Two-Year Evaluation of a Vocational Support Program for Adults on the Autism Spectrum

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In this article the authors provide a description and evaluation of a vocational support program for adults with autism spectrum disorders (ASD). They followed 9 participants through 2 years of the program. Increases in employment rates and income were found for program participants, and 7 participants retained their initial job placements through the 2-year period. Employers rated program participants highly on a range of important job skills, although these individuals continued to experience social challenges in the workplace. Case notes offer further insight into the experiences of adults with ASD in the workplace. Overall, the results suggest that individuals on the autism spectrum can be successful in competitive, entry-level employment.

Autism spectrum disorders (ASD) are characterized by impaired social interaction, a restricted repertoire of activities and interests, and impaired communication (except for relatively normal language use by individuals with Asperger syndrome; American Psychiatric Association, 1995). Several studies have demonstrated progression of skills among children with autism following early intervention, including language gains, improved social interaction, and significant IQ gains (Rogers, 1996). Whereas early intervention therapy results in a significant improvement in the functioning of individuals with ASD, relatively few interventions and research programs have focused on adolescents and adults. Few established therapeutic interventions exist for young adults on the autism spectrum, and there is a significant lack of service provision and multidisciplinary support (Moxon & Gates, 2001). This paucity of vocational services is likely to become an increasing problem as more individuals benefit from early intervention therapy and are mainstreamed into inclusive environments. The incidence of ASD is rising, with one recent study showing a 373% increase in the rates of autism from 1980 to 1994 (Dales, Hammer, & Smith, 2001). Therefore, a much larger number of adolescents with autism spectrum diagnoses will be approaching high school graduation in the next few years. Specialized programs and services will need to be developed, evaluated, and prepared for this influx. In particular, demands for vocational services and supports for adults with ASD will increase substantially, yet currently very little is known about how best to support these individuals in achieving success in competitive employment.

The social impairment of individuals with ASD makes obtaining and keeping a job difficult, even for those with normal intelligence (Morgan, 1996). In fact, people with ASD who have recognized qualifications still have employment levels and occupational status lower than those of individuals without neurodevelopmental diagnoses (Beversdorf, Smith, Crucian, Anderson, et al., 2000; Mawhood & Howlin, 1999), despite enhanced performance on certain tasks. Many of them have to rely on support from their families to find a job (Howlin, 2000). A recent follow-up study of 68 adults (average age = 29 years) who met the criteria for autism

and had performance IQs of 50 or above in childhood revealed that less than one third were in some form of employment, and the majority remained highly dependent on other persons for support (Howlin, Goode, Hutton, & Rutter, 2004). In the United States, only a handful of programs provide vocational support services specifically for individuals with ASD, perhaps the most established being the Treatment and Education of Autistic and related Communication-handicapped CHildren (TEACCH) program. TEACCH provides a range of services, including those to assistance in obtaining employment.

Once employed, individuals with ASD often demonstrate particular strengths, such as attention to detail, that are attractive to their employers (Smith, Belcher, & Juhrs, 1995). Strengths and special interests can be used by job developers and employers to produce better vocational outcomes (Olney, 2000). Companies also value the trustworthiness, reliability, and low absenteeism of employees with ASD (Howlin, Jordan, & Evans, 1995; Morgan, 1996). In addition, aspects of jobs that other employees may find unattractive, including social isolation or repetitiveness, often appeal to persons with ASD (Van Bourgondien & Woods, 1992). Even individuals who are severely affected by autism can overcome behavioral problems in the workplace if given appropriate reinforcements and behavior management (Smith & Coleman, 1986).

Among the primary problems encountered in the workplace are difficulties in communicating with coworkers and supervisors, failure to recognize social rules, poor ability to work independently, obsessive behaviors, and resistance to change (Howlin et al., 1995). A specialized vocational support program could provide the necessary counseling, training, and guidance to individuals on the autism spectrum, enabling them to overcome these problems and retain their jobs for reasonable lengths of time (at least 6 months), experience personal satisfaction in their jobs, and make valuable contribution to their companies' work forces. A specialized program could support these needs by (a) facilitating communication between the individual and his or her coworkers and helping him or her achieve social integration with other members of the workforce, (b) providing coaching to help the individual increase his or her independence in the job, and (c) if necessary, providing training aimed at specific behaviors such as resistance to change and obsessiveness. Achievement of these goals could be monitored by gathering feedback from employers and coworkers, as well as from the supported individual him- or herself. An effective vocational support program would be expected to provide services both before and after job placement, including training in finding and applying for jobs, counseling to help ensure that a potential job is a good match for the individual, job coaching until independence in job tasks is achieved, and following the participant's progress for at least 6 months after placement.

