researchers could use a method such as propensity score matching to match between AJC clients in the treatment and comparison groups based on their characteristics at enrollment, then compare their outcomes after program completion.

2. Intervention partners and recruitment pipeline

Successfully implementing this design option would require both forming close working relationships between intervention partners and developing a reliable recruitment pipeline of autistic young adults. Partners in the intervention include AJCs, DOL's OA and State Apprenticeship Agencies, employers, and one or more intermediary organizations. Each partner and its collaboration are essential to the intervention's successful implementation.

- **AJCs.** AJCs in both the treatment and control groups will participate in an outreach and recruiting campaign to increase awareness of Registered Apprenticeship for the focal population. The outreach and recruitment approach must be identical across AJCs to avoid imbalance in enrollee numbers and characteristics between the treatment and control group. In addition, the American Job Centers in the treatment group will hire additional staff dedicated to engaging and supporting autistic young adults in Registered Apprenticeship programs. These staff will inform them about Registered Apprenticeship and its long-term financial benefits and support them through the application process with mentoring, coaching, and organizing equitable access to transportation, technology, and other resources needed. These staff will also be responsible for growing and maintaining a local network of employers that offer Registered Apprenticeship programs and maintaining a close working relationship between employers and intermediary organizations.
- **DOL's OA and State Apprenticeship Agencies.** As mentioned earlier, the Office of Apprenticeship administers Registered Apprenticeship programs in conjunction with State Apprenticeship Agencies. Depending on the state, AJCs would collaborate either with that state's apprenticeship agency or with the federal Office of Apprenticeship to foster connections with Registered Apprenticeship programs.
- **Employers.** Because Registered Apprenticeship is an employer-focused, work-based training, the success of the intervention depends on local employers' willingness to participate. Two previous ODEP initiatives, the Apprenticeship Inclusion Model and PIA, suggest that employers are willing to engage in efforts to increase inclusiveness in apprenticeship programs.
- **Intermediary organizations.** The REYAAS project conducted listening sessions with autistic young adults and other interested parties to learn more about the challenges and barriers to autistic young adults' employment (Shenk and Aguillard 2022). Intermediary organizations with expertise in providing technical assistance to both employers and apprentices on the autism spectrum will be key

to addressing some of the major issues raised in the listening sessions, including biases in the recruitment and interview process, inequitable access to transportation and technology, and challenges to retention.

No data are available on the prevalence of autistic apprentices, and all three of the experts on Registered Apprenticeship that we interviewed for this report suggested that the number might be very small. Hence, the intervention should include a targeted outreach and recruitment campaign for the entire state. An intervention without this outreach would risk an insufficient sample size and limit the ability to detect impacts.

3. Data sources for the evaluation

The evaluation would use four key data sources:

- **Workforce Integrated Performance System (WIPS).** WIPS collects data on all individuals receiving Wagner-Peyser Employment Services provided through AJCs. Eligible individuals need to be at least 18 years old and have work authorization in the United States. For this reason, the evaluation design we propose focuses on autistic young adults ages 18 to 28. An advantage of choosing AJCs as the unit of random assignment in this clustered randomized controlled trial is that data on both treatment and comparison group members will be available in WIPS, including self-reported sociodemographic information such as sex, race and ethnicity, disability status, age, veteran status, education level, and county of residence.
- **Registered Apprenticeship Partners Information Database System (RAPIDS).** In most states, Registered Apprenticeship programs report data in RAPIDS. Even though WIPS contains part of these data, RAPIDS offers more granular data on employer, program, and participant characteristics. Both WIPS and RAPIDS collect data on individuals' disability status, but the information is missing for many (Kuehn et al. 2021), and neither system collects data on the type of disability for Registered Apprenticeship and Wagner-Peyser participants. To facilitate the proposed evaluation design, we assume AJC staff will be able to record the type of disability of program enrollees. Adding the ability to identify specific disability status would be helpful beyond this evaluation and create new research opportunities for understanding employment outcomes for apprentices with disabilities.
- **National Directory of New Hires (NDNH).** Quarterly employment and earnings data are available in the NDNH, a database that the Office of Child Support Enforcement at the U.S. Department of Health and Human Services maintains.
- **Personally identifiable information.** Evaluators need access to names and Social Security numbers to obtain NDNH data on program participants. To facilitate matching the WIPS data to NDNH data, state grantees will need to collect names and Social Security numbers as part of the intake process.

4. Practical considerations

Evaluation timeline

Registered Apprenticeship programs can take one to six years to complete. Hence, we estimate nine years as a reasonable timeline for executing this evaluation design. This period includes one year to design and implement the targeted outreach and marketing campaign to increase participation in Registered Apprenticeship programs, as well as hiring and training additional staff for the AJCs in the treatment group and give them time to establish local networks with employers. Program enrollment would start in

Year 2. Given the time it takes for a person to complete a Registered Apprenticeship program, the last enrollees from the end of Year 2 would complete their program by the end of Year 8. Year 9 would provide time to complete the collection of data on outcomes of interest as well as analysis and reporting.

A shorter timeline is possible if the impact evaluation focuses on shorter Registered Apprenticeship programs or if enrolling and getting paid in an apprenticeship is considered a primary outcome measure. However, realistically, the evaluation might require more than one annual cohort to achieve a sufficient sample size, depending on the number of autistic young adults who enroll in the program. Further, apprenticeships offer a pathway for long-term career advancement. As apprentices progress through their training, they acquire specialized knowledge and experience that opens opportunities for higher-level positions and increased earning potential later in their work life. Hence, an evaluation might also want to include following a portion of the sample over an even longer time.

