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TITLE: Effect of a 9-Month Internship for the Transition-Aged Military Dependents with ASD

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14. ABSTRACT The aims of the project are: 1. VCU will modify the Project SEARCH Plus ASD Model to meet the needs of military dependents with ASD. 2. VCU will implement the intervention based upon the Project SEARCH plus ASD Supports manual and will measure fidelity of implementation. 3. VCU will measure the impact of the intervention on the social communication, behavioral adjustment and employment outcomes of the military dependents who participate compared to an equal control group who do not receive the intervention. The three aims have been accomplished. The research is completed, and the Project SEARCH program is continuing at the 773rd Mission Support Group, Joint Base Langley Eustis, Fort Eustis site. All data has been collected and analyzed. This report includes citations and complete papers currently in process. Findings from this study indicate that youth who participated in Project SEARCH plus ASD supports acquired competitive integrated employment at much higher rates than those in the control group.					
15. SUBJECT TERMS Autism, ASD, Military Dependents, Military Connected Youth, Transition to Employment, Internships, Social Responsiveness, Quality of Life, Depression, Anxiety					
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1. INTRODUCTION: *Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.*

The objective of this project is to study the impact of Project SEARCH plus ASD Supports (PS+ASD) on the social communication, behavioral, and employment outcomes of military dependents with ASD across three vocational domains (employment status, wage, number of hours worked per week) and three personal domains (social responsiveness, mental health, and quality of life). The six hypotheses driving this project propose that young adults who participate in an employer-based employment training and placement program will: demonstrate a higher rate of employment, work more hours, and earn a higher wage than those in the control condition. Additionally, young adults who participate in a work-based employment training and placement program will increase their social responsiveness, display lower anxiety and depression scores, and report higher quality of life scores than those in the control condition. Specific Aims: Aim 1. VCU will modify the Project SEARCH Plus ASD Model to meet the needs of military dependents with ASD.

Aim 2. VCU will implement the intervention based upon the Project SEARCH plus ASD Supports manual and will measure fidelity of implementation.

Aim 3. VCU will measure the impact of the intervention on the social communication, behavioral adjustment and employment outcomes of the military dependents who participate compared to an equal control group who do not receive the intervention.

2. KEYWORDS: *Provide a brief list of keywords (limit to 20 words).*

Autism, ASD, Military Dependents, Military Connected Youth, Transition to Employment, Internships, Social Responsiveness, Quality of Life, Depression, Anxiety

3. ACCOMPLISHMENTS: *The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction.*

What were the major goals of the project?

List the major goals of the project as stated in the approved SOW. If the application listed milestones/target dates for important activities or phases of the project, identify these dates and show actual completion dates or the percentage of completion.

Major Task 1: Convene expert panel – 100% complete, the expert panel has been convened, and the PS+ASD Supports Model has been reviewed by the panel. The expert panel completed their work with respect to finalizing the PS+ASD model for military dependents. They also had input into the Relocation and Deployment Plan.

Major Task 2: Finalize the PS + ASD model for military dependents – 100% complete, the intervention model has been finalized, all recruitment materials and recruitment activities were completed in February 2019, the Family Relocation and Family Member Deployment Plan was implemented with one deployed military family in 2018, all staff members were trained in PS + ASD implementation in July-August 2017.

Major Task 3: Recruit participants – 100% complete, recruitment of all three participant cohorts completed. Recruitment efforts resulted in 46 applicants. Seven were found ineligible, one elected to not participate. (See Appendix 1 for de-identified enrollment log). Recruitment efforts

resulted in 38 participants who were enrolled. Of those enrolled, 22 were military dependent, while 16 were military connected youth.

Major Task 4: Implement PS + ASD for military dependents – 100% complete, 22 treatment participants to date have enrolled in PS + ASD. Cohort 3 treatment participants graduated the program on 6/4/19. Thus far, five out of seven Cohort 2 treatment participants are working in competitive, integrated federal jobs. Twenty-seven unique internship experiences across 12 different organizations were created by June 2019.

Major Task 5: Data collected - 100% complete, all data collection for all three cohorts has been completed. The no-cost extension of this project to September 2021 allowed us to complete data collection and analysis through all three points for cohort 3.

Major Task 6: Data analyzed – 100% complete, database was created, and all data was de-identified. All data was scored, coded and uploaded into our existing database. We have analyzed the data and have submitted three papers. One has been accepted and two are under review. We will share a metadata file with NDAR in the 2022 year.

What was accomplished under these goals?

For this reporting period describe: 1) major activities; 2) specific objectives; 3) significant results or key outcomes, including major findings, developments, or conclusions (both positive and negative); and/or 4) other achievements. Include a discussion of stated goals not met. Description shall include pertinent data and graphs in sufficient detail to explain any significant results achieved. A succinct description of the methodology used shall be provided. As the project progresses to completion, the emphasis in reporting in this section should shift from reporting activities to reporting accomplishments.

Major Task 1: The expert panel met and reviewed the PS + ASD model. The expert panel also provided recommendations on the Family Relocation and Family Member Deployment Plan, which were incorporated into the finalized plan. IRB supervision and communication was also maintained throughout the project. Milestone achieved: VCU RAMS IRB continuing review approval obtained, VA DARS and HRPO Continuing Review also obtained.

Major Task 2: The PS + ASD model was revised for military dependents. The Family Relocation and Family Member Deployment Plan was successfully implemented with the active duty military family of a Cohort 1 graduate. Recruitment activities for all cohorts (1 through 3) have been completed. Milestones achieved: PS+ASD Model revised for military dependents, Family Relocation and Family Member Deployment Plan developed, recruitment schedule set and completed, staff trained.

Major Task 3: All subtasks for Major Task 3 were completed as of the 2019 annual report. There are no new accomplishments for this goal.

Major Task 4: Despite the worldwide disruption caused by the COVID-19 pandemic, all three cohorts have completed their participation in the PS + ASD model at Joint Base Langley-Eustis at the Fort Eustis site.

Of the 21 completers of the PS+ASD program at Fort Eustis, 76.19% have gained competitive integrated employment (compared to only 4.35% of the control group completers).

Approximately 31.25% of those positions were in the federal workforce. Given the significant

challenges faced by transition-aged youth with ASD seeking employment, this represents a dramatic improvement in employment outcomes.

Milestones achieved: Internship sites developed, Cohort 1 -3 treatment group participants graduated. Majority of treatment group participants gained employment.

Major Task 5: Data collection was completed for all Cohort participants. Milestone achieved: All data collected for control and treatment group participants.

Major Task 6: All Cohort control and treatment group data have been de-identified. The database was developed in a secure online platform through VCU REDCap. REDCap is a secure encrypted web application used to build online surveys and databases. Data entry of all collected data was completed in June 2021. Research team completed analysis of the data in September 2021. Milestone Achieved: REDCap Database completed and data migrated, Data analysis completed.

What opportunities for training and professional development has the project provided?

If the project was not intended to provide training and professional development opportunities or there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe opportunities for training and professional development provided to anyone who worked on the project or anyone who was involved in the activities supported by the project. “Training” activities are those in which individuals with advanced professional skills and experience assist others in attaining greater proficiency. Training activities may include, for example, courses or one-on-one work with a mentor. “Professional development” activities result in increased knowledge or skill in one’s area of expertise and may include workshops, conferences, seminars, study groups, and individual study. Include participation in conferences, workshops, and seminars not listed under major activities.

Beginning in May of 2017 through out the entirety of the project, PS+ASD collaborative partners, including, the Virginia Department of Aging and Rehabilitative Services, New Horizons School Staff, York County Public Schools, Newport News Public Schools, Hampton City Public Schools, Virginia Commonwealth University Business Connections Staff, and Joint Base Langley Eustis business liaison met monthly to address problems associated with the project, engage in resource sharing, and ongoing information dissemination regarding the PS+ASD for military dependent’s model. In addition, project staff, including the on-site coordinator, employment specialist, teacher, and instructional assistant met daily for project briefings and weekly for professional development. Finally, there were a number of additional training and professional development meetings that occurred across the five years of the project. They included the following:

1. As a result of the CDMRP funding and the success of the project at Ft. Eustis, Virginia’s Secretary of Veterans and Defense Affairs requested that additional Project SEARCH sites be held on Virginia military installations. In 2019, Ms. McDonough began assisting with coordination of meetings between military installations and school systems to look at the Project SEARCH model and how it could be implemented on additional bases. Two installations, U.S. Army Garrison - Ft. Lee and Naval Air Station Oceana, have

agreed to host SEARCH. Ms. McDonough has been working with both teams to provide training and technical assistance related to hosting such a project on a military installation.

2. On November 10, 2016, Dr. Carol Schall and Ms. Jennifer McDonough met with the Fort Eustis Base Commander and his team to plan the project and develop implementation timelines. During this discussion Dr. Schall and Ms. McDonough trained the base command team in the Project SEARCH plus ASD model
3. On January 6, 2017, Dr. Carol Schall and Ms. Jennifer McDonough presented the Project SEARCH plus ASD model to the department leaders at Fort Eustis. Approximately 30 department leaders were present for that presentation.
4. On August 18, 2017, Dr. Paul Wehman presented Polytrauma Grand Rounds webinar to Veterans Administration Rehabilitation audience. Streamed live and recorded for use within the VA system.
5. On March 28, 2018, Dr. Carol Schall, and Ms. Holly Whittenburg presented the Project SEARCH plus ASD for Military Dependents to the Virginia Garrison Command Meeting at Quantico Station.
6. On March 22, 2018, Dr. Paul Wehman presented Institute for Community Inclusion, University of Massachusetts, Boston: Webinar- Expanding the dialogue on Autism,: Reflections on Research & Real life in Employment.
<https://icimedia.wistia.com/medias/lpdgbqss0f>
7. On August 22, 2019, Dr. Holly Whittenburg presented a workshop titled, “ASD in the workplace: Tapping into strengths and interests to increase employment success” to vocational rehabilitation counselors at the Virginia Department of Aging and Rehabilitative Services in Norfolk Virginia
8. On October 2-3, 2019, Dr.s Paul Wehman and Carol Schall presented Washington, DC. Autism Speaks Thought Leadership Summit on Transition to Adulthood. Poster session: Ten years of Transition Research for Young Adults with Significant Impact from ASD: Findings and Future Research.
9. On August 10, 2020, Jennifer McDonough and Thomas Dubois met with the new Ft. Eustis Installation Commander, Col. Chesley Thigpen. During the meeting, Ms. McDonough and Mr. Dubois shared the historical context of the research being conducted at Ft. Eustis through the CDMRP project as well as detailed information about Project SEARCH, success of each class of interns, and the different internships being hosted by the installation. Col. Thigpen was delighted in the work being conducted and expressed his openness to assisting the project and interns in any way he was able.
10. On October 16, 2020, Dr. Paul Wehman presented The HELP Group Summit. (virtual).. Helping Youth with Autism enter Competitive employment.

11. On March 21, 2021, Dr. Paul Wehman presented at Els for Autism Innovations Global Impact conference - Building a Neurodiverse Workforce. Keynote: Building a Neurodiverse Workforce: Employers Helping to Unlock the Work Potential of Youth with Autism; Inside scoop Q& A session ; and Moderated speaker panel .

How were the results disseminated to communities of interest?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how the results were disseminated to communities of interest. Include any outreach activities that were undertaken to reach members of communities who are not usually aware of these project activities, for the purpose of enhancing public understanding and increasing interest in learning and careers in science, technology, and the humanities.

Across the five years of the project there were numerous ways the results were disseminated to communities of interest. Specifically, the project team developed a number of different products and publications to disseminate findings from the project. They included peer-reviewed journal articles, national conference presentations and poster sessions, webcasts, fact sheets and briefs. Many of these products or citations will be provided in full under section 6. Products, below.

What do you plan to do during the next reporting period to accomplish the goals?

If this is the final report, state “Nothing to Report.”

Describe briefly what you plan to do during the next reporting period to accomplish the goals and objectives.

Not applicable, this is the final report for this project.

4. **IMPACT:** *Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:*

What was the impact on the development of the principal discipline(s) of the project?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how findings, results, techniques that were developed or extended, or other products from the project made an impact or are likely to make an impact on the base of knowledge, theory, and research in the principal disciplinary field(s) of the project. Summarize using language that an intelligent lay audience can understand (Scientific American style).

Findings from this project have been seen as contributing to the overall knowledge base on the employment of youth with autism. This project demonstrated the portability of the Project SEARCH plus ASD model to a new population, military dependent youth with ASD.

What was the impact on other disciplines?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how the findings, results, or techniques that were developed or improved, or other products from the project made an impact or are likely to make an impact on other disciplines.

As more individuals with significant impact from ASD demonstrate successful employment outcomes, the overall outlook regarding the lifelong impact of ASD will likely change.

What was the impact on technology transfer?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe ways in which the project made an impact, or is likely to make an impact, on commercial technology or public use, including:

- *transfer of results to entities in government or industry;*
- *instances where the research has led to the initiation of a start-up company; or*
- *adoption of new practices.*

Because of the success of the Fort Eustis project, Naval Air Station, Oceana has implemented the intervention. U.S. Army Garrison, Fort Lee is planning to implement the intervention in the coming year. It is likely that this model will continue to be adopted by other military bases.

What was the impact on society beyond science and technology?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how results from the project made an impact, or are likely to make an impact, beyond the bounds of science, engineering, and the academic world on areas such as:

- *improving public knowledge, attitudes, skills, and abilities;*
- *changing behavior, practices, decision making, policies (including regulatory policies), or social actions; or*
- *improving social, economic, civic, or environmental conditions.*

Beyond the bounds of science, this project has resulted in changes in attitudes among the co-workers of individuals with autism. Specifically, the co-workers of these youth now view them as contributors to their work environment rather than individuals who require care. Further, these individuals who gained employment have experienced growth in all areas of their lives.

5. **CHANGES/PROBLEMS:** *The PD/PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction. If not previously reported in writing, provide the following additional information or state, “Nothing to Report,” if applicable:*

Nothing to report

Changes in approach and reasons for change

Describe any changes in approach during the reporting period and reasons for these changes. Remember that significant changes in objectives and scope require prior approval of the agency.

Nothing to report

Actual or anticipated problems or delays and actions or plans to resolve them

Describe problems or delays encountered during the reporting period and actions or plans to resolve them.

Nothing to report

Changes that had a significant impact on expenditures

Describe changes during the reporting period that may have had a significant impact on expenditures, for example, delays in hiring staff or favorable developments that enable meeting objectives at less cost than anticipated.

Nothing to report

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents

Describe significant deviations, unexpected outcomes, or changes in approved protocols for the use or care of human subjects, vertebrate animals, biohazards, and/or select agents during the reporting period. If required, were these changes approved by the applicable institution committee (or equivalent) and reported to the agency? Also specify the applicable Institutional Review Board/Institutional Animal Care and Use Committee approval dates.

Significant changes in use or care of human subjects

There were no changes in the use or care of human subjects

Significant changes in use or care of vertebrate animals

Not Applicable

Significant changes in use of biohazards and/or select agents

Not Applicable

6. PRODUCTS: *List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state "Nothing to Report."*

- **Publications, conference papers, and presentations**

Report only the major publication(s) resulting from the work under this award.

Journal publications. *List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume; year; page numbers; status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

1. Wehman, P., Schall, C., Avellone, L., McDonough, J., Whittenburg, H., Dubois, T., & Broda, M. Effects of a 9-month military-base internship on the competitive integrated employment of military dependent and connected youth with ASD. *Journal of Autism and Developmental Disorders*. (Pending Revision). Federal Support Acknowledged. See Appendix B.
2. Avellone, L., Taylor, J., Ham, W., Schall, C., Wehman, P., Brooke, V., Strauser, D. A scoping review on internship programs and employment outcomes for students with intellectual and developmental disabilities. *Rehabilitation Research, Policy, and Education*. (Awaiting Publication). Federal Support Acknowledged. See Appendix C.
3. Schall, C., Sima, A. P., Avellone, L., Wehman, P., McDonough, J., & Brown, A. (2020) The effect of business internships model and employment on enhancing the independence of young adults with significant impact from autism. *Intellectual and Developmental Disabilities*, 58(4), 2020; 301-313. Federal Support Acknowledged.
4. Whittenburg, H., McDonough, J., Schall, C., DuBois, T., Vitullo, V., & Wehman, P. (In Review). The Impact of COVID-19 on the Employment of Military Dependent and Connected Youth with ASD. Submitted to *Journal of Autism and Developmental Disorders*. Federal Support Acknowledged. See Appendix D.
5. Whittenburg HN, Xu Y, Thoma C, Schall C, Ham W. Effects of Behavioral Skills Training with Video Modeling and in Situ Training on Workplace Conversational Skills of Autistic Students. *Focus on Autism and Other Developmental Disabilities*. (Awaiting Publication). Federal Support Acknowledged. See Appendix E.
6. Whittenburg, H., Schall, C., Wehman, P., McDonough, J., & DuBois, T. Helping High School-Aged Military Dependents with Autism Gain Employment through Project SEARCH + ASD Supports. Advance online publication. DOI: 10.1093/milmed/usz224; 2019; Federal Support Acknowledged.

Books or other non-periodical, one-time publications. *Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

1. McDonough, J. T., Brooke, A., Ham, W., Whittenburg, H. N., Schall, C. M., & Brooke, V. Preparing students for employment. In P. Wehman & J. Kregel (Ed.s) *Functional Curriculum for Elementary and Secondary Students with Special Needs*, 4th Ed. Austin TX: ProEd, 263-275; 2019; Chapter in Book; published; federal support acknowledged.

2. Wehman, P., Schall, C., Avellone, L., Brooke, A. M., Brooke, V., McDonough, J., & Whittenburg, H.. Achieving competitive integrated employment for individuals with intellectual and developmental disabilities. In L. M. Glidden, L. Abbeduto, L. L. McIntyre, & M. J. Tassé (Eds.), APA handbooks in psychology® series. APA handbook of intellectual and developmental disabilities: Clinical and educational implications: Prevention, intervention, and treatment (Vol. 2, p. 333–355). American Psychological Association. <https://doi-org.proxy.library.vcu.edu/10.1037/0000195-013>; 2021; Chapter in Book; published; federal support acknowledged.
3. Wehman, P., Schall, C., Taylor, J., Avellone, L., & Seward, H. Interdisciplinary Vocational interventions for Individuals with ASD. In R. Rieske (Ed.) Handbook of Interdisciplinary Treatments for Autism Spectrum Disorder. Cham, Switzerland: Springer Nature. ISBN 978-3-030-13027-5 (eBook). <https://doi.org/10.1007/978-3-030-13027-5>; 2019; Chapter in Book; published; federal support acknowledged.
4. Wehman, P., Ham, W., Whittenburg, H., Avellone, L., & McDonough, J. (2019). Assessment in transition from school to work and the community. In D. Strauser, T. Tansey, & F. Chan (Eds.), Assessment in rehabilitation and mental health counseling (pp. 283-306). DOI: 10.1891/9780826162434.0013; Chapter in Book; Published; Federal Support Acknowledged.

Other publications, conference papers and presentations. *Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication as noted above. List presentations made during the last year (international, national, local societies, military meetings, etc.). Use an asterisk (*) if presentation produced a manuscript.*

1. Whittenburg, H. N., & Schall, C. (February 22, 2019). Effective Strategies to Improve the Work-Related Social Skills of Youth with Autism. Presentation at Association for Positive Behavior Support International Conference on Positive Behavior Support, Washington, DC. National Peer Reviewed Conference Presentation; Federal Support Acknowledged.
2. Taylor, J., & Whittenburg, H. N. (June 24, 2019). Using technology to teach functional skills in school and work settings. Presentation at Virginia Community of Leaders in Autism Conference. Richmond, VA; State Conference Presentation; Federal Support Acknowledged.
3. Putnam, R., Schall, C., Smith, S., & Fontechia, S. (February 21, 2019). Innovative Practices in Vocational Services for Individuals with ASD and/or IDD. 16th International Conference on Positive Behavior Support. Washington, DC; National Peer Reviewed Conference Presentation; Federal Support Acknowledged.
4. Rothholz, D., Fowler, C., Lollar, R., Johnson, J., & Schall, C. PBS in Transition for Youth with I/DD: System and Content Considerations. 16th International Conference on Positive Behavior Support. Washington, DC; National Peer Reviewed Conference Presentation; Federal Support Acknowledged.

5. Schall, C., McDonough, J., & Whittenburg, H. (August 21, 2018). Helping High School-Aged Military Dependents with ASD Gain Employment Skills Through Project SEARCH + ASD Supports at Fort Eustis. Presentation at Military Health System Research Symposium, Orlando, FL; National Peer Reviewed Conference Presentation; Federal Support Acknowledged.
 6. Whittenburg, H. N., Gokita, T., & Pickover, G.S. (June 10, 2017). Building Collaborative Partnerships Between Schools and Businesses to Improve Transition Outcomes for Students with Disabilities. Presentation at Marymount University: Global Perspectives: Instructional Strategies for the Special Education Needs of ALL Learners Conference, Arlington, VA.
National Peer Reviewed Conference Presentation; Federal Support Acknowledged.
 7. Whittenburg, HN; (2020) Effects of Behavioral Skills Training with In Situ Training on Workplace Conversational Skills of Transition-Aged High School Students with Autism Spectrum Disorder; Dissertation; Published online <https://doi.org/10.25772/FVFE-F102>; Federal Support Not Acknowledged.
 8. Alexander, K. C., Clemens, E. M., Gilbert, M., McBreen, J., Whittenburg, H., Farmer, M., & Humana Military (2019). Life journey through autism: A guide for military families. Retrieved from Organization for Autism Research website: <https://researchautism.org/resources/a-guide-for-military-families/>; One time publication. Federal Support Not Acknowledged.
 9. Whittenburg, H., Ham, W., & McDonough, J. (2017). Research brief #1: Visual supports. Retrieved from Virginia Commonwealth University Work Support website: <http://www.worksupport.com/resources/viewContent.cfm/1257>; Online plain language publication; federal support acknowledged.
 10. Whittenburg, H., Ham, W., & McDonough, J. (2017). Research brief #3: Social narratives. Retrieved from Virginia Commonwealth University Work Support website: <http://www.worksupport.com/resources/viewContent.cfm/1256>; Online plain language publication; federal support acknowledged.
 11. Whittenburg, H., Ham, W., & McDonough, J. (2017). Research brief #4: Activity schedules. Retrieved from Virginia Commonwealth University Work Support website: <http://www.worksupport.com/resources/viewContent.cfm/1255>; Online plain language publication; federal support acknowledged.
- **Website(s) or other Internet site(s)**
List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

The Deployed 2 Work website provides an overview of the research study, with specific information about internship activities and instructional strategies.

<https://vcurrtc.org/deployed2work/>

In addition, we recorded a few webcasts that are archived for viewing by the public. They are listed below:

Understanding and Supporting the Mental Health Needs of Individuals with Autism Spectrum Disorders; presented on May 8, 2018 by Staci Carr, Ph.D. and Carol Schall, Ph.D.

<https://vcurrtc.org/training/webcastDetails.cfm/412>

Transition Services And Funding: Sam's Project SEARCH Real Example; presented on September 20, 2017 by Mark Peterson, VDARS, Sherrina Sewell, VDARS, Sam Hulcher, and Bradford Hulcher, <https://vcurrtc.org/training/webcastDetails.cfm/413>

What does WIOA Mean to Young Adults and Job Seekers? Presented on September 13, 2017 by Matt Luther and Jean Steveson of VDARS, <https://vcurrtc.org/training/webcastDetails.cfm/403>

- **Technologies or techniques**

Identify technologies or techniques that resulted from the research activities. Describe the technologies or techniques were shared.

A technique that was validated through single subject research through the dissertation work of Dr. Holly N. Whittenburg, On-Site Project Coordinator, was the use of behavioral skills training with video modeling and in-situ training. This practice is described in publication of Dr. Whittenburg's dissertation, and publication referenced above.

- **Inventions, patent applications, and/or licenses**

Identify inventions, patent applications with date, and/or licenses that have resulted from the research. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Nothing to report

- **Other Products**

Identify any other reportable outcomes that were developed under this project. Reportable outcomes are defined as a research result that is or relates to a product, scientific advance, or research tool that makes a meaningful contribution toward the understanding, prevention, diagnosis, prognosis, treatment and /or rehabilitation of a disease, injury or condition, or to improve the quality of life. Examples include:

- *data or databases;*
- *physical collections;*
- *audio or video products;*
- *software;*
- *models;*

- *educational aids or curricula;*
- *instruments or equipment;*
- *research material (e.g., Germplasm; cell lines, DNA probes, animal models);*
- *clinical interventions;*
- *new business creation; and*
- *other.*

As a part of the products designed and tested by this project, we developed the Relocation and Deployment Plan. Please see appendix A for a copy of this product.

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?

Provide the following information for: (1) PDs/PIs; and (2) each person who has worked at least one person month per year on the project during the reporting period, regardless of the source of compensation (a person month equals approximately 160 hours of effort). If information is unchanged from a previous submission, provide the name only and indicate "no change".

Example:

Name: Mary Smith
Project Role: Graduate Student
Researcher Identifier (e.g. ORCID ID): 1234567
Nearest person month worked: 5

Contribution to Project: Ms. Smith has performed work in the area of combined error-control and constrained coding.
Funding Support: The Ford Foundation (Complete only if the funding support is provided from other than this award.)