In the study we report on here, our primary purpose was to evaluate the effect of a 2-year vocational support program on employment rates and participant income. The study took place between 2000 and 2002 at a Midwestern university. Services included job preparation, job placement, and job coaching. A second purpose was to investigate a number of factors affecting employment among individuals on the autism spectrum, including job satisfaction, social integration in the workplace, and employers' evaluations of job performance. The results provide greater insights regarding the employment experiences of individuals with ASD in addition to an evaluation of our particular vocational program. Our specific research questions were as follows:

1. To what extent did our vocational support program affect employment rates, participant income, and other vocational outcomes (such as job retention) for participating adults with ASD?
2. How did employers evaluate the job performance and social integration into the workplace of adults with ASD?
3. How did adults with ASD rate their own job satisfaction and their satisfaction with services received from a vocational support program?
4. What specific strengths and challenges were experienced by adults with ASD who were competitively employed?

The employment goals were for participants to gain work experience, acquire more realistic career goals, and move toward financial independence.

METHOD

Participants

Nine individuals with ASD received services through the program in the 2-year evaluation period. Participants were recruited via an ASD clinic at our university

and the transition services offices of local high schools. Written consent was obtained from all participants in accordance with the regulations of our university's Institutional Review Board. Diagnoses were confirmed with the *Autism Diagnostic Interview–Revised* (ADI-R; Lord, Rutter, & LeCouteur, 1994), and, for those with Asperger syndrome ($n = 6$), the *Gilliam Asperger's Disorder Scale* (GADS; Gilliam, 2001). Participant demographics and psychometric data are shown in Table 1.

The amount of additional support required while in school varied among participants. Two received substantial remedial support, taking most classes in a special education classroom, 5 attended some classes in mainstream classrooms, and 2 others were completely mainstreamed. None required residential schooling, and all lived at home with their parents (except for one person, who lived independently). Five of the participants were still attending high school or were involved in some form of further education at the time that they enrolled in the program. The remaining 4 had graduated from high school. For the 4 participants in high school, program staff collaborated with their high school transition offices by providing progress updates during the job search and placement process. Once the participants had jobs, communication with transition officers continued for approximately 3 months to inform the officers of the participants' success. Two of the participants were employed at the time of enrollment: One had a paper route, and one was paid through a school work experience. Two other participants, although not employed, received Social Security income (SSI). The remaining 5 participants had no preprogram income and were not eligible for government benefits.

Procedure

Staffing Levels. Staffing levels for the program were modest, with a program coordinator employed part-time for 18 months and full-time for the last 6 months of the initial evaluation period. This individual provided all of the pre- and postplacement services described in the next sections. Individuals were enrolled in the program at staggered intervals to allow the program coordinator to place a participant in a job successfully prior to beginning work with the next participant.

The program also had an advisory council consisting of employer representatives, parents, individuals with ASD, and other professionals. Council members met on a quarterly basis for updates on the program and discussion of modifications and plans.

Preplacement Services. Prior to receiving services, each participant completed the enrollment process. An information packet sent to each potential participant contained a detailed questionnaire assessing skill levels in daily living, communication, cognitive, behavioral, and social skills. This questionnaire was completed by parents. The section on daily living skills included questions about personal hygiene, grooming, safety (e.g., crossing the road, following safety instructions), and use of public transportation. The language skills section asked about how many verbal directions the participant could follow at a time, his or her ability to engage in a two-way conversation, and his or her general language comprehension. The cognitive skills section included questions about basic math skills (e.g., addition and subtraction) and ability to tell the time. The section on behavior asked about aggression and tantrums. The social skills section detailed the participant's level of interaction with others, response to strangers, and everyday manners.

The participants themselves completed a questionnaire providing demographic and background information, including the name of their high schools, dates of graduation, and grades achieved. They also gave details on any previous work experience. Subsequently,

TABLE 1
Participant Demographic and Psychometric Data

Gender (Male/Female)	Age (yrs.) *M* (Range)	Full-Scale IQ *M* (Range)	Verbal IQ *M* (Range)	Performance IQ *M* (Range)
8/1	22 (18–36)	111 (95–131)	116 (99–133)	107 (71–122)

Note. IQ scores measured with *Wechsler Adult Intelligence Scale–Third Edition* (WAIS-III; Wechsler, 1997). Average IQ scores are based on results of 7 participants because it was not possible to reliably administer the WAIS-III to 2 participants due to low verbal skills.

each participant and his or her parents attended an enrollment interview with program staff, where more specific details regarding his or her strengths and challenges were gathered. Questions about employment interests were asked and later examined for the participant's level of job readiness (see the Case Notes section for details).