Cost drivers

We anticipate the intervention will have relatively high implementation costs. Cost drivers for the implementation include the design and implementation of the targeted outreach and marketing campaign in grantee states; the hiring of additional staff at AJCs; funds to provide apprentices on the autism spectrum access to transportation, technology, and other needed resources; and the costs associated with an intermediary organization providing technical assistance to both employers and apprentices. The length and extent of data collection and evaluation reporting would determine the evaluation costs.

Geographic considerations

The potential for full scaling of the proposed design is high. Registered Apprenticeship is already operating nationwide. If proven effective in improving employment outcomes and earnings for autistic young adults, the program can reach a large portion of the focal population. In addition, AJCs are located all over the United States and would offer an accessible point of intake for most autistic young adults.

For implementing the evaluation design option, more populous states might be more suitable because they offer a higher number of AJCs that can be randomly assigned. In addition, not all states participate in the RAPIDS database. RAPIDS data are harmonized, which makes analysis easier, so choosing states that participate in this case management system is the preferred option.

External validity

Eligible individuals for AJC services that are part of the WIOA Adult program must be at least 18 years old, but AJC services, including apprenticeships, can also be provided through the WIOA Youth program. Therefore, the entire focal population, autistic young adults ages 16 to 28, would be included in the intervention, with the caveat that employers might define minimum qualifications, such as educational levels and ability to perform certain tasks, which might limit the applicability of the findings to a specific subgroup of autistic young adults. Differences in the apprenticeship landscape across states might also mean that findings from an evaluation in one state might not carry over to other states. Finally, actual impacts might be concentrated in a specific subgroup of participants. Nevertheless, a carefully implemented evaluation design could have strong external validity if it assesses impacts on a sample that represents likely participants of a scaled-up program.

III. YouthBuild

The evaluation design option we present in this chapter would investigate the impact of an intervention that offers an enhanced program version of YouthBuild specifically tailored to the needs of autistic young adults. The suggested design option involves a cohort study. The first cohort would participate in a nontailored YouthBuild program. The second cohort would receive an enhanced version tailored to the program needs of young adults on the autism spectrum. Comparing the outcomes between both cohorts of young adults on the autism spectrum can produce moderate causal evidence on the impact of enhanced access to YouthBuild on autistic young adults' education, earnings, and employment outcomes.

A. Overview of YouthBuild

DOL's YouthBuild program is a nationwide, community-based pre-apprenticeship program serving more than 5,000 youth per year at over 175 organizations across 40 states (DOL n.d.[b]). Participation is restricted to the time frame six to 24 months, averaging about one year, and includes the following job training and educational opportunities for young adults:

1. Education that leads to a high school diploma or state equivalent. Some programs also offer support for postsecondary enrollment.
2. Vocational training opportunities where young people help renovate or construct housing for low-income communities. Since 2012, some YouthBuild programs also offer training opportunities in high-demand industries such as IT, health care, or hospitality.
3. Youth development services including leadership training and engagement in community service activities.
4. Other support services needed such as financial support, counseling, transportation, housing, and child care.

The administrative responsibility for YouthBuild lies with the Office of Workforce Investment's Division of Youth Services. The division provides approximately $90 million in annual funding for YouthBuild programs with 40 months of grant activity while grantees match 25 percent of their DOL grants with other funding. Eligible grantees include school districts, community colleges, workforce development boards, nonprofit and community-based organizations, Indian tribes, and housing development agencies (DOL n.d.[b]). DOL provides training and technical assistance to YouthBuild grantees via a contract, currently with YouthBuild USA.[6]

YouthBuild serves a diverse population

- In 2020, most (63 percent) of the participants in the DOL YouthBuild programs were men (YouthBuild USA 2022).
- Almost half (46 percent) were Black, 31 percent were Hispanic, 23 percent were White, 3 percent were Asian, and 3 percent were American Indian or Alaska Native.
- Of all participants in 2020, 79 percent earned a high school diploma and 43 percent enrolled in postsecondary education or jobs.
- A research study with participants from 2011 through 2013 found that about 10 percent of participants had been diagnosed with a disability, including both learning disabilities and physical impairments (Miller et al. 2018).

[6] YouthBuild USA is a 501(c)(3) nonprofit organization that assists a network of YouthBuild programs. Independent from providing technical assistance to DOL YouthBuild programs, YouthBuild USA offers training, technical

To be eligible for YouthBuild, individuals must be ages 16 to 24, have not earned a high school diploma, and meet one of the following criteria: be from low-income or migrant families, in foster care or aging out of it, formerly incarcerated, have disabilities, or are children of incarcerated individuals. Additionally, programs are allowed to enroll up to 25 percent of young adults who have their diploma and/or do not fall into the categories above if applicants are "basic skills deficient" (regardless of their high school diploma status) or if they have received a referral from a local secondary school to join a YouthBuild program to work toward earning a secondary school diploma.[7]

B. Existing evidence on the impact of DOL YouthBuild programs on employment outcomes

A randomized controlled trial study with individual random assignment provided high causal evidence that YouthBuild programs have the potential to enhance employment, earnings, and education outcomes for participants (Miller et al. 2018). YouthBuild increased the receipt of high school equivalency credentials by 11 percentage points four years after participants exited the program. It also had a positive impact on enrollment into vocational schools and postsecondary courses (11 percentage points and 9 percentage points, respectively). However, it had only a very small impact on earning a post-secondary degree. YouthBuild also increased the likelihood of being employed among youth who participated by 3 percentage points two years after enrollment, relative to a control group mean of 60 percent. A survey conducted four years after enrollment detected positive and significant impacts on the likelihood of being employed and on earnings at the time of the survey, but a corresponding increase in employment could not be documented when using administrative records from NDNH. The authors explain this discrepancy as groups experiencing low incomes being more likely to have informal jobs or being self-employed, or their employers not reporting wages.