Name:	Paul Wehman, Ph.D.
Project Role:	Principal Investigator
Researcher Identifier (e.g. ORCID ID):	https://orcid.org/0000-0003-1538-8821
Nearest person month worked:	0.4
Contribution to Project:	Oversaw all activities on the grant. Provided advice and supervision to staff on the project. Has been instrumental in and oversaw the submission of all IRB Protocols.
Funding Support:	

Name:	Carol Schall, Ph.D.
Project Role:	Co-Investigator, Research and Project Director
Researcher Identifier (e.g. ORCID ID):	https://orcid.org/0000-0001-7520-9974
Nearest person month worked:	2.2

Contribution to Project:	<i>Communicated with all IRBs throughout project. Oversaw and directed all research activities including data collection, scoring, database development, and data analysis. Developed and co-wrote all publications resulting from this project.</i>
Funding Support:	

Name:	<i>Jennifer McDonough, MS, CRC,</i>
Project Role:	<i>Project Coordinator</i>
Researcher Identifier (e.g. ORCID ID):	<i>https://orcid.org/0000-0002-3059-1943</i>
Nearest person month worked:	<i>0.6</i>
Contribution to Project:	<i>Coordinated project activities across all staff and collaborators. Attended all meetings to discuss project implementation. Collaborated with Dr. Schall to provide ongoing technical assistance to all direct staff at research site. Conducted fidelity checks. Collaborated with new projects at Naval Air Station Oceana and U.S. Army Garrison Fort Lee</i>
Funding Support:	

Name:	<i>Lauren Avellone, Ph.D.</i>
Project Role:	<i>Research Specialist</i>
Researcher Identifier (e.g. ORCID ID):	<i>https://orcid.org/0000-0003-2340-1598</i>
Nearest person month worked:	<i>0.8</i>
Contribution to Project:	<i>Coordinated and completed all baseline 12-month and 18-month data collection activities for all cohort treatment and control group participants. Continued to maintain database. Assisted with the writing of all publications resulting from this project.</i>
Funding Support:	

Name:	<i>Thomas Dubois</i>
Project Role:	<i>Job Coach</i>
Researcher Identifier (e.g. ORCID ID):	
Nearest person month worked:	<i>2.0</i>
Contribution to Project:	<i>Provided direct job coaching supports to participants in the project. Led job development efforts with all treatment group participants. Provided follow along supported employment services to all graduates who continued to work.</i>
Funding Support:	

Name:	<i>Hannah Seward</i>
-------	----------------------

Project Role:	Research Assistant
Researcher Identifier (e.g. ORCID ID):	
Nearest person month worked:	1.3
Contribution to Project:	Collected and scored all baseline 12-month and 18-month data collection activities for all cohort treatment and control group participants. Uploaded all data into database.
Funding Support:	

The table below presents the person months for all staff across all five years of the project:

Name	Person Months Reported in 2017	Person Months Reported in 2018	Person Months Reported in 2019	Person Months Reported in 2020	Person Months Reported in 2021
Avellone , Lauren E	*	1.2	1.2	1.68	0.8
Dansey, Kathleen	**	**	12	10.47	**
DuBois, Thomas A	1	10.2	10.8	10.78	2.0
McDonough, Jennifer T	1	3.36	3.2	2.44	0.6
Schaffer, Rhoda L	**	**	8.5	10.2	**
<i>Schall, Carol M</i>	<i>1</i>	<i>2.4</i>	<i>2.5</i>	<i>2.48</i>	<i>2.2</i>
Seward, Hannah E	*	*	*	1.53	1.3
Sima, Adam	*	*	*	*	*
Vanderburg, Nicholas M	*	*	**	**	**
<i>Wehman, Paul H</i>	<i>Less than 1</i>	<i>0.96</i>	<i>1.1</i>	<i>1.14</i>	<i>0.4</i>
Whittenburg, Holly N	1	10.2	8.1	8.62	**

Italics = Key Personnel whose effort was reported in every annual report regardless of number of person months

* Effort was only reported for non-key personnel if they exceeded 1 person month per calendar year

** Not employed by the project and provided no effort at all.

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

If the active support has changed for the PD/PI(s) or senior/key personnel, then describe what the change has been. Changes may occur, for example, if a previously active grant has closed and/or if a previously pending grant is now active. Annotate this information so it is clear what has changed from the previous submission. Submission of other support information is not necessary for pending changes or for changes in the level of effort for active support reported previously. The awarding agency may require prior written approval if a change in active other support significantly impacts the effort on the project that is the subject of the project report.

Nothing to report

What other organizations were involved as partners?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe partner organizations – academic institutions, other nonprofits, industrial or commercial firms, state or local governments, schools or school systems, or other organizations (foreign or domestic) – that were involved with the project. Partner organizations may have provided financial or in-kind support, supplied facilities or equipment, collaborated in the research, exchanged personnel, or otherwise contributed.

Provide the following information for each partnership:

Organization Name:

Location of Organization: (if foreign location list country)

Partner’s contribution to the project (identify one or more)

- *Financial support;*
- *In-kind support (e.g., partner makes software, computers, equipment, etc., available to project staff);*
- *Facilities (e.g., project staff use the partner’s facilities for project activities);*
- *Collaboration (e.g., partner’s staff work with project staff on the project);*
- *Personnel exchanges (e.g., project staff and/or partner’s staff use each other’s facilities, work at each other’s site); and*
- *Other.*

Virginia Commonwealth University was the only active partner in year five of this project. However, below we present the partners that assisted the project in years 1 – 4.

Organization Name: the 733rd Mission Support Group, Joint Base Langley Eustis (733 MSG-JBLE)

Location of Organization: Newport News Virginia

Partner’s contribution to the project 733 MSG-JBLE provides classroom space and multi-volunteer student internship site for the program.

Financial support; 733 MSG-JBLE do not offer any financial assistance.

In-kind support; 733 MSG-JBLE offers classroom tables and chairs, internet availability, and various office materials and supplies including white board and markers, LDC projector and screen.

Facilities (e.g., project staff use the partner’s facilities for project activities); Classroom space

Collaboration (e.g., partner’s staff work with project staff on the project); 733 MSG-JBLE business liaison collaborate and have signed a Memorandum of Understanding with all other organizations in the project. See Appendix 5 for signed Memorandum of Understanding.

Personnel exchanges (e.g., project staff and/or partner’s staff use each other’s facilities, work at each other’s site); None

Other; There are no other contributions.

Organization Name: Newport News Public Schools (NNPS)

Location of Organization: Newport News Virginia

Partner's contribution to the project NNPS is the school division operating the Project SEARCH Classroom. They are contributing a teacher and instructional assistant to the project. They also assist in all recruitment activities through their schools.

Financial support; NNPS do not offer any financial assistance.

In-kind support; NNPS offers 2 staff members to the project. They have also offered office equipment and materials including 2 computers, paper, pencils, and other classroom items. Finally, NNPS has offered time from their transition coordinator to supervise the teacher and coordinate the activities of the classroom.

Facilities (e.g., project staff use the partner's facilities for project activities); None

Collaboration (e.g., partner's staff work with project staff on the project); NNPS Staff collaborate and have signed a Memorandum of Understanding with all other organizations in the project.

Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); NNPS staff work on site in the classroom at 733 MSG-JBLE and

Other; There are no other contributions from NNPS

Organization Name: Hampton City Schools (HCS)

Location of Organization: Hampton, Virginia

Partner's contribution to the project HCS is a participating school division in the Project SEARCH Classroom. They also assist in all recruitment activities through their schools.

Financial support; HCS do not offer any financial assistance.

In-kind support; HCS have also offered office equipment and materials including paper, pencils, and other classroom items. Finally, HCS has offered time from their transition coordinator to participate in recruitment and planning meetings.

Facilities (e.g., project staff use the partner's facilities for project activities); None

Collaboration (e.g., partner's staff work with project staff on the project); HCS Staff collaborate and have signed a Memorandum of Understanding with all other organizations in the project.

Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); HCS staff visit the classroom at 733 MSG-JBLE

Other; There are no other contributions from HCS

Organization Name: Williamsburg, James City County Public Schools (WJCCPS)

Location of Organization: Williamsburg, Virginia

Partner's contribution to the project: WJCCPS is a participating school division in the Project SEARCH Classroom. They also assist in all recruitment activities through their schools.

Financial support; WJCCPS do not offer any financial assistance.

In-kind support; WJCCPS have also offered office equipment and materials including paper, pencils, and other classroom items. Finally, WJCCPS has offered time from their transition coordinator to participate in recruitment and planning meetings.

Facilities (e.g., project staff use the partner's facilities for project activities); None

Collaboration (e.g., partner's staff work with project staff on the project); WJCCPS Staff collaborate but have not yet signed a Memorandum of Understanding with all other organizations in the project. They will sign the MOU once they have students who elect to participate in the project.

Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); WJCCPS staff visit the classroom at 733 MSG-JBLE

Other; There are no other contributions from WJCCPS

Organization Name: York County School District (YCSD)

Location of Organization: York, Virginia

Partner's contribution to the project YCSD is a participating school division in the Project SEARCH Classroom. They also assist in all recruitment activities through their schools.

Financial support; YCSD do not offer any financial assistance.

In-kind support; YCSD have also offered office equipment and materials including paper, pencils, and other classroom items. Finally, YCSD has offered time from their transition coordinator to participate in recruitment and planning meetings.

Facilities (e.g., project staff use the partner's facilities for project activities); None

Collaboration (e.g., partner's staff work with project staff on the project); YCSD Staff collaborate and have signed a Memorandum of Understanding with all other organizations in the project.

Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); YCSD staff visit the classroom at 733 MSG-JBLE

Other; There are no other contributions from YCSD

Organization Name: Virginia Department of Aging and Rehabilitative Services (DARS)

Location of Organization: Newport News, Virginia

Partner's contribution to the project DARS is a participating agency in the Project SEARCH Program. They also assist in all recruitment activities through case lists.

Financial support; DARS receives a total of \$68,000 across the 4 years of the grant, (\$17,000 per year) to provide a case manager for all of the students included in the project.

In-kind support; DARS has not offered any in-kind support for the project.

Facilities (e.g., project staff use the partner's facilities for project activities); None

Collaboration (e.g., partner's staff work with project staff on the project); DARS Staff collaborate with all other organizations in the project.

Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); DARS staff visit the classroom at 733 MSG-JBLE

Other; There are no other contributions from DARS

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: *For collaborative awards, independent reports are required from BOTH the Initiating Principal Investigator (PI) and the Collaborating/Partnering PI. A duplicative report is acceptable; however, tasks shall be clearly marked with the responsible PI and research site. A report shall be submitted to <https://ebrap.org/eBRAP/public/index.htm> for each unique award.*

QUAD CHARTS: *If applicable, the Quad Chart (available on <https://www.usamraa.army.mil/Pages/Resources.aspx>) should be updated and submitted with attachments.*

9. **APPENDICES:** *Attach all appendices that contain information that supplements, clarifies or supports the text. Examples include original copies of journal articles, reprints of manuscripts and abstracts, a curriculum vitae, patent applications, study questionnaires, and surveys, etc.*

Appendix A: Relocation and Deployment Plan

Appendix B: Wehman, P., Schall, C., Avellone, L., McDonough, J., Whittenburg, H., Dubois, T., & Broda, M. Effects of a 9-month military-base internship on the competitive integrated employment of military dependent and connected youth with ASD. *Journal of Autism and Developmental Disorders*. (Pending Revision). Federal Support Acknowledged.

Appendix C: Avellone, L., Taylor, J., Ham, W., Schall, C., Wehman, P., Brooke, V., Strauser, D. A scoping review on internship programs and employment outcomes for students with intellectual and developmental disabilities. *Rehabilitation Research, Policy, and Education*. (Awaiting Publication). Federal Support Acknowledged.

Appendix D: Whittenburg, H., McDonough, J., Schall, C., DuBois, T., Vitullo, V., & Wehman, P. (In Review). The Impact of COVID-19 on the Employment of Military Dependent and Connected Youth with ASD. Submitted to *Journal of Autism and Developmental Disorders*. Federal Support Acknowledged.

Appendix E: Whittenburg HN, Xu Y, Thoma C, Schall C, Ham W. Effects of Behavioral Skills Training with Video Modeling and in Situ Training on Workplace Conversational Skills of Autistic Students. *Focus on Autism and Other Developmental Disabilities*. (Awaiting Publication). Federal Support Acknowledged.

Appendix A

Project SEARCH Plus ASD Supports

Family Relocation and Deployment Plan

PS + ASD Model

Family Relocation and Deployment Plan

Over the course of our lives, we experience many transitions. One of the most important ones is the transition from high school to adult life. This is an exciting, and sometimes challenging, period of time for many young adults, including youth with Autism Spectrum Disorder (ASD). Making the move from school to work requires young adults with ASD to develop a plan for the future, and then identify and access the supports and services needed to help them achieve their goals. For military dependent youth with ASD, this process may be a bit more complex, due to potential relocations and deployments. The goal of this guide is to provide military dependent youth with ASD and their families the needed information and resources to make the transition from school to work a successful one.

Transition Process

The transition process for youth with disabilities involves two different areas:

- **Transition planning:** Developing postsecondary goals related to critical adult outcomes in areas such as training, education, employment, and independent living
- **Transition services:** Participating in the services needed to achieve postsecondary goals (e.g., work experiences, college counseling, self-advocacy instruction, budget planning)

What Transition Is and Isn't

It can be difficult sometimes to keep straight what should (and shouldn't be) happening during the transition process. The chart below highlights several key transition-related ideas by describing examples and non-examples of effective transition planning and services.

TRANSITION IS...	TRANSITION ISN'T...
Collaborative: students, families, special educators, vocational rehabilitation counselors, and other adult service providers work together while the student is in high school to create a plan to prepare him or her for life after school.	Sequential – State vocational rehabilitation counselors and other adult service providers only become involved in planning when a student is about to exit high school

TRANSITION IS...	TRANSITION ISN'T...
Person-centered: The plan for transition incorporates the student's strengths, preferences, and interests. The student participates in meetings where transition planning and services is discussed.	One-size-fits-all: The transition plan is based on available programming or employment areas where "most" students with disabilities work. The student does not always attend meetings where transition is being discussed.
Results-driven: The focus of transition services and activities is on improving the student's academic or functional performance to prepare him or her for life after high school.	Activity-driven: The focus of transition is on participating in a particular program or attending a given course. The transition activities do not link back to specific transition goals or do not necessarily help the student learn the skills he or she needs to achieve his or her goals

Laws Guiding the Transition Process

The Individuals with Disabilities Education Act (IDEA)

For students who receive special education services, IDEA governs school-driven transition planning and services. Specific requirements related to transition within IDEA include:

- Providing transition services that are results-oriented, focused on helping students move from school to adult life, individualized, and include a variety of experiences and instruction to prepare students for life after school,
- IEP planning that starts no later than the year the student turns 16 - although some states may have laws that require transition planning to start sooner than that,
- Measurable postsecondary IEP goals that are based on transition assessments and are linked to the transition services and academic courses of study needed to help reach the goals

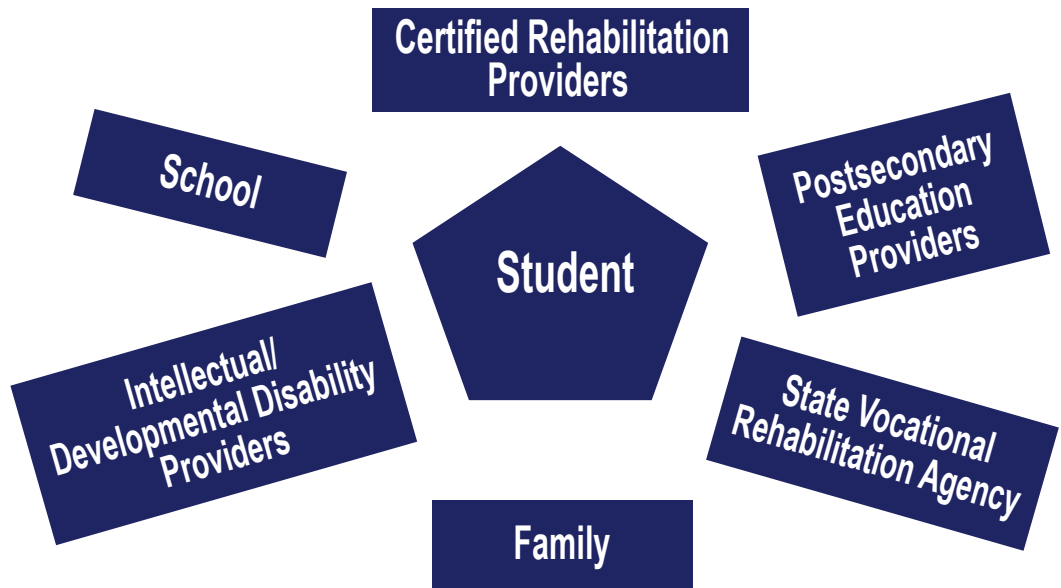
The Workforce Innovation and Opportunity (WIOA)

For students who receive special education services or who have a disability, additional pre-employment transition services may be available through WIOA. WIOA requires state Vocational Rehabilitation (VR) agencies to work together with schools, other state agencies, community providers, local workforce development boards, one-stop centers, and employers to develop a variety of work opportunities for transition-aged youth with disabilities while they are in school. State vocational rehabilitation agencies are required to provide the following pre-employment transition services:

- Job/career exploration counseling
- Work-based learning experiences
- Postsecondary educational counseling
- Workplace readiness training on social skills and independent living
- Self-advocacy instruction (see: <http://www.wintac.org/topic-areas/pre-employment-transition-services/resources/resources-instruction-self-advocacy>)

Who is Often Involved in the Transition Process?

As students get closer to leaving school, adult agency partners begin to play larger roles in developing strategies and providing services for achieving post-school outcomes. Although the partners involved in the transition process will vary for each student, based on the student's individualized transition goals, the graphic below identifies some of the most common partners in the transition process.



Promising Transition Practices for Young Adults with ASD

Recent research indicates that work experiences while in high school are strong predictors of post-school employment success for young adults with ASD and other disabilities (Carter, Austin, & Trainor, 2012). Work experiences may take a variety of forms, ranging from traditional community-based instructional programs, to volunteering, to internship programs like Project SEARCH, to paid part-time or summer employment. It's important for students and families to be aware of key features of successful work experience programs. Below is a list of program features, taken from the Project SEARCH + ASD Supports model, which may assist students with ASD in learning the skills needed to make a smooth transition from school to work.

Key Features to Look for in Work Experience Programs (Wehman, et al., 2012)

- Goal of competitive, integrated employment for students
- Sustained opportunities to learn work skills and gain work experience in areas related to students' personal career interests
- Ongoing collaboration between school, VR, other adult agencies, students, and families
- Instruction in work-related social skills
- Systematic instruction in learning work tasks
- Use of visual supports and handheld technology to increase student accuracy and independence in performing work tasks
- Development and implementation of positive behavior supports to address problem behaviors within the workplace setting

Considerations for Family Relocations

Planning family relocations can be challenging no matter the circumstances. However, when a military family with a transition-aged youth with ASD relocates, there are several additional factors to consider. First, state agencies have their own rules and policies for accessing support services. Be sure to make contact with state VR and state Intellectual and Developmental Disabilities (I/DD) agencies as soon as possible to start the process for applying for services. Second, if the family member with ASD is still enrolled in high school, learn about transition supports and services available through the local school district's special education transition programming. Remember, transition is individualized process based on the student's strengths and interests, so don't be afraid to advocate for what your student needs. Finally, consider how internship or work experiences gained on prior military installations could transfer to new settings. For example, if your student learned stocking and merchandising skills through an internship at the Exchange department store on your last assignment, she might be interested in applying for a part-time merchandising position at the Exchange department store on the new installation. Below is a list of "to do's" prior to and after a family relocation.

Transition "To Do's" During Family Relocations

Before the Move

1. Contact local VR office
2. Contact I/DD state agency
3. Contact new school district special education department (if student hasn't completed school yet)
4. Check special education department website of local school district in new location – look for transition information
5. Make list of current on-installation employment/internship contacts
6. Ask current employment/internship contacts if they can refer student to their counterparts at new installation

After the Move

1. Request permissive temporary duty when the soldier arrives at the new unit to allow more time off to get everything set up
2. If the student is still in school, schedule meeting with school to discuss transition services
3. Schedule initial meeting with local VR office counselor
4. Schedule initial meeting with state I/DD agency representative

Information to Share with New Settings

After a relocation, the focus shifts to helping the new team get to know your family member with ASD and putting in place the needed supports and services to keep moving forward towards competitive, integrated employment. The goal is to provide schools, VR agencies, other adult service providers, and potential employers with a clear picture of your student's strengths, skills, interests, and experiences. Use the checklist below to develop a portfolio about your student to share with new partners.

Checklist of Information to Share with New Teams

After Getting to Know the Student Information (for schools, VR, adult service providers)

- _____ I'm Determined One Pager (see: <https://www.imdetermined.org/resource/one-pager/>)
- _____ Consumer Profile
- _____ Work-based supports and effective instructional/behavioral strategies for student
- _____ Employment application information sheet (see: <https://www.cehd.umn.edu/DHH-Resources/Transition-Guide/resources/PersonalInformationSheet.pdf>)

Employment information (for schools, VR, adult service providers, and potential employers)

- _____ Letters of reference from mentors/supervisors
- _____ Internship evaluations
- _____ Letters of support from key people on post
- _____ Video Resume

Assessment Information (for schools, VR, adult service providers)

- _____ Support Intensity Scale results
- _____ Previous diagnostic information
- _____ Social Responsiveness Scale results (self and/or parent report)
- _____ If graduated, IEP Summary of Performance

Considerations for Family Relocations

Navigating deployments can be difficult for the soldier deploying and for the family members remaining behind. As with relocations, there may be additional considerations for military families with young adults with ASD. We've included a few transition tips for common deployment scenarios.

Transition Tips for Common Deployment Situations

- Scenario #1:** Family member deploys, young adult with ASD remains in present location
- Link with Army Community Services support groups to build support network for parent remaining behind
 - Use technology to keep deployed parent informed of what's happening with young adult's transition from school to work
 - Identify and implement supports for young adult
 - Keep young adult's service providers and/or employer informed regarding parent's deployment status
- Scenario #2:** Single parent deploys or dual military parents deploy, young adult with ASD remains in present location
- Share Family Care Plan in advance with school, adult service providers, transition team, onsite staff
 - Include review of Family Care Plan in transition planning meetings
 - Use technology to keep deployed parent(s) informed of what's happening with young adult's transition from school to work

- Identify and implement supports for young adult
- Keep young adult's service providers and/or employer informed regarding parent's deployment status

Scenario #3: Single parent deploys or dual military parents deploy, young adult moves to new location during deployment

- Make contact with new agencies, follow Family Relocation steps
- Share Family Care Plan in advance with school, adult service providers, transition team, onsite staff
- Include review of Family Care Plan in transition planning meetings
- Use technology to keep deployed parent(s) informed of what's happening with young adult's transition from school to work
- Identify and implement supports for young adult
- Keep young adult's service providers and/or employer informed regarding parent's deployment status

Work Incentives / Benefits Information

Individuals with disabilities and their families may be concerned about the effect of working on Social Security benefits, Medicaid benefits, and military-specific benefits, such as TRICARE. Although it's beyond the scope of this guide to outline the impact of work on benefits, we did want to mention that there are resources available to successfully navigate these systems. For instance, Social Security benefits counselors are available who can help individuals and families determine the effect of working on Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) benefits, including health insurance. Check with your local VR counselor to find out more about accessing these benefits analysis services. Social Security also offers a variety of incentives to help benefits recipients return to or begin work. Finally, representatives for the Defense Enrollment Eligibility Reporting System (DEERS) can also assist families in answering questions about TRICARE health insurance benefits.



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Appendix B

Wehman, P., Schall, C., Avellone, L., McDonough, J., Whittenburg, H., Dubois, T., & Broda, M. Effects of a 9-month military-base internship on the competitive integrated employment of military dependent and connected youth with ASD. *Journal of Autism and Developmental Disorders*. (Pending Revision). Federal Support Acknowledged.

**Effects of a 9-Month Military-Base Internship on the Competitive Integrated Employment
of Military Dependent and Connected Youth with ASD**

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Abstract

This waitlist-controlled cluster randomized clinical trial presents the results of PS+ASD for military dependent and connected youth with ASD. Following earlier findings regarding PS+ASD, this study expands upon that previous work by including the doubly disadvantaged military dependent and connected transition aged youth with ASD. Findings indicate that military dependent and connected youth who participated in PS+ASD gained competitive integrated employment at 60% despite the impact of the COVID-19 pandemic and economic downturn. In addition, these youth worked a mean of 24.42 hours weekly and earned an average hourly wage of \$9.38 at one year post baseline while the waitlist control group participants did not gain CIE. In addition, by 18 months, 58.3% of participants gained positions in federal employment. Implications of the study are discussed.

Keywords: autism, transition, employment, military, Project SEARCH plus ASD Supports

EFFECTS OF MILITARY-BASE INTERNSHIP

Individuals with autism spectrum disorder (ASD) display comparatively low rates of competitive employment versus individuals without disabilities and other disabilities (Alverson & Yamamoto, 2017; Shattuck et al., 2012). A decade of data from Vocational Rehabilitation (VR) services indicates that only an average of 37% of adults with ASD become employed within the community (Alverson & Yamamoto, 2017). Instead, over half of adults with ASD (56%) leave high school and end up in segregated work settings such as sheltered workshops making subminimum wage or in segregated non-work alternative settings such as day facilities (Taylor & Seltzer, 2011; Winsor et al., 2019). Providing meaningful work experience during transition-age years (14-21) is critical in combating poor post school outcomes. A plethora of research indicates that paid work experience obtained during high school is a strong predictor of employment after exit (Carter et al., 2012; Siperstein et al., 2014; Wehman et al., 2015). In fact, students with disabilities are 3.8 times more likely to be employed one year after high school if they were employed during high school (Rabren et al., 2002). Findings from the 2015 National Autism Indicators Report demonstrated that 90% of youth with ASD employed during high school later reported paid work (Roux et al., 2015). By comparison, only 40% of those who did not have a job in high school later secured paid work. Thus, it is essential that community work experience be prioritized during transition planning for youth and young adults with ASD.

In the face of such poor employment outcomes, the transition-to-work process is challenging for all young adults with ASD but military dependent youth with ASD face additional challenges (Hall, 2018). Military directed relocations cause frequent breaks in ASD related supports and services. To illustrate, military dependent youth with ASD change schools up to 9 times during K through 12th grade (Davis et al., 2016; The Ohio State University Project Team, 2011). Frequent relocation across different counties, states, and overseas disrupts the

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continuity of important educational supports due to challenges associated with transferring services in an effective and timely manner (Davis & Finke, 2015). Military families report trouble obtaining previous service records for their child, discrepancies in quality of services across locations, and having to transfer academic plans that were written specifically for other locations (Davis & Finke, 2015, Davis et al., 2016). Services barriers such as these present real cause for concern as military dependent children with ASD have a documented need for ongoing supports. For instance, Davis et al. (2016) found that 97% of military parents surveyed reported that their child with ASD had at least one medium level educational or behavioral intervention support need. In addition, 78.6% of military parents reported delayed access to services for their child with ASD following relocation (Davis et al., 2016). Despite these facts, military dependent youth with ASD remain an understudied population (Davis & Finke, 2015). To date, there is a paucity of research within the extant literature investigating effective interventions for transition-age military dependent youth with ASD that lead to competitive employment.

Several evidenced-based pathways to employment are currently recognized for non-military dependent youth with ASD, such as employment internships. In 2014, the Workforce Innovation and Opportunity Act (WIOA) mandated Vocational Rehabilitation (VR) agencies to allocate at least 15% of funding toward pre-employment transitions services (Pre-ETS) for youth and young adults with disabilities (Workforce Innovation and Technical Assistance Center, [WINTAC], 2019). This created more opportunities for transition-age students with disabilities to obtain work-based learning experiences, such as paid and unpaid internships, integrated within the community to the maximum extent possible (U.S. Department of Labor, 2018; WINTAC, 2019). The U.S. Department of Labor (2018) conceptualizes an internship as a temporary position that is primarily for the purposes of education and should therefore provide the type of

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training typically offered by an educational institution. Internships should thus provide beneficial learning opportunities as part of academic coursework or performed for educational credit (U.S. Department of Labor, 2018). Thus, employment internships are commonly utilized by adolescents and young adults as they prepare to exit secondary school and transition to paid work.