After completing the enrollment process, participants received preplacement services, with the goal of securing employment. Preplacement services included instruction in job search skills and help in identifying appropriate job advertisements using Internet searches, company Web sites, and job ads in newspapers. This service helped participants interpret job ads, understand what jobs might involve, and figure out whether they were under- or overqualified for particular positions. Advice on and help with preparing résumés, favorably completing job application forms, and creating positive impressions in job interviews were also provided. Participants practiced completing job application forms and were counseled about what to include, what not to include, and how to describe previous work experiences as favorably as possible. Mock job interviews were videotaped so that participants could later review their performance with the program coordinator. These skills were taught one on one, and support continued until an appropriate job was found, which took from 1 month to 8 months. During this waiting period, participants continued to practice and improve their job search skills and actively search for employment. The program coordinator spent at least 1 hour per week providing preplacement support to each participant, with the amount of time varying according to the participant's needs.

Postplacement Services. Once a potential position was found, the program coordinator conducted a job site evaluation using a checklist that covered the work environment (e.g., noise level, crowding, type of equipment used), other employees at the job site, potential support systems (including previous experience in working with individuals with disabilities), and the tasks to be completed by the individual. The aim of the job site evaluation was to help ensure an appropriate job match. If necessary, the coordinator engaged in job development with the employer and negotiated changes to the tasks required for the position.

Once the participant began his or her job, the program coordinator went to work with the participant and provided on-site job coaching support. The level of support needed varied from participant to participant but included help with training, acclimation to the job site, and social integration. The program coordinator ensured that each participant understood his or her job tasks and could complete them to the satisfaction of his or her supervisor, training the participant if necessary. She also ensured that the participant understood workplace rules, such as beginning and end times, break times, sick leave and vacation policies, and emergency procedures. The coordinator made sure that all participants knew their way around the buildings in which they were working, and how to get to and from work if they were commuting independently.

Employers and coworkers were offered information regarding ASD and how, given participants' strengths and challenges, to interact optimally with each participant. If it became apparent that a participant was not developing social relationships with his or her coworkers, the program coordinator would provide him or her with advice and strategies to help enhance integration, including encouraging him or her to greet coworkers when arriving at work and to say good-bye when leaving. Whenever possible, one coworker was designated as a contact person to whom the participant could go with general questions about the workplace and the roles of other employees. The program coordinator also encouraged the participant to have conversations with his or her coworkers during break times and provided suitable topics to help initiate conversations, including recent movies, news events, and hobbies. Helping the individual communicate effectively with his or her employer and coworkers is a critical component for a successful job placement and likely has an impact on his or her social integration into the workforce.

The amount of job coaching support provided per participant each week ranged from 4 hours to 20 hours, depending on the number of hours worked by participants and their needs. Job coaching was typically provided to one participant at a time, due to low staffing levels, and continued until each individual was independent in his or her position, which ranged from 1 day to 6 months. In addition, one participant had a permanent job coach provided by her high school. Job coaching support is important to most employees with ASD, particularly at the beginning of their experience in the new position, as they often have difficulty in becoming independent in their jobs.

Once each participant was able to operate independently in his or her job, the program coordinator made contact with the participant and his or her supervisor regularly to ensure that if any issues arose, or there were any changes in the job, support was available. Contin-

ued follow-on support is also a vital component of a successful program. During the first 2 weeks of employment, as part of this ongoing support, the coordinator visited the job site twice a week for a progress meeting with the participant and his or her supervisor. Typically, this was reduced to one meeting a week for the next 2 weeks and then to weekly communication by telephone or e-mail with the supervisor and the participant for another month. Subsequently, communication was reduced to once every 2 weeks, and at 6 months postplacement to once a month. Those parents closely involved in the program ($n = 7$) were also updated regularly on their children's progress in their job placements. If problems did arise, the program coordinator discussed these with the participant and his or her supervisor to find a solution. If necessary, the coordinator arranged a meeting with the participant to provide the necessary counseling or training or returned to the work site to offer additional hands-on training.