The study did not present any impact estimates for youth with disabilities and therefore also not by disability type. To our knowledge, no published studies exist on the impact of YouthBuild on employment outcomes and earnings of people with disabilities, including those on the autism spectrum. A new evaluation could produce rigorous evidence on the impacts of YouthBuild specifically for autistic young adults.

C. Evaluation design to assess an enhanced YouthBuild program

An evaluation of YouthBuild would assess the effects of an enhanced version of the program on the education, earnings, and employment outcomes of young adults ages 16 to 24 on the autism spectrum. From listening sessions with autistic young adults, advocates and policymakers, direct service providers, educators, employers, and researchers, Shenk and Aguillard (2022) identified that inequities in access to enhanced supports such as transportation, technology, and other necessary support resources create additional barriers to programs, services, and job training opportunities for autistic young adults. Some of the YouthBuild experts we interviewed for this project also shared the concern that autistic young adults might face challenges with some aspects of the YouthBuild programs such as communication with a

assistance, leadership development, funding for program development, and advocates for its affiliate network programs (YouthBuild USA 2022).

[7] According to WIOA, a person is considered to be basic skills deficient or have low levels of literacy if the person is either (a) a young person whose English reading, writing, or computing skills are at or below the 8th-grade level on a generally accepted standardized test or (b) a young person or adult who is unable to compute and solve problems or read, write, or speak English at a level necessary to function on the job, in the individual's family, or in society.

variety of program staff and partners due to the different components of the program. That said, they agreed YouthBuild's hands-on learning experience might be a good fit for young adults on the autism spectrum, though construction specifically might prove a challenge to those with sensitivities to loud noises. Given these insights, we suggest implementing the evaluation as part of a DOL grant program to one or more YouthBuild programs.

The program enhancement would include all the current elements of YouthBuild, but tailor them specifically to the support needs of autistic young adults. This is an integrated model, with an intervention testing additional tailored supports for autistic young adults. First, education techniques used during classes should reflect the current knowledge about how autistic young adults can learn best. Second, youth development services should mostly focus on communication and life skills. Finally, other support services should include regular one-on-one sessions with the YouthBuild case manager. These enhancements would enable support for the different individual needs of participating autistic young adults and appropriately recognize that autism comes with a high variation in support needs. A panel of researchers, advocacy groups, YouthBuild grantees, and autistic young adults should establish the exact design of the enhanced program version to guarantee all angles are seen and all voices heard.

1. Evaluation design

Due to the relatively small number of participants involved with each YouthBuild program, with almost all organizations serving under 100 participants per year, compared to Registered Apprenticeships or RSA-administered VR agencies, the evaluation design we propose is a study of two cohorts, in sequence. The first cohort will participate in the nontailored version of the YouthBuild program, and the second cohort will participate in an enhanced version.[8] Afterwards, evaluators can compare the outcomes of both cohorts while controlling for any observable differences across cohorts. This sequential approach comes with the risk that economic conditions significantly change at the time of program completion (such as a recession). However, because the duration of YouthBuild programs is only six to 24 months, this concern is relatively small, though not negligible.[9]

Alternatively, if more than one YouthBuild program participates, the sequential approach of the cohort study could be replaced with a non-random cluster-based approach. Two or more YouthBuild programs could either deliver an enhanced version of YouthBuild (treatment group) or a nontailored version (comparison group). Because YouthBuild is a rather small program with only 175 DOL YouthBuild programs participating nationwide, combining multiple programs into treatment and comparison groups might be needed to achieve sufficiently large and balanced sample sizes.

2. Intervention partners and recruitment pipeline

To ensure the design of an effective intervention tailored to the needs of autistic young adults, it is important to engage a strong partnership among education researchers, advocacy groups, YouthBuild programs, and young adults on the autism spectrum. Understanding these partnerships could be a key component of the evaluation. In particular, involving autistic young adults in the design of the

[8] We assume a uniform recruitment process for both cohorts at two different points of time. If the evaluation randomly assigns individuals to the first or second cohort (waitlist), individuals assigned to the second cohort might commit to other opportunities before they start YouthBuild. The small number of participants within a single YouthBuild organization would not generate a sufficient sample size via individual-level random assignment.
[9] The strength of causal evidence of the proposed evaluation design is not as strong as a randomized controlled trial but is likely to be more feasible given the small number of YouthBuild programs and how YouthBuild programs are funded and operated.

intervention is critical to appropriately tailor the program to address specific needs instead of externally perceived needs. Further, it is also important to learn about the feasibility of some theoretical ideas from the YouthBuild programs themselves, to determine if they could be successfully implemented.

Currently, YouthBuild programs rely on a variety of referral pipelines including school counselors and school districts, probation officers, post and flyers at malls and similar locations, and word of mouth. No data on the participation of autistic young adults in YouthBuild programs are available, but from the expert interviews we conducted, it seems likely the prevalence of autistic participants is low. The currently low participation by individuals on the autistic spectrum underlines the need to tailor YouthBuild programs to their needs.

