The Use of the Performance Diagnostic Checklist-Human Services to Assess and Improve the Job Performance of Individuals with Intellectual Disabilities

Madison Smith¹ · David A. Wilder¹

Published online: 20 February 2018

© Association for Behavior Analysis International 2018

Abstract

The Performance Diagnostic Checklist-Human Services (PDC-HS) is an informant-based tool designed to identify the variables responsible for performance problems. To date, the PDC-HS has not been examined with individuals with intellectual disabilities. In the current study, two supervisors with intellectual disabilities completed the PDC-HS to assess the productivity of two supervisees with disabilities who performed a pricing task in a thrift store. The PDC-HS suggested that performance deficits were due to a lack of training; a PDC-HS-indicated intervention was effective to increase accurate pricing.

- The PDC-HS is an informant-based tool designed to identify the variables responsible for employee performance problems in human service settings.
- The PDC-HS can be completed by some individuals with intellectual disabilities in a supervisory position to identify the variables responsible for problematic job performance among their supervisees.
- A PDC-HS indicated intervention was demonstrated to be effective to improve the job performance of individuals with disabilities.
- The PDC-HS may be a useful tool to support performance improvement and job maintenance among individuals with intellectual disabilities.

Keywords Performance Analysis · Staff Management · Job Coaching

Three quarters of adults with intellectual disabilities are unemployed (Migliore, Mank, Grossi, & Rogan, 2007). Many of those who are employed work in non-integrated settings such as sheltered workshops, which typically require job activities such as assembling, packing, and piecemeal construction. Some view sheltered workshops as safe settings in which individuals with disabilities can learn the skills necessary to obtain competitive employment; however, many individuals who begin working in these settings remain for years or even decades (Migliore et al., 2007).

Although integrated employment, in which individuals with disabilities work alongside their non-disabled peers, is less common than employment at sheltered workshops, re-

search has suggested that it has advantages over workshops, including better financial outcomes and increased opportunities for personal growth (Mavranetzouli, Megnin-Viggars, Cheema, Howlin, Baron-Cohen & Pilling, 2014). Of course, many individuals with disabilities who work in integrated settings need supports, such as a job coach, to maintain employment. In addition to job coaches, tools which have been demonstrated to be effective to enhance employee performance may also be used to support the employment of individuals with disabilities in integrated settings.

The Performance Diagnostic Checklist-Human Services (PDC-HS) is an informant-based assessment tool designed to identify the variables responsible for poor performance. The tool was developed specifically for use in human service settings, such as schools, clinics, group homes, and employment settings for individuals with disabilities (Carr, Wilder, Majdalany, Mathisen, & Strain, 2013). The PDC-HS consists of 20 questions, 13 based on interview and 7 based on direct observation of the performance problem, and focuses on four domains of performance: training; task clarification and

✉ David A. Wilder
dawilder@fit.edu

¹ School of Behavior Analysis, Florida Institute of Technology, 150 West University Blvd, Melbourne, FL 32901, USA

prompting; resources, materials, and processes; and performance consequences, effort, and competition. An intervention based on PDC-HS results is then implemented. These interventions include skills' training or improved personnel selection for the training domain; clarifying tasks, prompting, and changing the location of tasks for the task clarification and prompting domain; adjusting staff or processes for the resources, materials and processes domain; and increasing supervisor presence, feedback, or reducing response effort for the performance consequences, effort, and competition domain.

To assess the utility of the PDC-HS, Carr et al. (2013) used it at a university-based autism treatment center, where 15 staff members were required to clean and arrange their treatment rooms at the end of each treatment session. Cleaning duties were broken down into tasks and organized into checklists that were placed in each designated therapy room. Staff members were required to initial each cleaning task after they completed it, and the percentage of tasks correctly completed on the treatment room cleaning checklist at the end of each day was the primary dependent variable. Following baseline data collection for the cleaning checklists, the PDC-HS was administered individually to three supervisors who had identified problems with treatment room cleanliness. The results suggested that training and performance consequences were deficient; treatment for this included training and posted, graphed feedback. In order to demonstrate that the intervention derived from the PDC-HS was more effective than an arbitrarily selected intervention, Carr et al. also introduced task clarification and increased availability of materials for two other rooms at the center. This non-indicated intervention did not produce an appreciable improvement in cleaning task completion, but the indicated intervention (training and feedback) improved completion of cleaning tasks to 80%. These data suggest that the PDC-HS identified an effective intervention, and that, without it, a less effective intervention might have been used.

