Journal of Positive Behavior Interventions

Project SEARCH for Youth With Autism Spectrum Disorders: Increasing Competitive Employment On Transition From High School

Paul Wehman, Carol Schall, Jennifer McDonough, Alissa Molinelli, Erin Riehle, Whitney Ham and Weston R. Thiss

Published by:
Hammill Institute on Disabilities

and
$SAGE

http://www.sagepublications.com

Version of Record - May 28, 2013

>> OnlineFirst Version of Record - Oct 23, 2012

What is This?

Project SEARCH for Youth With Autism Spectrum Disorders: Increasing Competitive Employment On Transition From High School

Paul Wehman, PhD[1], Carol Schall, PhD[1], Jennifer McDonough, MS, CRC[1], Alissa Molinelli, BS[1], Erin Riehle, MSN, RN[2], Whitney Ham, MS, CRC[1], and Weston R. Thiss, CHESP, MBA[3]

Abstract

Supporting youth with autism spectrum disorder (ASD) in the transition to adulthood is challenging. This article provides a description of how Project SEARCH, a model transition program for youth with disabilities, was used to help youth with ASD gain competitive employment. This article includes two case studies and a thorough description of the additional supports provided to increase successful employment on graduation from high school. Key Project SEARCH program components include setting a goal for employment, providing successive intensive internships in a community business, and assuring collaboration between school and adult services staff. Supports specific to students with ASD include providing intensive instruction in social, communication, and job skills; visual supports; and work routine and structure. These supports are described in the provided case studies.

Keywords

Project SEARCH, autism, ASD, transition to employment

The incidence of autism has increased over the past 20 years (Centers for Disease Control and Prevention [CDC], 2012). As children with autism spectrum disorder (ASD) age into high school, the transition of youth with ASD from school to adulthood is has become a challenging for public school systems (Hendricks & Wehman, 2009; C. Schall, Cortijo-Doval, Targett, & Wehman, 2006; Shattuck, Wagner, Narendorf, Sterzing, & Hensley, 2011; Taylor & Seltzer, 2010; Wehman, Smith, & Schall, 2009). There are thousands of children increasingly being identified with ASD nationally, and as these children become adolescents, there is greater need to identify meaningful work, and postsecondary educational and community living outcomes for these students. Most of these students present uniquely challenging social and communication deficits despite also showing remarkable skills in different areas. The challenge for teachers and parents is to match the strengths of young people with ASD to work and community environments where they can succeed (Wehman, in press).

To date, public education has had difficulty in meeting the needs of adolescents and young adults with ASD. The National Longitudinal Transition Study 2 (NLTS2) provides a longitudinal review of outcomes experienced by youth with disabilities (Newman, Wagner, Cameto, & Knokey, 2009). The NLTS2 followed a large representative sample of youth enrolled in special education as they transitioned into young adulthood from 2001 through 2009, with a cumulative age range of 13 to 26 years. From the overall sample ($N = 11,000$), 922 youth were from the autism category. Newman, Wagner, Cameto, & Knokey (2009) reported that students with ASD only participated in general education about 33% of the time, with most coursework provided in special education (62%). Although the majority of time modifications to the curriculum were in place in general education settings, students with ASD

[1]Virginia Commonwealth University, Richmond, USA
[2]Cincinnati Children's Hospital Medical Center, OH, USA
[3]St. Mary's Hospital, Richmond, VA, USA

Corresponding Author:
Paul Wehman, Division of Rehabilitation Research, VCU Autism Center for Excellence, Medical College of Virginia, Virginia Commonwealth University, Richmond, VA 23284, USA
Email: pwehman@vcu.edu

Action Editor: Robert L. Koegel

were substantially less engaged than their typical peers in general education settings. In a recent study, Shattuck et al. (2011) examined patterns of service use among youth with ASD from the NLTS2 sample. Data analysis on youth who exited high school revealed that 32% attended postsecondary education schools, 6% had competitive jobs, and 21% had no employment or education experiences at all. Furthermore, 80% of these individuals were living with their parents, 40% reported having no friends, and only 36% had a driver's license. In addition, there was a dramatic decline in service use on exiting high school, and the uninsured rate more than doubled from high school (from 4% to 9%). In addition, Shattuck et al. completed a comparison of student with ASD to those with speech language disorders (SLD), intellectual disabilities (IDs), and learning disabilities (LDs) using the same data from the NTLS2 sample. This study confirmed the results posted earlier. Specifically, that student with ASD had worse outcomes when compared with their peers with other similar disabilities (2012). In this study, student with ASD had lower rates of participation in postsecondary education and employment than their peers with SLD, ID, and LD.

In a similar vein, Taylor and Seltzer (2010) described the post–high school educational and occupational activities for 66 young adults with ASDs who had recently exited the secondary school system. Analyses indicated low rates of employment in the community, with the majority of young adults (56%) spending time in sheltered workshops or day activity centers. Young adults with ASD without an ID were three times more likely to have no structured daytime activities, such as employment or postsecondary education, compared with adults with ASD who had an ID. Differences in behavioral functioning were observed by employment/day activity group. These findings suggest that the current service system may be inadequate to accommodate the needs of youths with ASD who do not have IDs during the transition to adulthood.

With the school-to-work challenges faced by youth with autism, it is clear that a well defined and structured plan for employment must be put in place. A program that is community based within a business and in which there is significant ongoing job training and support would be very appropriate. One program that could meet this criterion is Project SEARCH (Rutkowski, Daston, VanKuiken, & Reihle, 2006), a highly successful program that has been used with youth who have developmental disabilities such as IDs or LDs.

To date, no specific transition programs or models have been described for students with ASD. Nevertheless, there have been descriptions of important elements that should be included in individualized transition programs for youth with ASD (Holmes, 1998; C. M. Schall, Wehman, & McDonough, 2012; Wehman et al., 2009). Recommendations include the following:

- parental involvement;
- increasing functional independence and social competence;
- providing access to vocational experiences to increase career awareness;
- teaching self-management and self–determination; and
- using evidence-based practices to increase success.