3. Data sources for the evaluation

WIPS collects data on participants of the DOL YouthBuild program and is a sufficient data source for this design option. The data elements specific to DOL YouthBuild include self-reported sociodemographic information such as gender, race, ethnicity, age, veteran status, and education level, as well as WIOA performance indicators. The latter provide data on short-term education and employment outcomes during the second and fourth quarter after exiting the program, including employment status, median earnings, participation in educational or training activities, measurable skills gain, and employer retention. Because YouthBuild is more of a transitional service and successful participation should enable access to other opportunities such as postsecondary education or vocational training services like Registered Apprenticeship, these short-term outcomes can provide a good first insight into the impact of an enhanced program version on autistic young adults' eventual outcomes.

The WIPS data also include information on both the disability status and category of disability. However, disability information in WIPS does not specifically identify participants on the autism spectrum. To enable this evaluation design, we must assume that we can collect more granular level on disability types to identify autistic young adults.

Even though short-term outcomes can give an early look into YouthBuild's impact on employment and earnings outcomes, there is a risk that they underestimate the long-term benefits of participating in YouthBuild. If, for example, the enhanced program version increases the percentage of YouthBuild participants who attain a college degree or complete an apprenticeship program afterwards, earnings benefits might be significantly higher than what were observed only two or four quarter after program exit. Therefore, if early performance indicators would suggest that the enhanced model version might have positive employment, earnings, or education impacts, researchers could extend the study horizon by collecting additional data on postsecondary outcomes from the National Student Clearinghouse and earnings from NDNH.

4. Practical considerations

Evaluation timeline

We estimate three years as a reasonable timeline for executing this evaluation design. In Year 1, the comparison group would start their enrollment. YouthBuild is a relatively short program with a program duration of only six to 12 months. Hence, the treatment group's enrollment can already start in Year 2, assuming the evaluation can use the first year to design the enhanced YouthBuild program version tailored to the specific needs of autistic young adults. By the end of Year 2, both the treatment and

comparison groups would have completed the YouthBuild program. Year 3 could be used for collecting data on outcomes and analyzing and reporting.

Cost drivers

The intervention will have relatively low implementation costs. Cost drivers for the implementation would include the design and implementation of the enhanced program version tailored to the needs of young adults on the autism spectrum and the financial resources needed to provide equitable access to transportation, technology, and other resources needed for successful participation. The extent of data collection and evaluation reporting would determine the costs of the evaluation.

Geographic considerations

The potential for full scaling is moderate. YouthBuild consists of 175 programs in more than 40 states. Local organizations operate programs; although there is potential for partnering with organizations in more locations to reach a larger share of the focal population, maintaining fidelity to the model might be an implementation challenge.

External validity

The proposed evaluation design comes with several limitations to external validity. First, YouthBuild participants must be ages 16 to 24 and have not yet completed high school. This restriction excludes older individuals ages 25-28 in our focal population of autistic young adults ages 16 to 28. It also excludes those who have completed high school, except that programs are allowed to enroll up to 25 percent of young adults who have their diploma and/or do not fall into the categories above, if applicants are “basic skills deficient” (regardless of their high school diploma status) or if they have received a referral from a local secondary school to join a YouthBuild program to work toward earning a secondary school diploma. YouthBuild programs are not available in all locations, which excludes certain groups from having access to the program. This can be problematic in terms of external validity if the focal population in locations without access to YouthBuild looks different from that in locations with access. Fourth, findings from an evaluation of one YouthBuild program might not apply to other programs if they differ substantially in their service approach.

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IV. Supported employment in VR

In this chapter, we propose an assessment of the impact of an intervention that offers enhanced access to supported employment services in randomly selected VR offices. The intervention would boost access to existing supported employment services because of their potential to improve employment outcomes for autistic young adults. The evaluation design we propose involves a clustered random assignment of VR offices in one or more state VR agencies. By comparing outcomes for autistic young adults who do and do not have enhanced access to supported employment services, this design can generate a high rating of causal evidence (according to CLEAR guidance) on the impacts of enhanced access to supported employment services on employment outcomes.

A. Overview of the VR program

The VR program provides employment-related services and supports to individuals with disabilities to prepare them for and engage them in CIE.[10] The Rehabilitation Services Administration (RSA) administers the program and provides services in 78 VR agencies in all 50 states, the District of Columbia, Puerto Rico, and four territories.[11] The services VR agencies offer include career counseling, work-based learning experiences, financial support for vocational training and postsecondary education, rehabilitation technology, transition and pre-employment transition services, and supported employment services (U.S. Department of Education 2020).

VR serves a large population of individuals with disabilities nationwide. Around half a million individuals applied for VR services in 2019, and about 900,000 received services under an individualized plan for employment (IPE) (Office of Special Education and Rehabilitative Services 2022). The VR program serves a diverse mix of participants. In the program year 2019, 44 percent of VR participants were female, 49 percent were ages 16 to 24, and 25 percent were ages 25 to 44. Two percent of participants in that year identified as American Indian or Alaska Native, 2 percent as Asian, 20 percent as Black or African American, 15 percent as Hispanic or Latino, less than 1 percent as Native Hawaiian or from the Pacific Islands, and 59 percent as White (Office of Special Education and Rehabilitative Services 2022).

Although the VR program already reaches many young adults on the autism spectrum, misperceptions about eligibility and work capacity among autistic young adults may limit the use of VR services in this population. For example, autistic adults are more likely to be denied VR services than adults with other impairments because they might be considered too severely disabled to benefit from services (Lawer et al. 2009). At the same time, service providers in schools and other organizations may not provide resources

The VR program already serves many autistic young adults

Of the 566,367 young adults ages 16 to 28 who applied to VR in 2017–2019, 81,616 (14 percent) had a primary or secondary diagnosis of autism, and 53,592 in that group received services under an IPE (Shenk et al. 2023).