Project SEARCH is a 9-month intensive internship program recently identified as one of nine evidenced-based special education practices for transition-age students with disabilities (Rowe et al., 2021). Project SEARCH is comprised of a number of core components including workplace immersion, a supported employment approach with assessment, job development and job-site training, follow-along support, braided funding, and focus on meeting the needs of a host business (Rutkowski et al., 2006). Central to the Project SEARCH model is a collaborative effort among multiple agencies (e.g., host business, local education agency, community rehabilitation program, VR) which together provide a valuable system of vocational opportunities, funding, and employment and educational support (Almalki, 2021). Students who participate in Project SEARCH receive 180 hours of classroom instruction and 720 hours of applied experience in a work setting (Christensen et al., 2015; Christensen & Richardson, 2017). During Project SEARCH students work with educators and employment service providers to develop 2 to 3 individualized internship rotations within a host business that meets that student's vocational preferences, interests and strengths (Almalki, 2021). Students thus leave the internship with extensive work experience, a curated resume, employment references and already established connections to adult services agencies (e.g., VR) to promote a seamless transition to work.

Compared to people without disabilities and other disabilities, individuals with ASD have unique learning and sensory needs that can pose substantial barriers to securing and maintaining

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employment (Alverson & Yamamoto, 2017; Harmuth et al., 2018). These include communication and social difficulties, challenges fitting within certain work cultures, attitudinal issues from co-workers or supervisors, a lack of proper workplace support from employment agencies, and limited opportunities for upward mobility (Harmuth et al., 2018). Project SEARCH plus ASD Supports (PS+ASD) is an adapted model designed to meet the specific and unique diagnostic needs associated with ASD. Evidence-based strategies effective for individuals with ASD are embedded within the internship coursework and on-the-job experiences within the host business to teach social-communication, behavioral and educational skills necessary for success in an employment setting (Schall et al., 2015; Whittenburg et al., 2020). The PS+ASD model has been tested using the highest levels of methodological rigor and resulted in high rates of post internship employment for young adults with ASD (Wehman et al., 2017; Wehman et al., 2020; Whittenburg et al., 2020).

To illustrate, findings from two randomized control studies found superior rates of employment after internship exit for participants in PS+ASD Supports compared to peers receiving transition supports as usual (Wehman et al., 2017, Wehman et al., 2002). Wehman et al. (2017) found that 87% of PS+ASD interns were in competitive work one year after internship conclusion compared to only 12% of the control group. Findings from a multi-site randomized control study indicated that 73.4% of PS+ASD interns were employed one year after internship exit compared to 17% of the control group (Wehman et al., 2020). After completing PS+ASD Supports, interns receiving supported employment services on-the-job have been shown to need fewer employment intervention hours, earn higher wages, and demonstrate better job retention rates than peers receiving supported employment but who did not participate in PS+ASD Supports (Schall et al., 2015). In addition, youth and young adults who participate in PS+ASD

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showed lower support needs in a variety of major life domains including health and safety, social, home living and lifelong learning skills over a comparison group (Schall et al., 2020). One preliminary study reported early findings from the implementation of PS+ASD Supports on a military base. Early findings from Whittenburg et al. (2020) discussed the development of 14 internships within a military base and revealed that 83.3% of PS+ASD interns secured competitive employment compared to 0% of a control group. The purpose the current study is to describe the full sample findings from Whittenburg et al. (2020).

The objective of this proposed project was to study the impact of PS+ASD on the employment outcomes of military dependents with ASD using a randomized clinical trial with a waitlist control group. In order to accomplish this objective, the research team employed a waitlist cluster randomized controlled trial of PS+ASD for military dependents at Joint Base Eustis Langley 733d Mission Support Group. The research hypotheses tested in this study were:

1. Military dependent or connected young adults with ASD who participate in PS+ASD on a military base will demonstrate a higher rate of employment than those in the control condition.
2. Military dependent or connected young adults with ASD who participate in PS+ASD on a military base will earn higher wages on average compared to those in the control condition.
3. Military dependent or connected young adults with ASD who participate in PS+ASD on a military base will work more hours per week on average than those in the control condition.

Method

Trial Design

The design and development of this waitlist-controlled cluster randomized clinical trial was developed following the 2017 Consolidated Standards of Reporting Trials (CONSORT)

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Statement for Nonpharmacologic Treatments (Boutron, et al, 2017). Participants were allocated to the immediate treatment, or waitlist on a 1:1 ratio. This research trial was overseen by three institutional review boards (IRBs). The primary IRB was at Virginia Commonwealth University, with secondary review provided by the Virginia Department of Aging and Rehabilitative Services, and the Human Research Protection Office of the United States Army Medical Research and Development Command. This study was registered at clinicaltrials.gov as NCT04001790.

Participants

Participants were eligible to participate in the research if they met the following inclusion criteria:

- Have a medical diagnosis or educational eligibility of Autism or ASD
- Be a military dependent or connected youth
- Be between the ages of 18-21
- Be entering their final year of public-school participation in a participating school district and on track to receive an individualized education program certificate
- Possess independent personal hygiene, eating, and basic grooming skills
- Be able to pass a drug screen, felony check and willing to have up-to-date immunizations as may be required by internship sites, or potential employers
- Have a desire to gain competitive integrated employment upon graduation from public school

A military dependent youth was defined as the child or ward of:

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- a parent, stepparent or guardian who was currently serving on active duty in, on reserves, retired, or medically discharged from the Army, Navy, Air Force, Marines, Coast Guard, or the National Guard or
- a parent, stepparent or guardian who died in service of one of the branches of military listed above.

A military connected youth was defined as a person who had:

- A parent or guardian, immediate family member, or any person who lived in the same household who worked as a civilian on a military base, as a federal employee who provided work or services to a military base or whose office was located on a military base, or who was contractor to a military base
- An immediate family member other than the parent or guardian, or any person who lived in the same household who was serving on active duty in, on reserves, retired, or medically discharged from the Army, Navy, Air Force, Marines, Coast Guard, or the National Guard on active duty or reserves
- An immediate family member other than the parent or guardian or any person who lived in the same household who died in service of one of the branches of military listed above.

Participants were excluded if they were unable to provide consent. Participants who were not their own legal guardian were excluded if their legal guardian was not able or willing to provide consent and/or if the potential participant was unable or unwilling to provide assent. This clinical trial was a community-based trial with an implementation team who ensured the delivery of the intervention and a research team that supervised data collection and analysis.

Interventions

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The interventions compared in this study were PS+ASD for military connected and dependent youth versus high school as usual. Each intervention is described briefly below.

PS+ASD for Military Dependent and Connected Students

PS+ASD, as previously described, was the 9-month intervention that involved the delivery of the Project SEARCH model with the addition of an array of applied behavior analytic interventions to meet the needs of youth with ASD (Daston, et al., 2012; Wehman, 2017). Project SEARCH is a transition program that focuses on teaching youth with significant disabilities employment skills and behaviors by immersing transition-aged youth with significant disabilities into a large business environment. In addition, youth in the program identify career goals and rotate through three 10–12-week internships where they can learn skills to accomplish those career goals. The business' needs for entry level employees drive the opportunities provided in the program so that participating youth are learning skills in needed fields that match their career goals. The program is collaboratively funded and staffed by educational and adult services agencies. Finally, the goal of the program is for participating youth to gain CIE upon or soon after their graduation as they frequently graduate with a resume and references from the business site. In addition to specific job skills, participants also learn important behavioral skills that will increase their ability to gain and maintain CIE like transportation to and from work, clothing management for work, and money management for daily work experiences such as buying lunch and taking public transportation to and from work.

Wehman, et al. (2017 & 2020) developed an array of interventions and supports to meet the unique needs of youth with ASD seeking CIE. ASD supports included a higher ratio of professionals and paraprofessionals to interns. Project SEARCH usually has 3 to 4 students to every professional or paraprofessional staff member. PS+ASD has a lower student to staff ratio

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with 2 – 2.5 students to every staff member. This resulted in a higher amount of direct instruction available to participants with ASD (Wehman, et al., 2020). In addition, the job coach and educational staff were trained in and used applied behavior analytic instructional techniques to meet the learning needs of youth with ASD.

This iteration of the model was delivered on Fort Eustis Military Base. This was the second Project SEARCH model to be delivered on a military base, and the first to specifically target military dependent and connected youth with ASD. The military component added to the PS+ASD model was to provide the intervention on a military base and include specialized planning to address military related relocation or deployment that might directly affect these youth. This aspect addressed the needs of the military dependent and connected youth participants and their family members.

There were three teams of implementers that oversaw and implemented the research. The first was the implementation team. This team was composed of those individuals who implemented PS+ASD daily. They were the classroom teacher and paraprofessional educator, the assigned job coach, and the site coordinator. The implementation team met daily or more to implement PS+ASD and meet the needs of the participants. They received intensive initial training in the PS+ASD model and routinely received additional training based on the needs of the participants. In addition, the implementation team regularly met with a positive behavior support facilitator and/or a board-certified behavior analyst to provide additional individualized supports to students with ASD who had higher intensity needs. This aspect of support to the implementation team ensured that the ASD supports were delivered with fidelity to the participants. The second team was the oversight team. This team was composed of representatives from the military base, the three participating school divisions, the regional

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program, the employment services organization providing job coaching services, and the vocational rehabilitation case manager. This team met monthly to oversee the implementation of the program and plan for upcoming events like recruitment of new participants. These two teams are standard operations teams in the PS+ASD model and were funded through the regular funding streams including federal, state, and local education and rehabilitative services funds. The third team was the research team. This team ensured that the research aspect of the model was carried out using ethically sound research practices. They were also responsible for ensuring the training of an independent data collector and the implementation of all aspects of the research project. This third team was only present for research purposes and was funded by the research grant.

Fidelity of implementation to the intervention was monitored in multiple ways. Those ways included training the implementation staff by Project SEARCH developers from Cincinnati Children's Hospital and the Virginia State Project SEARCH Coordinator, monitoring by the project director who was the Virginia Project SEARCH Representative, review by the developers of Project SEARCH from Cincinnati Children's Hospital, monitoring of daily operations by the trained site coordinator, and monthly review by the research director and principal investigator.

High School as Usual

The high school condition in this study was considered the control arm of the waitlist cluster randomized controlled trial. Participants who were assigned to the high school arm of the study received their educational services at their assigned local high schools. They attended classes as planned in their individualized education program (IEP). These participants were not restricted from any services for which they might be eligible, including community-based employment training (CBET). Instead, the independent data collector collected copies of

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participant's IEP documents to develop adequate descriptions of the differences between the PS+ASD model and high school.

Measures

To measure the effect of the PS+ASD on the research hypotheses posed, the research team collected key baseline and outcome data using two researcher made surveys and two standardized measures of ASD and general support needs.

Researcher Made Baseline Survey

The baseline survey asked participants' age in years and months, gender, race, military connection of both parents, income level of the family home, medical diagnosis, primary and secondary IEP category, last measured intelligence quotient score, number of paid jobs and unpaid work experiences prior to enrollment in the study, and hours per week spent in CBET in the previous and current school years. This information was collected either in an interview format, or by asking the individual or their caretakers to complete the survey via paper and pencil format. If data were collected using the later format, participants and caretakers were provided with a self-addressed stamped envelope to return the survey. The surveys did not contain names, but only contained an assigned study identification number, thus, the independent data collector was not able to link the survey responses to the individual participant. This baseline survey was completed between September and October of the year in which the participant was participating in the research.

Researcher Made Outcomes Survey

The researcher made outcomes survey asked participants current employment status, descriptive information regarding the current employment status (where employed, job title, duties assigned, date of hire), whether the participant was employed with or without support,

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hourly wage earned, hours worked weekly, and employment benefits earned as a part of employment. This survey also updated any changes in the participant's military dependent or connected status. This survey was completed at 12 and 18 months after the baseline survey. This was also collected by the independent data collector in the same manners as the baseline survey.

Social Responsiveness Scale, 2nd Edition (SRS-2, Constantino & Gruber, 2005)

The SRS-2 is a 65-item scale that has been used as a measure of treatment effectiveness in recent studies (Aldridge, et al., 2012; Booker & Starling, 2011; Constantino & Gruber, 2005; Gantman et al., 2012). The SRS-2 Adult Form was normed on a sample of 2,210 reports of 702 adults aged 18 to 59. In these studies, the SRS demonstrated excellent internal, construct temporal stability, and interrater reliability with scores ranging from .93 to .97. In addition, the discriminant, concurrent, and structural validity of the instrument was measured in multiple ways and found to be good to excellent on all measures. Concurrent validity was measured through a comparison with the Autism Diagnostic Interview – Revised with scores ranging from .65 to .74 (Gantman et al., 2012). For the purposes of this study, the SRS-2 was used to confirm the presence of ASD and measure the impact of social communication and behavioral traits associated with ASD on participants in each group.

Support Intensity Scale – Adult Version (SIS-A, Thompson, et al., 2004)

The SIS-A is an interview-based assessment tool that identifies the type, amount, and frequency of support required by individuals with significant disabilities, including persons with autism, to perform 57 life activities. An additional 28 items addressed behavioral and medical support needs. The assessment was completed through an interview with the individual, as well as family, school, and community members with in-depth knowledge of the individual. The assessment generates a composite scale score and individual scale scores in the areas of home

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living, community living, lifelong learning, employment, health and safety, and social activities domains. For the purposes of this study, the SIS-A was completed at baseline and used as a descriptive and clinical tool to understand the support needs of participants. Reliability has been established for internal consistency (each factor exceeds .94), test-retest reliability (corrected r for each factor ranged from .74 to .94), inter-interviewer reliability ratings ranged from .74 to .96 (Thompson, et al., 2004). Validity has also been established for content, criterion, and construct (6 factor structure) validity (Bossaert, et al., 2009; Kuppens et al., 2010; Thompson, et al., 2004; Weiss et al., 2009).

Recruitment and Sample Size

Recruitment occurred within the three participating school divisions and one regional program who provided school services to students of military families near Fort Eustis Military Base. The school divisions sent students with ASD and challenging behaviors to the regional program due to their inability to meet the student's educational needs in the home school district. Those students from the regional program were coded to note their regional program participation but were counted as students from their home school district. Recruitment occurred between February and June of the year preceding participants' participation in the research. Potential participants were recruited through flyers sent home and during discussions at IEP meetings where the flyer was provided. Potential applicants were also invited to an informational meeting where the research was described. Interested participants completed an application to attend the program. Once the application was received, project research staff met with potential subjects and their family members/caretakers to complete the consent or consent/assent process with each potential subject. Subjects who were assigned legal guardians by a court completed an assent while their legal guardians completed the consent on their behalf. After completing the

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consent process, all applications were screened to ensure eligibility for the study. Once consent and screening was completed, potential participants were interviewed by the oversight committee. This interview process is a standard practice in PS+ASD.

The planned sample size identified for this waitlist cluster randomized controlled study was 32 with 16 in the PS+ASD group and 16 in the control group. The planned sample size of the study was determined *a priori* to have greater than 0.80 power to detect significant differences in two sided tests ($\alpha \leq 0.05$) between the treatment and control groups.

Randomization

Randomization was completed by using a random numbers list with each enrolled participant being assigned one of the random numbers. Participants were assigned groups using a digital random number generator. Participants were randomized by computer into the immediate PS+ASD group or the waitlist group. Waitlisted participants were not guaranteed automatic acceptance into the PS+ASD group in the next year. Instead, they were combined with all new enrolled participants for re-randomization. Some of the individuals who were randomized into the waitlist group were not eligible for the second randomization due to their age. Thus, this randomization scheme resulted in three groups that, after confirming no differences between these three groups, were combined into two groups. The initial three groups were PS+ASD Military immediate treatment group, high school to second randomization group, and high school only group. It is important to note that 11 participants were enrolled in the high school to second randomization and participated in two different cohorts of the study. This resulted in 10 participants who had one year of high school and one year of PS+ASD and one participant who had two years of high school. Because of their participation in two cohorts, these 11 participants

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are represented in each cohort in which they participated. Each of these groups are depicted in the flow of participants through the study in figure 1, below.

Blinding was not possible in this study due to the need to interview participants, their teachers, job coaches, and caretakers. To mitigate the influence that bias might have on the results, the research team employed an independent data collector who was not a part of the implementation or research development and design team. This individual completed all interviews, collected, scored, and logged all data in a secure digital database. To ensure correctness of the digital database, all paper copies of questionnaires and interviews were also securely stored and regularly cross checked with the digital database.

Statistical Methods

Data reporting was consistent with the recommended CONSORT guidelines (Boutron et al., 2017). Participant demographic and descriptive data are presented as means and/or percentages with standard deviations and ranges noted. Comparisons within and between groups was completed through the analysis of variance (ANOVA), chi-squared (χ^2), and standard t-test statistical procedures as required by the type of data analyzed. All p-values reported were considered significant if meeting a measured value of ≤ 0.05 . Effect sizes are reported using a Hedges g procedure due to the sample size presented. This statistic was used due to its sensitivity to smaller sample sizes.

Results

Implementation of the research procedures described above resulted in the recruitment of 45 individuals who were screened for eligibility in the study. Eight of those potential participants were excluded with five who did not meet inclusion criteria, and three who declined to participate. This resulted in the cluster randomization of 37 participants into the three groups

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depicted in the Flow of Participants through the Study (Figure 1). Once enrolled, all participants were included in analysis under the “intent-to-treat” principle. After randomization, one participant in PS+ASD dropped from the study after requiring intensive medical intervention due to a seizure disorder, two individuals who were assigned to the high school group were lost to follow-up, and six individuals in that group dropped from the study to participate in other outside of the two programs in this study.

Recruitment for this study occurred in three school years (2017-2018, 2018-2019, and 2019-2020). As noted, three school divisions participated in the program, but one school division hired and supervised the PS+ASD classroom teacher and paraprofessional educator. Consequently, the partner school divisions agreed to allow that school division’s cluster of potential students be awarded most slots in the program. This resulted in 4 of 6 in ’17- ’18, 6 of 8 in ’18 - ’19, and 6 of 8 in ’19 - ’20 school years slots going to that school division’s students. Even so, that school division was the largest in the study and had the most students apply and qualify to participate. Consequently, despite this cluster randomization scheme that favored the larger school division, the randomization ratio for all clusters was approximately 1.0 with cluster ratios ranging from 1.25 to 0.75. Finally, this recruitment strategy resulted in the enrollment of 22 (59.5%) military dependents and 15 (40.5%) military connected youth with ASD. Table 1 presents the recruitment and data collection schedule for each of the three participating cohorts.

The study procedures described above were significantly impacted by the COVID-19 crisis in the 2019-2020 school year. Specifically, the third cohort of participants were only able to attend 6.5 of the 9-month intervention in-person prior to the Governor of Virginia closing all school programs to in-person learning. In addition, the military base was closed to all non-essential off-base personnel and many of the internship sites were also closed. The impacts

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caused by this disruption and a comparison between cohorts was presented in another paper describing the impact of this global crisis on intervention implementation and employment outcomes (Whittenburg, et al., In Press). The protocol change has also been taken into consideration in this analysis of outcomes and serves as a limitation to findings as well.

Baseline Data

A comparison of the participants across the three initial groups on the demographic variables of age, gender, race, and family income was completed using χ^2 and t-test comparison of means. These analyses found no significant differences between the three groups on these variables. These data are presented in table 2.

Given that the groups were balanced across these demographic variables, the three groups were then analyzed for outcomes by intervention assignment into PS+ASD or High School as depicted in figure 1. Because there were 11 participants who had two years of participation in the research, this resulted in a final n of 48 with 22 in the PS+ASD group and 26 in the high school group. The clinical characteristics of these two groups at baseline are presented in table 3.

These data show that the PS+ASD group and the high school group were very balanced on every variable with no significant differences noted. All but ten participants had a medical diagnosis of one of the major ASDs while all but four were receiving special education services under the category of Autism, while 41 (85%) reported having both a medical diagnosis and educational eligibility. In addition, only 10 participants reported full scale IQ scores. None of the IQ scores provided were in the average or above range. Those who provided an IQ score did not overlap with those who identified IDD as a medical diagnosis or educational eligibility. So, a total of 17 (35%) participants reported having an intellectual disability in addition to Autism. In addition to ASD, 13 (27%) of participants reported other medical and psychiatric conditions.

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Those conditions included seizure disorder, fragile X genetic syndrome, attention deficit-hyperactivity disorder, schizophrenia, sensory processing disorder, fetal alcohol disorder, post-traumatic stress disorder, oppositional defiant disorder, and obsessive-compulsive disorder. A comparison across groups regarding the type and number of co-morbid disorders yielded a non-significant χ^2 p-value of 0.609. With respect to their support intensity needs, yet again, these participants ranged from having limited to extensive support needs. According to the support intensity grid developed by Luckasson, et al., in 1996, such individuals display support needs across several settings, require regular to high frequency support, and have a mix of natural to service-based supports. Finally, these individuals display a lesser degree of choice and autonomy.

Treatment and control participants did not display significantly different work histories at baseline with respect to either paid or unpaid prior work experience (Table 3). The average number of weekly hours participants spent in community-based employment training (CBET) during the school year prior to participation in this research study was low for both groups (PS+ASD, 7.23 hours; HS, 8.03 hours), with no significant difference observed. While PS+ASD participants reported a significantly higher number of average weekly CBET hours at baseline than HS participants (34.76 vs 9.38 respectively), these data do not indicate a difference in relevant experience across groups. Interviews collecting this data were conducted during the beginning of the academic school year, so reports of “current” CBET hours reflect only what participants were projected to receive during the upcoming school year. What is noteworthy about this information is that the PS+ASD group received a substantially large increase in CBET hours from prior to current years while the HS group did not experience an increase of similar magnitude across years.

12- and 18-Month Follow-up

Employment outcomes were measured at 12-months and 18-months after baseline. At both time points, PS+ASD participants displayed higher rates of employment, earned higher hourly wages and worked more hours per week than the HS control group at $p < 0.001$ level of statistical significance. These data are depicted in Table 4. Of the 20 PS+ASD participants, approximately 60% were employed at both 12-months and 18-months. In contrast, only one of the 18 participants in the HS control group were employed in sheltered work, while none were employed in CIE at either timeframe. While an odds ratio could not be calculated for the 12-month data collection point because of no employment outcomes for the control group, the PS+ASD group had 12.00 odds ratio (95% CI: 1.28 – 115.36). Given that employment outcomes in CIE for youth with ASD are still relatively rare, the odds ratio of 12 for the PS+ASD group gaining CIE is very impressive. In short, those who participated in PS+ASD had a 12 times greater chance of gaining CIE than their peers in high school.

Table 5 provides a description of employment outcomes. At the 12-month data collection period, 13 of the 21 PS+ASD participants were competitively employed within the community. These participants mainly worked part-time, averaging about 24 hours per week. All participants earned at or above federal minimum wage reporting an average hourly rate of \$9.38. Of those employed, 46% were federal employees and 15.4% received benefits including paid leave (e.g., annual, personal, or sick time), employer provided health insurance, life insurance, retirement, and health savings accounts. Jobs were secured by PS+ASD in 5 different industry types with the majority representing the Hospitality/Food Services (10.4%) and Retail industries (10.4%), along with Advisory/Information Services, Arts/Entertainment/Recreation, and Healthcare/Social Assistance.

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At 18-months, 60% of PS+ASD were employed within the community working a similar number of average hours per week (25.71) as at 12-months (24.42) and reporting a slightly lower hourly wage with an average of \$8.82 compared to 12-months (\$9.38). Over half (58.3%) were federal employees and 16.6% reported receiving employer sponsored benefits. The majority were still working in the Hospitality/Food Services (20%) and Retail industries (10%) as was observed at the 12-month data collection period.

Military Supports: Relocation and Deployment Plan

As described earlier, interruptions in services for military dependents with ASD often occur due to military family member deployments and relocations (i.e., permanent changes of station; Davis et al., 2016; The Ohio State University Project Team, 2011). To mitigate potential disruptions that research participants could experience in the event of relocations and deployments, the implementation and research teams, with vetting by the grant's advisory committee, developed a relocation and deployment plan to facilitate successful transitions to new locations. The relocation and deployment plan was used once during the course of the study, when two active-duty parents of a treatment group participant received orders to deploy overseas approximately one year after the participant completed the PS+ASD program. At that time, the participant was employed on base. Because of their deployment, that individual's parents arranged for him to live with extended family members in another state while they deployed. The relocation and deployment plan provided the participant and his family with information to facilitate connections with the vocational rehabilitation agency in the new state and highlighted the participant's career development and employment accomplishments, to assist employment service providers and potential employers in quickly recognizing the participant's strengths, interests, and previous work experiences. The plan included the participant's current resume, a

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video resume in which the participant demonstrated work skills he learned during his internships, letters of reference from his internship supervisors and employer, current certifications (e.g., food handlers first aid/CPR), and awards given to the participant for exceptional performance by the installation's medical center commander and PS+ASD program staff. The implementation team met several times with the participant and his family prior to their deployment to review the contents of the relocation and deployment plan and to support the family in contacting the state vocational rehabilitation agency. These efforts resulted in the quick opening of a vocational rehabilitation case when the participant arrived in the new state.

Discussion

Findings from the current study confirm previous results regarding the PS+ASD model with a new population, military dependent and connected youth with ASD. These findings mirror previous studies and were maintained across the significant employment and economic challenges posed by the COVID-19 pandemic. Indeed, the PS+ASD group had 12 times higher odds of gaining CIE than their equal peer control group who attended high school. Further, the acquisition of federal employment was also an important outcome. Specifically, the advantage of gaining a federal position implies greater employment stability and portability across the United States (Civil Service Success, 2020). In addition, the development of the relocation and deployment plan assisted one of the participants in a successful state to state transition so that services were not delayed by waitlists. Finally, that the results held across a global pandemic and economic crisis for a doubly disadvantaged group is very impressive.

The implementation team had initial concerns regarding the acceptability of some behavioral challenges posed by individuals with ASD on a military base. In fact, they were concerned that the high level of conformity and rule-based behavioral expectations might not be

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welcoming to individuals with ASD whose behavior might not conform. There was some apprehension that the behavioral challenges presented by individuals with ASD might be incompatible with the behavioral expectations of employees on base. Instead, the opposite was realized. The depth of rules and structure observed on the military base made the teaching of expectations relatively easier for most of the participants in the study (Whittenburg, et al., In Press). Further, the generalizability of the logistics learned on base were also observed as these interns moved from one internship to the next. If anything, the presence of the PS+ASD program on a military base was a valuable experience for all stakeholders involved.