Despite these sound recommendations, there is a paucity of research on interventions that might improve the outcomes of transition-age youth with ASD (Schall, Targett, & Wehman, 2013).

The Project SEARCH High School program provides a unique school-to-work transition model for young people with significant disabilities with a strong emphasis on internship rotations for the entire school year. The program combines real-life work experience, training in employability and independent living skills, and placement assistance through an active collaboration of the public education system, employers, and the state and local vocational rehabilitation (VR) system. The hallmark of the Project SEARCH model is complete immersion in the workplace. Students spend their entire school day at the workplace for a full school year, facilitating a seamless integration of classroom instruction and on-the-job training and support that cannot be achieved with occasional visits to the workplace or simulated work environments.

Project Search and Students With ASD

To examine how Project SEARCH might work for youth with ASD, we implemented the program in a suburban hospital. Therefore, the purpose of this article is to (a) present the components of Project SEARCH and how they were adapted for youth with ASD in a model program, (b) describe the problem-solving approach we used when implementing Project SEARCH for youth with ASD, and (c) examine two students with ASD and their internships. To date, we believe this is the first report focused on reporting the experiences of youth with ASD in Project SEARCH.

Project SEARCH: A Business-Led Transition Model

Project SEARCH is a business-led transition model where schools create collaborative partnerships with local large businesses such as hospitals, bank centers, or government centers. Such businesses afford students in transition to adult life the opportunity to work in internships across their senior year of high school. Once a business has agreed to participate in Project SEARCH, department managers receive information about the internship program and

Table 1. Sample List of Skills Taught During Morning Instructional Time in a Project SEARCH Classroom

Skill
Identifying job skill strengths, preferences, and interests
Communicating with supervisors and coworkers
Dressing and behaving professionally
Communicating with customers
Practicing specific work skills
Accepting correction
Asking for and taking a break
Calling in sick or late, or requesting time off
Preparing a résumé
Attending a job interview

meet with Project staff to discuss potential internships. This 1-year program follows the school's daily and yearly schedules; however, students attend their individualized program at the business instead of at school. The school day begins in a classroom space on the site of the business, with 1 hr of individualized instruction in job skills, followed by approximately 4 hr in the internship site. The instructional period of the day includes educational methods in multiple formats, including lecture, guided practice, role-play, discussion, and interactive individualized learning stations. The school day culminates with approximately 45 min of wrap-up time in the classroom. The skills addressed during instructional time include the communication and social skills essential to increasing success at work. Table 1 presents an example list of the skills taught during this instructional time.

It is important to note that all students entering this program have a goal of competitive employment and are committed to accepting employment, if offered and compatible with their career goals at any point throughout the year. Thus, students in this program must have completed all requirements to achieve a diploma prior to entering this program. The classroom portion of this program does not include any traditional academic coursework.

Critical Project SEARCH Components

Components of the Project SEARCH model set it apart from community-based instruction that many high school programs provide to transition-age students (Dymond, 2012). These include setting a goal of community-based employment at a competitive wage, rotation through internships that equate to career training, and shared case management between school and adult services agencies. Each of these critical components is discussed below.

Program-wide employment goals. Each Project SEARCH replication site sets and *actively pursues* competitive employment at a prevailing wage for each participant in the

program. This is *the primary goal* of the program. It means that the collaborating agency staff members meet regularly to discuss employment goals, strategically plan internships, and selectively identify job interviews for each student. In addition, Project SEARCH support staff regularly communicate with department chairs to inquire about the availability of employment within their department.

Internship model. The most critical aspect of Project SEARCH programs is the internship rotation. Students rotate through three 10- to 12-week internships throughout the school year. These internships usually comprise a set of skills the student requires to attain employment in a career of their choice. For example, if a student expresses an interest in data processing, that student may rotate through three internships that teach different aspects of that career. In a hospital program, such a student might complete an internship creating address files of donors to the hospital, followed by an internship in diabetes management to create a database with addresses of doctors, with a final internship inputting invoice totals into a spreadsheet in the accounts payable office. These internships serve both the student's learning needs and at the same time teach skills that are relevant to the business's hiring needs. That is, it is important that the internships represent, first and foremost, marketable skills for real jobs in the host business but not an entire job or a job that would replace a paid worker. Second, internships should help the host business complete their mission and not distract from the business. Finally, internships should provide the student with skills that advance them toward their personal employment goal.

Collaboration. The third important component of Project SEARCH is collaboration among agencies that serve students with disabilities in transition to adulthood. The essential collaborative partners include school staff, host business liaisons, rehabilitative services agency staff, developmental and/or IDs agency staff, employment services organization staff, transition students, and their families. Table 2 presents a list of agencies involved, their roles, and the frequency of interaction with the direct staff.

In this model, because of the direct roles that all team members play, adult services agencies share case management responsibilities and ownership of the intern's transition to employment with the school before the student graduates from high school.