[10] CIE is work for which the individual is compensated at or above minimum wage, receiving wages, benefits, and opportunities similar to employees without disabilities in a similar position and at a location where the individuals interact with others without disabilities.

[11] In 34 states, one VR agency serves individuals with all types of disabilities. In the remaining 22 states and territories, two VR agencies serve the population; one focuses on individuals who are blind or have visual impairments, and the other on individuals with all other types of disabilities.

to autistic young adults when providers perceive a given young adult to have an average to above-average IQ due to a misconception about their needs for services (Lee and Carter 2012). Moreover, one of the experts on VR who we interviewed for this report suggested there is often a misunderstanding of who can use VR services and a belief that those from higher-income families, which are more likely to have children diagnosed with autism, are not eligible.

B. Existing evidence on the impact of VR services on employment outcomes

The evidence on the causal effect of VR services on employment outcomes for transition-age young adults is limited. There is even less evidence of their impact on autistic young adults. Yin et al. (2023) examined the effect that having an IPE had on employment outcomes. They found that young adults with a signed IPE had higher employment rates and earnings up to two years after their VR case was closed than those who had not signed an IPE. The effects were stronger for young adults ages 14 to 18 than those ages 19 to 24. Dean et al. (2019) also found that participation in a transitioning program administered by the state of Virginia's VR agency improved young adults' employment and earnings outcomes for more than two years after the end of the program.

Additional causal evidence suggests that VR services can positively affect young adults ages 14 to 16 who receive Supplemental Security Income (SSI). In a randomized controlled trial with individual random assignment, Patnaik et al. (2022) found a sustained increase in employment after five years of enrollment in Wisconsin PROMISE, a program housed within the state's VR agency. This finding suggests that an effective model for young people with disabilities could include having VR counselors act as case navigators, enrolling young adults in VR and connecting them to VR services early during the transition to adulthood, and coordinating with other agencies that provide transition supports.

Recent studies measured the impact of VR agencies offering work-based learning experiences to high school students with disabilities in Maine, Maryland, Massachusetts, and Vermont. Although the implementation of these programs varied across states, they generally offered paid and unpaid experiences with employers to learn about career paths and acquire work-relevant skills. Evaluations of these programs found a promising level of take-up, with high school students participating in the program using more VR services. The effect of these programs on postsecondary education and training was mixed; in some settings, young adults in the treatment and comparison groups had similar outcomes. In other settings, the program had large and positive impacts on education. Ultimately, increased work-based learning experiences were not associated with improved employment outcomes 24 months after enrollment, except for higher mean hourly wages in one setting (Mann et al. 2021; Sevak et al. 2021; Siwach et al. 2021; Foley et al. 2022).[12]

Among the services that VR agencies offer, research indicates that supported employment (explained in detail in a text box on the next page) specifically shows promise in improving employment outcomes for autistic young adults. An increase in CIE was evident among young adults who received supported employment services compared to those who received other VR services (Wehman et al. 2014a). These authors studied a sample of young adults ages 16 to 25 with intellectual or developmental disabilities and constructed a comparison group using propensity score matching. They found that receiving supported employment services increased the employment rate among those who were high school graduates and beneficiaries of SSI or Social Security Disability Insurance (SSDI). Among high school graduates, 63 percent of the treatment group were employed at 90 days after VR case closure, a statistically significant

[12] The evidence is based on randomized controlled trial designs in Maryland and Vermont and quasi-experimental designs in Maine and Massachusetts.

increase of 20 percentage points compared to the comparison group. Those who were SSI or SSDI beneficiaries but had less than a high school education experienced similar increases.

C. Evaluation design to assess enhanced access to supported employment services in VR

The proposed evaluation would measure the impact of offering an enhanced model of supported employment services within state VR on young adults' employment-related outcomes.[13] The evaluation sample could include autistic and non-autistic individuals ages 16 to 28 who normally apply for VR services during the intervention period. This decision may streamline the implementation of the intervention and would not affect the evaluation design. However, VR application data make it easy to identify autistic young adults, so it is possible to restrict the intervention to this group.

An evaluation of an enhanced model of supported employment services would fill the knowledge gap about how VR services, especially supported employment services, can affect employment outcomes for autistic young adults. If the intervention offers enhanced access to supported employment services to all VR applicants in the treatment group offices, it could also compare the impacts for autistic young adults to those for non-autistic young adults with disabilities.

In the remainder of this section, we first describe our proposed evaluation design, then summarize components of that design including the pipeline, data needs, and practical considerations. Although we focus the evaluation design option on young adults on the autism spectrum, the key components of the design would not change if the intervention also included young adults with other types of disabilities.

Supported employment

Supported employment services are ongoing support services and other appropriate services needed to support and maintain a person with a significant disability in CIE (Office of Special Education and Rehabilitative Services 2022). Typically, services are provided to support the transition to CIE and are offered in a time-limited capacity not to exceed 24 months, unless under special circumstances. Supported employment services might include on-site job coaching, strategies to teach or reinforce appropriate behaviors, and skill training beyond what employers offer.

1. Evaluation design

The evaluation would involve one or more state VR agencies implementing the intervention according to a clustered random assignment of VR offices. With clustered random assignment, the evaluation randomly selects groups or locations, in this case VR offices, to either implement the intervention or not. Each office selected for the intervention or treatment group would implement the enhanced model of supported employment services; other offices would be assigned to the comparison group and would offer the usual VR services. See the evaluation design component of Section II for an explanation of clustered random assignment. We propose to randomly assign at the VR office level (rather than the individual applicant level) because VR counselors or relevant local partners provide supported employment services to VR office clients.