Data Collection. The primary outcome measures were employment rate and level of income. Data were also collected regarding job retention, hours worked, whether this was a participant's first paid job, and the length of time taken to find an appropriate job placement. For each participant, detailed case notes documenting his or her progress, strengths, and challenges experienced in the placement were kept. Case notes were updated by the program coordinator following progress meetings and update sessions with participants and their supervisors.

Descriptive Self-Report Measures. To gather more descriptive information, four supplemental assessment tools were designed to help evaluate the success of participants and the program and to provide insight into strengths of—and challenges experienced by—the participants. These were the *Assessment Worksheet*, the *Socialization Scale*, the *Job Satisfaction Index*, and the *Program Satisfaction Measure*. All four were designed as questionnaires and incorporated a rating scale to allow easy comparisons among different time points for each participant. Questions were formulated based on knowledge gained from previous support programs conducted by others and the program staff's knowledge of ASD. In formulating the questions, we attempted to predict how the strengths of and challenges faced by individuals with ASD in their daily lives would translate to the workplace. Although we do not yet have standardization data or reliability information for these measures, they did achieve our purpose of providing some evaluation and insight. Once the program has a larger number of participants, it will be possible to validate these measures formally.

The supplemental assessment tools were completed by participants or their supervisors in a quiet room in about 10 min each. The *Assessment Worksheet*, completed by each participant's supervisor, utilized a rating scale from 1 (*never* or *needs help*) to 5 (*always* or *excellent*) to evaluate the participant on 17 different skills and behaviors. The *Socialization Scale*, also completed by supervisors, consisted of six questions regarding individuals' social integration in the workplace. Each question was answered on a scale from 0 (*never*) to 10 (*always*), with higher scores reflecting greater social interaction. The *Job Satisfaction Index*, completed by participants, enabled program staff to monitor participants' happiness with their job and ensure that they continued to find their jobs rewarding. The measure consisted of 10 questions, answered from 1 (*strongly disagree*) to 5 (*strongly agree*), covering how interesting, enjoyable, useful, and challenging participants found their jobs. The *Program Satisfaction Measure* enabled participants to report their satisfaction with the program's services and staff. These questions utilized a rating scale from 0 to 10, with 10 the most positive score.

The questionnaires were completed at progress meetings 3 months and 6 months after job placement, and then every 6 months until the end of the study. Data were not collected within the first 3 months of employment because it would have been difficult for both participants and supervisors to gauge progress accurately over very short periods. Second, it was important to ensure that the participants were stable in their jobs before making the first measurement, as program staff intended to make comparisons between measures taken at the three different time points. To allow some comparison across time, results are from the 6 participants who completed their evaluations up to at least the 12-month point. Data recorded at the 18- and 24-month measurement points were not examined because only 3 participants were in their placements for that length of time.

Case Notes. As noted previously, case notes were kept on the progress, strengths, and challenges experienced by each participant in his or her job. The program coordinator updated these files from notes taken during progress meetings and updates with participants and their supervisors, including the enrollment visits. The

program coordinator subsequently examined case notes to identify common themes.

Case notes from each participant's enrollment visit were examined for the participant's level of job readiness. Observations on this issue were based on questions asked of the participant, including (a) What type of job do you see yourself in? (b) How much do you think you will get paid? (c) Why do you want a job? (d) What is an employer looking for in an employee? and (e) Where do you see yourself in 5 years' time? At the enrollment meeting, the program coordinator also discussed with participants the consequences of accepting, declining, and quitting jobs. Finally, participants were asked whether they had a résumé, whether they knew how to find a job, and whether they felt prepared for a job interview.

Case notes taken during progress meetings following job placement were also reviewed. During each progress meeting, participants and their supervisors were asked individually to provide general feedback regarding the participants' progress, strengths, and challenges in the job. These notes were subsequently categorized into communication, cognitive, behavioral, and social issues experienced by the participants in the workplace.

Data. Participants' employment and income levels 1 year after enrollment in the program were compared to those prior to enrollment using percentage increases. Means were calculated for the number of hours worked weekly, the number of months for which participants retained their jobs, and how many months it took participants to get jobs. Means were also calculated for scores from the *Assessment Worksheet*, *Socialization Scale*, *Job Satisfaction Index*, and *Program Satisfaction Measure*. Scores for each question were averaged across participants and examined at the three time points (3 months, 6 months, and 12 months following placement).

RESULTS

Table 2 outlines the key data regarding salaries, hours worked, and placement data collected during the initial 2-year evaluation period.