Designing the Project Search Model for Students With ASD

The Project SEARCH model reports a very high success rate related to the primary employment goal; specifically, 78.3% of students with varying disabilities who participate in the program achieve competitive employment at a prevailing wage (Rutkowski et al., 2006). Nevertheless, as noted earlier, students with ASDs present additional

Table 2. Agencies, Individuals, Roles, and Approximate Time Commitment

Agency/individual	Role	Approximate time
Student and family	Identify career goal, attain public transportation to and from the host business, work with program staff to acquire skills for successful employment on completion	Daily during the entire time the program is in operation
School	Provide teaching staff, instructional assistants, and curriculum and materials support	Daily during entire time the program is in operation, Supervisory staff have weekly contact approximately 10% to 20% of their time
Host business	Provide liaison and contact with departments to develop internships	10% to 20% of the liaison's time
Rehabilitative services agency	Provide case management, authorize job coaching, and follow-along services as necessary	Varies by number of students in program. Case manager usually observes students in program or meets with advisory team once monthly
Developmental/intellectual disabilities services agency	Where necessary and available, provides life-services case management and input into the student's transition plan.	Varies by number of students in the program and availability of services provided. Case manager usually observes students in program or meets with advisory team once monthly
Employment services organization staff	Provides job coaching services based on the needs of the student	Job coaches generally have daily contact with students in the program

challenges to employment related to the nature of the disability. Specifically, students with ASD display communication and social skill deficits that often act as barriers to employment. In addition, students with ASD frequently require a higher intensity of instruction to master skills to fluency and generalization.

Students with ASD who enter Project SEARCH must meet the same requirements as any other student seeking employment. This includes interviewing each student, their current teacher, and, if available, their family members. During this interview process, staff members inquire about student behavioral challenges, social skill needs, and communication support needs in detail. Although this information would not necessarily result in denying a student participation in the project, it does help the staff adjust the program to meet individual student needs. Thus, the application process is only slightly different from other Project SEARCH Models.

The intensity of instruction varies between students with ASD and those with other disabilities due to their unique social, behavioral, and learning characteristics. Table 3 presents the additional supports that are required for students with ASD to achieve success in their internships at Project SEARCH.

In short, students with ASD are significantly affected by their disability when interacting with others in the work environment. These social communication skills are critical to successful employment and frequently result in loss of employment when not addressed. Thus, students with ASD require a high intensity of social skills instruction and practice that other Project SEARCH sites may not routinely provide. Due to the increased instruction and supervision required for students with ASD, the Project SEARCH site described in this article has a higher ratio of staff to interns. Note, however, that this intensity does not equal one-to-one support for students. In fact, students with ASD who enter the program with one-to-one supervision are systematically faded from the highest intensity of support to increased independence across the school year. Nevertheless, Project SEARCH reports approximately 3 students to 1 staff member overall in their replication sites. This ASD-specific replication of Project SEARCH varies between 2 students to 1 staff member at the beginning of the school year to 2.5 students to 1 staff by the end of the school year. This ratio of staff is necessary to guarantee the intensity of instructional supports necessary to achieve the social and work skill development and to ensure that students are successful in attaining employment at the end of the school year.

Problem-Solving Model Used to Serve Students With ASD in Project Search

This additional level of support results in a problem-solving model that is flexible and allows for direct staff input. Figure 1 demonstrates a graphic representation of the problem-solving model used in this specialized implementation of Project SEARCH for students with ASD.

Once an intern displays a problem behavior, staff members meet with the behavior analyst to review the questions shown in Figure 1. By considering each question, the

Table 3. Additional Supports Provided to Students With Autism Spectrum Disorder and Their Direct Support Staff in Project SEARCH

Support	Description
Behavioral consultation with behavior analyst	Project staff meet weekly with a behavior analyst who assists them with prioritizing behaviors for intervention, functionally analyzing behavior challenges, developing positive behavior support programs, assessing the success of the programs, revising them as necessary, and developing teaching strategies for replacement social skills
Consistent structure to seemingly unstructured internships	Job coaches create structured schedules so that interns have a consistent order to their tasks and daily schedule
Defining idioms, social skills, and work expectations	In consultation with the behavior analyst, program staff teach interns to follow behaviorally defined steps to accept correction, interact with patients, communicate with coworkers, interpret work related idioms, such as "Aspire to Excellence" and "Take the High Road with Patients," and meet other euphemistically stated employer expectations
Visual supports to increase implementation of strategies	Educational staff develop numerous written and picture oriented task lists, social skill cue sheets, and behavioral checklists to assist students in following their schedule and understanding how to cope with difficult social expectations at work
self-monitoring checklists and implementing reinforcement programs	In consultation with the behavior analyst, project educational and job coaching staff develop and implement individualized self-monitoring and reinforcement program to change problem behaviors in the work environment
Role-playing and practice for required social skills	Educational staff and job coaches provide practice to student in important social skills, such as accepting correction through role-play and in real situations multiple times daily to ensure mastery of skill and generalization to multiple environments within the business settings
Intensive instruction and monitoring of student success occurs regularly	Educational staff and job coaches collaborate to assure that student receive adequate practice at social skills across employment environments to guarantee successful mastery

support team is able to develop solutions to the problems presented. Behavior support plans that result from this process include three important components. They are antecedent strategies that reduce the likelihood that a problem behavior occurs, instructional strategies that either teach the intern the expected behavior or increase the generalization of the behavior to the new setting, and consequential strategies that strengthen the occurrence of the desired behavior. The two case studies presented below offer an example of this strategy in action.

Strategies to Success: Two Case Studies

Method

The individuals described in the two case studies presented below participated in a randomized clinical trial that is continuing as of the publication of this article. The individuals in these case studies were students in a public special education program in Virginia prior to inclusion in this Project SEARCH replication. They both were recruited to the program, applied to become Project SEARCH interns in their final year of high school. The application process,

including completing a written detailed application, consisted of the following:

- personal data (name, address, date of birth, diagnosis, gender, etc.);
- school services data (grade point average [GPA], attendance history, copy of student's individualized education program (IEP), total credits achieved, etc.);
- paid employment and unpaid internship history;
- future employment goals;
- list of services provided by all possible agencies;
- independent living supports needed;
- behavioral supports needed;
- open-ended questions for students regarding future goals; and
- list of personal and professional references.