Limitations

Despite these impressive findings, there are important limitations to the current study that bear consideration. While we opted for the waitlist control group design due to ethical problems associated with denying a successful intervention to control group participants, such a design may inadvertently elevate the treatment effect. Thus, the actual odds ratio to gain CIE after PS+ASD may be slightly less than the measured odds ratio in this study and more comparable to other randomized controlled designs such as Wehman, et al., 2020 where the odds ratio was calculated between 4.5 to 5.84 at graduation and 1-year follow-up. Nevertheless, PS+ASD was very robust in terms of the CIE outcomes achieved by those exposed to the model. A second limitation is the lower number of participants in this study. While we completed a power analysis for this study at the 0.80 level, it is possible that unidentified sources of error were introduced through the recruitment, randomization, and implementation processes. Even so, the equality of the groups across the demographic and clinical characteristics presented in this study suggest the researchers did their best to minimize such sources of error. In addition, the fact that the COVID-19 pandemic differentially affected the cohorts in this study serves as a limitation as well. The

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final limitation is related to fidelity to the model. While PS+ASD relies upon the provision of applied behavior analysis (ABA) to guide its implementation, ABA itself is largely an individualized problem-solving process that requires a high degree of knowledge, clinical skill, and flexibility across participants as settings and contexts requiring differentiated interventions (Whittenburg et al., In Press). As such, there is a need for increased research regarding the scalability of the ASD supports model beyond the Project SEARCH program to other similar programs and other populations of individuals.

Generalizability

The degree to which these results are generalizable to other military dependent and connected youth with ASD at other military installations is yet to be answered. While these results are encouraging, caution is urged regarding the wholesale generalizability of these findings. However, as this is the third randomized controlled trial of PS+ASD, and those who participate experience much higher CIE outcomes than their peers with ASD in high school bears strong consideration of this model as an evidence-based practice for transition aged youth with ASD seeking CIE upon graduation from high school. Indeed, when considering the balance of the benefits provided through CIE to young adults with ASD and the odds of gaining CIE through PS+ASD, the next questions related to this intervention are to measure dose and scalability (Schall, et al., 2021). Indeed, this study included a third cohort who did not receive a full “dose” of the intervention. Instead of 9 months of PS+ASD, the COVID-19 pandemic resulted in only 6.5 months of intervention. Is it possible that the PS+ASD model could be altered to be part of a school year rather than a full school year? This is a critical question to be considered as PS+ASD is limited in its accessibility to all locations and applicants. Future research should explore how to increase access to the intervention to more individuals with

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intellectual and developmental disabilities who display challenging behaviors and across more sectors, such as rural, and urban locations.

Conclusion

We feel the implications of this study are highly substantial. First, this appears to be the first trial looking at the effects of an intensive 900-hour internship on the offspring of military service members on a large US military base. The outcome data showing the acquisition of CIE with an average of 24 hours per work at 18 months is excellent. This is especially important given the tremendous pressure our military families are under with their jobs in service to our country while raising a child with autism. Second, by using a military base, we were able to provide a level of standardization of internship training rotations across military bases which is meaningful given how service members are frequently move from base to base quite suddenly. The logistics of completing tasks from one base to another are standardized, leading to greater portability and stability among employees with ASD as their families relocate. Indeed, the development and implementation of the relocation and deployment plan resulted in a seamless transition for the one individual whose family was deployed after his participation in the project. Finally, this study included a majority of black, indigenous, people of color participants, a group that has been highly underserved in CIE training programs.

We used a combination of customized and supported employment techniques to help identify, train, and support jobs for treatment participants as well as well recognized transition planning techniques as the PS+ASD intervention year ended (Wehman, 2011). Additionally, all participants were simultaneously students in public schools, and active clients of their local rehabilitative services office. This led to a seamless transition from school to adult services upon graduation. Finally, it is worthwhile noting the ease of knowledge translation achieved because

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of this study. Specifically, the Governor of Virginia, a military veteran himself, was sufficiently impressed that the state has implemented more PS+ASD sites at different military bases in Virginia. This shows the importance of scaling up and expanding PS+ASD to more military bases across the United States.

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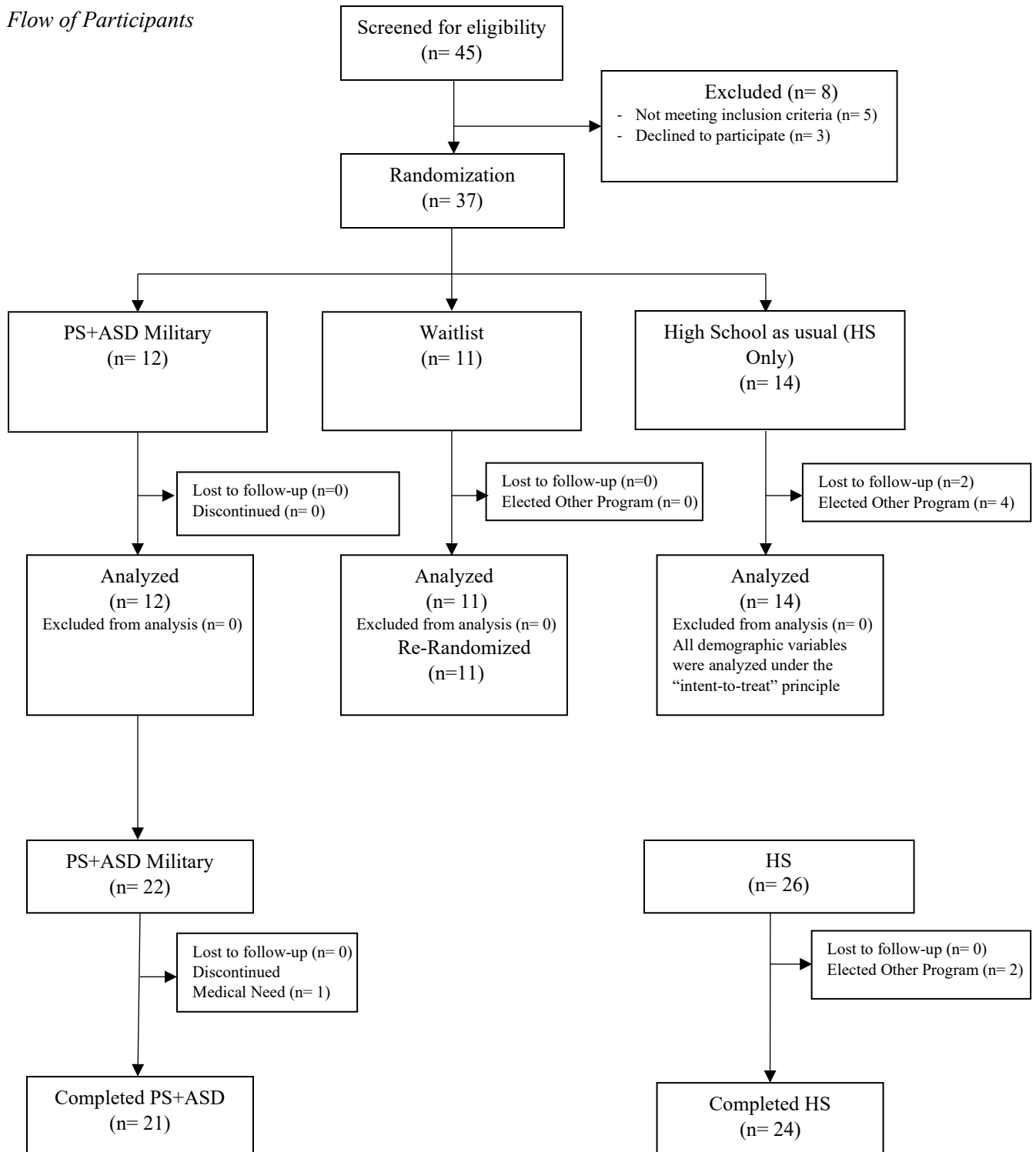
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Figure 1

Flow of Participants



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Table 1

Research Activities Timeline for Each of the Cohorts

	Recruitment, Screening and Enrollment, Randomization	Baseline	12-Month Follow- up	18-Month Follow- up
Cohort 1	March – June 2017	Sept. – Oct. 2017	Sept. – Oct. 2018	March – April 2019
Cohort 2	March – June 2018	Sept. – Oct. 2018	Sept. – Oct. 2019	March – April 2020
Cohort 3	March – June 2019	Sept. – Oct. 2019	Sept. – Oct. 2020	March – April 2021

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Table 2

Demographic Baseline Data

Demographic Variable	PS+ASD Military n = 12	Waitlist n = 11	High School Only n = 14	Total Sample n = 37	p-value
Age					0.261
Mean	19.42	19.9	19.58	19.59	
Sd	1.01	0.77	1.27	0.99	
Range	18.00 – 21.67	18.58 – 20.75	18.00 – 20.75	18.00 – 21.75	
Gender %					0.182
Male	8 (67%)	11 (100%)	11 (70%)	30 (81%)	
Female	4 (33%)	0	3 (21%)	7 (19%)	
Other	0	0	0	0	
Race					
Black	7 (58%)	5 (45%)	4 (29%)	16 (43%)	0.224
White	5 (42%)	5 (45%)	8 (57%)	18 (49%)	0.1
Latinx	0	1 (9%)	1 (7%)	2 (5%)	0.478
Asian American	0	0	1 (7%)	1 (3%)	0.598
BIPOC	7 (58%)	6 (54%)	6 (43%)	19 (51%)	0.771
Family Income*					0.535
< \$20,000	0	1 (9%)	2 (14%)	3 (8%)	
\$20,000 - \$49,999	2 (17%)	2 (18%)	0	3 (8%)	
\$50,000 - \$99,999	3 (25%)	1 (9%)	1 (7%)	5 (14%)	
\$100,000 - \$149,999	1 (8%)	1 (9%)	3 (21%)	5 (14%)	
> \$150,000	2 (16%)	0	0	2 (5%)	
Missing	4 (33%)	6 (55%)	8 (57%)	18 (49%)	

NOTE. *Only 19 participants elected to share their family income.

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Table 3*Clinical Variables Across PS+ASD and High School Groups*

Variable	High School n = 26	PS+ASD n = 22	Total n = 28	p-value
Medical Diagnosis*				χ^2
Autism	12 (42%)	13 (59%)	25 (50%)	0.371
ASD	3 (11%)	7 (31%)	10 (20%)	0.085
PDD-NOS	2 (7%)	1 (5%)	3 (6%)	0.654
Aspergers	1 (4%)	1 (5%)	2 (4%)	0.904
Missing	10 (36%)	0	10 (20%)	
Educational Eligibility*				χ^2
Autism	19 (68%)	20 (91%)	39 (78%)	0.115
Intellectual Disability	3 (11%)	3 (13.6%)	6 (12%)	0.827
Other Health Impaired	1 (4%)	2 (9%)	3 (6%)	0.454
Multiple Disabilities	1 (4%)	1 (5%)	2 (4%)	0.904
Missing	4 (14%)	0	0	
Reported Intelligence Quotient**	59.75 (11.84)	62.17 (2.93)	61.2 (7.28)	t-Test 0.714
Support Intensity Scale**				t-Test
Support Needs Index	78.95 (5.93)	76.64 (5.75)	77.71 (5.88)	0.214
Minimum – Maximum Score	67 – 89	63 – 90	63 – 90	
Social Responsiveness Scale, 2 nd Ed**				t-Test
Total Score, t-score	67.32(11.41)	61.81 (9.85)	64.63 (10.84)	0.110
Minimum – Maximum Score	41.00 – 88.00	49.00 – 83.00	41.00 – 88.00	
Social Awareness, t-score	62.79 (12.73)	58.10 (9.18)	60.33 (11.19)	0.194
Social Cognition, t-score	69.63(11.79)	64.00 (9.49)	66.68 (10.86)	0.103
Social Communication, t-score	64.00 (10.99)	60.29 (9.89)	62.05 (10.46)	0.268
Social Motivation, t-score	62.26 (11.27)	56.71 (8.63)	59.35 (10.23)	0.087
Restricted Interests and Repetitive Behaviors t-score	70.16 (13.99)	63.90 (13.20)	66.87 (13.77)	0.154
DSM-V Social Communication and Interaction	66.05 (11.389)	60.86 (9.23)	63.33 (10.51)	0.120
DSM-V Restricted Interests and Repetitive Behaviors	70.16 (13.989)	63.90 (13.19)	66.87 (13.77)	0.154
Prior Paid Work Experience***	0.21 (0.41)	0.09 (0.29)	0.15 (0.36)	t-Test 0.292
Prior Unpaid Work Experience***	0.16 (0.37)	0.09 (0.29)	0.12 (0.33)	t-Test 0.524

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Prior School Year Weekly Hours in CBET***	8.03 (5.49)	7.23 (5.26)	7.60 (5.32)	t-Test 0.637
Current School Year Weekly Hours in CBET***	9.38 (6.35)	34.76 (1.09)	23.41 (13.48)	t-Test <0.001

NOTE: *Reported as n (percentage of group) **Reported as standard score (standard deviation)

***Reported as mean (standard deviation)

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Table 4*Treatment and Control Contrasts for Key Outcomes*

Variable	<u>Treatment Condition</u>			<u>Control Condition</u>			<u>Difference</u>	<u>Effect Size</u>
	N	Mean	SE	N	Mean	SE	C - T	<i>g</i>
Employment								
12 mos.	20	61.9%	11%	18	0.00%	0.00%	61.9%***	2.33
18 mos.	20	60%	11%	18	0.00%	0.00%	60.00%***	2.33
Hourly Wages								
12 mos.	21	6.18	1.02	27	0.00	0.00	6.18***	1.98
18 mos.	21	6.05	0.99	27	0.00	0.00	6.05***	1.99
Hours per week								
12 mos.	21	0.52	0.11	27	0.04	0.04*	0.49***	1.30
18 mos.	21	0.38	0.11	27	0.04	0.04*	0.34**	0.94

Notes. The value displayed for t-tests are the differences in the means across the groups. For employment (a dichotomous measure), a two-sample test of proportions was used. *There was one control condition subject who reported 12 hours weekly employment in sheltered vocational work but did not know the hourly wage due to piece rate sub-minimum wages earned.

*** $p < .001$. ** $p < .01$.

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Table 5*Descriptive Employment Outcomes*

PS+ASD				HS		
Variable	<i>n</i>	%		<i>n</i>	%	
Employed						
12 mos.	21	61.9		18	0	
18 mos.	20	60.0		10	10%	
Benefits Earned						
12 mos.	13	15.4		-	-	
18 mos.	12	16.7		-	-	
Federal Employment						
12 mos.	13	46.2		-	-	
18 mos.	12	58.3				
Industry Employed						
12 mos.						
Advisory, Information Services	13	2.1		-	-	
Arts, Entertainment, Recreation	13	2.1		-	-	
Healthcare, Social Assistance	13	2.1		-	-	
Hospitality Food Service	13	10.4		-	-	
Retail	13	10.4		-	-	
18 mos.						
Advisory, Information Services	12	3.3		-	-	
Arts, Entertainment, Recreation	12	3.3		-	-	
Healthcare, Social Assistance	12	3.3		-	-	
Hospitality Food Service	12	20.0		-	-	
Retail	12	10.0		-	-	
	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD
Weekly Hours Worked						
12 mos.	12	24.42	5.99	18	-	-
18 mos.	12	25.71	6.23	10	0.04	-
Hourly Wage						
12 mos.	13	9.38	1.57	18	-	-
18 mos.	12	8.82	0.94	10	-	-

Appendix C

Avellone, L., Taylor, J., Ham., W., Schall, C., Wehman, P., Brooke, V., Strauser, D. A scoping review on internship programs and employment outcomes for students with intellectual and developmental disabilities. Rehabilitation Research, Policy, and Education. (Awaiting Publication). Federal Support Acknowledged.

A Scoping Review on Internship Programs and Employment Outcomes for Students with Intellectual and Developmental Disabilities

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Abstract

Transition policy in the United States has endorsed work-based learning experiences, including internships, for students with intellectual and developmental disabilities (IDD) in order to combat poor rates of post-school employment. Workforce Innovation and Opportunities Act (WIOA) state plans have reported use of internships as a way to provide Pre-Employment transition services (Pre-ETS). Internships are complex programs that vary in terms of length, payment, funding, and collaborative partnerships, and are intended to provide an educational experience for students to develop vocational skills. The purpose of this scoping review was to examine the impact of internship participation on employment for students with IDD. Systematic searches of electronic databases containing peer-reviewed sources were conducted. Nineteen articles were included in the final sample. Findings identified specific internship programs that have been examined within the peer-reviewed literature base, the level of evidence each provides concerning the impact on employment outcomes, and pertinent internship characteristics observed across studies. Implications for future research and practice are discussed.

Keywords: Internships, Employment, Intellectual and Developmental Disabilities, Scoping Review, Work-based learning

A Scoping Review on Internship Programs and Employment Outcomes for Students with Intellectual and Developmental Disabilities

One of the first major milestones for young adults exiting secondary school is the acquisition of employment. There are several benefits associated with work for individuals with intellectual and developmental disabilities (IDD) including financial independence, community inclusion, opportunities for socialization, and a sense of identity (Akkerman et al., 2016; Saunders & Nedelec, 2014). Despite these outcomes, the prospect of securing competitive integrated employment (CIE) remains unattainable for many individuals with IDD. According to a recent national report, only 20.3% of those receiving support through state IDD agencies in 2017 were in integrated employment settings (Winsor et al., 2019). Other estimates of employment are similarly low, with only 14.7% of adults with IDD in paid community work (Butterworth et al., 2015) and 18% competitively employed among a representative U.S. sample (Siperstein et al., 2013). Those who do not secure CIE often end up in segregated work facilities earning substantially low wages (typically below minimum wage) or participating in non-work alternatives for no pay, such as volunteer work (Winsor et al., 2019).

Legislative efforts within the United States have attempted to improve transition services for students with disabilities over the past three decades. Efforts have concentrated on increasing the use of evidence-based practices (EBP) in transition planning, expanding opportunities for applied work experience prior to school exit, and prioritizing CIE as the employment goal over segregated or non-work alternatives (Association for People Supporting Employment First [APSE], 2019; Cook et al., 2008). In 1990, the Individuals with Disabilities Education Act (IDEA) initiated the individual transition plan to help strategically guide students with disabilities to better post-school outcomes. More recent efforts include provisions mandated by

the Workforce Innovation and Opportunity Act (WIOA) of 2014 which direct state Vocational Rehabilitation (VR) agencies to distribute at least 15% of funding toward Pre-ETS activities, such as work-based learning experiences, for transition-age youth with disabilities (Workforce Innovation Technical Assistance Center [WINTAC], 2016). Work-based learning experiences are implemented in integrated community business settings and include various educational activities like job shadowing, service learning, practicums, informational interviewing, student-led enterprises, and both paid and unpaid internships (WINTAC, 2016).

Work-Based Learning and Internships

Work-based learning opportunities for transition-age youth are important because numerous studies have demonstrated a positive relationship between work experience in high school and post-school employment. Among these, Wehman et al. (2015), Siperstein et al. (2014) and Carter et al. (2012) all found that community-based work during high school was a significant predictor of later employment for individuals with IDD and other disabilities. A significant finding from the 2015 National Autism Indicators Report revealed that nearly 90% of youth with autism spectrum disorder (ASD) who were employed in secondary school later secured paid work compared to only 40% of those who did not have a job in high school (Roux et al., 2015). In general, students with disabilities who are already employed before exiting high school are nearly 3.8 times more likely to be employed one year later (Rabren et al., 2002). Providing these opportunities early, specifically prior to school exit, is key because CIE outcomes are higher for individuals who participate in paid work experience prior to age 21 (Siperstein et al., 2014).

Internships

Internships are a particular type of work-based learning experience for transition-age youth. The U.S. Department of Labor (2018) defines “internship” as a temporary position that includes the following characteristics: a) job-site training, b) paid or unpaid, c) educational d). benefits the intern, e) does not displace other employees, and f) does not guarantee employment at the host business upon conclusion. Support for the positive impact of internships on post-school outcomes has been reported within the literature (Carter et al., 2011; Leahy et al., 2018; Rowe et al., 2021; Shandra & Hogan, 2008). Compared to other work-based learning activities (e.g., mentoring, cooperative education, job shadowing, school sponsored enterprise, technical preparation, and majoring in a career), internship participation is linked to increased wages after exiting secondary school (Shandra & Hogan, 2008, Schall et al., 2015). Carter et al. (2011) found that students who had participated in internships, tech prep, or entrepreneurship had the highest likelihood of paid employment after high school compared to other transition related activities (e.g., in-school work experience, pre-vocational activities, and employment IEP goals).

The transition-to-work internship model Project SEARCH was recently listed as one of nine evidence-based interventions emerging from the empirical literature as a special education practice for transition-age students with disabilities (Rowe et al., 2021). Findings from an expert consensus survey also established the Project SEARCH model as an evidence-based vocational rehabilitation practice according to a poll of nation-wide rehabilitation educators, counselors, and researchers (Leahy et al., 2018). Overall, these findings highlight several broad benefits of internships on CIE outcomes. However, a variety of different internship models are implemented across the United States and little is known about how these models differ, for whom they are most effective, and the impact each has on different dimensions of employment (e.g., hours worked, wage, type of work, etc.).

Current Review

To date, no systematic reviews could be located by authors comprehensively scoping the body of literature on transition-to-work internships for students with IDD. As federal and state initiatives continue to promote and fund internships as a strategic transition activity, it is important to determine which specific internship models have been investigated within the peer-reviewed literature, how these models differ, what impact different internship models have on employment outcomes, and for whom the internship models are effective in terms of achieving CIE. To address this gap in research, authors conducted a scoping review to broadly map the existing peer-reviewed literature on the impact of internship participation on employment outcomes for individuals with IDD. Scoping reviews offer a general synopsis of a topic that has not been previously systematically reviewed (Arksey & O'Malley, 2005). Thus, the purpose of this scoping review was to map the existing literature and add credence to the evidence base supporting the use of internships for transition to employment. The following research questions were developed to guide the review:

1. What level of evidence exists for the impact of internships on employment outcomes for individuals with IDD?
2. What specific internship characteristics are associated with employment outcomes for individuals with IDD?
3. Which groups of individuals with IDD can benefit more from internship participation in terms of employment outcomes?

Method

A strict protocol was followed by using The Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR) framework developed by

Tricco et al. (2018). This scoping review specifically examined peer-reviewed sources.

Candidate articles were collected via the following empirical databases: *ERIC, Education Research Complete, PsychNET, Academic Search Complete, PubMed, CINAHL, Psychology and Behavioral Sciences Collection, and SocINDEX*. Ancestral searches of reference lists for studies included in the final sample were also performed. Articles published between 1990 and present were included to capture publications since IDEA (1990) first included provisions for transition-focused services. While this review focused on application to U.S. policy and practice, international sources were also included to ensure the most comprehensive collection of information regarding the efficacy of internships on employment for IDD was analyzed.

Inclusion/ Exclusion Criteria

Inclusion criteria was organized by population, intervention, and outcome. Specific search terms are provided in Table 1. The target population was defined as youth and adults with IDD. However, mixed samples (e.g., participants with severe disabilities including individuals with IDD) were also included. While the purpose of this review is to examine internships as a transition service for K-12 recipients, samples that comprised older interns (i.e., 22 and up) were also included. The term internship was defined using the criteria set forth by the U.S. Department of Labor (2018). In addition to describing internships for individuals with IDD, all articles in the final sample also reported information on employment outcomes (e.g., securing a job, hours worked, wage, or type of work).

Excluded articles were published before 1990, were non-English translated, did not include individuals with IDD, did not examine internships, or focused on other information pertaining to internships besides employment outcomes (e.g., employer satisfaction, program descriptions, collaboration recommendations, communication training, etc.). It should be noted

that internships implemented within the context of postsecondary education programs for students with IDD were also excluded from this review. Examples of excluded internship programs comprised those embedded within programs such as Transition and Postsecondary Programs for Students with Intellectual Disability (TPSIDs) or Comprehensive Transition Programs (CTP) associated with college enrollment (Grigal & Papay, 2018). These programs occur within a complex educational framework that contain advanced training above what transition from secondary school-to-work programs provide and therefore are more appropriately analyzed as a separate construct.

Procedure

The screening process consisted of multiple steps. First, candidate articles collected from peer-reviewed sources were organized in Zotero, a reference management software program where duplicate articles across databases were identified and removed. Next, two authors applied inclusion and exclusion criteria to candidate articles by reviewing titles and abstracts. Articles identified during the title/abstract review were then subject to a full-text review. Inter-observer agreement was calculated at or above 91% for both phases. Disagreement among included and excluded articles were then discussed until agreement was achieved. Figure 1 illustrates the screening process at each stage.

Results

The final sample consisted of 19 peer-reviewed articles on internships and employment for individuals with IDD. Of these, four specific internship models were identified including Project SEARCH (PS), Project SEARCH plus ASD Support (PS+ASD), Marriott Bridges (Bridges), and Start on Success. The PS+ASD model is an extension of the traditional Project SEARCH model and includes specialized additive components for individuals with a diagnosis

of ASD. It was thus determined to be conceptually different from the traditional Project SEARCH program and these two models were therefore analyzed separately for the purpose of this review. A description of each of these models is presented in Table 2 along with a list of the full sample of 19 articles under “level of evidence.” Despite conducting an international search, nearly all articles in the final sample were from the United States ($n = 18$) with one from the United Kingdom (i.e., Kaehne, 2016).

Internship models identified through database searches were coded for level of evidence. Research designs were ranked from highest to lowest in terms of methodological rigor. Each category is considered more methodologically robust than those on a lower tier creating levels of evidence for an intervention from highest to lowest quality (Concato, 2000). Methodologies with higher rigor produce stronger levels of evidence for the effectiveness of a particular intervention. The framework set forth Odom et al. (2005) based on guidelines established by the Oxford Centre for Evidence-based Medicine was used to assign levels of evidence presented in Table 2:

- a) Level I - meta-analysis and randomized control trials (RCT)
- b) Level II – quasi-experimental, pre-experimental, and non-randomized control designs
- c) Level III – non-experimental, correlation, and case study designs
- d) Level IV – expert committee report and consensus

Level of evidence is used to guide interpretation of findings regarding the impact of internships on employment in subsequent sections of this review.

Research Question One - Employment Outcomes

To answer the first research question on evaluating employment outcomes, we analyzed articles from the final collection that specified the following; the amount of participants within a population or sample who became employed, the type of employment acquired (CIE or other),

hours worked per week, wages earned per hour, and the number of interns from the sample hired by the host business. Twelve of the 19 articles included this level of description concerning outcomes, allowing for comparisons to be made across studies. This subset of 12 articles is listed in Table 3. All findings in Table 3 refer to work obtained after internship exit—not employment, wage, or hours held during internship participation.