More recently, Ditzian, Wilder, King, and Tanz (2015) utilized the PDC-HS with three supervisors and four staff members at a treatment center for children with autism. They targeted the problem of staff in the facility improperly securing therapy room doors, which was a safety concern. After collecting baseline data on door closing, Ditzian et al. administered the PDC-HS, which indicated that there were problems with a lack of consequences for employee performance. Based on these outcomes, an intervention that utilized graphed feedback at the beginning of each session was implemented and performance improved. Ditzian et al. also compared the effects of a non-indicated intervention for this problem

with two employees. This non-indicated intervention, consisting of a written prompt, was ineffective.

Although the PDC-HS has been used with a variety of staff members without disabilities, it has never been evaluated with employees who have an intellectual disability. Thus, the purpose of the current study was to examine the utility of the PDC-HS with adults with disabilities in an integrated employment setting to assess performance problems exhibited by their peers. In this study, PDC-HS respondents, who had an intellectual disability, supervised staff members who also had a disability. The supervisees exhibited a performance deficit.

Method

Setting and Participants

The study was conducted at a privately owned and operated thrift store, at which individuals with disabilities were employed. The store also employed individuals without disabilities. Nine employees and 30 volunteers worked across various sections of the store including the furniture department, the clothing department, and the café. We conducted all sessions in the laundry room of the thrift store. We recruited participants based on their interest in gaining further on-the-job support. Four employees with disabilities and one manager without a disability participated. The participants with disabilities included four men: Bruce, Michael, Sam, and Taylor, whose ages ranged from 26 to 45. All were diagnosed with a pervasive developmental disorder, but had good language skills; they communicated in fluid, multiple word sentences while remaining on topic. Michael and Taylor could read. Each participant had received a specialized high school diploma or equivalent certificate before seeking further job training at the thrift store.

In their positions at the thrift store, Michael and Taylor were supervisors and Bruce and Sam were supervisees. Thus, for the current study, dyad 1 consisted of Michael acting as the supervisor for Bruce. Dyad 2 consisted of Taylor acting as the supervisor for Sam. The supervisors were responsible for observing behavior, completing the PDC-HS, and implementing the intervention. The supervisees, Bruce and Sam, exhibited a performance deficit prior to the start of the study. These roles were held constant throughout the investigation. Michael and Taylor had been paid employees of the thrift store for 1 to 2 years. Bruce and Sam had been employed at the store for approximately 6 months.

Ruth, a store manager who had no intellectual disability, also participated. Ruth helped to identify participants and assisted in data collection. She also completed a PDC-HS questionnaire for Bruce and Sam.

Dependent Variable

At the time they were initially hired, Bruce and Sam had received training on how to price clothing, however both made repeated mistakes and their work did not meet the criterion necessary to place the items they priced on the sales floor. Thus, the dependent variable was the accuracy of price tag completion. Price tags were required to have 5 pieces of information written on them, some of which must have been written twice, once above and once below the tag's perforation, for receipt purposes. In order for an item of clothing to be considered accurately priced, 8 separate spaces on the price tag had to be completed. This included the following information above the perforation: (1) employee initials, (2) the date, (3) the gender of the item (men, women), (4) the size of the item, and (5) the price. Information that was to be written below the perforation included the gender, the size, and the price of the item. If at least one space was completed incorrectly, the item was considered to be inaccurately priced. The dependent variable was measured in this manner across both the baseline and intervention conditions.

Data Collection and Interobserver Agreement

We created checklists describing target behaviors for the task. The checklist included 8 specific steps (i.e., each piece of information described above that the supervisee was required to write on the price tag for each garment). The specific dependent variable was the percentage of price tags correctly and independently completed by each participant. Each session consisted of 10 opportunities (i.e., ten items of clothing). Trained observers collected data during or directly following the completion of each task by recording the accuracy of task completion using the checklist created for the task. For each session, the number of correct opportunities was divided by the total number of opportunities (10). This number was then converted to a percentage.

To assess interobserver agreement (IOA), a second independent observer, trained on the data collection procedures, directly observed participant performance. We compared data from two observers on a trial-by-trial basis by dividing the number of trials in which both observers agreed by the total number of trials (10), and converting to a percentage. For Bruce (dyad 1), IOA data were collected for 30% of sessions and mean agreement was 98%. For Sam (dyad 2), IOA data were collected for 41% of sessions; mean agreement was 100%.

Procedure

Baseline After performance problems were identified, we collected baseline data separately for each participant. Baseline sessions were conducted by prompting each participant to

price 10 items of clothing at a time. All materials necessary to price items was available and no feedback on performance was provided.