After receipt of the application, the students then participated in an interview to further determine their match for the program and begin to assess potential internship matches. This portion of the process mirrors the usual Project SEARCH application and acceptance process. Because of the research aspect of this Project SEARCH replication, students who met the three research criteria (over the age of 18, had an ASD
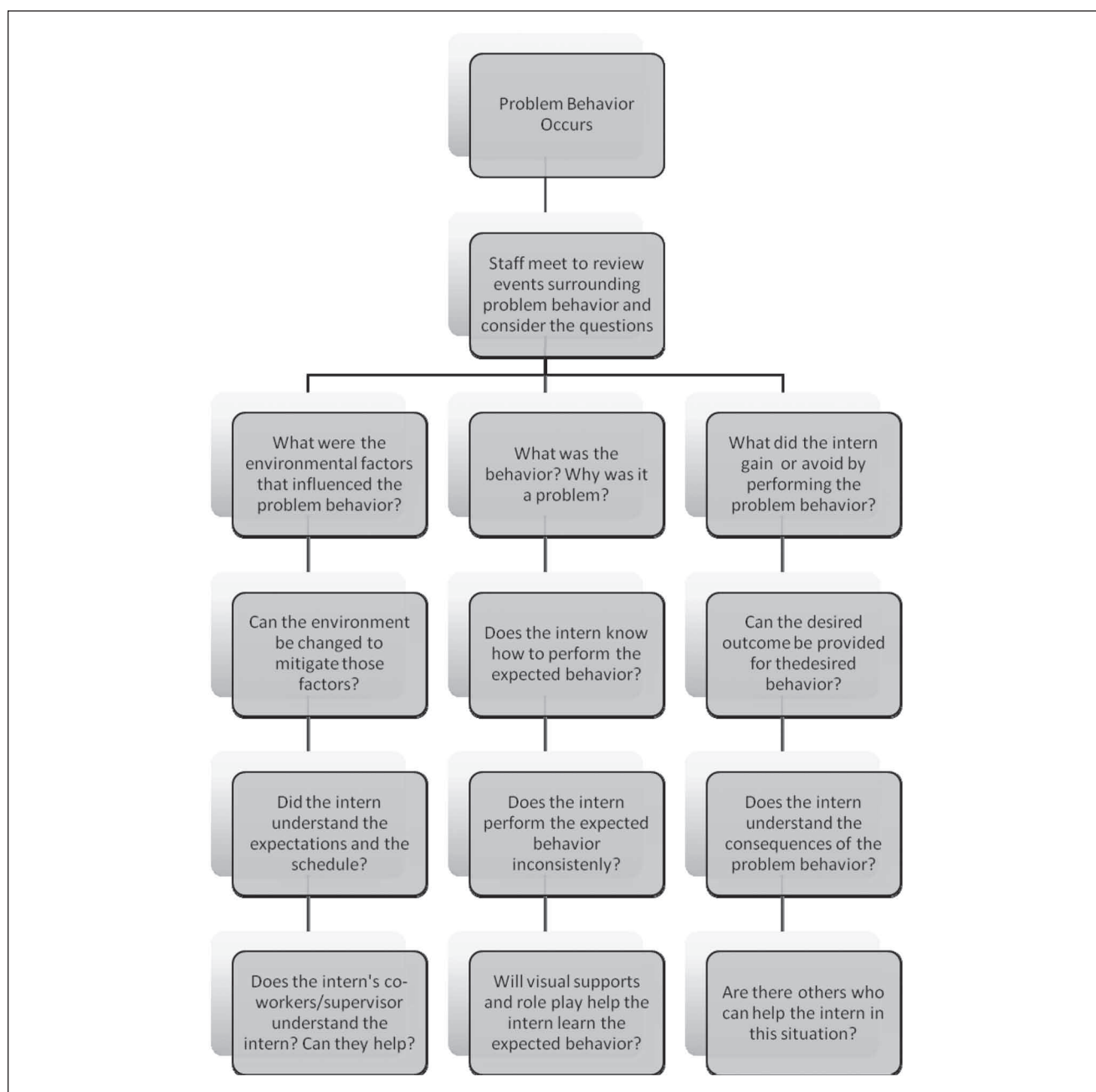
Figure 1. Problem-solving model for Project SEARCH for students with autism spectrum disorder.

diagnosis, and had continued eligibility for special education services in high school) were assigned numbers and randomized into the Project SEARCH program or continued in the public school setting where they had previously received their education (school-based group). Those students assigned to the school-based group continued to receive the educational supports and services as identified in their IEPs without interaction from the Project SEARCH staff or research team beyond intervals of data collection on

outcomes. Those students assigned to the Project SEARCH group attended their final year of high school in the host business. That business was a 391-bed suburban hospital with adjoining medical office buildings in Richmond, Virginia. The results of the randomized clinical trial (RCT) will be presented on completion of the research in future articles. These two case studies are presented to provide a program description of Project SEARCH and to demonstrate the supports used for these students with ASD.

