Peer-Mediated Literacy-Based Behavioral Interventions: A Job Coaching Strategy for Secondary Students With ASD

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Abstract

Many secondary students with autism spectrum disorder (ASD) are not taught employability skills and routines needed for competitive or supported employment in regular community environments. Literacy-based behavioral interventions (LBBIs) that combine print, pictures, and behavioral rehearsal are effective for promoting acquisition and maintenance of numerous skills, but have not been investigated as a job coaching intervention for individuals with ASD. In this study, a peer coworker was taught to deliver an LBBI guide to students with ASD as a job coaching intervention for three skills in an employment preparation routine: preparing and selling coffee in a work-site food truck. Results showed students' accuracy with the skills in the work routine increased, and maintained after the intervention.

Keywords

Adolescents and adults with autism spectrum disorder (ASD) and other developmental disabilities regularly experience learning difficulties and generalization challenges with new skills, along with limited opportunities to prepare for employment, community living, and educational experiences after high school (Mazzotti et al., 2016). An evolving body of research on predictors of post-school outcomes (Carter, Austin, & Trainor, 2012; Kaye, Jans, & Jones, 2011; Mazzotti et al., 2016; Test et al., 2009) shows that the very experiences needed for students and employees with the most need for supports frequently are not able to access them. For example, employment supports and curricular options typically are very limited in secondary schools (Guy, Sitlington, Larsen, & Frank, 2009), and meaningful employment preparation experiences are equally difficult to obtain in post-secondary community settings (Brady & Rosenberg, 2002; Test et al., 2009; Wehman, Chan, Ditchman, & Kang, 2014). Because employment preparation opportunities have been limited, many of the interventions are intensive and require highly focused and individualized supports that include direct coaching, feedback, and monitoring of individual work performance (Marshall et al., 2014; Wehman et al., 2014). Although employment preparation for most students with disabilities requires thorough attention to job carving, task production, and quality control, for students with ASD, employment training also includes attention to the social interaction requirements of job tasks and other issues (Sansosti,

Merchant, Koch, Rumrill, & Herrera, 2017). Because most students with ASD experience challenges with many social functions, task training in the absence of employment socialization often results in additional employability difficulties, with up to a third of young adults with ASD unable to obtain paid employment after high school (Newman et al., 2011).

In their review of instructional procedures that promote employability skills, Bennett and Dukes (2013) identified a significant gap in the research literature among secondary students with ASD. Of the few studies that targeted this group, significant questions remain regarding efficacy of job coaching strategies, impact on employment outcomes, and lack of community-based employment training. Similar findings have been reported by other researchers who reported minimal attention has been paid to transition planning for adolescents and adults with ASD (Hendricks & Wehman, 2009), their employment outcomes (Gilson, Carter, & Biggs, 2017; Hendricks, 2010), and their need for community-friendly prompting strategies (Van Laarhoven,

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Kraus, Karpman, Nizzi, & Valentino, 2010). Although students with ASD are a vastly underrepresented group in the employment preparation research, research on their employment outcomes has been encouraging. A host of interventions have been found as effective, including (a) video modeling of self and others (Bellini & Akullian, 2007; Kellems & Morningstar, 2012); (b) video, audio, and static picture prompting (Bereznak, Ayres, Mechling, & Alexander, 2012); (c) variations of behavior skills training interventions (Burke, Andersen, Bowen, Howard, & Allen, 2010; Palmen & Didden, 2012); (d) selecting high preference over low preference tasks (Graff, Gibson, & Galiatsatos, 2006); and (e) a variety of portable electronic devices and tablets (Burke et al., 2013; Mechling, 2011). However, as the Bennett and Dukes (2013) and Gilson et al. (2017) reviews show, this research also identified numerous challenges. Many of the studies paid less attention to employability and instead focused on behavior reduction topics, were conducted in noncommunity settings, or were implemented with coaching and supervision intensity unlikely to be replicated in most community settings.

Literacy-based behavioral interventions (LBBIs) have potential as a job coaching strategy if developed and presented as an employment training manual. LBBIs include a class of interventions presented in a story format to teach new skills and routines (Bucholz & Brady, 2008). LBBIs with print, visuals, and guided rehearsal have been used in a variety of formats including social scripts (Krantz & McClannahan, 1998), picture activity schedule (Spriggs, Gast, & Ayres, 2007), Social Stories™ (Gray, 2000), and other formats that incorporate print, pictures, and rehearsal into instruction (Weiss & Harris, 2001). A recent LBBI format (Brady, Honsberger, Cadette, & Honsberger, 2016) builds a task analysis for an instructional outcome into a personalized story or guidebook. Each page of the guide contains instructions and pictures with a personal point of view to deliver an instructional package with a *read, point, model, practice*, and *praise* format. These stories and guidebook LBBIs have been used to teach safety skills (Kearney, Brady, Hall, & Honsberger, 2018) and self-care routines (Brady, Hall, & Bielskus-Barone, 2016; Brady, Honsberger, et al., 2016) to children and adults with developmental disabilities. Where many LBBI formats have relied on professionals or parents to deliver the intervention (Kokina & Kern, 2010; Test, Richter, Knight, & Spooner, 2011), the story and guidebook LBBI studies have been increasingly investigating peer-mediated delivery of the instruction (Brady, Honsberger, et al., 2016; Kearney et al., 2018).