Employment Rates After Internship Exit

To avoid confusion, the umbrella term “employment” is used in this review to describe both CIE and work outcomes collectively, but articles in Table 3 are labeled individually. Articles are marked “CIE” if specified by the publishing authors and “work” if CIE was not explicitly stated. Eight of the 12 subset articles analyzed for research question one specified outcomes as being CIE for intern participants while four articles did not define the type of work obtained. Table 3 shows the percent of interns from each article who secured CIE or work. In instances where articles reported multiple data points measuring employment rates over time, the highest percent employed was recorded in Table 3 to demonstrate maximum outcomes possible. Not all articles reported when data collection occurred after internship exit, but this information is documented as “months’ post-internship for those studies which did report a timeframe.

With respect to articles reporting CIE outcomes only, the PS+ASD model demonstrated the highest rates of transition to competitive employment ranging from 73 to 90% among participants at three months after exiting the internship (Wehman et al., 2014; 2017; 2020; Whittenburg et al., 2020). These findings occurred at the highest level of evidence (I), were derived from all RCT designs including one multi-site study, and demonstrated a stark contrast to the 0-17% employment rates reported for control participants who received transition supports as usual. The highest employment rate reported by the control group (17%) does not reflect full

CIE outcomes since Wehman et al. (2020) reported that at least one participant was in segregated or volunteer work.

Three of five Project SEARCH articles reported CIE rather than work outcomes at tiers II and III level of evidence. Tier II research does not involve true randomization and is therefore more sensitive to threats of validity than a tier I design, but does examine independent and dependent variables under experimental conditions, and therefore provides evidence of the impact of the internship intervention on employment outcomes (Odom et al., 2005). Given the lack of control conditions, tier II and III research is more sensitive to methodological differences. To wit, wide variation in CIE outcomes from 33% to 83% was observed across studies (Christensen et al., 2015; Christensen & Richardson, 2017; Green et al., 2013). There was only one article specifying CIE outcomes for the Bridges' model. This study used a Tier III correlational design and a high rate of CIE (77%) was reported (Gold, 2013). This data should be viewed somewhat cautiously though due to the limits of the correlational design.

When analyzing employment outcomes more generally (i.e., CIE and work), ten of the 12 articles reported employment outcomes for 60% or more of internship participants. The only exceptions were two Project SEARCH models (i.e., Green et al., 2013; Kaehne, 2016). The reason rates for these two studies fell below the majority of the other articles in the subset cannot be definitively concluded based on the information provided. Timing of data collection may have led to the wide range of outcomes. Findings may also be explained by low sample sizes (e.g., Green et al., 2014) and reporting styles that reflected an average across cohorts rather than a total percent by cohort or across cohorts (e.g., Kaehne, 2016).

Hours Worked per Week

When analyzing the reported hours worked per week, the ranges are difficult to compare due to varying methodology. For example, in tier I RCT, designs, the “intent to treat” standard requires that means and ranges be reported across all participants, employed or not, while tier II, quasi-experimental, and tier III, correlational studies may be reporting means and ranges only for those who are employed (Xi et al., 2018). Table 3 identifies studies where the “intent to treat” standard was applied to reported results.

The internship model Project SEARCH considers a successful employment outcome to include at least 16 hours or more per week (Project SEARCH, 2018). By that metric, average hours for participants across all studies for all internship models in the subset exceeded 16 hours, with the lowest average hours per week at 18 and the highest at 27. However, the range of hours reported across articles clearly depict that some interns were working far less, as few no hours (Wehman et al., 2017) and some far more, as many as 40 hours per week (Christensen et al., 2017; Muller & VanGilder, 2014; Whittenburg et al., 2020). Data for three control group comparisons revealed higher mean hours worked for PS+ASD participants versus those receiving high school services as usual (Wehman et al., 2017; 2020; Whittenburg et al., 2020).

Wage per Hour.

The U.S. federal minimum wage has been \$7.25 since 2009 (U.S. Department of Labor, 2009). Table 3 provides mean wage per hour and range of hours worked by article. The base range of each study was cross-referenced with data from The U.S. Department of Labor (2009) from the year data was collected in each article. Wages in Table 3 were then coded as being equal to or greater than minimum wage. The only international article included in this sample indicated that reported wages met national minimum requirements (Kaehne, 2018). Results indicated that all wages earned by all participants from internships across studies in the subset

were either at or above federal minimum wage, including those marked as work rather than CIE. Intern participants from PS+ASD held a higher mean wage per hour than control participants (Wehman et al., 2017; 2020; Whittenburg et al., 2020). These findings are informative because while not all studies specified CIE as the outcome, above or below minimum wage earnings is an important indicator of quality employment outcomes.

Employed by Host Business

Interns are not considered an employee of the business but rather a recipient of a vocational training experience and are therefore not guaranteed employment within a host business upon conclusion of the internship (U.S. Department of Labor, 2018). However, host businesses do end up hiring interns in some instances. Only six of the 12 articles in the subset reported the total number of interns who were ultimately hired by the host business. Results are discussed by internship model.

Of those articles reporting this information, nearly half of Project SEARCH interns found permanent employment with the host business. A range of 40% to 51% was reported across three studies (Christensen & Richardson, 2017; Christensen et al., 2015; Muller et al., 2014). Interns who were hired on by the host business had better job retention over time compared to those who found employment at other businesses (Christensen et al., 2015). One PS+ASD article reported the number of interns hired by the host business and it reflected the highest percent across all internships (80%) but the sample size was extremely small (four of six interns). Findings from the Bridges model included substantially larger sample sizes than both the Project SEARCH and PS+ASD models but returned mixed findings with Fabian et al. (2007) reporting 20% and Luecking et al. (2000) reporting 75% across two studies. Overall, whether or not employment was secured within the host business remains underreported in the literature.

Research Question Two - Internships Characteristics

Internships are complex and multifaceted programs that include many operational components, multiple stakeholders, formal and informal agreements, and financial resources to sustain (Christensen et al., 2015). The purpose of research question two was to investigate individual internship characteristics in relation to employment outcomes. The full sample of 19 articles was used to analyze research question two (Table 2). Of the articles examined, none conducted a component analysis. Thus, this review was not able to pinpoint specific internship characteristics as having a causal effect on employment outcomes. However, several consistent components were shared by all four internship models.

Internship models described a full *work immersion* approach where students received on-site training in an integrated community business. Project SEARCH even embeds required classroom hours in a dedicated space within the host business (Wehman et al., 2014). Internships also described using a *demand-side approach* which focuses on being sensitive to the needs of the business and developing internships that are meaningful and mutually beneficial to both the business and the intern (Christensen et al., 2015; Wehman et al., 2014; 2017; 2020; Whittenburg et al. 2020). *Fidelity of implementation* was another theme that emerged across studies. Strict protocols were put in place by internship programs to establish and monitor adherence to the established model's guidelines. The Project SEARCH model is licensed through Cincinnati Children's Hospital Medical Center and provides training for implementation sites (Christensen et al. 2015). Bridges assigns project directors to oversee programs (Fabian, 2007). The Start on Success model, which was originally developed by the National Organization on Disability does not oversee program sites but detailed replication guidelines are available via other expert organizations (Center on Transition Innovations, 2020).

All four internship models were *time* and *resource-intensive*. Internship length spanned anywhere from one semester (approximately 18 weeks) to 12 months (Fabian, 2007; Whittenburg et al., 2020) with Start on Success offering a possible second year to students for whom it was considered beneficial (Sabbatino & Macrine, 2007). Students amassed as many as 720 applied hours in Project SEARCH (Wehman et al., 2014) and 240 hours in the Start on Success Model (Center on Transition Innovations, 2020). Project SEARCH and PS+ASD also incorporated a classroom vocational training component along with the required applied work which totaled about 180 hours. Start on Success requires classroom hours for a one to two-semester duration though specific hours were not specified (Center on Transition Innovations, 2020).

Similar *vocational training strategies* were reported across models. These included career planning and counseling (Fabian, 2007; Hemmeter et al., 2015), job development procedures for creating individualized internships (Sabbatino & Macrine, 2007; Wehman et al., 2014; 2017; 2020; Whittenburg et al. 2020), behavior management strategies (Ham et al., 2014; Wehman et al., 2014; 2017; 2020; Whittenburg et al. 2020), on-the job training to help interns learn specific vocational skills (Christensen & Richardson, 2017; Gross et al., 2018; Muller & Van Gilder, 2014; Sabbatino & Macrine, 2007; Wehman et al., 2014; 2017; 2020; Whittenburg et al. 2020; Wittig et al., 2014), and travel training (Christensen & Richardson, 2017; Wittig, 2014). Three of the four internship models (i.e., PS+ASD, Project SEARCH, and Bridges) also described some process for installing follow-along services to help students find and maintain paid employment after the internship concluded (Fabian 2007; Green 2013; Hemmeter et al., 2015; Wehman et al., 2014; 2017; 2020; Whittenburg et al. 2020).

Finally, all studies described *collaborative relationships* that facilitated the internship program. By and large, these included an educational partner from local education agencies (LEAs) or universities, adult service agencies such as Vocational Rehabilitation (VR) or Community Rehabilitation Providers (CRPs) and representatives from a host business (Table 2). Connection to adult services as an intern was identified as being particularly important by a number of studies because it ensured that students exited high school with immediate support (Wehman et al., 2014; 2020). While a range of industries was reported, healthcare was the most predominant business profile to serve as a host business (Christensen et al., 2015; Green, 2013; Gross et al., 2018; Ham et al., 2014; Luecking & Fabian, 2000; Muller & Van Gilder, 2014; Sabbatino & Macrine, 2007; Schall et al., 2015; Wehman et al., 2012; 2014; 2017). In general, host businesses tended to be large organizations and corporations (e.g., hospitals, military bases, universities) with varying branches within the business (e.g., food service, lodging, retail stores, etc,) which maximizes opportunities within one organization to develop many different types of internships. Although more targeted research is needed to identify which specific internship components are linked to better postsecondary outcomes, these common characteristics across internships highlight particular areas for further inquiry.

Research Question Three - Application to Specific Populations

The purpose of research question three was to investigate specific populations or individual characteristics of individuals with IDD who benefit from participation in an internship program with respect to employment outcomes. The full sample of 19 articles was used to answer research question three (Table 2). Results from this review revealed both strong and emerging evidence for the application of internships to specific populations. The results of seven studies indicated that the PS+ASD model was highly effective in achieving CIE for *youth with*

an ASD diagnosis, a group who notoriously have poorer employment outcomes than other disability categories (Burgess & Cimeara, 2014; Roux et al., 2013). One of these studies provided emerging evidence for the efficacy of the PS+ASD model with *military-connected youth* with a diagnosis of ASD, a group who is under-researched in the literature and who face additional challenges to employment such as frequent relocation, break in continuity of services, and inadequate transfer of vocational or educational records (Davis & Finke, 2015; Whittenburg et al., 2020).

The results of another study described successful use of the Project SEARCH model with *youth in rural counties* where access to transportation is difficult and the range of industries is more limited than in urban or suburban settings (Wittig et al., 2014). Three articles on Bridges' interns reflect employment outcomes for traditionally marginalized *racial and ethnic populations with IDD* (e.g., Black, Latinx, Asian, etc.) who often face disparity in employment outcomes (Oberoi et al., 2015; Sevak et al., 2015). Finally, the results of one study indicated that a *history of segregated work* may mitigate the effects of the Project SEARCH internship. Using an older sample of adults (ages 25-51), Christensen and Richardson (2017) found that none of the participants who had been in a sheltered workshop longer than 5 years successfully transitioned to employment after participation in Project SEARCH. While preliminary, these findings indicate emerging evidence of the utility of internships with specific populations who have historically faced barriers to employment. More in-depth research into who internships benefit is needed.

Discussion

This review identified four main internship models which have been investigated within the peer-reviewed literature (e.g., Project SEARCH, PS+ASD, Bridges, Start on Success).

Differing levels of evidence were observed for each by the articles included in this review. The strongest support was identified for the PS+ASD internship for individuals with ASD and the Project SEARCH model for individuals with various intellectual and developmental disabilities, including ASD. Both models were supported by the top two level of evidence tiers. Research on the Bridges model for individuals with IDD and other disabilities was limited to correlational research, but results were fairly consistent across multiple studies with regard to employment rate, wage, and hours. The Start on Success model remains the least examined of all internship models included in this review with only one article identified and only selective case study findings reported (Sabbatino & Macrine, 2008).

Overall, most studies reported employment rates either at or above 60% with the exception of only two, which reported 33% (Greene, 2013) and 51% (Kaehne, 2006). Still, these rates surpass previously mentioned reports of 14.7% to 20.3% employment among individuals with IDD (Butterworth et al., 2015; Siperstein et al., 2013; Winsor, et al., 2019). Findings reflected a mix of CIE and work (outcomes not specified as CIE), but all internship models produced employment outcomes with wages higher than the federal minimum wage. This is important in light of the push to prioritize CIE outcomes over segregated work which can legally pay very little due to 14(c) subminimum wage certificates (U.S. Commission on Civil Rights, 2020). Internship participants from included studies mainly worked less than the U.S. standard 40-hour/week for full-time employment. It is unclear what might explain this finding. Many factors influence how much an individual may choose to work. It is certainly possible that those with less hours were still working their preferred quantity within what was possible for the individual's work stamina, schedule, and family responsibilities. Previous research also indicates

that individuals with disabilities may purposefully reduce hours to maintain consistent benefit eligibility (Iwanaga et al., 2020).

Several common characteristics were observed across internship models including use of similar vocational training strategies, a need for collaborative partnerships, adopting a demand-side approach, full workplace immersion, and time and resource-intensive support. The full internship experience encompasses hundreds of hours of training which contrasts steeply with typical work-based learning activities, such as job shadowing that may last a few days or work sampling which lasts for a few weeks (Cease-Cook et al., 2015). The extent to which such a lengthy duration of training is needed, and how shortened experiences may impact employment outcomes is unknown. Such extensive training during high school did however result in the need for far fewer vocational intervention hours (80) than peers without internship experience (184) for Project SEARCH participants (Schall et al., 2015).

Emerging evidence related to use with specific populations was also gleaned from this review. These include benefits to populations with recognized disparities in employment outcomes (e.g., those with an ASD diagnosis, traditionally marginalized racial and ethnic groups with disabilities) or additional barriers to employment (e.g., military-connected youth, rural populations, extensive history of segregated employment). However, these themes should be interpreted with caution as more research is needed on individual characteristics and internship participation.

Implications for Research

Findings from this review offer a foundation to base future research upon. This review used a scale for organizing studies based on level of evidence which was limited exclusively to research design (Odom et al., 2005). However, higher methodical designs do not inherently

guarantee higher quality results, nor are they immune to threats to validity and potential for bias, particularly if other aspects of the study were conducted poorly (e.g., randomization was not conducted properly, severe attrition, reported confidence intervals). Indicator checks for quality within each methodological design were not completed in this review but is a suggested next step for progressing the discussion on evidence supporting internships and employment.

Greater consistency in defining and reporting outcomes is also needed in future research. Since legislative efforts continue to promote CIE outcomes over segregated alternatives (e.g., APSE, 2019; WIOA, 2014), it is important to specify whether findings pertain to CIE or aggregated work outcome types. More consistent reporting on whether employment outcomes occurred within or outside the host business is also needed. Employment through the host business offers both advantages and disadvantages. The business provides a work culture that is likely accepting of diversity as suggested by their cooperative agreement to act as a host business and the business gains an employee who is pre-trained trained on their particular workplace skills and standards. On the other hand, a business may have limited capacity to hire interns over time so clarification regarding what extent interns secure employment at other businesses is needed.

Research investigating more specific links between particular internship characteristics (e.g., type of training strategies, internship hours, collaborative partners, host business, etc.) and employment outcomes is also suggested to provide better information on what is truly essential to include in these complex programs and still achieve desirable outcomes. Additionally, while all of the internship models presented described structured recruitment and application procedures, more information on who is selected is important so it can be determined if these programs are effective for those with the most significant support needs. Lastly, the PS+ASD model described high levels of staff training in use of evidence-based techniques (e.g., applied

behavior analysis, behavior management, visual supports, social communication training, etc.) to promote on-the-job success for interns (Wehman et al 2014; 2017; 2020). Further research regarding level of staff training needed to impact specific outcomes is suggested.

Implications for Practice

The findings in this review provide strong support for internship programs as an evidence-based way for practitioners to aid transition-aged young adults with IDD in gaining CIE upon exiting high school. The CIE outcomes associated with internship participation are impressive compared to non-internship comparison groups, and the programs meet many of the requirements for transition programming included in IDEA (2004) and WIOA (2014).

Businesses who seek to increase the diversity of their workforce by including employees with IDD can also gain excellent employees by providing internships to transition-aged youth.

Internship programs can therefore provide significant benefits to all stakeholders involved.

At the same time, most programs take an extensive amount of time to implement. Thus, it would be essential to assist transition-age youth in planning for the time commitment early in their high school careers to ensure they can meet both the academic and internship requirements within the time they have to complete their schooling. In addition, the collaborative relationships required to implement an internship program involve discussion and planning to ensure buy-in from various partners. Perhaps the most important consideration for practitioners is the need for a collaborative business that is large enough to supply multiple internships while also providing relevant training opportunities to the interns. It is also critical to consider the staffing requirements of internship programs. Some of the programs, such as PS+ASD emphasized particular skills of the staff, such as applied behavior analysis, and an understanding of business

culture (Wehman et al., 2020). Such skills may require additional training to the educational and employment support staff who implement the program.

Internship programs require practitioners to consider the target population carefully prior to implementation. To date, there is sufficient evidence to conclude such programs are efficacious for individuals with ASD and other IDD, and limited evidence for the efficacy provided to military-connected and dependent youth, and racially and ethnically disadvantaged youth with IDD. Additionally, none of the studies reviewed addressed the issue of cost for internship programs or program capacity. This would be very important information for practitioners seeking to implement such programs. Internship programs have a limited number of spaces available and therefore cannot serve the needs of the entire population of transition-age youth with IDD in a school district.

Implications for Policy

Findings of this study provide several important insights related to policy. Primarily, while the included studies show that definitive research evidence is still emerging, the efficacy of many of the models demonstrates the potential of internships to operate as an effective policy tool in improving employment outcomes for individuals with IDD. As such, our review provides evidence supporting recent policy and legislation such as WIOA (2014), which emphasizes internships and other work-based learning experiences as required Pre-ETS activities aimed at promoting CIE. Furthermore, our review shows that multiple stakeholder partnerships are a key factor in successful internship models, a finding which aligns strongly with the interagency partnership requirements mandated by WIOA (2014). These partnerships required by state VR agencies should provide an important means of building and implementing effective internship programs as a Pre-ETS activity within states and localities. Although this review is able to

provide some initial guidance based on evidence of promise in these internship models, much more research is needed to provide for a more thorough evaluation of the efficacy of internships to promote CIE; this includes analysis of intervention dosage, intensity, and specific components that should be included in order to achieve policy goals related to the employment of people with IDD.

Limitations

Several limitations were noted with this review. First, all but one of the included studies were conducted in the United States. It is quite possible that research published outside the U.S. used different terminology to refer to activities conceptually equivalent to internships or different diagnostic labels other than IDD, and as a result, those studies were not located by our search. Our search did identify more international research (e.g., O'Bryan, Daston, & Riehle, 2014), but these studies were excluded from our review since employment outcomes were not reported. This review focused exclusively on peer-reviewed sources in order to broadly scope existing levels of evidence that have been scrutinized by the scholarly community. However, non-peer-reviewed grey literature sources issued by expert committees, government websites or pertinent disability organizations could provide additional insight into the efficacy of internships for students with IDD and should be considered in future research.

Database searches yielded widely used internship models (e.g., Start on Success, Project SEARCH, Bridges, PS+ASD) but it is acknowledged that many smaller scale arrangements that meet the Department of Labor (2018) definition of an internship are likely occurring within the United States and abroad but not being reported on or published. It is also possible that relevant literature published prior to 1990 was excluded due to the date restriction of our sample. Lastly, internships associated with postsecondary education programs (PSE) for students with ID were

not included because this review focused specifically on transition from secondary school to work and because PSE programs include advanced training from a college or university that is fundamentally different than that received by the population in this review. However, the inclusion of vocational internships provided within the context of a PSE program for students with ID may have provided additional insight.

Conclusion

Findings from this review offered overall general support for use of internships as a pathway to CIE for individuals with IDD with wide variation in evidence across specific models. The PS+ASD and Project SEARCH models emerged with strong levels of evidence while that for Bridges' is still somewhat emerging according to the measurement system used in this review. All internships identified in this review are complex programs that are in need of investigation on a much more granular level than what is currently available within the peer-reviewed literature. As states and localities continue to implement and expand Pre-ETS programming through WIOA (2014), many more youth will participate in internships. Further research is needed to ensure the internship experience is as effective as possible in connecting transition-age youth with disabilities to better employment outcomes.

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Table 1*Search Terms*

Construct	Search terms
Population	“intellectual disab*” OR “developmental disab*” OR “mental retardation” OR “autis*” OR “autism spectrum disorder*” OR “asperger*” OR “ASD” OR “high functioning autis*”
Intervention	“Internship” OR “transition to work program” OR “practicum” OR “traineeship” OR “work-based learning” OR “mentorship” OR “paid work experience” OR “apprenticeship” OR “externship”
Outcome	“Employment” OR “work” OR “job” OR “competitive integrated employment”

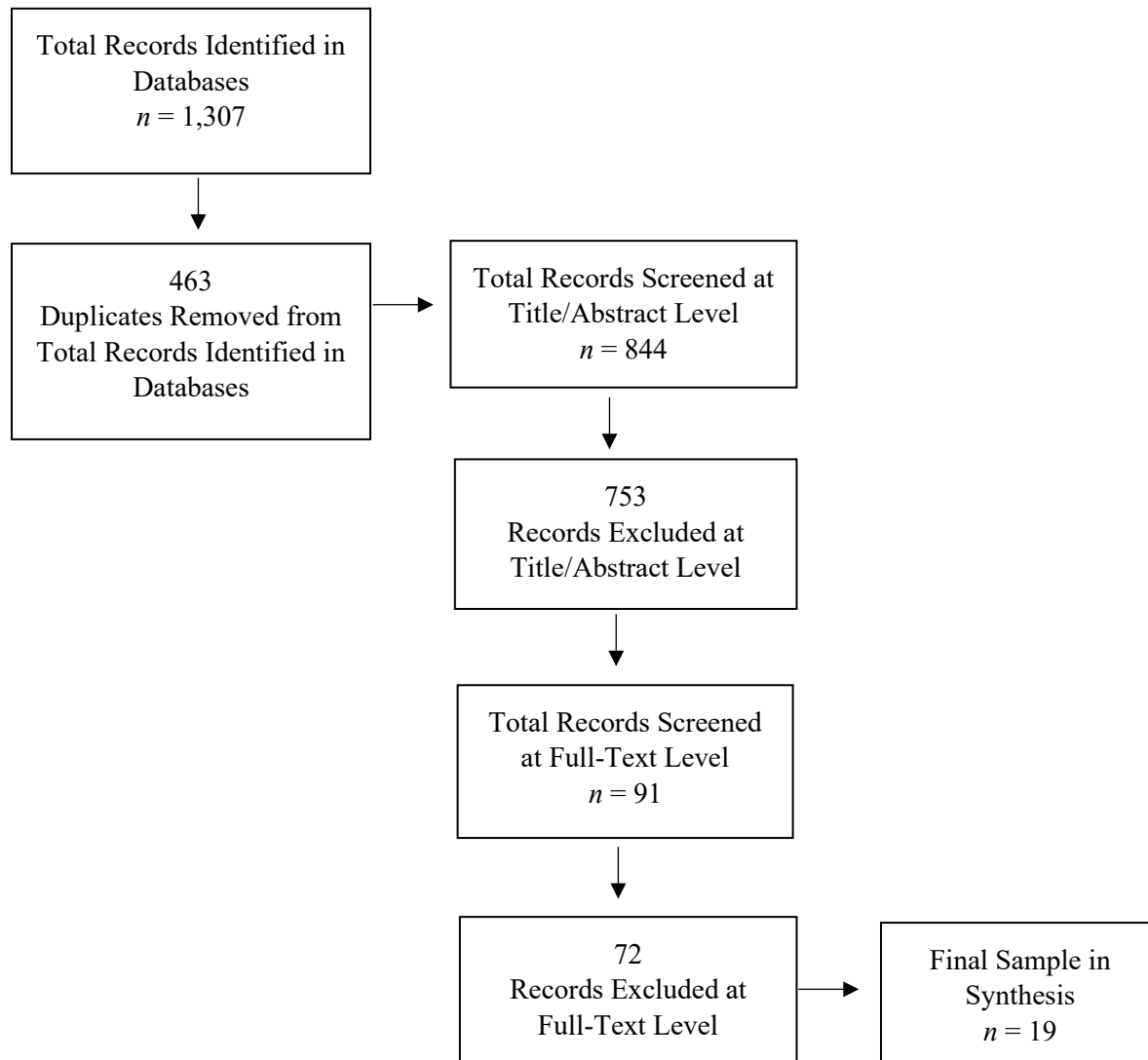
Figure 1*Article Selection Process by Stage*

Table 2*Summary of Internship Models & Level of Evidence*

Model	Internship Components	Length	Dosage	Host Business	Collab. Partners	Paid vs unpaid	Level of Evidence: Full Sample	
PS+ASD	Project SEARCH with ASD specific supports (social-communication, behavioral, educational), workplace immersion, job development, job-site training, follow-along support, demand-side approach	9 months (3 internships)	900 hours (720 intern, 180 class)	Healthcare; military base	LEA, VR, CRP, Business	Unpaid	I, II, III	4 RCT (Wehman et al., 2014; 2017; 2020; Whittenburg et al., 2020); 1 non-exp. (Schall et al., 2015); 2 case study (Ham et al., 2014; Wehman et al., 2012)
Project SEARCH	Workplace immersion, job development, job-site training, follow-along support, demand-side approach	9-12 months (3-4 internships)	900 hours (720 intern, 180 class)	Healthcare, retail, government, university	LEA, VR, CRP, Business	Unpaid	II, III	3 pre-exp. (Christensen et al., 2015; Christensen & Richardson, 2017; Muller & VanGilder, 2014); 1 non-exp. (Kaehne, 2016); 3 case study (Green, 2013; Gross et al., 2018; Wittig et al., 2014)
Bridges	Integrated work experience, job placement, on-the-job training, follow-along support	18 weeks - 24 months	3-week goal setting, 12 week internship	Retail, food, hotel, government, education, utilities	LEA, VR, Business	Paid	III	4 non-exp. (Fabian, 2007; Gold et al., 2013; Hemmeter et al., 2015; Luecking & Fabian, 2000)
Start on Success	Integrated work experience, job development, workplace supports	9 months (possible 2 nd year)	18-week class, 240 intern hours	University; hospital	LEA, local university, VR, Business	Paid	III	1 case study (Sabbatino & Macrine, 2007)

Note. Basic model components are described. Collab = collaborative, LEA = local education agency, Non-exp. = non-experimental, CRP = community rehabilitation provider, Pre-exp. = pre-experimental, RCT = randomized controlled trial, VR = vocational rehabilitation

Table 3*Employment Outcomes by Internship Model for Subsample of Articles*

Internship	Study	Sample	% Emp.	Type	Months After exit	Hr/week Mean (Range)	Wage/ hr Mean (Range)	≥ Min Wage
PS+ASD	Wehman et al., 2014	24 treat. 16 cont.	87.5 6.3	CIE	3	18 (-) -	\$8.25 (0-9.63)** -	Y
	Wehman et al., 2017	31 treat. 18 cont.	90.2 6.0	CIE	3	19 (0-30) 1 (0-22)	\$8.61 (0-10.66)** \$0.53 (0 -10.00)**	Y Y
	Wehman et al., 2020	79 treat. 25 cont.	73.4 17.0	CIE Work	12	21 (4-40) 16 (8-27)	\$9.67 (7.25-12.07) \$8.68 (7.50-10.23)	Y Y
	Whittenburg et al., 2020	6 treat. 8 cont.	83.3 0	CIE	12	27 (20-40) 0	\$8.87 (8.31-11.00) 0	Y -
PS	Christensen et al., 2015	124	83.0*	CIE	6	23 (20-24)	\$9.00 (-)	Y
	Christensen et al., 2017	8	63.0	CIE	-	18 (2-40)	\$9.25 (9.00 -10.00)	
	Green, 2013	6	33.0	CIE	4	≥ 20	≥ \$7.25 (-)	Y
	Kaehne, 2016	315	51.5*	Work	10	23 (6-38)	£7.68 (5.85-11.50)	Y
	Muller et al., 2014	10	60.0	Work	3	- (20-40)	-	-
Bridges	Fabian, 2007	4,571	68.0*	Work	-	22 (-)	\$6.91 (-)	Y
	Gold et al., 2013	5,847	77.2	CIE	-	19 (-)	\$8.29 (-)	Y
	Luecking et al., 2000	733	68.0	Work	6	23 (-)	\$5.71 (-)	Y

Note. *Mean percent reported for multiple cohorts, **includes unemployed, – not reported, CIE = competitive integrated employment, cont. = control, emp. = employed, hr = hours, treat. = treatment, Y = yes.