	1	2	3	4	5
Performance of Job Skills	Could not/would not do any of task	Requires manual/hand-over-hand prompting on 75% of tasks	Requires detailed verbal instruction or detailed modeling on 75% of tasks	Requires minimal verbal reminders or gestures on 75% of tasks	Independent on 90% of tasks
Overall Production Rate	Production rate is 50% or less task finished (compared to coworker)	Production rate is 50% or greater with no improvement over time	Production rate is 50% or greater with improvement	Production rate is 75%–90% task finished (compared to coworker)	Production rate is 90% or greater task finished (compared to coworker)
Accuracy	Less than 25% of work is accurate, requires intensive direct instruction to learn tasks	Less than 50% of work is inaccurate, requires direct teaching to increase accuracy	Completes over 50% of work accurately, requires close supervision to correct errors	Completes over 75% work accurately, requires prompts to check and correct work	Completes over 90% of work accurately, self-checks and self-corrects work
Communication	Actively avoids communication with others	Requires hand-over-hand prompting or direct instruction to communicate	Requires verbal prompting to communicate or converses too much when communicating	Requires reminders to communicate or converses a little too much when communicating	Initiates greetings, offers assistance, answers questions in personal communication mode
Interaction with Supervisors/Coworkers	Demonstrates problem behavior as a result of interaction with supervisor/coworker	Avoids interaction with supervisor/coworker	Tolerates inter-action with supervisor/coworker but does not implement directive or overly dependent on supervisor/coworker interaction	Interacts with supervisor/coworker with minimal support from staff	Listens to supervisor, accepts correction, follows supervisor directives, participates in department meetings
Appearance	Requires more uniforms to maintain neat and clean appearance	Requires frequent reminders to clean or change soiled uniform	Keeps uniform neat and clean 3/5 days	Keeps uniform neat and clean and 4/5 days	Arrives at work in a neat and clean uniform 5/5
Safety	Could not/ would not ask for help or demonstrate safety practices/procedures	Requires manual/hand-over-hand prompting 75% of the time asking for help and demonstrating safety practices/procedures	Requires detailed verbal instruction or detailed modeling 75% of the time asking for help and demonstrating safety practices/procedures	Requires minimal verbal reminders or gestures 75% of the time asking for help and demonstrating safety practices/procedures	Asks for help when needed, demonstrates all safety practices and procedures independently

Figure 2. Weekly Rating Rubric.

Data Collection

Data collection on job sites in community businesses poses some challenges. Specifically, the presence of a data collector can be disruptive to the business and the activities of the intern. Consequently, the educational and job coach team used a rubric to track each intern's performance across seven dimensions of job skills and behaviors. Those dimensions were the following:

1. performance of job skills;
2. overall production rate;
3. accuracy;
4. communication;
5. interaction with coworkers;
6. appearance; and
7. safety.

The intern met with their teacher and job coach weekly to score themselves on each dimension on a 5-point rubric. The intern, in collaboration with their team, then set goals for the upcoming week. The result was a weekly percentage rating across all seven dimensions. Figure 2 presents the Weekly Rating Rubric.
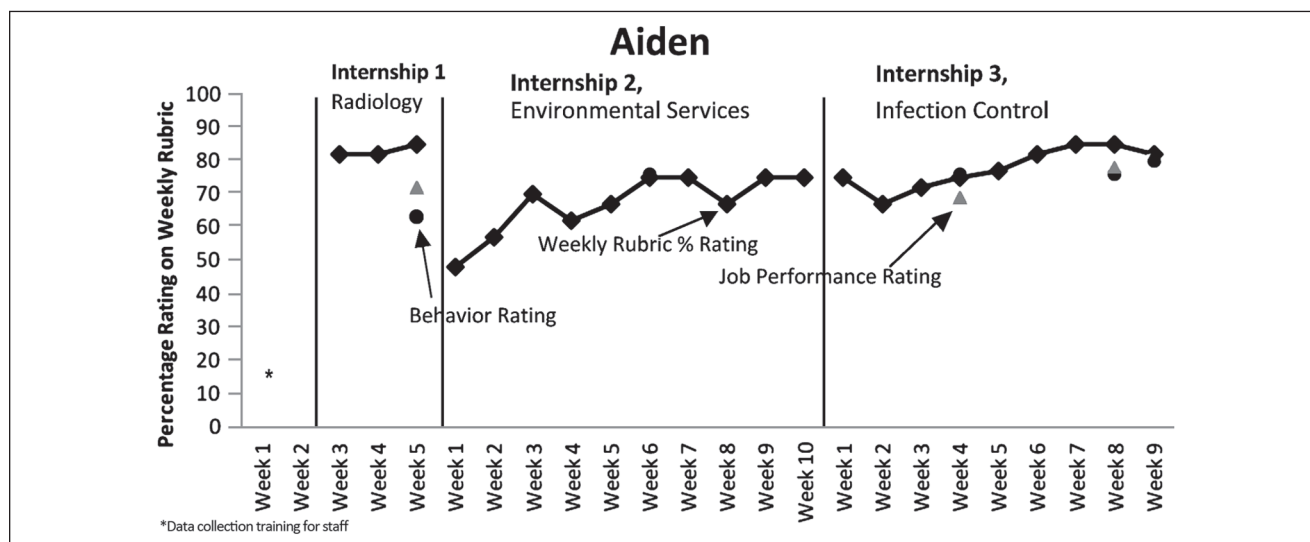
Figure 3. Aiden's ratings on the Weekly Progress Report and Internship Evaluation.

In addition, each intern was evaluated in their internships at three to four points during the internship on their social behavior, communication, appearance, and job performance. This evaluative rating was completed with a 5-point Likert-type scale (1 = *poor* to 5 = *excellent*). These scores are presented in a graph for each case presented below. (Because the purpose of this article is to review the types of supports provided related to behavior and job performance, the evaluative scores on communication and appearance are not included in these graphs.)

Aiden

Participant characteristics. Aiden is a 19-year-old African American man with autism. Prior to inclusion in the program, Aiden reported never having paid employment. He did have a two internship experiences at fast-food restaurants as a part of his IEP. These experiences ranged from 2 to 7 hr per week and occurred during his school day. He is serious minded and enjoys structure, following rules, and staying busy with work. Occasionally Aiden initiates conversation with others, though he frequently talks to himself quietly, repeating words, phrases, or songs. He does not have friends and spends most of his time at home watching TV or playing video games. Consequently, he requires a lot of support in the area of social interaction with others.