VR offices have previously implemented these types of designs. For example, VR agencies in Kentucky and Minnesota implemented a similar design as part of the Substantial Gainful Activity project (Martin

[13] We refer to supported employment as the main intervention to be evaluated. However, a similar evaluation design can be applied to other types of enhanced VR services.

and Sevak 2020; Kehn and Honeycutt 2020). Because VR offices likely have different experiences providing services, including supported employment, to autistic young adults ages 16 to 28, the random assignment could use stratification. Using historical data, offices can be categorized according to key characteristics, such as average number of clients in the focal population. The evaluation would conduct random assignment in each stratum to ensure that offices in the treatment and comparison groups are balanced in their experiences providing services to autistic young adults.

If randomly assigning VR offices is not feasible, an alternative (and less rigorous) evaluation design could implement a nonrandom assignment of offices into treatment and comparison groups. Under this scenario, researchers could use a method such as propensity score matching to match between VR clients in the treatment and comparison groups based on their characteristics at enrollment, then compare their outcomes at and after VR case closure.

2. Intervention partners and recruitment pipeline

The evaluation would implement the intervention in one or more state VR agencies. VR agencies are well-positioned to implement this intervention because they already identify autistic young adults among their applicants (see Shenk et al. 2023) and offer supported employment as one of their services. Employers are key partners in implementing the intervention. VR agencies would establish or strengthen relationships with local employers to find employment for autistic clients. Once the client is placed with an employer, the VR agency would work with the employer to provide enhanced supported employment services to the client.

The evaluation will build on and enhance the existing VR infrastructure in the participating states, including the pipeline that already refers autistic young adults to VR agencies. However, to guarantee that the intervention reaches a significant share of this population, VR agencies could expand their outreach to the main referral sources of young adults on the autism spectrum applying for VR. Among those ages 16 to 22, elementary and secondary educational institutions are the most common referral sources (Shenk et al. 2023). The VR agency staff could strengthen relationships with school staff to provide autistic students with information about VR-supported employment services. VR agencies could also use sessions of pre-employment transition services (pre-ETS) to spread this information.[14] To reach older autistic young adults (ages 23 to 28), VR agencies could partner with other sources. Among individuals in this group, self-referral to VR is the most relevant source of referral. Still, VR agencies could partner with other organizations to disseminate information about VR-supported employment services, including Centers for Independent Living, autism advocacy organizations, and postsecondary institutions.

[14] These are services that state VR agencies should make available to all students with a disability and in need of services, regardless of whether they have applied for services at a VR agency (Employment and Training Administration 2014).

3. Data sources for the evaluation

The evaluation would use data from the following two sources:

- **State VR data.** VR agencies collect data needed to administer their program in existing management information systems. These data include information to identify young adults on the autism spectrum as well as information on VR service use and short-term employment outcomes.[15,16]
- **State UI data.** States collect information from employers on workers' earnings. These data would provide information on young adults' quarterly employment status and earnings.

4. Practical considerations

Evaluation timeline

We estimate five years as a reasonable timeline for executing this evaluation design. This would involve a yearlong set-up period to solidify partnerships and establish the details of the intervention, including the assignment of offices to treatment and comparison groups. Enrollment into the intervention would occur throughout Year 2. Enrollees in the treatment group would receive enhanced supported employment services for up to 24 months. Hence, the last cohort of enrollees from the end of Year 2 could receive services up until the end of Year 4. Year 5 would then provide time to complete the collection of data on outcomes of interest as well as analysis and reporting. A shorter evaluation timeline is possible if outreach can begin sooner or if supported employment services are offered for less than 24 months.

In practice, the timeline for the evaluation also depends on the number of autistic young adults applying for VR services and the VR agency's capacity to provided supported employment services. If the VR agencies have already established relationships with local employers to connect autistic young adults to employment and have the resources to identify and provide the needed support services, then the time to implement the intervention may be shorter. However, it may take several months for a cohort of young adults to find employment and start using supported employment services.

If multiple VR agencies are involved, obtaining a large enough sample might take less time. If a single state agency is involved, multiple years of enrollment might be necessary for a large enough sample of autistic young adults to apply for VR services.

An evaluation could also include a longer follow-up period, which would contribute to the field with evidence of how supported employment services affect longer-term employment outcomes for autistic young adults. For example, the evaluation could measure employment 36 or more months after VR application or a longer period by using earnings records from UI wage records or the NDNH.

[15] Evaluators cannot use the national RSA-911 data (which are based on state submissions of their VR data) because the intervention is implemented at the VR office level, and RSA-911 data do not include office identifiers. Moreover, evaluators will need personally identifiable information to link the use of VR services to outcomes in other data sets; such information, although available in RSA-911 data, is not typically available to researchers even in the restricted-use files from RSA.

[16] Identifying autistic young adults in state VR data requires complete information about the person's impairment. On average, 13 percent of VR applicants during program years 2017–2019 with age and other complete information had missing impairment information (Shenk et al. 2023). The evaluation could bring awareness about the importance of correctly filling out this information to VR offices.

Cost drivers

We anticipate the intervention will have moderate implementation costs. Cost drivers for the implementation primarily include the costs of outreach efforts to increase referrals from partners to VR agencies and the cost of implementing enhanced supported employment services to the treatment group. The latter would vary by the nature of the enhanced supported employment services and the number of participants. Studies indicate that supported employment services tend to be more costly than other services that VR applicants with autism typically use (Roux et al. 2016). The extent of data collection and evaluation reporting would dictate evaluation costs. Evaluation costs can be relatively low if analyses rely primarily on the existing data sources described above.