In two studies, LBBIs have also shown promise as an intervention to teach employability skills. The first study combined a pair of experiments by Bucholz, Brady, Duffy, Scott, and Kontosh (2008) who taught two employees (aged 26 and 48 years with IQs ranging from 29 to "below 59") to

request work supplies in an effort to reverse a long-term decline in their productivity. A guidebook LBBI was created to demonstrate how to request (a) additional supplies, (b) assistance, and (c) a work break when needed. Both women significantly increased their requests and work productivity, and these improvements were still evident 3 months after the intervention ended. In the second experiment of Bucholz et al., an LBBI was developed for a 57-year-old man with Down syndrome in an effort to decrease his transition time back to work after a break. His LBBI story showed him returning from breaks with decreased prompts delivered by coworkers who escorted him. Results showed the employee increased his independent and timely returns to work, while decreasing his reliance on prompts by coworkers.

In a more recent investigation of LBBIs as an employment intervention, Hall, Brady, Kearney, and Downey (in press) examined the effects of three different LBBI delivery formats on the work skills of college students with intellectual disabilities. In addition to the paper-based story formats in previous LBBI studies, Hall et al. explored whether LBBIs delivered as e-books (same story and pictures but delivered on an iPad) and enhanced e-books (same story but with embedded videos instead of pictures delivered on an iPad) would affect students' learning of vocational skills needed for community employment (answering a phone and taking a message; using an office copier; filing papers and reports). All three LBBI formats were effective in promoting students' acquisition and maintenance of employment skills, with some differential effects linked to the format.

As research with LBBIs has gained interest as an intervention for secondary students and adults, investigators have suggested the story and guidebook strategy might have potential as a job coaching intervention to prepare students for community employment settings. However, for job coaching interventions to be effective, the interventions must combine several features that sometimes appear to conflict with one another (Bennett, Brady, Scott, Dukes, & Frain, 2010). The coach's availability, supervision schedule, and the robustness of the intervention often vary across work sites (Bennett et al., 2010; Bennett & Dukes, 2013). In addition, job coaching interventions may or may not rely on a direct instruction model to teach new skills to an acquisition criterion. When job coaching does include direct instruction, additional resources often are needed to enable coaches to deliver the training (Targett & Wehman, 2009).

To date, the LBBI applications have not included secondary students with ASD in the employability studies, although elementary and secondary students with ASD have been part of the LBBI research on self-care skills. Also, the LBBI studies have not examined the efficacy of students or adults who are peer coworkers in delivering LBBIs that target employment skills and routines. Peer

coworkers have long been recommended as a natural employment support for many employees in community settings (Brady & Rosenberg, 2002; Hendricks & Wehman, 2009). Peer coworker potentially can provide low-intensity coaching or support to employees typically provided by paid professionals (Bennett & Dukes, 2013; Marshall et al., 2014).

The purpose of this study was to explore the efficacy of an employment-focused LBBI as a means of teaching job skills to secondary students with ASD. The LBBI was delivered by a peer coworker as part of an employability preparation program within a school curriculum. There were two research questions:

1. **Research Question 1:** Will a peer-mediated LBBI increase the acquisition of three work skills that comprise an employment routine by secondary students with ASD?
2. **Research Question 2:** If students acquire the work skills and employment routine, will they maintain their skills after the LBBI is removed?

Method

Participants and Setting

Three young adult females and a young adult male, all of whom attended a public charter high school for students with autism, were recruited to participate in this study. These students all had a primary educational eligibility of ASD with a secondary educational eligibility of language impairment. The three female students, Beth, Meg, and Gwen, served as our trainees, and the male student, Mark, served as the peer coworker. All three trainees had verbalized interest in working on a food truck, and acquiring vocational skills was a target on each of their Individualized Education Program (IEP). The peer selected to participate in the study worked as a current employee on the food truck. All participants had reading skills below grade level, consisting of reading comprehension scores of at least a fifth-grade level.

Beth was a 22-year-old female with a diagnosis of ASD as indicated by the *Autism Diagnostic Observation Schedule–Second Edition* (ADOS-2). She possessed a full scale IQ score of 54, a verbal score of 58, and general ability score of 54 via the *Wechsler Adult Intelligence Scale–Fourth Edition* (WAIS-4). The *Diagnostic Assessment of Reading–Second Edition* (DAR-2) indicated that Beth's reading comprehension and word recognition were at a fifth-grade level.

Meg was a 21-year-old female with a diagnosis of ASD as indicated by the ADOS-2. Meg had a full scale IQ score of 54, verbal score of 23, and general ability score of 37 as indicated on the WAIS-4. Meg's performance on the DAR-2 revealed reading comprehension at the fifth-grade level and word recognition at the 11th-grade level.

Gwen was a 19-year-old female with a diagnosis of mild-moderate autism on the *Childhood Autism Rating Scale–Second Edition: High Functioning* (CARS-2HF). Gwen had a special nonverbal composite score of 98 on the *Differential Abilities Scale* and demonstrated a reading comprehension at the fifth-grade level on the DAR-2.

The setting for the study was a food truck run by the students of the high school. The food truck functioned as a microenterprise for students to access vocational training in a natural setting. One of the services provided by the food truck was a morning coffee service that was offered to local businesses 2 to 3 days per week, as well as to the staff, the students, and their parents on the school campus. All sessions were conducted in the school parking lot in front of the main entrance of the school. The interior of the truck had a counter top area for food and beverage preparation, as well as a customer service window.