PDC-HS After baseline data were collected, the supervisor of each dyad, Michael and Taylor, completed the PDC-HS. Each supervisor read and answered PDC-HS questions and conducted direct observations of his supervisee's performance and the resulting permanent products (i.e., priced items). The experimenter was present as the supervisors completed the PDC-HS, but did not assist, except to clarify questions. The supervisor did not modify the PDC-HS when he presented it to his supervisee.

The store manager, Ruth, who was familiar with Bruce and Sam's performance, also completed the PDC-HS for each participant at the conclusion of each baseline phase. By having an acting supervisor and a store manager complete the PDC-HS for the same employee, we were able to assess the validity of the supervisor's assessment outcomes by comparing them with the manager's responses.

Intervention Based on PDC-HS results, we designed an intervention specific to the problematic domain for each dyad. For both dyads, the PDC-HS results indicated that participants were in need of additional training on item pricing. We designed a price training intervention that included three steps (i.e., inform, model, and deliver performance-based feedback) for the supervisors to deliver to their supervisees. We then taught the supervisors how to deliver the training and collected treatment integrity data on the supervisor's implementation of the training. The training consisted of step-by-step instructions and included the 8 pieces of information to be written on each price tag (described above). During modeling, the supervisor delivered the training to a confederate while the supervisee observed. Supervisors were required to ensure that supervisees attained a mastery criterion of at least 80% correct responding across two consecutive 10-trial sessions. Both supervisees met this criterion within 10 sessions. Once supervisees met this criterion, no additional feedback was provided to them. After the supervisors trained each employee, they began intervention sessions to evaluate the effectiveness of the training to improve item pricing. Post-training intervention sessions were identical to baseline sessions. That is, no feedback was provided by the supervisor to the supervisee during these sessions. We used a concurrent multiple baseline design across participants to evaluate the effectiveness of the PDC-HS indicated intervention.

Treatment Integrity

We collected data on the accuracy of steps completed by the supervisor when delivering the training to the supervisee as a measure of treatment integrity. Specifically, we collected data

Fig. 1 Results of the PDC-HS for Ruth (store manager; upper panel) and Michael (supervisor in dyad 1; upper middle panel) who completed the PDC-HS to assess the performance of Bruce (dyad 1). Results of the

PDC-HS for Ruth (store manager; lower middle panel) and Taylor (supervisor in dyad 2; lower panel) who completed the PDC-HS to assess the performance of Sam (dyad 2)

on the extent to which Michael and Taylor informed, modeled, and provided performance-based feedback when training each of the 8 pieces of information described above. Michael implemented the training for Bruce with 92% integrity. Taylor implemented the training for Sam with 100% integrity.

Results and Discussion

Figure 1 depicts results of the PDC-HS for the dyads as completed by the store manager (upper panels) and the supervisor (lower panels). For both dyads, the PDC-HS indicated that a lack of training on how to accurately price items was the main variable that was contributing to low levels of performance for both supervisees within the dyads. For dyad 1, all of Ruth's (the store manager) responses to the *training* questions suggested a problem. Seventy-five percent of Michael's (the supervisor) questions in the *training* domain suggested a problem. For Ruth, 20% of the questions in the *consequences, effort, and competition* domain suggested a problem, and for Michael, 40% of questions suggested a problem. For the

domains *task clarification and prompting* and *resources, materials, and processes*, Ruth's and Michael's responses indicated that 16 and 0% of questions, respectively, suggested a problem.

For dyad 2, Ruth's responses indicated that 75% of questions in the *training* domain indicated a problem. Taylor's (supervisor) responses indicated that 100% of questions in the *training* domain suggested a problem. For Ruth and Taylor, 40% of the questions in the *task clarification and prompting* domain suggested a problem and 16% of questions in the *resources, materials, and processes* domain suggested a problem. For the *consequences, effort, and competition* domain, 60 and 20% of questions indicated a problem, as suggested by Ruth and Taylor, respectively. Although the *consequences, effort, and competition* domain was somewhat elevated for both dyads, we selected a single component intervention that addressed only the most elevated domain (training) to enhance the supervisors' ease of intervention implementation.

Figure 2 depicts results of the treatment evaluation. Bruce (dyad 1) did not correctly price any items during baseline.