Geographic considerations

The VR program already operates nationwide. Hence, in theory, promising services such as supported employment can be scaled up to cover a large portion of the focal population (young adults with autism ages 16 to 28). However, access to VR services, including supported employment, varies substantially by state. For example, RSA-911 case service records from 2014 show that, on average, 23 percent of autistic VR users received supported employment services. There was sharp variation across states; no autistic VR user in New Jersey received supported employment services, while all autistic VR users received supported employment services in Wyoming (Roux et al. 2016). Due to these variations, if more than one state participates in the intervention, the evaluation should randomly assign VR offices separately within the state because local characteristics, such as the availability of VR services and labor market conditions, might affect the effectiveness of the intervention.

External validity

State VR services are generally available to individuals at different points along the autism spectrum. However, the intervention's findings might apply only to parts of the focal population on which the intervention has an impact, if any. For example, intervention participants might come from a specific state or be a part of a specific subgroup of the focal population, or impacts might be concentrated in a specific subgroup of participants. Nevertheless, a carefully implemented evaluation design could have strong external validity if it assesses impacts on a sample that represents likely participants of a scaled-up program.

V. Virtual Interview Training for Transition Age Youth

The evaluation design option we summarize in this chapter would assess the impact of an intervention that implements VIT-TAY in randomly selected Job Corps centers. The intervention would implement VIT-TAY because of its potential to improve employment outcomes for autistic young adults. The evaluation design we propose involves a clustered random assignment of Job Corps centers in one or more Job Corps regions. By comparing outcomes for autistic young adults who participate in Job Corps and do and do not use VIT-TAY, this design can generate a high rating of causal evidence (according to CLEAR guidance) on the impacts of VIT-TAY on employment outcomes.

A. Overview of VIT-TAY

VIT-TAY is an interactive, computerized job interview simulator. It consists of e-learning content and simulated practice of filling out job applications and handling job interviews. VIT-TAY aims to improve interview skills and increase access to employment (Smith et al. 2020).[17] VIT-TAY was designed for transition-age young adults with autism based on feedback from transition-age youth and other interested parties on another interview training program developed for adults with severe mental illness—Virtual Reality Job Interview Training.

VIT-TAY consists of virtual interviews led by two virtual hiring managers and supported by a virtual job coach. The hiring managers' personalities and moods can change interactively. Interview questions vary based on a job application for one of 14 jobs that trainees complete before starting the training. There are three levels of training difficulty, and participants advance through them. The training is based on a curriculum that includes job interview preparation tips and interview skills. Participants can interact with the platform using speech recognition or typing (Smith et al. 2021). Published studies that tested the effectiveness of VIT-TAY examined young adults ages 16 to 26, enrolled in school, with an autism diagnosis and a 3rd-grade reading level or higher (Sherwood et al. 2023; Smith et al. 2020, 2021).[18]

B. Existing evidence on the impact of VIT-TAY on employment outcomes

The evidence on the causal effect of virtual interview trainings on outcomes for autistic young adults is limited, but promising. For example, studies suggest that students with disabilities might prefer virtual learning environments, such as virtual reality and computerized simulations, because they create nonthreatening environments that allow students to make mistakes and receive feedback (Spencer et al. 2019). Specifically for autistic young adults, evidence shows that virtual interview trainings improve interview performance (Burke et al. 2018, 2021).

Strong causal evidence shows that VIT-TAY not only improved job interview performance among autistic young adults but also improved their employment outcomes. One study showed that participants who used VIT-TAY and pre-ETS were 25 percentage points more likely to report placement in CIE six months after the intervention than those who used only pre-ETS (Smith et al. 2021). Despite existing evidence, the longer-term impacts of job interview trainings and their effects when scaled up for a larger

[17] SIMmersion, LLC, in partnership with researchers at the University of Michigan, developed the software. The university and Dr. Matthew Smith have financial ties to sales of the virtual interview tool.

[18] Autism diagnosis was determined by a score of 60T or higher via parent or teacher report using the Social Responsiveness Scale (60T corresponds to a mild deficit in social interaction; higher scores indicate increased levels of severity). The study excluded participants if they had hearing or visual limitations that prevented them from using the virtual tool or a documented medical illness affecting their cognition.

population of autistic young adults have not been evaluated. Developing job interview skills is an important tool for transition-age young adults. For example, several states list mock interviews as a work-based learning experience in their pre-ETS policies (Carlson et al. 2019).

C. Evaluation design to assess the use of VIT-TAY in Job Corps

The evaluation would measure the impact of offering VIT-TAY within Job Corps on young adults' employment-related outcomes, The evaluation sample could include autistic and non-autistic individuals ages 16 to 24 who are Job Corps participants during the intervention period. This decision may streamline the implementation of the intervention and would not affect the evaluation design. However, the evaluation can use Job Corps program application data to identity autistic young adults, so it is possible to restrict the intervention to this group.

We propose Job Corps as the intervention setting in this report; however, the design framework can be translated into the offer of VIT-TAY in other settings. We chose Job Corps as the example setting because it is a large, nationwide residential career training program that has been operating for more than 50 years. The program is already at scale and helps tens of thousands of disadvantaged individuals ages 16 to 24 complete their high school education, trains them for meaningful careers, and assists them with attaining employment. The evaluation would implement the intervention in one or more Job Corps regions, which include multiple centers.