Behavioral Measure, Data Collection, and Interobserver Agreement

The dependent measure for this study was the number of correct steps performed on the task analysis for each employment skill. A task analysis was created for each of three employment skills that comprised an employment training program involving a food truck routine. The skills included (a) setting up the food truck, (b) setting up a coffee service, and (c) filling a coffee order (barista). The task analysis for each employment skill is found in Table 1. To collect data, each student was individually observed while performing the food truck employment skills. Steps of the task analysis did not necessarily have to be performed in order; however, some steps required completion in sequence. For example, participants were required to place the coffee maker in the designated area before plugging the coffee maker into the outlet; however, cup lids could be placed in their designated area before the coffee cups. Each step was scored as correct and independent if the student performing the step completed it correctly without any assistance from the peer coworker. An incorrect response was recorded if the student did not complete or omitted a step of the task analysis. Only steps that were both correct and independent were used for instructional decisions and included in the graphed results. Data were collected using paper–pencil recording sheets by live observers stationed away from the students, yet close enough to see and hear them during the observations. The typical distance between the students and observers ranged from 5 to 10 ft. All observers were experienced teachers enrolled in, or graduates of, a special education graduate program. All were trained to the criterion on the data

Table 1. Task Analysis of Employment Skills.

Setting up the truck	Setting up the coffee	Filling a coffee order
1. Unlock bolt on left side of flap.	1. Place coffee maker in designated area.	1. Take receipt from register.
2. Unlock bolt on right side of flap.	2. Plug coffee maker into outlet.	2. Read order on the receipt aloud.
3. Push open flap.	3. Push power on the back of the coffee maker.	3. Get one coffee cup and place in coffee maker.
4. Lift ledge on outside of truck.	4. Open the lid to coffee maker water tank.	4. Open coffee maker lid.
5. Pull up piece 1 on left side.	5. Pour water from bottle into opening until the fill line.	5. Get one coffee pod and place in coffee maker.
6. Pull up piece 2 on right side.	6. Replace water tank lid.	6. Close coffee maker lid.
7. Place tip jar on left side of ledge.	7. Place coffee cup lids in designated area.	7. Press "Brew."
8. Place other tip jar on right side of ledge.	8. Place coffee cups in designated area.	8. When liquid stops, open coffee maker lid.
9. Place small trash can on inside counter.	9. Place coffee cup sleeves in designated area.	9. Throw used coffee pod in the trash.
10. Place large trash can on left of outside ledge.	10. Place box of coffee pods in designated area.	10. Take coffee cup out of coffee maker.
11. Place napkins next to tip jar.	11. Bring supply box outside.	11. Put coffee cup lid tightly on the coffee cup.
12. Place sandwich board in front of truck.	12. Place creamers in designated area.	12. Place a cup sleeve on the coffee cup.
13. Place menu on the counter.	13. Place sugars in designated area.	13. Give the coffee to the customer.
	14. Place stirrers in designated area.	14. Say "Have a great day!"
	15. Bring supply box back inside truck.	

collection system of 90% accuracy and practiced using the data sheets prior to the study.

Data were collected simultaneously by two observers during 30% of Beth's sessions, 38% of Meg's sessions, and 31% of Gwen's sessions. Observer agreement was determined by dividing the number of agreements between observers by the total number of steps observed, then multiplying by 100. Observer agreement across all students and sessions was 98%. For Beth, agreement across the three employment skills ranged from 76.9% to 100%. For Meg, agreement across the three employment skills ranged from 84.6% to 100%. Agreement for each of the three employment skills for Gwen was 100%.

Development of the LBBI

The three jobs identified above were task analyzed. Each job consisted of 13 to 15 steps (see Table 1). Following the development of the task analyses, three LBBI training manuals were created. Each page in the training manuals represented one step in the task analysis and was comprised of a picture of the individual step being completed with text describing the step. Manuals ranged from 14 to 16 pages in length, and the length of each sentence was between three and nine words. Each page was printed on 8 × 11 in. sheets, and each page of the manual was placed in a laminated sleeve and compiled into a three-ring binder. The font used for each training manual was Calibri 48. A sample page from a story is found in Figure 1.
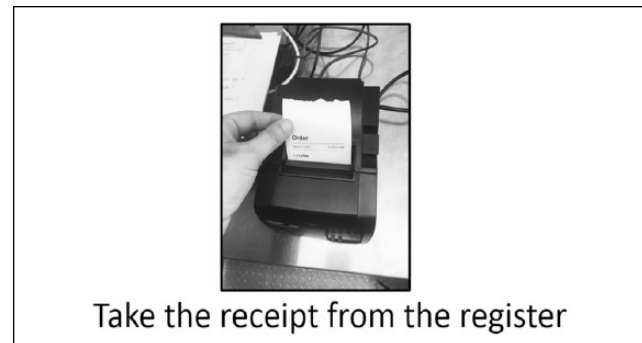

Take the receipt from the register

Figure 1. Sample page from an LBBI training guide (filling a coffee order).
Note. LBBI = literacy-based behavioral interventions.

Experimental Design and Procedures

A multiple probe design across tasks was utilized for each participant in this study. This experimental design was selected to avoid exposing participants to extended periods of inaccurate practice without intervention (Kennedy, 2005). Due to the sequential nature of the jobs, each participant received intervention for the individual jobs in the same order (i.e., setting up the truck, setting up coffee service, filling a coffee order).