Employment Outcomes and Income Levels

Employment Levels. We investigated whether the program had a significant impact on employment levels among participants. A comparison of the number of jobs held before enrolling in the program and 1 year after enrollment showed that employment levels increased. Two of the participants, who were already employed at the time they enrolled in the program, were helped to find better-paying, permanent positions. The remaining participants were not yet employed; therefore, employment levels increased by 78%.

Income Levels. We compared differences in income pre- and postintervention. Two participants were already employed preintervention, and 2 others, although not employed, received Social Security benefits. Including these four incomes, the mean preintervention income for all participants was calculated to be $1.60 per hour (range = $0.00–$4.00); 1-year postintervention, the mean was $7.10 per hour (range = $5.15–$8.99). Therefore, we saw an increase of 443.75% in income levels. Two positions gained through the program included full health and retirement benefits. For the two participants receiving SSI, the amount of support they received was not affected by employment because their earnings did not exceed the threshold at which their benefits would have been affected. However, this was taken in to consideration when evaluating possible job options.

Hours Worked. Placements in permanent positions were found for all of the participants, and hours worked per week ranged from 4 to 40, with an average of 17.11. The number of hours worked depended primarily on the endurance levels of each participant and thus the amount of time they themselves wanted to work. This was considered during the job search stage, and only jobs that would match the individual's level of endurance were considered.

Job Retention. One participant left the program due to a family relocation. Of the remaining eight participants, one was not successful in the position after 6 months of employment. Following the 2-year evaluation period, the seven participants who remained in their jobs had held these positions for an average of 12.5 months (range = 2.5–21 months). These were their original placements; only one placement was necessary for each participant during the 24-month evaluation period, probably because of the selective job-matching processes we used. For 6 of the 9 participants, this was their first paid position.

Length of Time to Placement. The length of time it took to place participants ranged from 1 month to

TABLE 2
Overview of Salary, Hours Worked, and Placement Data

Participant	Hourly income ($)		Hrs worked/wk	How long in job? (mos)	First paid job ever?	How long took to place? (mos)	Job placement
	Preplacement[a]	Postplacement					
1	4.00 (SSI benefits)[b]	6.00	7.00	17.0	Y	6.0	Clerical
2	0	6.75	6.00	21.0	Y	2.0	Bookstore
3	3.50 (paper route)	6.00	4.00	14.0	Y	4.5	Supermarket
4	0	8.99	40.00	12.0	N	3.0	Food service
5	0	8.99	40.00	12.0	N	1.0	Food service
6	3.50 (SSI benefits)[b]	8.00	9.00	9.0	N	8.0	Clerical
7	0	8.00	20.00	2.5	Y	4.0	Hotel kitchen
8[c]	3.50 (school work exper.)	5.15	20.00	6.0	Y	8.0	Janitorial
9[d]	0	6.00	8.00	6.5	Y	3.5	Supermarket
Total	14.50	63.88	154.00	87.5[e]		40.0	
Average	1.60	7.10	17.11	12.5		4.5	

Note. SSI = Social Security Income.
[a]Hourly income has been calculated from either weekly or monthly incomes. [b]Hourly income calculated by dividing monthly SSI income by 160 hours per month (or 40 hours per week × 4 weeks). [c]Unsuccessful placement. [d]Family relocated. [e]Calculated based on the 7 participants who remained in their jobs at the 2-year evaluation point.

8 months, with an average of 4.5 months. During this time, participants received preplacement services.

Job Placements. For the most part, the participants held entry-level positions, which reflected the fact that the majority had recently graduated from high school. Placements were based on each participant's vocational interests, previous experience (if any), and aptitude for the particular job under consideration. Types of jobs included food service, retail, and clerical work. The two individuals who were already employed (paper route and school work experience) were helped to find better-paying, permanent jobs through our program. As individuals in the program increase their work experience and skills, they could be placed in more challenging and higher-paying positions. For the duration of this evaluation period, each participant remained in his or her original job placement because none of the participants were ready for a more demanding job.

Descriptive Assessments

Data from the assessments are provided in Tables 3, 4, and 5. These results are from the six participants who completed their evaluations up to at least the 12-month point to allow comparisons across time. Therefore, participants' ratings were averaged and examined at the 3-month, 6-month, and 12-month measurement points.