Internships and job coach interventions. Aiden's first internship was with the radiology department. He was responsible for stocking linens, cleaning and erasing x-ray cassettes, and cleaning and turning over patient rooms. The challenges that he faced most were regarding his social behaviors. Aiden invaded personal space and rubbed or

touched the person with whom he was interacting. Aiden's job coach worked with him on appropriately positioning his body and keeping his hands to himself and used two different instructional strategies to teach Aiden to maintain an appropriate distance from coworkers. These were visual supports depicting appropriate distance from others in work and social situations and role-playing scenarios to clearly define for him the types of space and contact appropriate to the situation. To make the behavioral expectations concrete, Aiden learned that professional behavior meant no touching, giving personal space and using appropriate language (no cursing). Aiden's second internship was in the engineering department. In this department, the employees worked in teams of at least two. For Aiden, who still needed support with his social interactions, working with a partner would provide a safe and supportive atmosphere. During this internship experience, Aiden became independent installing light bulbs and vacuuming the air ducts in the hospital.

Aiden's first and second internships provided his job coach with a lot of insight into his interests and strengths at work. Specifically, he worked best when completing repetitive tasks, cleaning, and following rules. Aiden also had strong orienting abilities and demonstrated increasing independence in each internship. This knowledge resulted in a match to the infection control department for his final internship. Aiden became responsible for cleaning, and stocking 75 isolation carts (which hold materials for nurses and visitors to wear when entering patient rooms) throughout the hospital. Aiden mastered the sanitizing of isolation carts quickly, but initially he had difficulty remembering how to stock the carts. His job coach created a laminated

checklist for him, so Aiden was able to write on it to determine how many supplies he needed to restock. Now that Aiden was working independently, he struggled getting to lunch and leaving work on time. Because Aiden has trouble telling time, his job coach helped him set alarms on his cell phone, which was a quick, simple solution. Figure 3 shows how Aiden's performance improved with the implementation of these supports.

During the first 5 weeks of the program, Aiden received ratings on the Weekly Rating Rubric ranging from 82% to 85%. At the same time, however, his rating on behavior at Week 5 was 63%, while his overall job performance was rated at 72%. During his second internship in environmental services, his ratings on the Weekly Rating Rubric increased steadily from 48% to 75%, while his behavior and job performance were both rated at 76%. In his final internship, Aiden's ratings on the Weekly Rating Rubric ranged from 67% to 82%, while his behavior ratings change from 69% at Week 4 to 76% at Week 7 and 80% at Week 8. His job performance ratings for this internship also showed improvement from a rating of 76% at Week 4 and 7 to 80% at Week 8.

These data show that Aiden made progress throughout all areas in internships. It is important to note that during his first internship in radiology, Aiden demonstrated excellent job skills but also displayed challenging behavior including touching or rubbing others and cursing at coworkers who corrected his behavior. These behaviors occurred most frequently during Aiden's first internship in radiology where he had extended periods without tasks to complete (downtime). This was due to the nature of work in the radiology department where there are times when patients are not in need of services, and the radiology cassettes and x-ray rooms are prepared for the next patients. Thus, the team determined that this internship was not a good match for Aiden. The data presented in Figure 2 confirms this finding where his overall job performance (light gray triangle) is rated 10 percentage points higher than his behavior (dark black circle). The data also demonstrate that Aiden's independence in his second and third internships increased along with his social behavior.

Employment outcomes. Aiden currently works in the infection control department 20 hr a week earning US$9.14/hr. He takes specialized transportation to and from work. As an employee, he is also responsible for cleaning, refilling, and replacing batteries in the 45 to 50 freestanding hand-sanitizing machines throughout the hospital. When he replaces hand sanitizer in a machine, he needs to record the date that it was done. Because writing neatly is a challenge, Aiden's job coach obtained a rubber stamp for him so that he could simply stamp the date onto the chart. He now has an iPod Touch where he keeps his checklist and receives reminder alarms.

Aiden's greatest challenge continues to come from inappropriate social interactions, invading personal space, touching coworkers, and problem solving when faced with confrontation. He has difficulty with sensitivity and with putting himself in the other person's shoes. In one particular incident, a patient and a visitor confronted Aiden because they did not like the way he was looking at them and they felt uncomfortable. When confronted, Aiden felt offended, but he did not back down from the conflict, and when he finished speaking with them he cursed to himself as he walked away. He was not able to reason and understand where they were coming from, and he was very angry and embarrassed. After meeting with his supervisor, Aiden reported that his supervisor told him to "take the high road." This cliché confused Aiden. To address these social challenges, Aiden's job coach created a card with visual aids that Aiden keeps on his supply cart. On that card, his job coach defined "taking the high road" as follows:

- Say "I'm sorry."
- Walk away.
- Call your job coach and your supervisor to tell them what happened.

These tools coupled with frequent reminders, role-playing, and support from his family have helped Aiden cope with his challenges and be a highly valued colleague.

Jason

Participant characteristics. Jason is a 20-year-old Caucasian man with Asperger syndrome as well as severe scoliosis resulting in pressure on his lungs. This condition affected his work endurance. Jason did have part-time employment prior to participation in the Project SEARCH group. He worked at a local movie theater where he cleaned individual theaters. He struggled with the social aspects of that job in that he would sometimes leave the back door of the theater open on his friends' suggestions. He also participated in in-school internship experiences at fast-food restaurants for 2 to 7 hr per week. He enjoys reading and spending time talking to people while he works, but during downtime, he prefers to be alone, reading a book or playing his Nintendo DS. Occasionally, other people perceive Jason in a condescending/rude manner; thus, he is also abrupt and direct in his conversation with others.