Appendix D

Whittenburg, H., McDonough, J., Schall, C., DuBois, T., Vitullo, V, & Wehman, P. (In Review). The Impact of COVID-19 on the Employment of Military Dependent and Connected Youth with ASD. Submitted to Journal of Autism and Developmental Disorders. Federal Support Acknowledged.

**The Impact of COVID-19 on the Employment of
Military Dependent and Connected Youth with ASD**

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Abstract

Research is needed that describes how COVID-19 has affected the employment of youth with autism. We present data on three cohorts of military connected and dependent youth with autism participating in a randomized, waitlist-controlled trial of Project SEARCH + ASD Supports to describe potential effects of COVID-19 on employment. We also present three case studies of participants to highlight challenges and opportunities they faced during the transition process. Findings indicate that the pandemic appeared to affect the 2019-2020 cohort most negatively, with employment outcomes lagging the previous two classes by 29.1% to 48.2%. However, the case studies highlight approaches that effectively supported participants, including interagency collaboration, partnerships with the military and federal employers, skilled employment specialist support, and family involvement.

Keywords: autism, transition, employment, military, COVID-19

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COVID-19 and Employment of Military Connected and Dependent Youth with Autism

The COVID-19 crisis created significant disruptions to the global economy. Within the United States, the COVID-19 crisis led to an initial economic recession in Spring 2020, followed by a partial recovery later in the year as some workers returned to pre-pandemic positions with employers after furloughs and layoffs (Weber Handwerker et al., 2020). Economic data thus far point to an uneven and lengthy recovery process, with certain factors negatively affecting employment, including higher levels of the COVID-19 virus within communities, the emergence of new COVID-19 variants, worker and/or business telework incompatibility, and specific industries' vulnerability to state-mandated safety orders (i.e., leisure and hospitality, retail trade, arts and entertainment and recreation; Dalton, 2020; Weber Handwerker et al., 2020).

In the first two months of the pandemic, nearly one million working-age people with disabilities became unemployed and the unemployment rate for this population rose to 18.9% (Office of Disability Employment Policy [ODEP], 2020). While improvements were reported in the months that followed, unemployment rates have consistently remained much higher than pre-pandemic rates; for the month of January 2021, the unemployment rate for persons with disabilities was 12.6%, nearly double the rate for persons without disabilities. A review of employment records for employees with IDD also revealed the negative impact of COVID-19 and the recession that followed on work status, with many workers with disabilities being laid off or furloughed from March to June 2020. Once these individuals returned to work, a significant reduction in the number of hours worked monthly further impacted their income (Schall et al., 2021).

The COVID-19 pandemic has also dramatically affected employment outcomes for transition-aged youth with disabilities. Their unemployment rate is far higher than the overall

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rate for individuals with disabilities and their peers without disabilities. In January 2021, the rate for youth with disabilities 20 – 24 years of age was 20.9%, double the rate of youth without disabilities in the same age range (ODEP, n.d.). The overarching negative impact of the COVID-19 pandemic on the employment of youth with disabilities is clear. However, it is unclear how specific transition experiences, employment factors, and youth characteristics may support or hinder the employment of youth with disabilities during the current COVID-19 pandemic.

Transition from School to Work

Previous research indicates that transition programs and work experiences during high school predict successful postschool employment outcomes for students with disabilities (Mazzotti et al., 2021). The Project SEARCH model offers students with intellectual and developmental disabilities, including autism, extensive work-related instruction and sustained work experiences, and it has been shown to be effective in improving employment outcomes for this population (Leahy et al., 2014; Rowe et al., 2021). Instead of attending traditional high school, students enrolled in Project SEARCH are embedded within a local business, where they receive work-related instruction and participate in three 10 to 12 week internships in different areas of the business over the course of a school year.

Research conducted over the past 10 years has demonstrated the effectiveness of the Project SEARCH model, when combined with applied behavioral analytic techniques such as task analysis, discrete trial training, behavioral rehearsals, visual supports and prompts, self-management procedures, and reinforcement systems, in improving employment outcomes for transition-aged students with autism (Project SEARCH + ASD Supports; Wehman et al., 2017; Wehman et al., 2020). Two multi-site, randomized clinical trials of the Project SEARCH + ASD Supports model (PS+ASD) compared employment outcomes of transition-aged youth with

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autism with significant support needs who participated in PS+ASD to control group students with autism and significant support needs who received traditional high school-based transition services. The employment rates of PS+ASD participants at 12 months post-graduation were significantly higher than those of control group participants who received traditional transition services, at 87% employed versus 12% employed and 73.4% employed versus 17% employed in each of the randomized clinical trials respectively (Wehman et al., 2017; Wehman et al., 2020).

PS+ASD and Military Dependent and Connected Youth with Autism

More recently, PS+ASD's effectiveness for military dependent and connected youth with autism has been investigated. Military dependent and connected youth with autism may experience compounded difficulties during the transition from school to work, due to frequent relocations, deployments, and subsequent educational changes (Davis & Finke, 2015; Lincoln & Sweeten, 2011). Preliminary results from Year One of a three-year, randomized waitlist-controlled trial indicate that military dependent and connected youth with autism who participate in PS+ASD also experience better employment outcomes than their peers who receive traditional, high school-based transition programming (Whittenburg et al., 2020). However, the onset of the COVID-19 pandemic temporarily disrupted this research study. In the spring of 2020, schools closed, the military significantly curtailed physical access to installations, troop movements paused, and multiple military installation organizations and surrounding community businesses furloughed and/or laid off workers. PS+ASD treatment group cohort members were affected by these disruptions in different ways, and their experiences reflect the challenges and opportunities of the larger US workforce during the COVID-19 pandemic.

Rationale and Purpose of Current Study

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The differential impact of the COVID-19 pandemic on transition-age youth with disabilities is evident, with this population experiencing much higher rates of unemployment in comparison to their peers without disabilities (ODEP, n.d.). However, to our knowledge, research has not been conducted that investigates the COVID-related experiences of military connected and dependent youth with autism who are in the transition process. To identify and provide effective targeted support for this population of youth with autism and their families, we need to increase our understanding of the impact of the COVID-19 pandemic and subsequent recession on their employment.

Therefore, the purpose of this study is to describe how the COVID-19 pandemic and subsequent recession affected the employment of military connected and dependent youth with autism who were in the process of transitioning from school to work. In this paper, we present the overall findings regarding the impact of the COVID-19 pandemic on the employment of those treatment participants who were employed prior to the pandemic, those who were seeking employment as the pandemic affected the United States, and we conclude with three case studies of military connected and dependent youth with autism who were in different stages of that process to highlight the challenges and opportunities they faced. We conclude by describing the strategies used by transition teams to support them in their quest for stable competitive, integrated employment. We seek to answer the following research question: What was the impact of the COVID-19 pandemic and subsequent recession on the employment of military connected and dependent youth with autism who participated in PS+ASD? This question is addressed by providing data for two sub research questions. They are:

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1. What was the overall impact of the COVID-19 pandemic on all treatment group participants in the PS+ASD for military dependent and connected youth who participated in the treatment condition?
2. What were the descriptive experiences of three of the participating treatment group youth of the impact of the COVID-19 pandemic?

Method

The data used to analyze the impact of the COVID-19 pandemic on the employment of transition aged military dependent and connected youth with ASD were collected prospectively as a part of the larger randomized waitlist-controlled trial of PS+ASD. In this paper, we present descriptive data of the impact of the pandemic. In addition, the three case studies presented here were drawn from those PS+ASD participants. The case study data presented herein was also collected prospectively by the authors. This descriptive study was approved by the [redacted for blind review] University Institutional Review Board.

Setting

The setting for the randomized waitlist-controlled trial was a mid-sized military installation in the southeastern United States. The PS+ASD group participants had access to internships in a wide range of settings on base (e.g., hotel, commissary, retail store, child development center, museum, medical center, dental clinic, event venue, recreation center), and were matched with internships based on their career goals, interests, and skills. During PS+ASD, participants received employment skills instruction and internship support from a full-time special education teacher and full-time special education teaching assistant provided by one of the partnering school districts, the university-based employment specialist, and the university-based research site coordinator. After completing PS+ASD, treatment group participants

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continued to receive supported employment services through the university-based employment specialist for job development, job placement and training, and follow-up services.

Measures

The measures relevant to this descriptive study were internship and employment status, a baseline questionnaire, and the Support Intensity Scale.

Internship and Employment Status

This variable was collected and reported qualitatively by providing a list of employment outcomes by participant, their current duties, wages earned, and hours worked. This information was updated monthly and reported to the funding agency and the management team of the PS+ASD for military dependent and connected youth. The management team was composed of leaders from the military base and each of the participating school districts.

Baseline Questionnaire

The baseline questionnaire was composed of 20 questions. It collected the participant's age, gender, race, medical diagnoses, individualized education program (IEP) eligibility categories, prior paid and unpaid employment experience, and the number of hours spent in the previous year in Community Based Employment Training (CBET). This questionnaire was completed by the participant and their parents/caregivers at the beginning of the school year.

Support Intensity Scale

The Support Intensity Scale (SIS, Thompson, et al., 2004) is a comprehensive interview that provided a description of the youths' entering support needs in six domain areas as well as their exceptional medical and behavioral challenges. The six domain areas include home, community, lifelong learning, employment, health and safety, and social activities. The final support needs index (SNI) score is a standard score that provides an estimate of the overall

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support needs an individual displays across four levels of support. They are limited support needs (SNI = 0-60), intermittent support needs (SNI = 61-84), extensive support needs (SNI = 85-116), and pervasive support needs (SNI = 117 or higher). The SIS interview was completed at the beginning of the school year by a trained data collector who was not a part of the implementation of PS+ASD.

Participants

The participants for this study were recruited for the randomized waitlist-controlled trial from school districts surrounding the military installation. To be included in the study, participants had to have a medical and/or educational diagnosis of autism, be working toward a special education high school certificate of completion (versus a standard diploma), be eligible for vocational rehabilitation (VR) services, be independent in self-care, and be a military dependent or connected youth between the ages of 18-21. Military dependent youth were defined as students whose primary caregivers were active-duty military members, retired military members, or active-duty military reserve members. Military connected youth were defined as students whose immediate family members served in the military or were civilians working with the military (Whittenburg et al., 2020). It is important to note that all participants in the randomized waitlist-controlled trial demonstrated significant impact from their disabilities that entitled them to continued special education services through age 22 and deficits in communication and adaptive skills that required ongoing direct instruction to teach (e.g., independent living skills, transportation skills, work-related social skills; Wehman et al., 2020; Whittenburg et al., 2020). For the case studies, we drew on experiences of participants from each of the three annual cohorts whose job development and/or employment were impacted by the COVID-19 pandemic and subsequent recession in different ways.

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Findings

The Overall Impact of the COVID-19 Pandemic

Across the three years of the randomized waitlist-controlled trial, 22 participants were randomized into the PS+ASD treatment condition. There were six participants in the 2017-2018 school year, 8 in the 2018-2019 school year and 8 in the 2019-2020 school year. The third cohort was mid-year when the COVID-19 pandemic hit, resulting in the closing of all in person public schools in Virginia. One participant in the 2018-2019 school year was terminated from the program due to a lack of personal independence. This resulted in 13 individuals who participated in a full year of PS+ASD and 8 who participated in a partial in-person/virtual year of PS+ASD. The employment outcomes at 12 months post baseline for each of the three years of the program are presented in Table 1.

While 13 of 21 individuals gained employment at the 12 month point from baseline, an additional three individuals gained employment after that time point resulting in 16 participants out of 21 who gained employment. By September 2019, two participants relocated out of the state, and two individuals quit their jobs and were not seeking employment. As of September 2020, 12 participants had achieved competitive integrated employment, three participants were seeking employment, and one participant was completing an unpaid internship in the community prior to seeking employment. Table 2 presents the working status of those 16 for September and December 2020, and March and June 2021.

As noted in Tables 1 and 2, the pandemic seemed to have the most impact on the 2019-2020 cohort whose employment outcomes lagged behind the previous two classes by 29.1% to 48.2%. Other ways the pandemic impacted all these individuals was through temporary furlough and loss of hours, especially between September 2020 - March 2021 when only seven of 16

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individuals were working on-site, with one individual receiving pay while furloughed. By June of 2021, however, as vaccination rates increased, the on-site employment outlook increased dramatically with 12 individuals working on their job site, and only two continuing to work reduced hours.

Descriptive Experiences of Three Participants

To further describe the individual impact of the pandemic, the authors present three case studies, one from each of the cohorts in the larger randomized waitlist-controlled trial of PS+ASD for military dependent and connected youth. Several sources of data were used to develop the case studies and verify their accuracy. These included daily case notes, post-graduation supported employment services files, and employment outcomes collected at baseline, 12 months, and 18 months following the research protocol (Whittenburg et al., 2020).

Grady Before the COVID-19 Pandemic

Grady is a 23-year-old, Black, military dependent youth who was medically diagnosed with autism and epilepsy and received special education services under the category of Autism on his IEP. He received most of his special education services in self-contained special education classrooms. While in high school, Grady received 4 hours weekly of community-based employment training (CBET) prior to attending PS+ASD. According to the SIS, Grady required intermittent support with a support needs index of 75 (Thompson, et al., 2004). His highest support needs were noted in the areas of employment activities and social activities where he required extensive support. Grady enrolled in PS+ASD at the beginning of the 2017-2018 school year and successfully completed PS+ASD in June 2018 as a member of the first cohort of treatment group participants. At PS+ASD, Grady took part in three different 10-to-12-week internships on the military installation. His first internship was at the base commissary, where he

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checked products' expiration dates, stocked and organized shelves, and assisted customers.

Grady's second internship was at the installation's food court. At the food court, he learned how to take customer orders and operate a cash register, and he was responsible for cleaning and maintaining the food court area during the busy lunch rush. Grady interned at one of the installation's recreation centers for his final internship experience. He checked guests in and out of the facility, issued sports equipment to guests, sanitized cardio equipment, and checked cardio equipment. Immediately after completing PS+ASD, Grady applied for and was offered a full-time federal position as a recreation assistant at one of the recreation centers on the military installation.

The Impact of COVID-19 on Grady's Employment

In March 2020, Grady had been employed as a full-time recreation assistant for almost two years and earned \$13.16 per hour. Grady's job responsibilities focused on assisting guests, maintaining equipment and the overall appearance of the recreation center, and ensuring that recreation center rules and guidelines were followed by guests. Grady spent a portion of each work shift at the recreation center front desk, where he greeted guests, scanned ID cards of guests into the computer system, and checked out gym equipment to guests. Grady was also responsible for conducting hourly census counts of the number of guests in each area of the recreation center. He worked collaboratively with his coworkers to complete required daily and weekly cleaning and sanitation tasks (e.g., cleaning cardio equipment, returning weightlifting equipment to appropriate locations, dust mopping gymnasium floors, cleaning locker rooms).

When the COVID-19 pandemic began, Grady was receiving supported employment follow along services, where his employment specialist checked in with him and his supervisor two to three times per month to monitor progress, offer support when learning new tasks, and

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problem solve issues together. As the COVID-19 pandemic grew in spring 2020, local military leaders began to make determinations about which departments on base would remain open and which departments would close to limit the spread of the virus. In March 2020, the installation recreation centers were deemed to be non-essential and high-risk areas for potential COVID-19 spread. Grady, like the other recreation center employees, was able to access weather and safety leave, which allows federal employees to stay home but still be paid during major weather or public safety events. Grady remained at home but still received a paycheck while the recreation centers were closed to the public.

While Grady was at home, his employment specialist maintained contact with him, his family, and his supervisor to share information related to evolving installation COVID-19 policies. To minimize health risks and adhere to social distancing guidelines developed by the installation, the supported employment organization, and the state vocational rehabilitation agency, communication occurred through email, phone calls, and video conference meetings, instead of face-to-face contact. As plans began to be made for recreation center employees to return to in-person work, the employment specialist's focus shifted to teaching Grady skills and practices he would need to follow new COVID-related guidelines and minimize personal risk while at work. The employment specialist met with Grady and his family via video conference to teach handwashing skills, social distancing, and proper mask usage. Because video models had been used successfully with Grady in the past to teach work skills, the employment specialist incorporated online classes and videos about COVID-19 hygiene skills into these sessions. In addition, Grady and his family practiced hand washing and mask wearing together for gradually longer periods of time. Specifically, they began taking walks around their neighborhood while wearing masks and practiced wearing masks inside their home. Grady also practiced hand

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washing using CDC-recommended guidelines (e.g., wash hands frequently, wash all parts of hands, wash for at least 20 seconds) while at home. Please see Table 3 for additional information on strategies used to teach COVID-19 specific skills to Grady, Daniel, and Timothy.

When Grady returned to in-person work in September 2020, there were new policies and procedures to learn that required more intensive training and support from the employment specialist. For instance, the employment specialist helped Grady safely navigate break times by showing him how to check the new employee break schedule, to set alarms on his phone to independently know when to go and return from breaks, and to check the break room before entering to comply with new COVID social distancing requirements. Grady also had to learn new sanitizing procedures, such as regularly cleaning all high touch areas (i.e., doors, plexiglass barriers) and more intensively cleaning exercise machines. Because these new responsibilities required more targeted training and support than could adequately be provided through follow along services, the employment specialist coordinated with Grady's VR counselor. Grady's VR counselor approved post-employment services, which allowed the employment specialist to provide jobsite training to Grady when he returned to in-person work. The employment specialist was onsite every day the first week that Grady returned to work and then gradually faded the level of support over the subsequent three weeks, as Grady mastered the new policies and procedures. Grady was transferred from post-employment services back to the less intensive follow along services beginning in November 2020. He has returned to his full-time employment at 40 hours weekly earning \$13.40 per hour.

Daniel Before the COVID-19 Pandemic

Daniel is a 24-year-old, White, military connected youth with an uncle and grandfather who served in the military and who was a member of the second annual cohort of treatment

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group participants in the 2018-2019 school year. He had a medical diagnosis of autism, attention deficit hyperactivity disorder, and sensory processing disorder. He received his education in a specialized public day school for children and youth with autism and challenging behavior and, as a result, was not included in any other activities with peers without disabilities. In that program, he received two hours weekly of CBET. According to the SIS-SNI of 77, he also required intermittent support with his highest areas of support needs measured in the areas of home activities and employment activities. He also was reported as having challenging behavior on the SIS. He completed PS+ASD in June 2019. At PS+ASD, Daniel completed three separate internships - at the commissary, the warehouse of the installation's medical center, and the food court. During his internship at the commissary, Daniel checked shelves for expired and damaged items on the sales floor and consolidated stock in the commissary warehouse. Daniel interned in the warehouse of the installation's medical center for his second internship experience, where he prepared packages for shipping, assisted with receiving supply orders, made deliveries to different medical clinics, and inventoried supplies. At the food court, Daniel learned to wash and sanitize dishes for one of the restaurants and cleaned/maintained the dining area during the lunch rush. During the summer after completing PS+ASD, Daniel was hired by the hotel on the installation as a part-time laundry attendant.

The Impact of COVID-19 on Daniel's Employment

In March 2020, Daniel had been employed at the installation hotel for approximately eight months as a part-time laundry attendant and earned \$9.50 per hour. Daniel's VR case had been successfully closed, and he received supported employment follow along services, consisting of weekly check-ins with him, his coworkers, and his supervisor. Daniel had multiple job tasks he was responsible for completing during his work shifts. First, he independently

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checked hotel floors for dirty linens that the housekeepers had removed from guest rooms, and he transported the dirty linens in laundry carts back to the hotel linen room. Second, he worked in collaboration with his coworkers to visually inspect, count, and record the amount of soiled linen to be sent out to the laundry service contractor. Finally, Daniel worked with his coworkers to determine which hotel floors needed new linens, to prepare laundry carts with the correct amounts of new linens, and then deliver those new linens to designated housekeeping closets on the hotel floors.

In March 2020, as the COVID-19 pandemic began to spread and troop movements, planned conferences, and scheduled trainings slowed and then stopped, the installation hotel's guest count decreased dramatically. To limit the potential spread of the virus and address declining guest counts, the hotel adjusted employees' work schedules and implemented weather and safety leave. Daniel continued to work in person at the hotel for three days each week but remained at home and continued to be paid for the other two days a week he was regularly scheduled to work. The employment specialist was unable to provide in-person supported employment services through May 2020, due to COVID-19-related restrictions limiting installation access to essential personnel only. Instead, the employment specialist collaborated with both Daniel and his employer to identify an alternate approach that provided Daniel with the support he needed and met the needs of the hotel (i.e., was unobtrusive, did not take excessive time away from Daniel's work responsibilities). The team agreed to use periodic, short video chats between the employment specialist and Daniel to teach Daniel new policies and procedures. At the beginning of this process, the employment specialist checked in with Daniel a minimum of three times a day via video chat, then faded the check-ins to once a day as Daniel

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mastered the new procedures, then to two to three times per week, and ultimately, to once a week.

The video chats focused on helping Daniel learn and incorporate new COVID-related procedures. For instance, the employment specialist instructed Daniel on proper mask usage and reinforced correct masking procedures through unscheduled video chat check-ins. With the implementation of the staggered work schedule at the hotel, Daniel had less coworker support than before the pandemic and had to complete more tasks on his own (e.g., preparing clean laundry carts and delivering linens to different floors of the hotel). Daniel and the employment specialist used video chats during these tasks to check Daniel's accuracy and to answer questions he had about completing the tasks independently. On the occasions when another laundry attendant was scheduled to work at the same time as Daniel and they were working together within the linen room to conduct linen inventory, the employment specialist used video chats to teach Daniel how to maintain six feet social distance from his coworker by using familiar items within the laundry room to demarcate distance. The employment specialist and Daniel also worked together to identify strategies for managing increased downtime at work. Daniel set timers on his phone to know when he should check back with his supervisor to see if there was more work to be done, and the employment specialist followed up with brief video chats to make sure he was back at work. Within each of these areas, the employment specialist collaborated with Daniel's supervisor and coworkers to ensure that the skills being taught adhered to organizational standards and to address questions that arose.

By June 2020, restrictions on installation access were lessened, and the employment specialist was cleared to begin face to face services with Daniel at the installation hotel again. The employment specialist used a combination of in-person visits and video chat check-ins to

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ensure that Daniel continued to incorporate the new skills and procedures into his work. In October 2020, Daniel returned to his regular, in-person work schedule, and he was offered a promotion to full-time employee. Daniel accepted the position, and he is now eligible for full federal benefits including medical, dental, and retirement options and a guaranteed 40-hour work week earning \$10.40 per hour.

Timothy Before the COVID-19 Pandemic

Timothy is a 23-year-old, White, military connected youth who participated in the third treatment group cohort at PS+ASD during the 2019-2020 school year. He was connected to the military through his grandfather and aunt who both served. He had a medical diagnosis of autism and intellectual disabilities and was served in special education services under those categories too. Prior to PS+ASD, he volunteered eight hours weekly at a local museum by completing simple data entry. This prior experience served him well, as he and his mother reported limited support needs on the employment activities scale of the SIS. Despite this finding, Timothy did require intermittent support needs with a SNI of 76 and demonstrated greater support needs in health and safety, social, and community activities. Timothy completed two internships during PS+ASD before governor-mandated school system in-person learning closures and significantly decreased access to military installations forced PS+ASD to end early in April 2020. Prior to that, Timothy participated in internships with the installation's military museum and the military identification/badge office. During his internship at the military museum, Timothy stocked and inventoried merchandise in the museum's gift shop, greeted and assisted visitors to the museum, and helped to update the museum foundation's donor database. At the military identification/badge office, Timothy assisted visitors, tracked the time spent in the office by each visitor during the badging process, and entered that data into a customized spreadsheet.

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The Impact of COVID-19 on Timothy's Employment

As mentioned above, Timothy did not have the opportunity to participate in a final internship; instead, he participated in online classes with the school system for the remainder of the school year. In April 2020, Timothy and his family contacted the PS+ASD team about the possibility of participating in a third internship in fall 2020. Timothy, his family, his VR counselor, his special education team, and his employment service provider team began to meet regularly via video chats from April 2020 through July 2020 to discuss different options and develop a plan.