Job Evaluation. Ratings from the *Assessment Worksheet,* which was completed by the participants' supervisor, are shown in Table 3. The results show that ratings remained fairly stable over the three measurement points (3, 6, 12 months). However, improvements were seen in transitioning independently to a new task, examining work for errors, and asking for help when needed. Overall, the participants were rated highly by their supervisors on a range of critical job skills and be-

TABLE 3
Averaged Ratings by Supervisors Across Participants From the Assessment Worksheet

Worksheet item	3 mos	6 mos	12 mos	Average	Range
Has no absences	4.0	3.5	4.8	4.1	2–5
Is punctual	4.2	4.2	4.0	4.1	1–5
Completes assigned tasks	4.0	3.5	4.7	4.1	1–5
Returns to work if distracted	4.2	3.8	3.5	3.8	2–5
Transitions independently from one task to another	2.3	2.8	3.5	2.9	0–5
Begins work promptly	4.0	3.7	4.3	4.0	2–5
Observes rules of department	3.5	4.0	4.2	3.9	2–5
Works at an acceptable speed for given task	3.8	3.3	3.5	3.5	1–5
Dependable	4.2	4.0	4.5	4.2	3–5
Demonstrates expected knowledge of job	4.0	3.7	4.3	4.0	3–5
Examines work for errors before submitting it	2.3	3.0	3.7	3.0	0–5
Makes specified changes based on constructive criticism	3.3	4.2	3.8	3.8	2–5
Follows verbal directions	4.0	4.2	3.5	3.9	2–5
Follows written directions	3.8	4.2	3.7	3.9	2–5
Asks for help when needed	2.5	3.5	4.2	3.4	1–5
Begins a task as soon as requested to do so	3.8	4.0	4.0	3.9	1–5
Asks for additional work or directions once a task is complete	3.5	3.5	4.0	3.7	1–5

Note. Of the 9 participants, 6 had completed assessments up to at least the 12-month measurement point. Items rated on a scale (5 = *always/excellent,* 4 = *above average/good,* 3 = *average/usually,* 2 = *below average/sometimes,* 1 = *below average/seldom,* 0 = *never/needs help*).

haviors, including punctuality, knowledge of their job, dependability, ability to follow directions, and beginning a task when requested to do so.

Social Integration. For the *Socialization Scale*, also completed by supervisors, average ratings across the participants (0 = *never,* 10 = *always*) increased at each measurement point, demonstrating that over time individuals with ASD can become more integrated in the workplace. Ratings are provided in Table 4. Ratings for interest in socializing with co-workers, greeting, and saying goodbye were high; however, ratings remained low for (a) joining in social activities with co-workers outside of work and (b) making friends in the workplace.

Job Satisfaction. For the *Job Satisfaction* measure, completed by the participants, ratings from each participant are shown in Table 5. Ratings ranged from 5 (*strongly agree*) to 1 (*strongly disagree*). Participants indicated that their jobs were satisfying and enjoyable, although their ratings for this item were slightly lower at the 12-month measurement point than at 3 months and 6 months. They either agreed or strongly agreed that (a) their job was useful and (b) they were happy with their job and grateful to have it. The rating level for finding the job challenging declines over time, which may reflect improved job performance.

Program Satisfaction. Satisfaction ratings with services received through our vocational support program

TABLE 4
Averaged Ratings by Supervisors Across Participants From the Socialization Scale

Scale item	3 mos	6 mos	12 mos	Average
Shows interest in socializing w/ co-workers	5.8	5.8	7.8	6.5
Greets co-workers when appropriate	5.7	6.7	7.8	6.7
Says goodbye to co-workers when appropriate	4.0	6.0	8.5	6.2
Engages in "chit chat" with co-workers	4.3	4.5	5.2	4.7
Joins in activities outside of workplace	0.0	0.5	1.8	0.8
No. of friendships formed[a]	1.8	3.5	4.0	3.1

Note. Of the 9 participants, 6 had completed assessments up to at least the 12-month measurement point. Items rated on a Likert scale (0 = *never*, 10 = *always*), except for No. of friendships formed, which was rated on a scale of 0 (*none*) to 10 (*close*).