Internships and interventions. Jason's first internship was with the coronary care unit (CCU), a small eight-room unit. His job was to remove soiled linen bags, stock medical supplies, and restock lab trays. A sedentary portion of his job was to stamp patient flow sheets (charts). Jason needed little support learning his job skills. As originally presented, this internship would require Jason to set his own schedule and determine his own work priorities. At the same time, his greatest challenge was his work ethic and concern for work quality. He rushed through his work so that he could read or watch
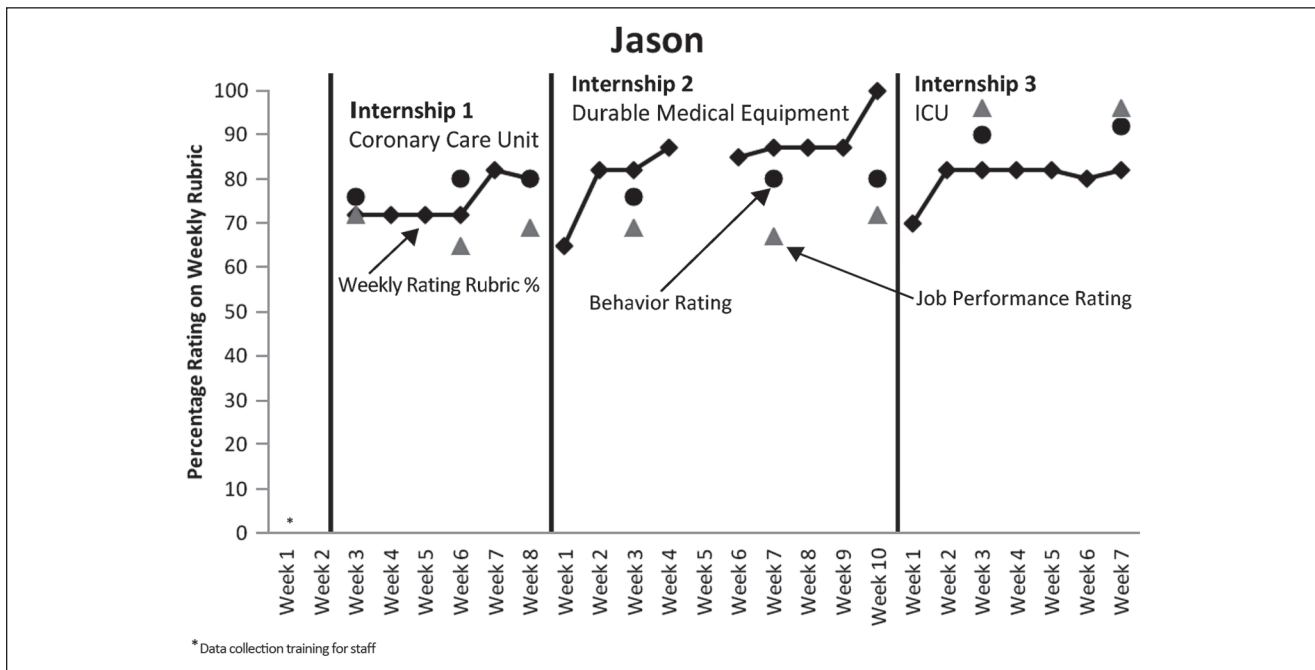
Figure 4. Jason's ratings on the Weekly Progress Report and Internship Evaluation.

television in the break room. To institute good work habits, Jason was prohibited from bringing a book to his internship, and his job coach created a structured schedule that provided periods for him to complete his duties. In addition, his job coach developed a daily schedule that met the requirements of the unit and provided a consistent structure to Jason's day.

Jason's second internship was with Biomedical Durable Equipment. Employees in this department work on teams of two, and they circulate systematically throughout the hospital to clean and distribute intravenous (IV) pumps. Jason built a close relationship with his work partner and enjoyed saying hi to everyone he passed throughout the hospital. He learned how to properly clean IV pumps, as well as the IV poles to which they are attached. Jason frequently had to be reminded to take his time to clean thoroughly. Jason always counted how many items he cleaned on a shift and was proud to announce this number daily to his job coach and employer. He did not face challenges with job tasks, but by the nature of the job, his break times were limited. Over time during this internship, his endurance improved.

Jason was very successful in his first internship but needed to develop more as a professional. His job coach created a similar experience for him on the intensive care unit (ICU), which is a much larger unit with 20 beds. Similar to his duties on CCU, he was responsible for stocking bedside carts, stocking linen in patient rooms, removing soiled linen, restocking syringes, and making lab deliveries. Productivity and high quality were still a challenge for Jason. To maintain higher productivity and quality, Jason's

job coach consulted with the behavior specialist and developed a self-monitoring task list for which Jason had to complete a certain number of tasks before each break he received. This program made his break time contingent on his completion of tasks. This program resulted in higher productivity and quality, although Jason continued to have periods of time where he would '"slack off" a bit more. Despite his inconsistent work quality, he was liked on the unit, and his work was highly appreciated. A typically somber floor benefited from the upbeat, and naive, yet positive attitude that Jason displayed while working around the unit. Jason's Weekly Progress and Internship Evaluation data are presented in Figure 4.

During the first 8 weeks of the program, Jason received ratings on the Weekly Rating Rubric ranging from 72% to 80%. His behavior ratings during this period were commensurate with the Weekly Rating Rubric, with percentages ranging from 76% to 80%. At the same time, however, his rating on job performance lagged behind these other ratings, with percentages of 72, 65, and 69. During his second internship, his ratings on the Weekly Rating Rubric increased steadily from 65% to 100%, while his job performance ratings were stable at 69%, 67%, and 72%. His behavior ratings during the same period were at 76%, 80%, and 80%. In his final internship, Jason's ratings on the Weekly Rating Rubric ranged from 70% to 82%, while his behavior ratings increased from 90% at Week 3 to 92% at Week 7. His job performance ratings for this internship also showed stable improvement, with 96% ratings in Weeks 3 and 7 of this internship.

Arguably, Jason experienced the greatest improvement in his overall weekly progress rating during his second internship in Durable Medical Equipment. In this internship, his overall ratings were higher than during the first and the third internships. At the same time, his social behavior and job performance evaluation remained consistent across the first and second internships, with ratings between 70% and 80%. In the third internship, however, Jason's social behavior and job performance evaluation rose significantly, with the addition of behavioral supports, and ranged between 90% and 96%. This provides evidence that the supports put into place to improve Jason's work effort were successful across the year.