An evaluation of the offer of VIT-TAY in Job Corps would have the potential to fill the knowledge gap about how VIT-TAY affects outcomes for transition-age autistic young adults. It might be possible to evaluate these research questions by subgroup depending on the sample size of autistic young adults in each subgroup. To maximize the likelihood that such an evaluation is possible, the evaluation design could define a subgroup of interest and incorporate it into the random assignment design as a stratum. If all Job Corps participants of centers in the treatment group receive the intervention, the evaluation also could assess the differential impacts between young adults with autism, those with other disabilities, and those without disabilities.

1. Evaluation design

The evaluation would involve one or more Job Corps regions implementing the intervention according to a clustered random assignment of Job Corps centers. The region would randomly select half of its Job Corps centers for the treatment group and half for the control group to enable a rigorous evaluation. Participants in the treatment group would have access to VIT-TAY on top of Job Corps, and participants in the control group would receive only Job Corps.

The random assignment would happen at the level of the Job Corps center because implementing VIT-TAY involves training instructors to assist young adults with the training. The clustered design minimizes spillovers from instructors who might work with participants in the treatment and control groups. It also minimizes ethical concerns that individuals at the same center have different available services.

Job Corps centers are located across communities with different participant and labor market characteristics. To increase the likelihood that treatment and control groups would be balanced across observed characteristics, the evaluation could stratify random assignment by location characteristics. Using historical data, the evaluation would categorize centers according to their average number of participants and other characteristics, such as rural or urban. The evaluation would randomly assign

centers in each stratum to increase the likelihood that treatment and control groups are similar, on average.

If random assignment of Job Corps centers is not possible, an alternative evaluation design could implement a nonrandom assignment of centers into treatment and comparison groups. The counterfactual would be constructed based on matching characteristics of Job Corps participants in the treatment and comparison groups at enrollment and comparing their outcomes at their exit from Job Corps.

2. Intervention partners and recruitment pipeline

The evaluation sample would include young adults ages 16 to 24 who participate in Job Corps during the intervention period. Job Corps already serves autistic young adults. For example, in program year 2022, Job Corps served 24,184 participants, of which 9,146 had a disability (Office of Job Corps 2023). In program year 2018, 1 percent of students exiting the program reported a spectrum disorder. Among all students, 102 reported Asperger's syndrome, 323 reported autism, 12 reported Pervasive Developmental Disorder – Not Otherwise Specified, and one reported other (students could report multiple disabilities) (Office of Job Corps 2019).

Although autistic young adults participate in Job Corps, a successful evaluation would require a larger sample of these participants. Job Corps centers could expand their outreach to guarantee that they reach a significant share of autistic young adult. The centers could connect with schools, advocacy organizations, and employment services to increase participation of the focal population, in addition to sharing information about the program in media outlets (Johnson et al. 1999).

In addition to connecting with local organizations, centers could partner with the University of Michigan's Level Up Lab to secure the instructor training at each Job Corps center to implement VIT-TAY (Sherwood et al. 2023).

3. Data sources for the evaluation

The evaluation would use data from the following two sources:

- **Program administrative data.** These data, which would help identify young adults on the autism spectrum, include information on self-reported disability at enrollment and short-term employment outcomes. Center Disability Coordinators collect and record these data in the Job Corps Center Information System (Office of Job Corps 2019).
- **NDNH data.** These data include quarterly employment and earnings data. The Office of Child Support Enforcement at the U.S. Department of Health and Human Services maintains the NDNH database.

Although access to program administrative data and UI data are essential to measuring the main evaluation outcomes, a comprehensive evaluation might include a survey and qualitative data collection. A survey could provide information not captured in the administrative data, such as job satisfaction and underemployment. Qualitative data may provide insights into the implementation and mechanisms in the causal pathway that connects the intervention to the outcomes.

4. Practical considerations

Evaluation timeline

We estimate four years as a reasonable timeline for executing this evaluation design. This period would involve a yearlong set-up period to reach out to partners and set up the details of the intervention. During Years 2 and 3, autistic young adults would apply for Job Corps and receive Job Corps services including VIT-TAY. After that, there would be a year of follow-up to collect data on outcomes of interest and a period for analysis and reporting.

This evaluation period would vary depending on how long participants stay in Job Corps and at what moment in the program they would have access to VIT-TAY. On average, Job Corps participants with a disability stay eight months in the program (Office of Job Corps 2019). Because the goal of VIT-TAY is to improve skills for job interviews, the virtual training could be offered in the final months of the Job Corps program. This timeline also depends on the number of autistic young adults enrolled in Job Corps. If multiple Job Corps regions and centers are involved, obtaining a large enough sample for the evaluation might take less time.

Cost drivers

We anticipate the proposed intervention will have moderate implementation costs. The main cost drivers for the implementation are purchasing the VIT-TAY software and training staff to implement VIT-TAY at the centers. Virtual training requires fewer resources than other interview trainings, such as mock interview role-plays with a teacher; therefore, scaling it up would not be resource intensive. The extent of data collection and evaluation reporting would dictate evaluation costs.

Geographic considerations

Because Job Corps already operates nationwide, if the evaluation finds that VIT-TAY improves employment outcomes for autistic young adults, implementation could expand to all centers to reach a larger share of autistic young adults ages 16 to 24.

External validity

The evaluation would test the intervention in an existing service environment and could have strong external validity if it assesses impacts on a sample that represents likely participants of a scaled-up program. Still, the proposed evaluation design contains several limitations to external validity, since autistic young adults who choose to participate in Job Corps might be a selected group with certain characteristics, limiting the applicability of the findings to groups with different characteristics. Moreover, the intervention's impacts might be concentrated in a specific subgroup of participants and would therefore not apply to other subgroups.

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