TABLE 5
Averaged Ratings Across Participants From Their Answers to Items on the Job Satisfaction Index

Index item	3 mos	6 mos	12 mos	Average
Satisfying	4.2	4.2	3.5	4.0
Interesting	3.8	3.2	3.3	3.4
Enjoyable	4.3	4.2	3.3	3.9
Useful	5.0	4.5	4.0	4.5
Challenging	3.2	3.0	2.5	2.9
Tiring	2.3	2.5	2.7	2.5
Frustrating	2.0	2.5	2.7	2.4
I am happy with my job	4.0	3.7	3.8	3.8
I wish I could leave my job	1.8	1.7	2.7	2.1
I am grateful for my job	4.5	4.5	4.5	4.5

Note. Of the 9 participants, 6 had completed assessments up to at least the 12-month measurement point. Items rated on a scale (5 = *strongly agree*, 4 = *agree*, 3 = *unsure*, 2 = *disagree*, 1 = *strongly disagree*).

were high and remained at a similar level across the three measurement points. On a scale from 1 to 10, with 10 being positive, ratings for the job itself had an average score of 7.7 at 3 months, 6.7 at 6 months, and 7.2 at 12 months. Satisfaction with supports received from program staff had an average score of 10.0 at 3 months, 9.8 at 6 months, and 9.0 at 12 months, and satisfaction with the program overall had an average score of 9.0 at 3 months, 8.7 at 6 months, and 9.3 at 12 months.

Descriptive Observations From Participants' Case Notes

Case notes from the initial visit with each participant were examined for level of job readiness. Reviewing these notes indicated that most of the participants were not well prepared for employment and had unrealistic expectations regarding the realities of employment (see Table 6 for some specific examples). Case notes taken

during progress meetings following job placement revealed a number of common themes among the participants. These included difficulties in the following areas:

- understanding abstract concepts related to their job, such as how their role related to the roles of other employees;
- making friends;
- doing other employees' work without receiving recognition; and
- being unfairly blamed for co-workers' mistakes.

Examples from postplacement case notes are also provided in Table 6. Despite such challenges, the majority of the program participants also demonstrated significant success in their jobs. Supervisors and co-workers reportedly admired the reliability, honesty, strict adherence to rules, and attention to detail of the study participants, who would often complete the job tasks exactly as trained, with preciseness and motivation. They also acquired more general skills, such as improved communication, ability to work with others, and ability to solve problems that arose during the job. Support from co-workers was very influential to the overall success of all of the participants.

DISCUSSION

Following enrollment in our vocational support program, both employment rates and income increased for the participants. The majority, 6 out of 9, obtained their first paid job through the program and, at the time of assessment, had held their jobs on average for more than a year, indicating a good job retention rate. Participants were placed in competitive employment on average within 4.5 months of program enrollment and worked the number of hours a week they desired. These findings support the results of studies of previous employment programs

TABLE 6
Descriptive Categories and Observations From Participants' Case Notes

Case note category	Observation example
Level of job readiness	• Has unrealistic expectations of employment options and salary range • Displays minimal understanding of importance of employment; consequences of accepting, declining, or quitting jobs • Lacks vocational skills, such as job-search skills, résumé preparation, interviewing
Communication skills	• Interrupts others; does not know when to ask a question • Makes inappropriate statements • Demonstrates honesty
Cognitive skills	• Has difficulty seeing overall picture regarding his or her role in the company and how others depend on him or her • Understands impact of behavior on the opinions of others • Needs a set routine, clear instructions, and rules • Demonstrates good attention to detail, precision in work
Behavioral skills	• Has difficulty in meeting strict expectations of job performance • Some demonstrate problems with punctuality and break times, but others very reliable • Fixates on bad experiences, unable to cope with criticism • Is motivated, enthusiastic
Social skills	• Excluded from social events outside the workplace • Experiences difficulty in understanding social boundaries between co-workers as well as customers • Displays vulnerability regarding being taken advantage of by co-workers • Shows improvement in working with others

Note. Observations from case notes are taken from the case files of all 9 participants.

in which researchers demonstrated that with supports, individuals on the autism spectrum can be successful in competitive, entry-level employment (Keel, Mesibov, & Woods, 1997) and can benefit from employment-support programs (Garcia-Villamisar, Ross, & Wehman, 2000; Smith & Philippen, 1999).

Employers rated the job performance of the participants highly on a range of important job skills, including being punctual, knowing the job, being dependable, following directions, and beginning a task when requested to do so. Ratings were lower for transitioning independently to a new task, examining work for errors, and asking for help when needed, but all participants showed improvement over time. Regarding social integration, although the participants were rated highly for interest in socializing with co-workers, their ratings remained low for joining in social activities with co-workers outside of work and for making friends in the workplace. Therefore, participants in our program continued to experience challenges in the social domain despite (a) the program coordinator's efforts to improve communication between the participant and his or her co-workers and (b) more direct efforts to integrate the individual socially. Other researchers have also identified communication difficulties with co-workers and failure to recognize social rules as challenges for employees with ASD (Howlin et al., 1995). Problem with socialization is a defining characteristic of individuals on the autism spectrum, but additional studies will be needed to see whether improvements are made over a longer time period.