Baseline. During baseline sessions, participants were brought to the food truck where the peer coworker was waiting. The participant was informed that she was going to

learn how to do jobs on the food truck, and then was asked to perform the specific task by the peer coworker (i.e., "Set up the truck," "Set up the coffee service," or "Fill a coffee order"). No further instructions or prompts were provided to the participant. Requests for help were answered by the coworker to "do your best." Baseline sessions were terminated after 30 s of no response, or if the participant stated, "I don't know how."

Peer training. Prior to intervention, an investigator implemented a peer training protocol used in previous studies to prepare the peer to implement the LBBI consistently (Brady, Hall, & Bielskus-Barone, 2016; Brady, Honsberger, et al., 2016). This included using the LBBI as a training manual to teach the peer coworker to explain each step in the activity to the student workers. Peer training was conducted over 2 days for 20 min each day and involved role-play with an investigator. The peer was taught to read the sentence on the page, point to the picture and gesture toward the item or area, pause to allow the trainee an opportunity to point to the picture or item, and then provide praise when the trainee completed the step correctly. During the 2-day training, the peer coworker rehearsed the procedure until he was able to complete these steps using pages of the storybook accurately and independently with the investigator. Each day, the peer coworker delivered the intervention to a student and the peer rehearsed the intervention steps with the investigator prior to the students approaching the truck. No formal data were collected on fidelity of the LBBI delivery by the peer coworker because in previous peer-mediated LBBI research, this protocol was found to be effective in assuring that peers delivered the intervention accurately (Brady, Hall, & Bielskus-Barone, 2016; Brady, Honsberger, et al., 2016).

Intervention. Once the intervention condition was implemented, the peer coworker participated in a practice reading of the target vocational activity with the researcher prior to each intervention session to assure that the peer could deliver the intervention as intended. As in the peer training activities, however, no formal procedural fidelity data were collected during these sessions. Intervention sessions began similar to baseline sessions, where the participant was brought to the food truck where the peer coworker was waiting. The peer coworker told the participant "I am going to read you the instructions for setting up the food truck / setting up the coffee service / filling a coffee order," and then proceeded to read the LBBI manual related to the target task. The peer coworker read each page of the story, pointed or gestured to the area the specific step took place, and modeled the physical motion required to complete the step. Once the LBBI manual was completed, the peer prompted the participant to begin the activity by saying, "It's time to: set up the truck / set up the coffee / fill a coffee

order." The peer coworker remained within the 5 ft. of the participant to prompt the participant if she or he made a mistake on any step. If a mistake was made, the peer coworker would turn to the appropriate page in the training manual and reread the instructions for that step to the participant.

Follow-up. Follow-up sessions were conducted once the participant demonstrated stable responding on a particular job. These sessions were included to determine whether the participants would be able to complete each job in the absence of the LBBI. The follow-up sessions were conducted in the same manner as baseline. The peer coworker was present but did not read the LBBI or provide any feedback to the participant.

Data Analysis

Data were initially analyzed using traditional visual inspection procedures. This included calculating measures of central tendency and ranges for each student's performance during baseline, intervention, and follow-up, with additional attention to direction, trend, and level of the data in each condition. Condition changes were made based on the level and trends of individual data points.

In a post hoc analysis, we supplemented the visual inspection with an effect size estimate for single-subject design studies, the percent of nonoverlapping data (PND). PND was established separately for baseline-to-intervention, and from baseline-to-follow-up conditions, for each employment skill for each student. Intervention effectiveness was established using the standards recommended by Scruggs and Mastropieri (2013), where interventions were considered (a) *highly effective* if 90% to 100% of data do not overlap with baseline, (b) *moderately effective* if 70% to 90% of data do not overlap with baseline, (c) *minimally effective* if 50% to 70% of data do not overlap with baseline, and (d) *ineffective* if 50% or fewer of the data fall below baseline.