One of the first issues that emerged during the team meetings was that Timothy was not sure of his ultimate career goals. This issue is frequently addressed across the PS+ASD internships, but especially during the third internship as interns prepare for graduation and their job search. Given the loss of the third internship opportunity due to COVID, Timothy and the team decided to engage in person-centered planning to support Timothy in identifying the type of work he wanted to do and in finding a third internship off base that would provide him with additional skills and experiences. Timothy's VR counselor approved and provided funding for the additional internship. Over the summer, Timothy and his team met regularly via video conferences to discuss his interests, wants, and dreams. Timothy was able to describe what was important to him in a job, identify important people in his life who support him, list things he likes and dislikes, and ultimately, develop both short- and long-term goals related to his career and his life outside of work. Timothy decided that he wanted to work in a professional setting, in a job with a regular schedule that allowed him to use his skills and interests in computers and customer service.

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Once Timothy had determined his career goal, he and his team used their professional and social networks to identify potential local organizations who might be willing to host Timothy in an internship. The employment specialist had a contact within the local city government, who as a former military officer, was familiar with and very supportive of PS+ASD. Together, they developed a part-time internship for Timothy at a local museum. Timothy worked as an intern at the museum from August 2020 through March 2021. He performed a variety of work tasks during his internship experience. For instance, he digitally scanned paper and photographic historical artifacts into a computer, placing the scanned images into different electronic folders based on topical area. When museum staff changed out displays, Timothy was responsible for inventorying each item within the display. Timothy also greeted visitors who came into the museum gift shop and answered commonly asked questions from museum guests. One of Timothy's concerns as he prepared to begin his internship was how to protect himself from COVID-19. Timothy's team began by providing him with easy-to-read information on COVID-19 and showing him how he could access current state and local-level COVID data online. As he had done with Grady, the employment specialist also used online resources, video chat instructional sessions, and family practice activities to teach the importance of regularly washing his hands, practicing social distancing and how to properly wear a mask in public.

While Timothy was engaged in the internship at the local museum, he and his team continued to seek paid employment opportunities for him in the local community, and Timothy expressed an interest in obtaining a federal office support position on the installation. The team was able to identify an additional internship experience that would further enhance Timothy's professional skills and increase his marketability in this area. Timothy began a final internship in

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the military installation's marketing department in March 2021. In this internship, Timothy's responsibilities include: (a) attending weekly staff meetings to discuss current projects that the team is working on, update the team on the status of projects he has been assigned, and get his tasks for upcoming week; (b) using graphic design software packages (i.e., PhotoShop) to create fliers, posters, and memorandums about events happening across the installation; (c) distributing promotional information to various organizations on the installation; and (d) assisting with developing and implementing special events on the installation (e.g., 10k runs, concerts, meet and greets). During this internship he also had to adjust to several changes in installation COVID-19 policies. The employment specialist assisted him with these changes by providing him with the latest information on masking and helping him understand the specific situations during which he was to wear a mask, did not have to wear a mask, and changes in social distancing. As of the preparation of this case study, Timothy continues to intern in the marketing department and remains focused on his job search.

Discussion

COVID-19 has substantively affected people with disabilities, as the employment-related barriers they experienced pre-pandemic were exacerbated by the pandemic, resulting in higher unemployment rates than their peers without disabilities (Office of Disability Employment Policy, 2020). Transition-aged youth with autism experienced barriers to employment prior to COVID-19 which kept them from securing a job, whether it was skill level, connection to services, or lack of opportunities due to misconceptions of their abilities by employers in the community (Carter et al., 2011; Kaya et al., 2016; Schall et al., 2021). COVID-19 only enhanced the challenges transition-aged youth with autism face in finding and retaining employment.

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The descriptive data reported here underscore these challenges but also suggest that the effects of the pandemic may vary depending on the point in which military connected and dependent youth with autism are in the transition process and ongoing developments with the virus. Specifically, our data indicate that the cohort of participants whose PS+ASD programming was interrupted by COVID-19 had competitive, integrated employment at 12 months post-baseline at substantively lower rates than participants from previous cohorts. This finding may reflect difficulties with finding employment during the early phases of the pandemic, as the 2019-2020 cohort entered the job market during the time when workers' hours were often cut, employees were furloughed, and hiring processes were frozen (Weber Handwerker et al., 2020). However, the data also mirror recent positive changes within the larger labor market as vaccinations become more readily available and state emergency orders were lifted. By June 2021, most PS+ASD participants were working regularly scheduled hours on their actual job sites and all employed participants had moved out of furlough status. These findings underscore how closely interrelated the employment status of military connected and dependent youth with autism is with the larger COVID-19 pandemic, and how changes in employment can occur relatively quickly, based on the progress or loss being made in the fight against the virus.

Additionally, the three case studies highlight specific strategies and supports used to help military-connected youth with autism find and maintain employment and deal with the unique employment circumstances brought about by the pandemic. One of these strategies was interagency collaboration. Interagency collaboration during the transition process is a well-documented key to employment success (Noonan et al., 2008; Saleh et al., 2019; Valentini et al., 2019; Wehman et al., 2014), and for the military dependent and connected youth with autism profiled in these case studies, having effective collaborative teams (including school staff, VR

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counselors, supported employment providers, families, a military liaison, and military employers) allowed the participants to quickly access services, effectively problem solve work-related issues when they arose, and receive individualized supports. This was especially important during the final months of 2019-2020 school year, as schools shifted to virtual learning, local VR agencies closed their offices to in-person services, and employers began furloughs, layoffs, and/or hiring freezes.

It is also important to note how participants benefited from employment and partnerships with the military and federal government. In contrast to many other employees with and without disabilities during the early stages of the COVID-19 pandemic, neither Grady nor Daniel was laid off. In fact, they continued to receive paychecks while remaining at home to prevent the spread of the virus. These case studies contrast with findings from the recent study conducted by Schall et al. (2021) on the employment of people with IDD during the start of the pandemic, which found that employees with IDD were more likely to be furloughed or laid off during that period when compared to the previous year. One possible explanation for this finding is that the defense sector is more resilient in the face of immediate economic pressures faced by businesses, which often drive furloughs and layoffs. Timothy also benefited from established partnerships with the military, as his collaborative team was able to leverage existing connections with current and previous military leaders to develop two internship experiences that helped Timothy move towards his employment goals. However, Timothy has not yet found competitive, integrated employment within his chosen field. His case highlights the complexities of job development within the COVID-19 pandemic, in which it may be more difficult for youth with autism to find employment within “non-essential worker” fields.

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The youth profiled here also benefited from access to research-based, employment-focused transition programming that was specifically designed to meet the needs of military dependent and connected youth with autism and their families. PS+ASD had notable success pre-pandemic (Wehman et al., 2017, 2020; Whittenburg et al., 2020) and served as a connection to ongoing supported employment services and employment training for the participants. In addition, PS+ASD provided participants with uniquely designed services shown to be effective for youth with autism; including internships/employment that align with the person's unique skills, abilities, and interests; social skills instruction specific for working environments; and a team of trained professionals with extensive knowledge regarding the military, federal employment, autism and behavior supports (Wehman et al., 2017, 2020; Whittenburg et al., 2020). As described in each of the case studies, the COVID-19 pandemic often required the collaborative team to shift how they provided services (e.g., to digital/virtual platforms), but the use of evidence-based practices and supports remained consistent.

Finally, as the COVID-19 pandemic required the closing of many businesses, these youth with autism ended up in their homes. Services that were delivered in-person became virtual, and the families of these youth became much more personally involved in delivering some of the required instruction and supports needed to ensure success upon these individuals' return to in-person work. This required the employment specialist and family members to coordinate and collaborate on the development of strategies to increase hand washing, mask wearing, and social distancing skill sets. The families and employment specialist essentially shifted roles. Specifically, the families implemented the instructional plans, while the employment specialist developed and discussed needs in the work environment. This level of collaboration and

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cooperation would have been difficult to achieve if these families were not fully involved with their young adult's transition planning to this point.

Limitations

This study had several limitations readers should consider. First, the findings of this study are descriptive in nature, and therefore are not generalizable. Second, the data presented here only describe youth who had participated in PS+ASD on a military base, were military dependent or connected, and had a diagnosis of autism. Their experiences during the COVID-19 pandemic may not accurately reflect the experiences of the larger population of transition-aged youth with disabilities during this same period. In particular, the youth described in this study all possessed strong connections to the local military installation, VR agencies, and a university-based supported employment organization as a condition of their participation in the research study. These connections cannot be understated in helping to contextualize the positive employment experiences reported here, as military dependent and connected youth with disabilities across the country often lack connections with VR agencies and adult employment service providers and experience frequent disruptions in services due to relocations and deployments (Awsumb et al., 2020; Davis & Finke, 2015; Kaya et al., 2016; Lincoln & Sweeten, 2011). Finally, it may be possible that the response to COVID-19 was unique to this area of the United States. The area where all three participants reside and work is a smaller metropolitan area, largely military-based, yet with a significant number of older residents and nursing care facilities. As such, this area had a high incidence of COVID-19, yet nothing as significant as the numbers reported in New York City and other larger metropolitan areas (CDDEP, 2021). These contextual factors could have affected both the individual experiences of the participants and the local, state, and military governmental responses to the pandemic. Nonetheless, the findings of

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this study do show the importance of community VR service provider connections and the impact that connectivity has on finding and sustaining employment even during a pandemic.

Study Implications

While this study only shows a small sample of the experiences of military dependent or connected youth with autism, it should be noted that many participants made progress towards their employment goals during the COVID-19 pandemic. Helping military dependent and connected youth with autism and their families make connections to adult service organizations is key. This should occur as part of a coordinated transition planning process during high school, including the student, their family, the special education team, a state VR agency representative, and any adult service providers the student is or could be working with. If the person has already exited school, then they should contact their state VR agency when they are considering employment so that they are able to establish a connection and are ready for services as soon as possible.

As the pandemic continues to evolve, it will be important for researchers to continue to investigate the potentially long-lasting effects of COVID-19 on the employment of youth with autism. This study highlights potentially promising strategies and approaches in supporting military dependent and connected youth with autism in making progress toward their employment goals, but it also raises other questions about approaches to supporting students whose transition experiences were interrupted by the pandemic and the effectiveness of supported employment services delivered via digital/virtual platforms in helping youth with autism learn work tasks and address work-related issues. Larger scale research is needed that examines the employment outcomes of youth with autism over time and seeks to identify effective approaches to supporting youth with autism whose transition experiences were

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disrupted by the pandemic, along with research that compares the efficacy of virtual and traditional modes of supported employment and transition service delivery. Finally, this study captures some of the currently shifting employment landscape, as businesses deal with evolving governmental COVID-19 guidance, cycles of outbreaks, and unpredictable labor supply and demand. Research is needed that investigates employer staffing needs, hiring practices, and recruitment strategies to better determine how to facilitate the hiring and continued employment of youth with autism both during and after the COVID-19 crisis.

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Table 1*Employment Outcomes by Cohort Year*

	2017-2018	2018-2019	2019-2020*
n Completed PS+ASD	6	7	8
Employed at 12 Months	4	6	3
% Employed	(66.6%)	(85.7%)	(37.5%)
Average Hourly Wage**	\$8.77 per hour	\$8.86 per hour	\$11.22 per hour
Average Hours Worked Weekly	25.75 hours weekly	24.16 hours weekly	22.5 hours weekly
In Job Development Phase of Supported Employment	1	1	3
In High School	1	0	0
Completing Additional Unpaid Internships	0	0	1
Not Seeking Employment Until Pandemic Resolved	0	0	1

Note: *Partially in person, partially distance learning, **Minimum wage in Virginia was \$7.35 per hour

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Table 2*Employment Status of Participants in PS+ASD from Sept. 2020 - June 2021*

Total n = 16	Sept. 2020	Dec. 2020	March 2021	June 2021
Employed Working Regular Hours on Job Site	4	5	5	10
Employed Working Reduced Hours on Job Site	3	2	2	2
Furloughed* With Pay	1	1	1	0
Furloughed Without Pay	2	3	2	0
Unemployed Due to Pandemic	1	0	0	0
Unemployed Due to Self-Choice	1	2	2	1
Seeking Employment	3	2	3	2
In Internship	1	1	1	1

Note: Furlough refers to individuals who will eventually return to their jobs once businesses are opened after the restrictions are lifted.

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Table 3*Approaches to Teaching COVID-19 Specific Skills*

	Hand washing	Mask wearing	Maintaining social distance
Instructional methods	Task analysis Video modeling Error correction	Video modeling Error correction Increasing time interval	Video modeling Visual cues in natural environment Error correction
Use of technology to support instruction	Zoom video conferences to teach skill Use of online content Video modeling	FaceTime video calls to reinforce skill usage Video modeling	FaceTime video calls to teach skill Video modeling
Routine building strategies	Add icon to visual schedule Practice skill at critical transitions	Add icon to visual schedule Practice skill at critical transitions	Add icon to visual schedule Practice skill at critical transitions
Generalization strategies	Program reminders into smart phone Share visual supports with employer	Program reminders into smart phone Share visual supports with employer	Program reminders into smart phone Share visual supports with employer
Coworker supports	Teach coworkers to prompt skill	Teach coworkers to prompt skill	Teach coworkers to prompt skill
Family supports	Ask families to practice handwashing at home Ask families to set up hand washing station in home	Ask families to practice mask wearing in public locations Ask families to practice mask wearing indoors at home for increasingly longer intervals Ask families to try a variety of mask styles to determine which provides the most comfort and protection	Ask families to practice identifying what makes “6-feet social distance” at home Ask families to locate and practice using provided visual cues (e.g., stickers on floors, information on doors and walls) in public spaces that indicate appropriate social distancing within that specific setting

Appendix E

Whittenburg HN, Xu Y, Thoma C, Schall C, Ham W. Effects of Behavioral Skills Training with Video Modeling and in Situ Training on Workplace Conversational Skills of Autistic Students. Focus on Autism and Other Developmental Disabilities. (Awaiting Publication). Federal Support Acknowledged.

**Effects of Behavioral Skills Training with Video Modeling and in Situ Training on
Workplace Conversational Skills of Autistic Students**

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Abstract

This study investigated the effects of behavioral skills training (BST) with video modeling and in situ training on workplace conversational skills of four transition-aged autistic students enrolled in a community-based internship program. Intervention sessions began with BST, which included direct instruction, video modeling, conversational practice, and feedback on practice performance, and concluded with in situ training, during which participants conversed with coworkers in their internship settings. Data were collected on participants' accuracy in conversing with coworkers through mock conversations and in situ trials in internship settings. Findings demonstrated a functional relation between the implementation of the intervention package and increases in skill accuracy on in situ trials for all participants. Substantive improvements in participants' mock conversation scores within training settings were also noted. Findings highlight the importance of in situ training and how video modeling can be incorporated within a BST instructional sequence.

Keywords: autism, transition, employment, behavioral skills training, in situ training, social communication skills

Effects of Behavioral Skills Training with Video Modeling and in Situ Training on Workplace Conversational Skills of Autistic Students

Transition-aged autistic students often need support in developing workplace social communication skills; however, traditional transition planning and activities may not provide these students with the skills and knowledge needed to meet workplace expectations. Wehman et al. (2012) found that autistic students required direct instruction and sustained support to learn and adhere to workplace social expectations and norms, communicate effectively with coworkers and customers, and accept feedback from supervisors. This conclusion aligns with other research stressing the importance of providing social skills instruction within the authentic contexts in which the skills will be used (Bellini et al., 2007; Ledford et al., 2018). Yet very few studies to date have investigated the use of work-related social skill interventions for transition-aged autistic students within competitive, integrated workplace settings (Whittenburg et al., 2020). Research is needed that teaches transition-aged autistic students workplace social skills that align with student needs and employer expectations and is taught within the integrated, competitive settings where the skills will be used.

Instructional Strategies for Social Skills

Previous research describes how behavioral skills training (BST), in situ training, and video modeling have been used to support autistic people in developing social skills. BST is an instructional strategy that teaches specific skills through direct instruction and practice. It consists of four sequential steps - instruction, modeling, rehearsal, and feedback (Miltenberger, 2014), and is sometimes used in combination with in situ training. During in situ training, participants practice targeted skills in the authentic settings in which skills are used, and feedback on performance is delivered immediately to correct errors and reinforce accurate trials

(Miltenberger, 2014). When used with BST, in situ training promotes skill generalization to different people and settings (Gunby & Rapp, 2014; Miltenberger et al., 2013).

Within the past decade, researchers have investigated the use of BST or BST with in situ training to teach greetings, non-scripted conversational skills, and a variety of work-related social communication skills in (e.g., making confirming statements when given direction, asking for a task model, apologizing, asking for feedback, asking for help with materials) within university-based clinics (Grob et al., 2019; Hood et al., 2019), and peer-focused conversational skills in a comprehensive rehabilitation facility (Nuernberger et al., 2013). These studies also incorporated prompting (Grob et al., 2019; Hood et al., 2019) and/or reinforcement (Hood et al., 2019; Nuernberger et al., 2013) into the intervention package to facilitate participants' skill acquisition. While they support the effectiveness of BST with in situ training in teaching conversational skills to autistic people, they also highlight gaps in current knowledge. Specifically, research has yet to examine the use of BST with in situ training to teach workplace conversational skills to transition-aged autistic students within competitive, integrated employment settings.

Video modeling, in which learners view videos of themselves or others successfully completing the steps of a given task, has demonstrated efficacy in the acquisition of a variety of skills for autistic adolescents and adults (Roth et al., 2014). Moreover, skills acquired through video modeling tend to generalize well to other settings (Hume et al., 2009). Walsh et al. (2017) used video modeling within a comprehensive social skills curriculum and documented substantive gains in a variety of work-related social skills for autistic young adults. In other studies, video modeling interventions resulted in improvements in problem-solving during functional and vocational tasks (Yakubova & Zeleke, 2016). Video modeling shows promise in

teaching work-related social skills because it provides an antecedent-based, visually focused strategy for instruction prior to encountering similar situations in authentic workplace settings.

Purpose of the Study

Very few studies have investigated interventions to improve the work-related skills of autistic people, and even fewer studies have focused on the work-related social skills of transition-aged autistic youth within competitive, integrated workplace settings (Whittenburg et al., 2020). Studies targeting improvements in workplace conversational skills are needed, given the importance of these skills in developing positive interpersonal relationships with coworkers and ultimately, in promoting successful employment outcomes. While BST with in situ training has been successfully used to teach transition-aged autistic youth and adults social communication skills, no studies to date have investigated the effects of BST with video modeling and in situ training to teach workplace conversational skills to transition-aged autistic students within competitive, integrated settings.

The current study seeks to address this gap within the existing literature by investigating the effectiveness of an intervention package including BST, embedded video modeling, and in situ training to teach workplace conversational skills to transition-aged autistic students within community-based internship settings. The following research question guided the study: What are the effects of BST with video modeling and in situ training on the workplace conversational skills of transition-aged autistic students within community-based internships?

Method

Participants

The four participants were recruited from a larger research study investigating the effects of the community-based [PROGRAM NAME] internship model, which provided autism-specific

supports and strategies to autistic youth who were working toward special education certificates of completion from high school and who required intensive instruction to learn new skills ([Authors, 2014; Authors, 2020; Authors, 2020]). To be included in the current study, participants had to have a medical diagnosis or educational determination of autism, be between the ages of 18 and 22 years old, have received no previous instruction within internship settings on workplace conversational skills, and demonstrate deficits in workplace conversational skills. Participants' workplace conversational skills proficiency were measured through three structured workplace observations and semi-structured interviews with the participants' special educator or job coach, using two subscales of the Virginia Commonwealth University and Autism Speaks Community Based Functional Skills Assessment for Transition Aged Youth with Autism Spectrum Disorder (CBFSA; Schall et al., 2014), the Work Observation – Peer Relationships, Socialization, Social Communication – Level 3 Life Seeker subscale (WO-PSS-3) and the Peer Relationships, Socialization, Social Communication Interview (PSSI). Internship employers also completed a researcher-developed questionnaire about the relevance of different work-related social skills described within the CBFSA to their specific workplace environments. IRB consent for the present study was obtained through the Virginia Commonwealth University Institutional Review Board and was approved by the Virginia Department of Aging and Rehabilitative Services and the participating school district. All participants gave their informed consent or assent before study procedures began.

Rodney

Rodney was a 21-year-old White student who received special education services under the category of autism. He was able to read materials written at a fourth-grade level and used multi-word phrases and sentences to communicate. Pre-intervention observations and an

interview with Rodney's job coach provided additional information about Rodney's work-related social skill performance. Rodney consistently followed verbal and written directions given by his supervisor and job coach, and he demonstrated use of workplace etiquette when appropriate (i.e., saying "Thank you," and "You're welcome."). With verbal prompting from his job coach, he asked questions to gain clarification or assistance on his internship. Rodney's job coach reported that making eye contact with others was difficult for him. During pre-intervention observations, Rodney rarely initiated conversations with his coworkers or customers. He typically responded to coworker conversational exchanges with one-word replies.

Thomas

Thomas was a 21-year-old White student who received special education services under the category of autism. He was able to read simple sentences, familiar sight words, and safety signs. Thomas used short (one to three word) verbal phrases to respond to questions and comments from others, but rarely initiated communication. Thomas' special educator reported that he accepted correction well, typically responding by saying "I'm sorry," and trying to fix the error. The special educator also stated that Thomas had difficulty with verbal communication and struggled to find the words to ask for help or problem solve on his internship. During pre-intervention observations conducted at his internship site, Thomas did not greet or engage in conversations with coworkers or customers, although he was presented with multiple opportunities to do so.

Terrence

Terrence was a 21-year-old Black student who received special education services under the category of autism. Terrence's reading skills were at a fifth grade level, and he used a variety of statements and questions to make comments, describe his thoughts and feelings, and gain

clarification. Terrence's job coach reported that he possessed strong verbal communication skills and was able to remember and apply work-related information presented to him verbally. The job coach also stated that Terrence sought clarification when he did not understand something and accepted changes in routines well, and that he required intermittent verbal prompts to use a quiet voice volume in his internship setting. During pre-intervention observations, Terrence responded to customer greetings and directions from his internship supervisor with verbal prompts. He did not initiate greetings or engage in conversations with his coworkers within the observation timeframes.

Chris

Chris was a 21-year-old Black student who received special education services under the category of autism. He was able to accurately read short texts written at a second grade level but struggled with reading comprehension. Chris used simple sentences and questions to verbally communicate his wants and needs and to seek clarification or support from familiar individuals. The special educator indicated that Chris followed verbal multi-step directions at work, accepted correction by apologizing and trying to fix the mistake, and used work-appropriate etiquette (i.e., saying, "Thank you" and "You're welcome"). The special educator also stated that Chris' conversations tended to focus on his personal interests, specifically cell phones, or concerns/worries he was experiencing. In the internship setting, Chris was observed to occasionally initiate greetings with customers and coworkers and to regularly respond to greetings from coworkers. However, he did not initiate conversations with coworkers, and he typically replied to coworker conversational questions with one-word responses.

Setting and Materials

The setting for the study was a mid-sized military installation in the southeastern United States, which was the location of the [PROGRAM NAME] program and the larger research study. Researchers conducted the intervention at each participant's internship site on the military installation. Rodney interned at the military museum, Thomas and Chris interned in the supply room and housekeeping departments, respectively, at the installation's hotel, and Terrence interned at a small medical office in the outpatient medical center. BST with video modeling was conducted in private locations at each of the internship sites, and in situ training occurred in the internship locations where participants interacted with coworkers (the museum gift shop and office reception area for Rodney; the employee break room, the linen room, the supply room, and hotel hallways for Thomas and Chris; the receptionist area and in office hallways for Terrence). All mock conversations, BST with video modeling portions of intervention sessions, and in situ trials were video recorded.

Instructional materials¹ were developed for the BST portion of intervention sessions. Researchers created a type-written chart on a piece of plain white paper that described the basic components of conversing with coworkers (i.e., who are coworkers, what you can say to them in conversations, when you can have conversations, why it is important to talk with coworkers). On a separate piece of white paper, the specific steps to conversing with a coworker were typewritten. Researchers also created individualized videos of each participant performing the steps to conversing with a coworker within their respective internship settings on a seventh generation iPad with the iMovie application. Researchers recorded video segments of participants as they performed each step in the conversing with a coworker skill sequence. Performance errors were edited out of videos using iMovie, and video segments were combined

¹ Instructional materials are available upon request by contacting the first author (REDACTED EMAIL).

to create seamless, error-free videos of each participant performing all steps to conversing with coworkers. Participants viewed the videos of themselves during the modeling part of BST sessions.

Dependent Variable and Measurement

The dependent variable was participants' accurate and independent performance of the steps to conversing with a coworker in training and in situ settings, measured through task analysis. The task analysis was based on a review of previous task analyses on conversational skills within the research literature (Hood et al., 2017; Nuernberger et al., 2013) and through observations of competent models within participants' internship settings. The target skill, conversing with a coworker, was behaviorally defined as gaining the coworker's attention, initiating or responding to a greeting to start the conversation, participating in at least three conversational exchanges with the coworker, and then ending the conversation by saying goodbye and leaving the area or returning to work tasks. A conversational exchange occurred when each conversational partner took a turn by speaking in the conversation (i.e., the participant spoke and then the coworker responded, or the coworker spoke and then the participant responded). Conversational exchanges had to include workplace-appropriate conversational topics, such as talking about the weather, asking coworkers how they were doing, commenting on a work routine or work-related event, and talking about coworkers' interests. Table 1 shows the steps to the task analysis used in the study.

Task analysis data on mock conversations were collected in the private training area at the beginning of each study session. During mock conversations, participants were asked to demonstrate how they would have a conversation with their coworkers. Mock conversations were conducted with the first author, who was familiar to participants as research co-coordinator

for the larger [PROGRAM NAME] study. Task analysis data on in situ trials were collected during 10-minute observational periods in the participants' internship setting immediately. Researchers watched to see if participants engaged in a workplace conversation with a coworker on the first naturally occurring opportunity. If a naturally occurring opportunity did not arise during the observational period, then the researchers arranged a contrived opportunity (i.e., asked a coworker to stand within the participant's immediate proximity or greet the participant). Coworkers were told that participants were learning about and practicing conversational skills, but no other instructions were provided.

All mock conversations and in situ trials were video recorded; the recordings were subsequently reviewed and coded using the task analysis form. Steps completed accurately and independently were coded as correct responses; steps completed inaccurately, prompted, or skipped were coded as incorrect responses. If participants did not initiate a conversation during baseline and maintenance phases, then the mock conversation or in situ trial was scored as 0% accuracy. During the intervention phase, indirect verbal prompts (e.g., "Who can you talk to?") were provided to participants if needed to initiate a conversation and were scored as incorrect responses on the task analysis. The target number of exchanges for each conversation was set at three, based on previous research (Nuernberger et al., 2013) and observations conducted during the development of the task analysis. If a participant engaged in more than three conversational exchanges, then only the first three exchanges were coded. The number of steps performed correctly was added, divided by the total number of steps in the task analysis, multiplied by 100, and rounded to the nearest tenth place, to calculate the accuracy percentage for each mock conversation and in situ trial.