The participants rated their own job satisfaction quite highly, agreed that their jobs were useful, and reported being happy in their jobs and grateful for their jobs. However, their ratings did decrease over time, which could be due to their also rating the job as less challenging. As individuals in the program increase the amount of work experience and improve their skills, some of them could be ready for placement in more challenging and higher-paying positions in the near future. Participant satisfaction ratings regarding the program's services and staff were high.

Specific strengths of and challenges experienced by persons with ASD in the workplace appeared when we examined the case notes. Most of the participants were not well prepared for employment prior to enrolling in our program, and they had unrealistic expectations of what having a job would be like. Comprehending abstract concepts regarding their jobs and their roles, such as why the job was done a specific way, or in what way their job related to the jobs of others in the workplace, were challenging for the participants, who also had difficulty making friends and some times were taken advantage of in the workplace. Regarding strengths, supervisors and co-workers praised the reliability, honesty, strict adherence to rules, and attention to detail shown by program participants, factors that were also identified in previous research (Howlin et al., 1995; Morgan, 1996; Smith et al., 1995). Participants also acquired more general skills, such as improved communication, ability to problem solve, and ability to work as part of a team.

The level of family involvement varied by participant. Some parents were more heavily involved in their child's progress than others. All of the parents were involved in the enrollment process and provided detailed information regarding their child's strengths and weaknesses. The majority of parents were involved in the final decision concerning accepting a job offer. Although program staff regularly updated most parents regarding the participants' progress in the job placement, we believe that parental involvement could have been increased. For example, direct input from the parents in developing strategies and solutions to challenges their children experienced in the workplace would have been beneficial.

Study Limitations

The evaluation of our vocational support program could be improved by utilizing a broader range of tools. Self-report measures are difficult to validate because responses often can be skewed in a positive direction. Structured observations within the workplace may provide a more accurate account of participants' job performance and social integration than ratings given by their supervisors, and this could be introduced in a future study. Also a larger number of participants and a further extended period of data collection would enhance generalization of the findings. Individual differences among participants, such as number of hours worked and type of employment, may have affected responses on the self-report measures. A larger number of participants would allow for a more flexible analysis in which such additional factors could be taken into account.

Future work will also be needed to expand our findings in a case-controlled manner, in which comparisons between individuals receiving program services (intervention group) and individuals not receiving services for 1 year (deferred enrollment group) can be made. This would allow us to examine the possibility that some individuals may achieve employment on their own as a result of maturation. In addition, the two groups (intervention, deferred enrollment) could be matched for a

number of additional factors that may have affected the study outcome data, including age, gender, previous employment experiences, and level of vocational preparation. Subsequent comparisons between two such groups would allow a more controlled and detailed evaluation of our program.

Implications for Practitioners

Examining the case notes indicated that most of the participants had few vocational skills to prepare them for posttransition employment, such as job-search and interview skills. They had unrealistic expectations regarding employment and salaries, and they did not understand the importance of having a job after graduation from school. More emphasis should be placed on vocational preparation prior to high school graduation for individuals with ASD, with special attention to these issues. In addition, family involvement and parental support are known to be important factors in vocational success (Burt, Fuller, & Lewis, 1991), and closer collaboration between schools and families would be beneficial in helping the individual with ASD prepare for transition. This may also lead to more work experiences in the community prior to graduation, which would significantly enhance the individual's awareness and understanding of the realities of employment.

Professionals who are directly supporting adults with ASD in the workforce should focus additional efforts on social integration with co-workers. It appears from our findings that employees with ASD may need an extensive amount of support in this area. When difficulties arose in a placement, the cause often was not the individual's actual job performance, which was generally rated highly, but other socially related factors, as reflected in employers' ratings on the socialization scale. A failure to understand the impact of their behavior on the opinions of others, difficulty in understanding social boundaries in relationships, and vulnerability among co-workers were all social issues that may have negatively affected the success of the job placement for a study participant. Educating supervisors and co-workers as to how to interact optimally with an adult with ASD—and identifying a co-worker to provide natural supports within the workplace—may also enhance social integration and acceptance. In addition, building social support networks outside of the job placement, such as groups for adults with ASD and other community groups, could generalize social skills learned in these settings to an enhanced socialization at work.

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