Social Validity

Social validity data were collected from four professionals who worked with the participants (i.e., speech pathologists, teachers, and job coaches) and the three participants. After the conclusion of the follow-up sessions, the professionals and the participants were asked to provide their opinions on the procedures used and the outcomes of the intervention via short questionnaires. Questionnaires for professionals and participants each consisted of five statements. Response options for each statement for the professionals' questionnaire consisted of a four-choice scale indicating level of agreement (*strongly agree, agree, disagree, strongly disagree*, and a *not sure* option). Response options on the
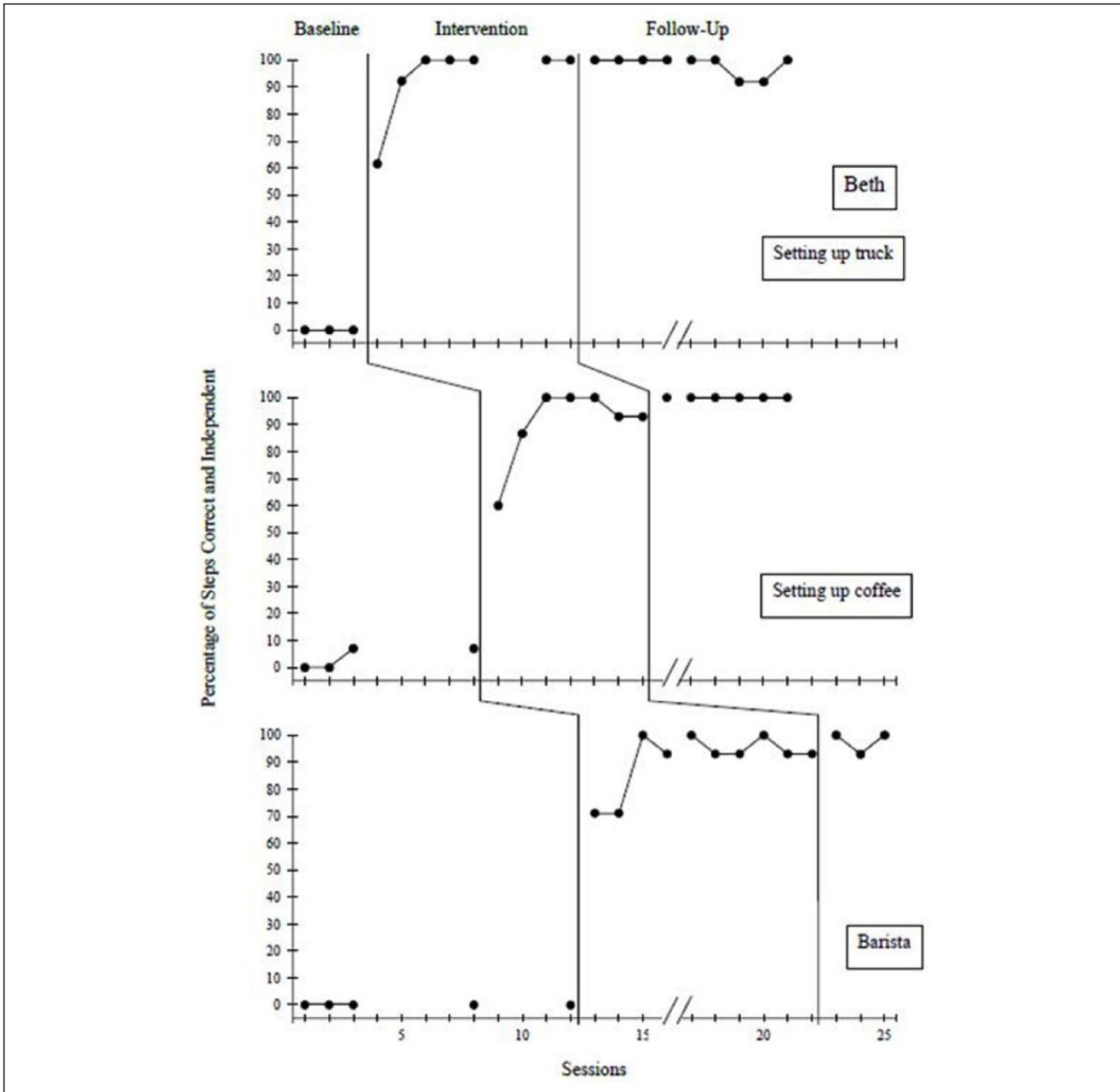
Figure 2. Beth: Percentage of independent correct steps on task analyses for three vocational tasks.

participants' questionnaire also consisted of a four-choice scale indicating level of agreement to given statements (*absolutely, kind of, not really, no way*, and a *not sure* option).

Results

Beth's Employment Skills

Beth's performance of the three employment skills is found in Figure 2. During baseline for all three skills, Beth completed zero steps correct during most of her baseline observations, but achieved 7% correct and independent twice on one of the tasks (setting up the coffee service). When the LBBI was introduced on her first task (setting up the food truck), Beth demonstrated 100% of the steps correctly and independently by her third session, and retained that level of performance over the subsequent intervention sessions. When the LBBI was applied to her second task (setting up the coffee service), Beth displayed similar results and achieved 100% of the steps after three sessions, missing one step (93%) during two sessions. For the third

task (filling a coffee order), Beth again achieved 100% by her third session, then varied between 93% and 100% during the following seven sessions. During the follow-up observations for each of the three tasks, Beth maintained high and stable responding after the LBBIs were removed. During seven of the nine follow-up observations for the first task, Beth performed 100% of steps correctly and independently, with two of the sessions performed at 93% accuracy. During the six follow-up observations on the second task, Beth demonstrated 100% accuracy. For her third task, two of three of Beth's follow-up sessions were performed at 100% accuracy, and one at 93%. This level of performance was maintained during two extended breaks during the follow-up conditions. Due to school calendar, there was a break of 50 calendar days during the follow-up conditions for Beth's first two training tasks. This resulted in a total of 91 calendar days between Beth's last intervention session and the final follow-up observation for the first task, and 82 calendar days for the second task.

Meg's Employment Skills

Meg's performance of the three employment skills is found in Figure 3. During baseline for all three skills, Meg completed zero steps correct during 11 of 12 of her baseline observations. When the LBBI was introduced on her first task (setting up the food truck), Meg demonstrated 100% of the steps correctly and independently during her second intervention session, and continued that level of performance during four of the next five sessions. When Meg received the LBBI with her second task (setting up the coffee service), she achieved 100% accuracy on her fourth intervention session, and her data remained between 93% and 100% over the next four intervention sessions. For the third task (filling a coffee order), Meg again achieved 100% during the second intervention session. Over the next eight intervention sessions, Meg's independent accuracy ranged between 86% and 100%. When Meg did not achieve 100% correct, she missed the steps of taking the receipt from the register and/or repeating the order aloud. Finally, when the LBBI was removed, Meg completed 10 follow-up sessions for the first task, all of which were completed with 100% independent accuracy. Meg completed six follow-up sessions with the second task; she performed five of these sessions at 100% accuracy and one session at 93%. All of the follow-up sessions for the third task were performed with 100% accuracy. Like Beth, Meg also had an extended break during the follow-up conditions due to breaks in the school calendar. There was a break of 75 calendar days during the follow-up conditions for Meg's first training task, resulting in a 92-calendar day break between Meg's last intervention session and the final follow-up observation for this task. There was also an 83-calendar day break between the last day of intervention and the first follow-up observation for Meg's second task.