Study Design

The study utilized a multiple baseline across participants single case research design (Kazdin, 1982). All participants began the baseline phase concurrently. The implementation of intervention was staggered across participants and continued for each participant until the criterion for skill mastery was met, defined as three consecutive in situ trials with at least 80% accuracy. Subsequent participants began the intervention after the previous participant completed five intervention sessions or achieved skill mastery, whichever came first. Maintenance data were collected on mock conversations and in situ trials two weeks after the intervention phase ended.

Procedures

Baseline Phase

Each baseline session began with a mock conversation in the private training area at the participants' internship sites. During the baseline phase, task analysis data were collected on mock conversations, but participants did not receive any instruction, prompting, or feedback on the conversing with a coworker skill. The second half of each baseline session consisted of an in situ trial. Researchers observed participants in their workplace settings to determine if participants engaged in workplace conversations with coworkers on the first occurring opportunity (the in situ trial). No instruction, feedback, or prompting was provided to participants during baseline in situ trials.

Video Self-Model Creation Session

After the baseline phase was concluded but before the intervention phase began, participants worked with researchers to create video self-models of the steps to conversing with a coworker within their respective internship settings, which were subsequently used in the BST portion of the intervention. Immediately following the video self-model creation session, a mock

conversation was conducted to gauge the effect of creating a video self-model on participants' demonstration of workplace conversational skills.

Intervention Phase

Each intervention session started with BST with video modeling and ended with in situ training, following procedures used by Nuernberger et al. (2013). Mock conversations were conducted at the start of every intervention session, followed by BST with video modeling in the private training area. During BST with video modeling, the first author described the steps to conversing with coworkers using the training materials, participants watched the video model of themselves conversing with a coworker, participants practiced the steps to conversing with a coworker on multiple BST trials with the first author, and participants received explicit feedback on their performance. Practice trials were conducted during each intervention session, and once participants achieved three consecutive BST trials with 100% accuracy during each intervention session, they returned to their internship sites. The mean number of practice BST trials per intervention session for Rodney was 3.33 ($SD = .58$), 4.11 ($SD = 2.42$) for Thomas, 3.67 ($SD = .58$) for Terrence, and 3.92 ($SD = 1.71$) for Chris.

The in situ training portion of the intervention session occurred at the internship site, immediately following BST. Researchers watched participants for 10-minute observational periods to assess their use of workplace conversational skills when conversing with coworkers (i.e., the in situ trial). If participants made errors during the in situ trial (i.e., did not greet a coworker in their immediate vicinity, did not continue a conversational exchange, did not return to work after the conversation ended), then researchers intervened immediately and provided participants with a targeted indirect verbal prompt (i.e., "Who can you talk to?" "What could you say next?" "Where do you go now?"). Following in situ trials with errors, omissions, or

prompted responses, researchers immediately provided an additional round of BST with video modeling to the participant in the private training setting. The intervention phase for each participant was discontinued once the criterion for skill mastery was met.

Maintenance

One maintenance session was conducted two weeks after the intervention phase ended for each participant. Maintenance session procedures mirrored those during the baseline phase. Researchers collected maintenance data on the mock conversation in the private training area and on the in situ trial in the internship setting.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for a random sample of 25% of the mock conversation and in situ trial video recorded sessions in each phase. A secondary coder was trained on and practiced coding mock conversations and in situ trials with the first author using the task analysis form until they reached 100% IOA on three consecutive recordings. The secondary coder viewed a random sample of 25% of the mock conversations and in situ trials within each phase and used the task analysis form to record whether the participant performed each step to conversing with coworkers accurately. The secondary coder's scores for each step were then compared to the original scores for each step to determine agreement. IOA was calculated using the total agreement method, by dividing the number of agreements into the number of possible responses and multiplying by 100 (Kazdin, 1982). IOA scores ranged from 50% to 100%, with a mean score of 90%. For the four double-coded sessions that fell beneath 80% IOA, the secondary coder was provided additional training on specific coding procedures related to the disagreements. The sessions were then recoded by both coders, and 100% IOA was obtained for each of the sessions that fell beneath 80% IOA.

Fidelity of Implementation

Fidelity of implementation was evaluated using a researcher-developed checklist. A random sample of 25% of intervention sessions was selected for fidelity checks and was scored by the secondary coder using intervention session video recordings. Each step of the intervention package was evaluated using a 0- to 2-point scale, where 0 = step was not implemented at all, 1 = step was partially implemented, 2 = step was fully implemented, and N/O = there was no opportunity to perform the step. Evaluated steps included whether the researcher described the steps to conversing with a coworker, showed the participant the video model, completed at least three mock conversation trials with the participant, provided specific verbal performance feedback after each trial, observed the participant having a workplace conversation in their internship, and completed an additional round of BST (e.g., instruction, video modeling, practice, and feedback) if errors occurred during the in situ trial. A fidelity percentage was calculated for each observed session by dividing the total number of points awarded for the session by the total number of possible points and multiplying that number by 100. The overall mean fidelity percentage was 96.8%, with scores ranging from 88.9% to 100%.

Social Validity

The researchers used several measures to assess the social validity of the intervention package. First, participants completed an eight-item, researcher-developed questionnaire entitled the Social Validity Measure for Participants that asked them to rate their agreement with various statements about the intervention and its effects on their social skill performance at work. Second, the participants' special educator and job coach completed a modified version of the Treatment Acceptability Rating Form-Revised post-intervention (TARF-R; Reimers et al., 1991). The modified version of the TARF-R used in this study consisted of 19 items and utilized a five-

point Likert-type scale, in which positive perceptions were scored more highly (Langthorne & McGill, 2011). Finally, the CBFSA was used to conduct follow-up interviews with the special educator and job coach and to observe participants in three post-intervention observations.

Results

Mock Conversations

All participants' mean baseline mock conversation accuracy percentage scores were low (Rodney $M = 50\%$, Thomas $M = 8\%$, Terrence $M = 66\%$, Chris $M = 31\%$). While visual analysis indicated that Thomas and Chris' baseline mock conversation data were stable, Rodney and Terrence's baseline data showed more variability. Rodney's baseline trend line was affected by the first mock conversation data point, as his first mock conversation score was substantially lower than subsequent baseline probe scores. Therefore, a fourth baseline data point was added to promote baseline stability. Terrence's baseline mock conversation scores, although relatively high, displayed a descending trend.

Graphed results for Rodney, Terrence, and Chris showed improvements in mock conversation accuracy after the video creation session. Mock conversation scores increased by 30 percentage points for Rodney and Terrence and by 20 percentage points for Chris. Furthermore, increases in mock conversation scores occurred between the video creation session and the first intervention phase session for Thomas, Terrence, and Chris. The positive change was 80 percentage points for Thomas and 20 percentage points for Terrence and Chris.

With the introduction of the BST with video modeling and in situ training intervention package, all four participants' skills increased. Mock conversation data for three participants (Rodney, Terrence, and Thomas) showed an immediate response to the intervention, with high levels of accuracy (80% to 100%) documented within the first two intervention sessions. Chris

required three sessions to achieve higher levels of accuracy (90% to 100%) but maintained mock conversation performance at those levels after that point. Intervention phase mock conversations for Rodney and Terrence were discontinued after two sessions, as they had met study mastery criteria (three consecutive in situ trials with 80% or higher accuracy) at those same points in time.

One maintenance session was conducted for each participant in the training setting two weeks after the intervention phase ended for the participant. All four participants achieved mock conversation scores of 100% accuracy in these follow-up sessions. Figure 1 displays graphs of mock conversation score accuracy across participants for each phase of the study.

In Situ Trials

During in situ trials, participants were observed in their internship settings to assess their skills in conversing with coworkers on the first opportunity. Less variability in data was seen in situ trial baseline scores. Baseline in situ trial accuracy percentage score range was 33 for Rodney ($M = 10\%$), 0 for Thomas ($M = 0\%$), 20 for Terrence ($M = 3\%$), and 30 for Chris ($M = 5\%$).

A functional relation was demonstrated between the introduction of the intervention package and increases in skill accuracy in conversing with coworkers during in situ trials across the four participants. Ascending data trends were noted for all participants after the intervention package was implemented. Researchers documented increases in level between baseline and intervention phases for all four participants, and there was no data overlap for any participant between baseline and intervention phase in situ trials. Two participants, Rodney and Terrence, achieved skill mastery criteria in three intervention sessions. Thomas achieved skill mastery in nine sessions, and Chris achieved skill mastery in 13 sessions. In initial intervention phase in situ

trials, both Thomas and Chris required indirect verbal prompts to initiate and maintain conversations with coworkers in their immediate vicinity. Furthermore, all participants' frequency of unprompted conversational initiations increased after implementation of the intervention package, as shown in Table 2.

Three out of four participants (Rodney, Terrence, and Chris) maintained skills at the follow-up in situ trial session conducted approximately two weeks post-intervention. Although Thomas demonstrated the skill of conversing with a coworker at a higher level of accuracy (56%) than at baseline (0%), he did not meet skill mastery criteria at follow-up. Figure 2 displays graphs of in situ trial accuracy across participants for each phase of the study.

Social Validity Results

Results from the questionnaire administered to participants show overall positive perceptions of the intervention package. All participants agreed that their workplace social skills improved from being in the study and that being in the study helped them do their jobs better. All participants agreed that telling them about the social skill and practicing the skill helped them learn it. However, Terrence responded that he was unsure if showing him the skill helped him learn it and if communicating better with others at work was important to him, and he did not feel that receiving feedback on his performance of the skill was helpful. Rodney indicated that he was not sure if understanding social rules at work was important to him. The modified TARF-R results indicate the special educator and job coach had favorable perceptions of the intervention package. They reported that they understood the intervention, liked the intervention procedures, and thought it would be effective in improving their students' social skills. They also indicated that the intervention package was inexpensive, would take little time to implement, and would cause very little disruption to the internship program. In addition, all four participants

demonstrated overall gains in social skill scores on post-intervention observations using the CBFSa. Rodney's scores improved from 73.2% to 94.8%; Thomas' scores increased from 73.6% to 82.5%; Terrence's scores increased from 69.8% to 92.3%, and Chris' scores improved from 56.5% to 93.8%. Finally, CBFSa post-intervention interview scores with the special educator or job coach increased for three out of four participants. Rodney's scores improved from 64.0% to 77.1%, Thomas' scores increased from 70.7% to 72.0%, and Terrence's scores increased from 65.3% to 68.6%. Chris' CBFSa interview score decreased from 78.7% to 62.7%. The special educator reported that Chris experienced issues with medication management during the study period, which negatively affected her ratings of his social communication skills. However, the skills rated lower by Chris' special educator, such as his ability to participate in group activities and his ability to apologize and correct behavior, were not skills specifically targeted by the intervention package.

Discussion

This study examined the effectiveness of BST with video modeling and in situ training on the workplace conversational skills of four transition-aged autistic students participating in the Project SEARCH plus ASD Supports internship program on Fort Langley Eustis Military Base. A functional relation was demonstrated between the intervention and improvements in workplace conversational skills across all four participants within the in situ setting. Increases in conversational skill accuracy during mock conversations were also noted with the four participants. All four participants maintained skills at mastery level within the training setting at two weeks post-intervention; three out of four participants maintained skills at mastery level in the in situ setting two weeks post-intervention.

Importance of in Situ Training

Findings from this study point to the importance of in situ training in improving the workplace conversational skills of transition-aged autistic students. Across all participants, mean baseline mock conversation scores were higher than baseline in situ trials. Skills also increased more slowly within in situ settings than BST settings during the intervention phase for two of the four study participants. These differences highlight how the two portions of the intervention package targeted different aspects of the conversing with coworkers skill set. The BST with video modeling portion of the intervention taught participants what to say and do during workplace conversations, but participants learned how to apply and respond to novel conversational situations (e.g., interruptions, unscripted conversational exchanges, different conversational partners) within real life workplace settings through in situ training. Results suggest that the in situ training portion of the intervention package promoted skill generalization through the multiple stimuli conditions described above and by exploiting functional contingencies, specifically the social reinforcement provided by coworkers, which occurred as result of workplace conversations (Stokes & Osnes, 1989).

Findings of the current study also align with previous studies, which found that in situ training facilitates skill acquisition for autistic learners in real life contexts (Gunby & Rapp, 2014; Kornacki et al., 2013; Nuernberger et al., 2013). The current study adds to the growing body of evidence that supports teaching social skills in the contexts in which skills are used and including real life communication partners in social skill interventions (Bellini et al., 2007; Gilson & Carter, 2016; Ledford et al., 2018). Teaching social skills in workplace contexts with authentic communication partners gives autistic learners multiple opportunities to practice relevant skills in the contexts in which the skills are used, thus supporting skill generalization outside of training settings.

Use of Video Modeling Within the Intervention Package

After baseline but prior to the introduction of the intervention package, all participants worked with researchers to develop video self-models of the steps to conversing with coworkers. Data collected after the video creation session showed that scores increased for three participants (except Thomas) on mock conversations following the singular video creation session. Mock conversation scores increased further with the introduction of the full intervention package across all participants. Due to the multi-component nature of the intervention package, researchers were unable to discern which component(s) of the intervention were responsible for behavior change. However, these data offer supporting evidence that creating and watching a video of themselves conversing with coworkers helped most participants learn the skill. This finding is in keeping with participant self-reports. Three out of four participants agreed with the statement that showing them the skill helped them learn it. This finding also aligns with previous research, documenting the effectiveness of video modeling with autistic learners across a range of skills (Allen et al., 2010; Roth et al., 2014; Yakubova & Zeleke, 2016). Future research utilizing multielement designs could be useful in determining the specific impact of video modeling within the larger intervention package.

Implications for Practice

This study offers several implications for practice. First, these findings indicate the importance of teaching work-related social skills in the settings in which they are used. Differences in baseline workplace conversational skill usage on mock conversations and in situ trials and differences in skill increases post-intervention across these same settings suggest that learners need to practice conversational skills in real life workplace settings to use them effectively. Second, this study highlights a process for identifying contextually relevant skills by

using the CBFSA and obtaining employer input on which social skills are deemed important within specific workplace settings. Engaging in careful assessment of learner needs and workplace values will help ensure that taught skills are relevant and meaningful within different work environments. Third, this study demonstrates how video modeling can be situated within BST to help transition-aged autistic students more readily acquire workplace conversation skills. BST provides a method for incorporating video self-modeling in an existing instructional sequence, and findings from this study suggest that creating and watching videos of themselves perform a work-related social skill may help autistic learners improve their skill usage.

Limitations and Future Directions

One of the major limitations of the current study is that only two intervention phase mock conversation data points were collected for Rodney and Terrence. During the intervention phase, in situ trials occurred at the end of each intervention session, and mock conversation data were taken at the beginning of the next intervention session. Because Terrence and Rodney achieved the criterion for skill mastery after three in situ sessions, the intervention was discontinued, and data were only collected for two intervention phase mock conversations. Future studies examining this intervention package should increase the criterion for skill mastery to four in situ sessions at 80% accuracy or more to allow for at least three mock conversation data points during the intervention phase.

Second, Rodney and Terrence's baseline mock conversation scores showed variability and several higher accuracy data points. To address potential validity concerns, researchers extended the baseline with additional data points for Rodney and documented an overall downward trend in baseline data for Terrence before moving to the intervention phase. It could be that the higher levels of behavioral accuracy demonstrated by Rodney and Terrence during

baseline mock conversations reflected more developed expressive communication skills.

However, neither participant demonstrated the ability to accurately use workplace conversational skills in real life settings during baseline in situ trials. Future studies may want to systematically evaluate the efficacy of this intervention for participants with different expressive language abilities.

Third, this study taught participants to engage in three exchanges per conversation. Sometimes coworkers and participants extended conversations past three exchanges, particularly during in situ trials. However, only the first three exchanges were coded, to maintain consistency of results across mock conversations and in situ trials. While a review of the BST and in situ session video recordings did not indicate major differences in skill performance in conversational exchanges occurring after the third one, future researchers may want to consider coding all exchanges in each conversation.

Finally, this study only targeted one specific work-related social skill, conversing with coworkers, for intervention. Moving forward, it will be important to determine the effectiveness of this intervention package in teaching other social skills that have been identified by employers as important to workplace success for transition-aged autistic youth. Similarly, coworker conversational skills, including how those skills supported or hindered communicative efforts of transition-aged autistic students, were not investigated in the current study. Research is needed that examines how coworker and student interactions affect each other's social communication skill development, which could lead to the development of training interventions that increase the skills of all conversational partners within business settings.

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Table 1*Task Analysis of Conversing with Coworkers Skill*

Step	Description
1 - When coworker is within hearing distance (3-7 feet away from participant), gain their attention.	Call the person's name, wave at them, gesture to them, stand near them, or make eye contact.
2 - Initiate greeting or respond to greeting from coworker.	Say hi/hello or respond to greeting from coworker by saying hi/hello back if greeted first.
3 - Ask coworker question/make comment to coworker about a workplace-appropriate topic or respond back to coworker's comment or question.	Topics include the coworker's well-being; the weather; work routines, procedures, and events; plans; special events; coworkers' interests.
4 - Wait for coworker's response.	Remain in the area and stay silent during reply.
5 - Ask coworker a different question/make a different comment to coworker about a workplace-appropriate topic or respond back to coworker's comment or question.	Ask a different question or make a different comment about the same or a new workplace-appropriate topic; reply to the comment or question with an on-topic statement.
6 - Wait for coworker's response.	Remain in the area and stay silent during reply.
7 - Ask coworker a different question/make a different comment to coworker about a workplace-appropriate topic or respond back to coworker's comment or question.	Ask a different question or make a different comment about the same or a new workplace-appropriate topic; reply to the comment or question with an on-topic statement.
8 - Wait for coworker's response.	Remain in the area and stay silent during reply.
9 - End the conversation by saying farewell or stating why you need to finish the conversation.	Say goodbye or say, "I have to go back to work," "I have to go now."
10 - Return to performing tasks or leave area.	Begin to perform work tasks or leave the area.

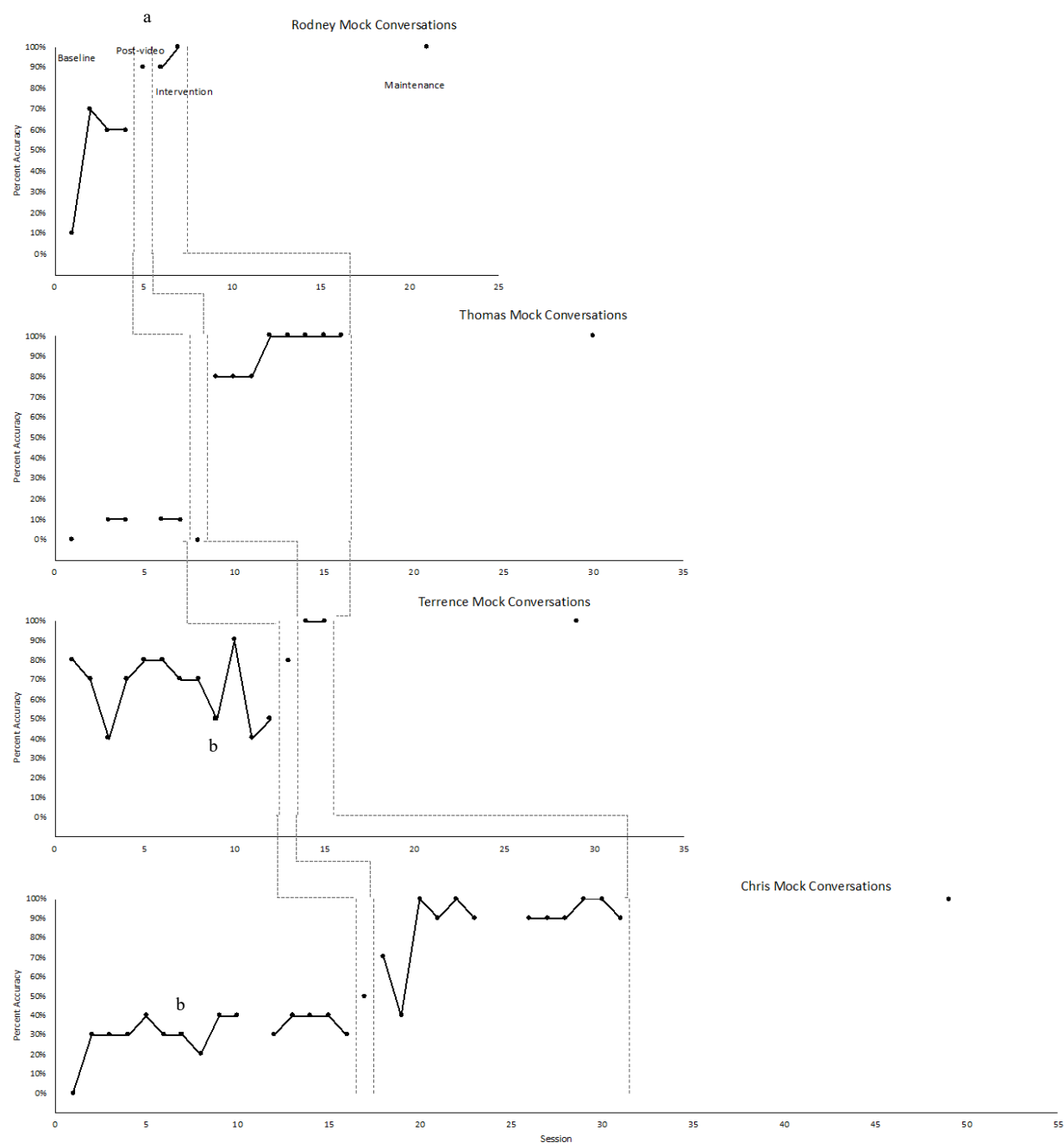
Table 2*Frequency of Unprompted Conversation Initiations Compared with Opportunities to Initiate*

Participant	Baseline		Intervention		Maintenance	
	Mock conversation	In situ trial	Mock conversation	In situ trial	Mock conversation	In situ trial
Rodney	3(4)	0(4)	2(2)	3(3)	1(1)	1(1)
Thomas	0(5)	0(5)	8(8)	6(9)	1(1)	1(1)
Terrence	2(12)	2(12)	2(2)	2(3)	1(1)	1(1)
Chris	0(15)	3(15)	11(12)	6(13)	1(1)	1(1)

Note. The first number in each cell indicates the total number of unprompted workplace conversations initiated by the participant in each phase of the study. Numbers in parentheses represent the total number of opportunities to initiate conversations within each phase.

Figure 1

Mock Conversation Accuracy Across Participants



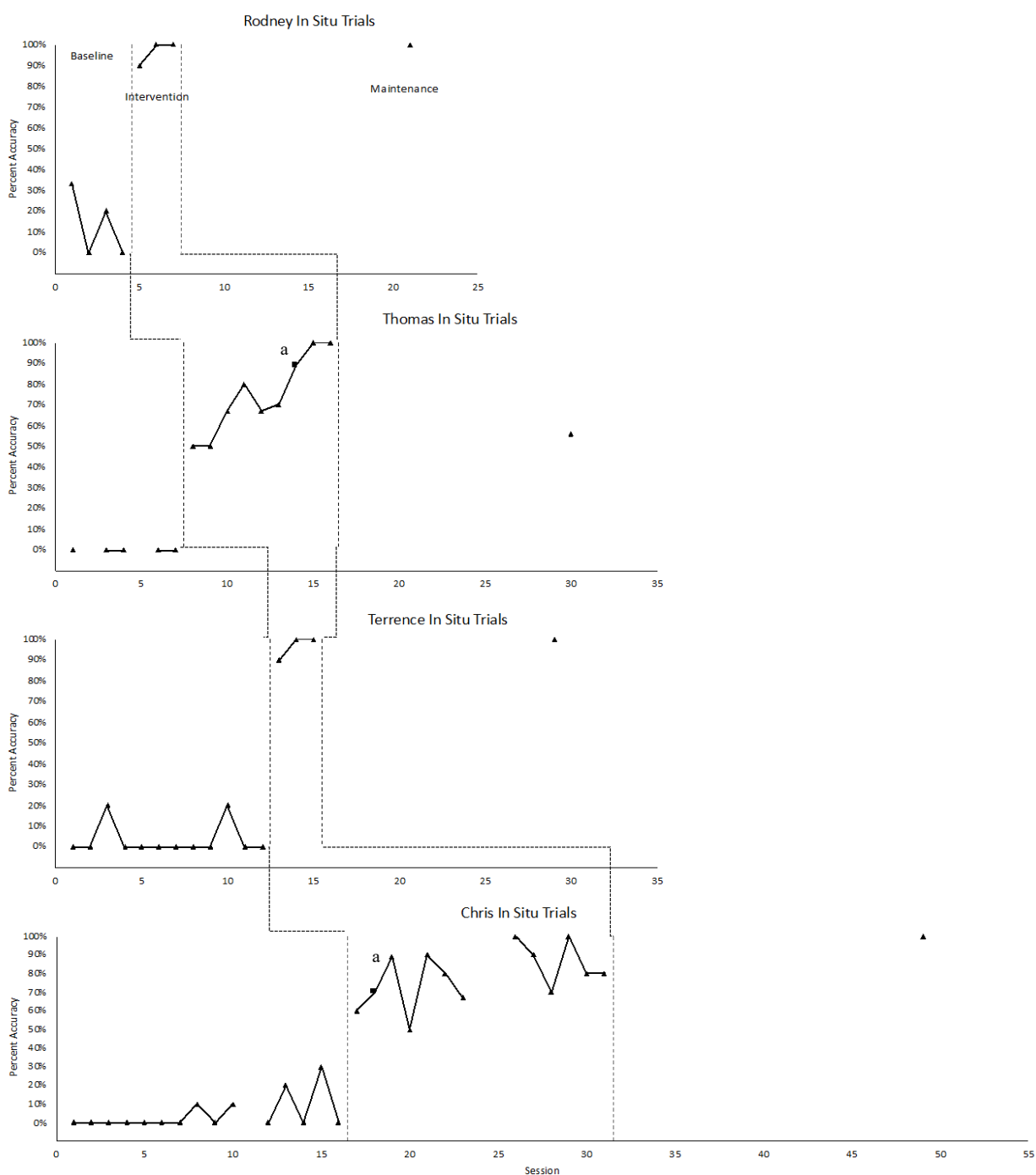
Note. This figure shows scores on mock conversations conducted in the training setting.

^a The post-video condition occurred after video model creation but before intervention start.

^b Square data points indicate where interobserver agreement fell below 80%.

Figure 2

In Situ Trial Accuracy Across Participants



Note. This figure shows scores on in situ trials in the internship setting.

^a Square data points indicate where interobserver agreement fell below 80%.