Employment outcomes. Following his graduation from Project SEARCH, Jason was hired to work 20 hr a week in the ICU, where he earns US$9.14/hr. He continues to complete the tasks that he was responsible for as an intern and works closely with his job coach on consistently stocking the carts properly, completing all of them in a day, and following his schedule. Jason has an iPod Touch that contains a checklist of supplies for bedside carts, photos of properly stocked carts, and reminder alarms. Jason's job coach has created several schedules and daily logs to hold him accountable for the work that he completes and the way that he spends his time. His job coach continues to work with him and the people on his unit to ensure that the supports in place are being used properly and updated as needed.

Discussion

The individuals presented in these case studies demonstrate how youth with ASD can successfully transition into meaningful health care employment. They are employed in atypical jobs when compared with other persons with significant disabilities. Their performance has improved as they have become increasingly competent over time. The concept of the multiple rotations or internships over 9 months at the hospital appeared to enhance their learning capacity. Project SEARCH may provide a model of intensity in workplace training and support that has not heretofore been applied to transition-age youth with ASD as it has to young children with ASD.

It is important to note that only 6% of all youth with ASD gain competitive employment (Shattuck, Wagner, Narendorf, Sterzing, & Hensley, 2011). In this report, as well as recent others (Wehman et al., 2012), it appears that youth with ASD may have more employment potential than has been realized to date. This study provides evidence that access to intensive training embedded in community environments may improve the employment outcomes for youth with ASD.

Project SEARCH has proved to be an effective school-to-work transition model for these two youth with ASD. We have documented the ways this model can be adapted for youth with ASD and clearly have more to learn. This work is part of a bigger overall project studying individuals with ASD in Project SEARCH.

We do know that initially this is a highly time-intensive program for establishing sites and supporting interns. In addition, we know that behavioral training expertise is required by staff members. We have also learned that customizing jobs and internships for each person's strengths is essential. Although the immediate employment results for these students were positive, future practice in Project SEARCH should address issues including expansion of the number of hours individuals work and inclusion in positions where individuals receive benefits. In addition, it is important to monitor the amount of employment specialist support that individuals with ASD require to achieve independence.

This study described the implementation of Project SEARCH in a suburban hospital for 18- to 22-year-old high school students with ASD and presented two case studies from that implementation. Future research should expand this replication to other industries. In addition, future studies should include randomized clinical trials to control for bias in selection. Nevertheless, the outcomes described in this study provide evidence of successful vocational models to support youth with ASD at work.

References

Centers for Disease Control and Prevention. (2012). Prevalence of autism spectrum disorders—Autism and Developmental Disabilities Monitoring Network, 14 Sites, United States, 2008. *Morbidity and Mortality Weekly Report: Surveillance Summaries*, *61*(3), 1-19.

Dymond, S. (2012). Community participation. In P. Wehman & J. Kregel (Eds.), *Functional curriculum for elementary and secondary students with special needs* (pp. 351–385). Austin, TX: PRO-ED.

Hendricks, D., & Wehman, P. (2009). Transition from school to adulthood for youth with autism spectrum disorders: Review and recommendations. *Focus on Autism and Other Developmental Disabilities*, *24*, 77–88.

Holmes, D. L. (1998). *Autism through the lifespan: The Eden model*. Bethesda, MD: Woodbine House.

Newman, L., Wagner, M., Cameto, R., Knokey, A.-M (2009). *The post-high school outcomes of youth with disabilities up to 4 years after high school. A report from the national longitudinal transition study-2* (NLTS2) (NCSER 2009-3017). Menlo Park, CA: SRI International.

Rutkowski, S., Daston, M., VanKuiken, D., & Reihle, E. (2006). Project SEARCH: A demand-side model of high school transition. *Journal of Vocational Rehabilitation*, *25*, 85–96.

Schall, C., Cortijo-Doval, E., Targett, P. S., & Wehman, P. (2006). Applications for youth with autism spectrum disorders. In P. Wehman (Ed.), *Life beyond the classroom: Transition strategies for young people with disabilities* (4th ed., pp. 535–575). Baltimore, MD: Paul H. Brookes.

Schall, C., Targett, P., & Wehman, P. (2013). Applications for youth with autism spectrum disorders. In P. Wehman (Ed.), *Life beyond the classroom*, 5th ed. (pp. 447-472). Baltimore, MD: Paul H. Brookes Publishing.

Schall, C. M., Wehman, P., & McDonough, J. (2012). Transition from school to work for students with ASD: Understanding the process and achieving better outcomes. *Pediatric Clinics of North America*, *59*, 189–202.

Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics*, *129*(6), 1–8.

Shattuck, P. T., Wagner, M., Narendorf, S., Sterzing, P., & Hensley, M. (2011). Post high school service use among young adults with autism. *Archives of Pediatrics and Adolescent Medicine*, *165*, 141-146.

Taylor, J. L., & Seltzer, M. M. (2010). Employment and postsecondary educational activities for young adults with autism spectrum disorders during the transition to adulthood. *Journal of Autism and Developmental Disorders*, *41*, 566–574. doi:10.1007/sl0803-010-1070-3

Wehman, P. (2013). Life beyond the classroom: Transition strategies for young people with disabilities (5th ed.). Baltimore, MD: Paul H. Brookes Publishing.

Wehman, P., Lau, S., Molinelli, A., Brooke, V., Thompson, K., Moore, C., & West, M. D. (2012). Supported employment for young adults with autism spectrum disorder: Preliminary data. *Research and Practice for Persons with Severe Disabilities*.

Wehman, P., Smith, M., & Schall, C. (2009). *Autism and the transition to adulthood: Success beyond the classroom*. Baltimore, MD: Paul H. Brookes.