Gwen's Employment Skills

Gwen's performance of her three employment skills is found in Figure 4. During baseline for all three skills, Gwen did not perform any of the skills correctly and independently. When the LBBI was introduced on her first task (setting up the food truck), Gwen achieved 100% of steps correct on her second intervention session and remained stable at 100% during all subsequent intervention sessions. When she received the LBBI with her second task (setting up the coffee service), Gwen demonstrated 80% independent accuracy during the first intervention session, then remained at 100% for the next four intervention sessions. For the third task (filling a coffee order), Gwen again achieved 93% during the first intervention session. Over the next four intervention sessions, Gwen demonstrated 100% independent accuracy. During the follow-up observations for each of the three tasks, Gwen maintained high and stable responding after the LBBIs were removed. During her eight follow-up observations with the first task, Gwen performed 100% of steps correctly and independently during seven observations. During her six follow-up observations with the second task, and her three follow-up observations for the third task, Gwen performed 100% of steps correctly and independently.

Performance Changes and Effect Size Differences Across Conditions

In addition to the visual inspection of the respective figures of the individual students, we summarized the performance changes within and across conditions for all students and experimental tasks. The changes across the conditions show the substantial improvements in performance following the use of the LBBI training manual. Finally, we calculated the PND as a post hoc analysis to establish the effect size of the peer-mediated LBBI on individual students. The effect size for all three skills, for each of the three students, was 100% between baseline and intervention conditions. Between baseline and follow-up for all skills and all students, PND was also 100%. These findings indicate that the LBBI was highly effective based on standards described by Scruggs and Mastropieri (2013).

Social Validity

The social validity assessment measured student and staff perceptions of the importance of teaching the employment skills to the students, the feasibility of using the LBBI as a job coaching strategy, and the students' ability to perform the employment skills. Each of the staff surveyed "strongly agreed" that (a) participants wanted to learn additional jobs on the food truck and (b) job skills the participants learned were important for employment.
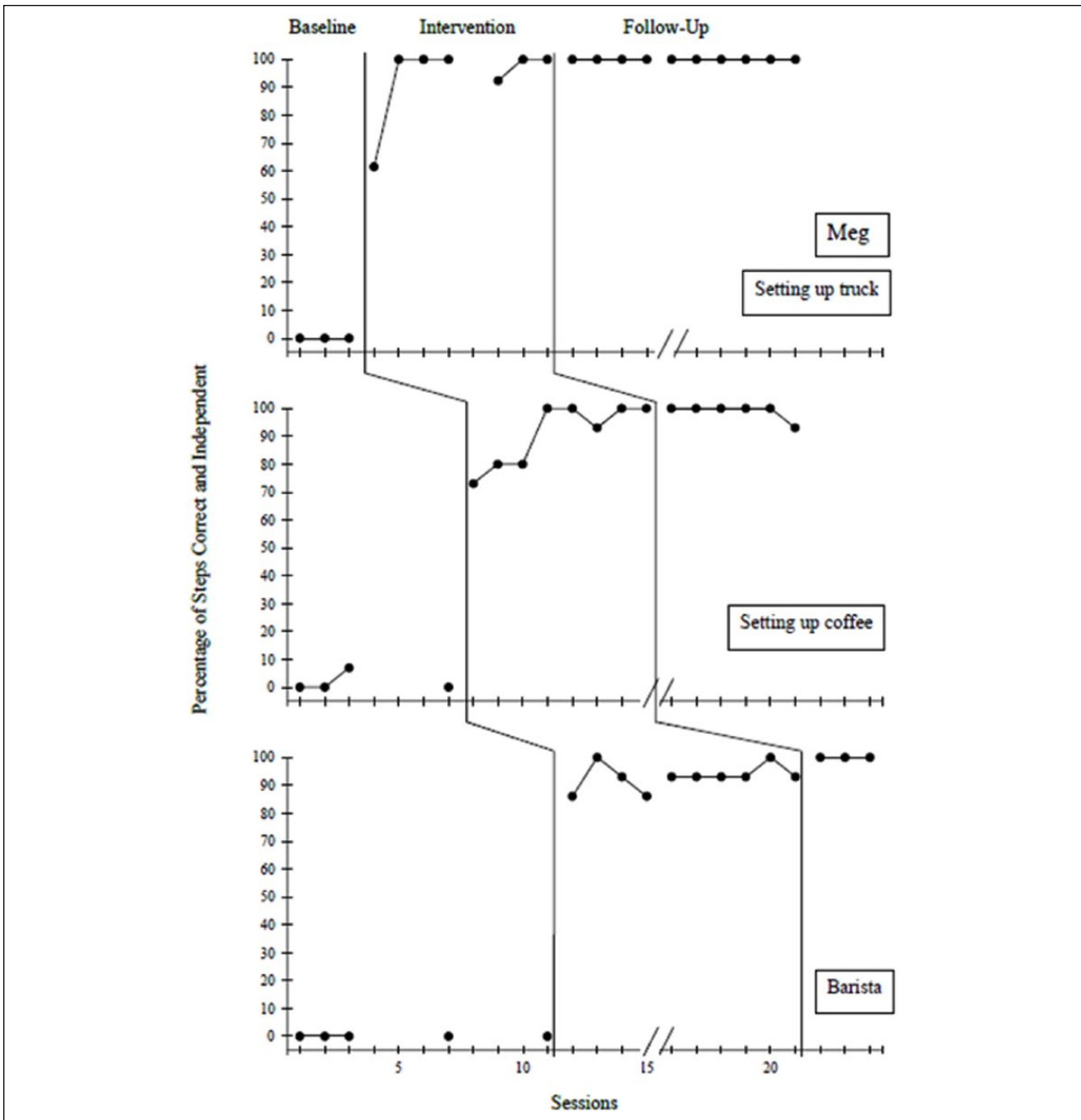
Figure 3. Meg: Percentage of independent correct steps on task analyses for three vocational tasks.

All staff who were surveyed also indicated that they "agreed" or "strongly agreed" that (a) students knew how to perform the targeted skills, (b) students were willing to work on the food truck coffee service, and (c) having a peer coworker teach the skills was acceptable. Students who participated in the study "agreed" or "strongly agreed" that they (a) knew how to complete the jobs necessary for coffee service on the food truck and (b) wanted to learn other jobs related to working on the food truck. All students "strongly agreed" that they (a) thought the job skills they learned were important for working on the food truck, (b) liked having a peer coworker teach the jobs on the food truck, and (c) were willing to work on the food truck with the coffee service.
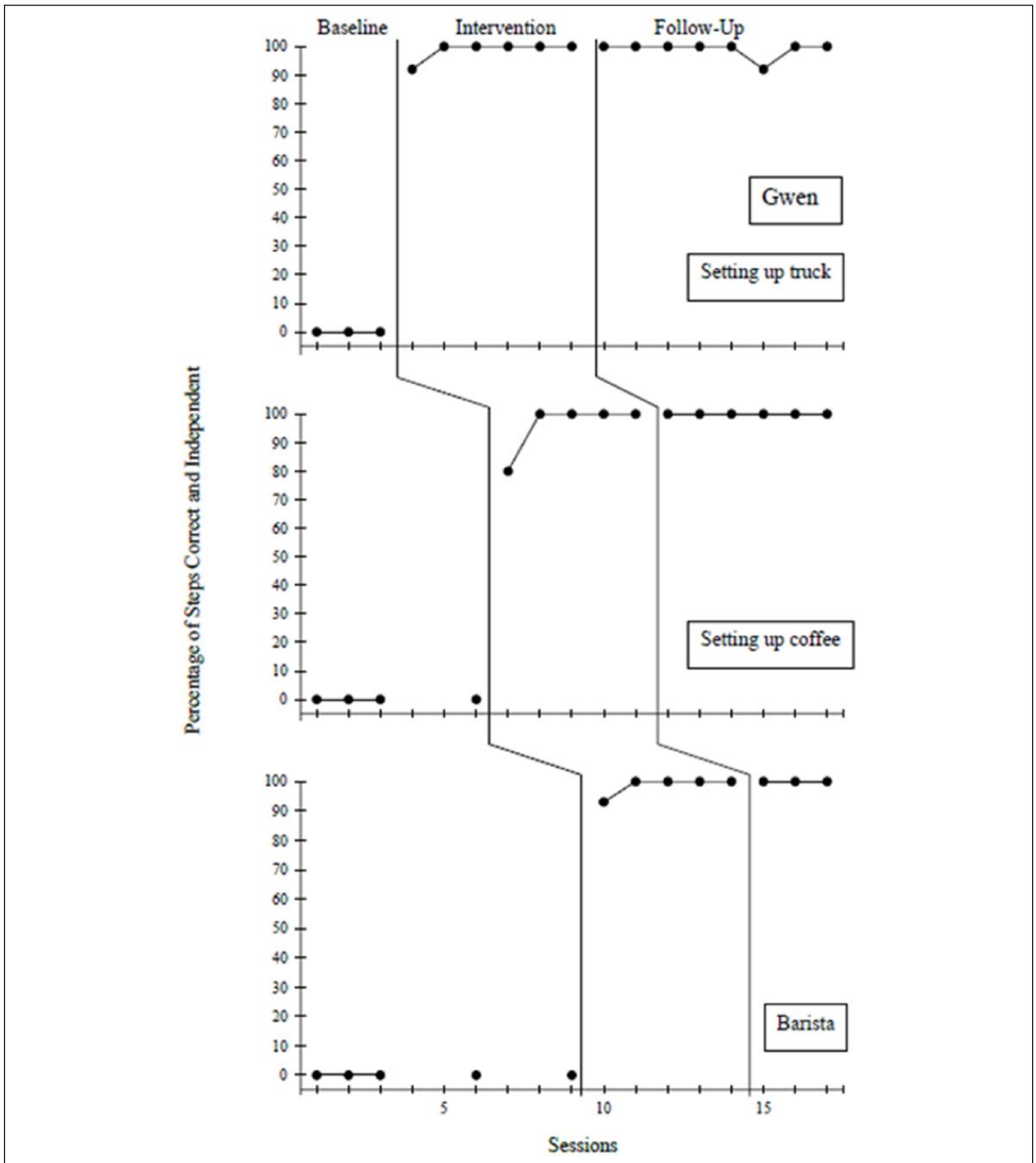
Figure 4. Gwen: Percentage of independent correct steps on task analyses for three vocational tasks.

Discussion

The purpose of this study was to determine the effects of a peer-mediated LBBI on acquisition of skills that comprise an employment routine by students with ASD and to determine whether skills would maintain after the intervention was removed. Each of the three students in this study rapidly acquired the skills to complete three tasks necessary to work on a food truck's morning coffee

service, and each maintained those skills after the coaching intervention was removed. Skill maintenance was especially notable for two of the participants (Beth and Meg) who experienced an extended break (50 and 75 days) during the follow-up condition due to the school calendar.

Each of the participants demonstrated 100% of the steps correct on all three employment tasks during most of intervention and follow-up sessions. When errors were made in intervention and follow-up, they were commonly on steps that were not critical to the completion of the task (e.g., closing the water tank lid, or throwing the used coffee pod in the trash). Other common errors included steps of taking the receipt from the register and reading the order out loud; in this training situation, these errors were quite minor and did not affect the function of the employment task as orders were typically the same each time (i.e., one coffee per customer). It is important to note that each participant reported they "absolutely" enjoyed having a peer coworker coach them to perform the jobs on the food truck. These positive reactions toward the method of instruction may have contributed to the rapid acquisition of the skills. Participants also reported that they "absolutely" were willing to work on the food truck coffee service as a regular job. This willingness to continue working on the food truck coffee service may indicate a level of confidence to independently perform the skills that were targeted.

In the empirical literature to date, story-based interventions typically have been delivered by professionals or parents (Brady et al., 2016a; Kokina & Kern, 2010; Test et al., 2011). Recently, however, there have been studies published where LBBIs have been successfully delivered by peers (Brady et al., 2016a, 2016b; Kearney et al., 2018). As the fourth example of peer-mediated LBBI instruction, this study extends the LBBI literature and advances it in a new direction of *employment-based* LBBI instruction delivered by existing coworkers. Including a peer coworker to present an LBBI and provide coaching within the training process may lessen the intensity of services typically provided by paid professionals; in turn, this provides a potential solution to the job coaching barriers identified frequently in the supported employment literature (Marshall et al., 2014; Wehman et al., 2014). In addition, this study addresses other challenges reported by Bennett and Dukes (2013) and Gilson et al. (2017) by focusing on skills necessary for employability conducted in natural settings with low-intensity coaching strategies. Thus, the intervention in this study not only provided participants with an opportunity to receive vocational training in a school-based microenterprise but also incorporated a strategy that could be used with other employment skills. The potential of having a peer coworker provide on-the-job coaching based on a training manual (the LBBI guide) opens the door to decreasing the intensity of instruction required by professionals. Peer coworkers are a source

of natural supports in the workplace (Test et al., 2009; Wehman et al., 2014); this source of coaching and support represents a typical employment training paradigm, and can reduce workplace social barriers that sometimes result from the presence of a separate job coach (Hendricks & Wehman, 2009).

Limitations

This study had several limitations that should be taken into consideration when interpreting the results. For example, the study did not explore whether skills acquired would generalize to other novel employment settings, or whether students would use their new skills in the presence of other people. The targeted tasks were specific to those performed in a school-based microenterprise, but it remains unknown as to whether the participants would demonstrate these skills in a more traditional café setting. The peer coworker who delivered the LBBI became a familiar face to the participants, was present during all sessions and conditions, and the participants responded favorably to coaching and prompts from that peer. The study did not examine whether the acquired skills would continue to be demonstrated in the absence of this coworker or in the presence of a different peer coworker. Another limitation to the study was the skills targeted were rote in nature; that is, the food truck skills were the same every time, with little to no variation. It is unknown whether the participants would adapt to changes in the routine or variations that are bound to occur when working in a fast-paced, food service environment.

An additional limitation of this study involves the lack of objective data to demonstrate the fidelity of the intervention. Although the investigators implemented a training protocol that included rehearsal and practice sessions determined to ensure accuracy of implementation in previous studies prior to the peer coworker implementing the LBBI (Brady, Hall, & Bielskus-Barone, 2016; Brady, Honsberger, et al., 2016), we did not collect any objective data indicating the extent to which the intervention was actually delivered as designed. We recognize the importance of an objective demonstration of procedural fidelity if LBBIs are to be accepted as an evidence-based job coaching intervention in future practice (Cook et al., 2015; Kratochwill et al., 2013).

Suggestions for Future Research

To further build upon the findings from this study, future research could examine the generalization effects of the LBBI training manual to other vocational environments and tasks, and with other coworkers, supervisors, and customers. Future research might also examine whether a peer coworker might be successful when delivering an LBBI with more complex job tasks that require discrimination of environmental stimuli and/or decision-making based on

varying employment conditions. Research has indicated that LBBIs delivered by professionals, parents, peers, and coworkers to be effective in increasing a variety of skills. As we strive to help individuals on the autism spectrum work and function independently, another consideration for future research could be to explore whether LBBIs might be used as a self-management tool when environmental conditions and demands are less predictable.

Implications for Practice

As individuals with developmental disabilities transition from school-based services, the need for effective interventions to teach, coach, and support these young adults in vocational environments becomes paramount (Hendricks & Wehman, 2009). The quicker professionals are able to fade supports and facilitate independent performance, the more likely it becomes for individuals to be successful within an employment setting. Identifying natural supports within these settings and incorporating existing supports into instructional and coaching contexts can decrease dependence on professionals and increase vocational independence.

Declaration of Conflicting Interests

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