Fig. 2 The percentage of items correctly priced during baseline and intervention phases for Bruce (the supervisee in dyad 1) and Sam (the supervisee in dyad 2)

During the intervention phase (i.e., following training), Bruce's performance ranged from 80 to 100% accuracy when pricing clothing items. Bruce's mean percentage of items priced correctly was 90%. Sam (dyad 2) also priced no items correctly during baseline. Following training, Sam's pricing accuracy increased to 100% during the first session and maintained at that level for the remainder of sessions.

The results of this study suggest that the PDC-HS can be used to support the job performance of individuals with intellectual disabilities in an integrated work setting. Not only did the PDC-HS indicated intervention improve employee performance, but the employee's supervisors, each of whom also had an intellectual disability, produced PDC-HS outcomes which very closely matched the outcomes identified by the store manager, who did not have an intellectual disability. Thus, supervisors with disabilities successfully assessed and improved the performance of their supervisees without the need for additional personnel, such as a job coach, to work directly with the supervisee.

In a brief, post-experimental assessment of social validity, Micheal and Taylor, the acting supervisors from dyads 1 and 2, reported increased confidence in directing employees. They also commented that the training intervention was easy to deliver. When asked if they would use the PDC-HS for future performance problems, both supervisors indicated that they would. Bruce and Sam, the supervisees, reported that they were satisfied with the training.

One limitation of this study is that only one PDC-HS derived intervention (i.e., training) was evaluated.

Although this is appropriate because only one domain was identified as problematic, it is possible that other interventions would have been more difficult for supervisors with disabilities to implement. For example, supervisors may have had more difficulty prompting employees or providing regular feedback on performance. Future research should examine the extent to which supervisors with disabilities can accurately implement a variety of interventions to improve performance. Future research might examine specialized training or prompts to enhance the integrity of supervisor delivered interventions.

Another limitation involves the way in which the dependent variable was measured. In order for an item of clothing to be considered accurately priced, 8 separate spaces on the price tag had to be completed. In a few sessions, participants completed some, but not all of the spaces. In these sessions, the item was scored as inaccurately priced. Although data collection was identical during the intervention phase, this may have artificially deflated participant accuracy of pricing. However, we collected data in this manner because the thrift store required an item's price tag to be completely accurate before the item was placed on the floor. Thus, this is the standard by which we chose to evaluate intervention effects.

These data, along with recent data by Lerman, Hawkins, Hillman, Shireman, and Nissen (2015) and Lerman, Hawkins, Hoffman, and Caccavale (2013) suggest that individuals with disabilities can be taught to manage and supervise their peer's work performance.

Future research should examine other methods of supporting individuals with disabilities in integrated employment settings. Job coaches, although helpful, are expensive. Tools and procedures which can enhance performance may have the potential to increase employee success at a lower cost.

Future research should examine modifications to the PDC-HS to make it more user-friendly for people with disabilities. For example, the wording of some PDC-HS questions might be simplified to enable more individuals to answer independently. An abridged list of suggested interventions, without journal citations, might also be provided. Future research should also focus on internet-based methods of increasing the employability of individuals with disabilities. Internet-based training and feedback systems could be used to efficiently prepare groups of individuals for some types of employment (e.g., in the fast food industry).

Compliance with Ethical Standards

Research described in this article was not funded. This study was approved by an Institutional Review Board and informed consent was obtained from all participants.

Conflict of Interest The authors declare that they have no conflict of interest.

References

- Carr, J. E., Wilder, D. A., Majdalany, L., Mathisen, D., & Strain, L. A. (2013). An assessment based solution to a human service employee problem: An initial evaluation of the Performance Diagnostic Checklist-Human Services. *Behavior Analysis in Practice*, 6(1), 16–32. <https://doi.org/10.1037/t32807-000>.
- Ditzian, K., Wilder, D. A., King, A., & Tanz, J. (2015). An evaluation of the Performance Diagnostic Checklist-Human Services to assess an employee performance problem in a center-based autism treatment facility. *Journal of Applied Behavior Analysis*, 24(1), 199–203. <https://doi.org/10.1002/jaba.171>.
- Lerman, D. C., Hawkins, L., Hillman, C., Shireman, M., & Nissen, M. A. (2015). Adults with autism spectrum disorder as behavior technicians for young children with autism: outcomes of a behavioral skills training program. *Journal of Applied Behavior Analysis*, 48(2), 233–256. <https://doi.org/10.1002/jaba.196>.
- Lerman, D. C., Hawkins, L., Hoffman, R., & Caccavale, M. (2013). Training adults with an autism spectrum disorder to conduct discrete trial training for young children with autism: a pilot study. *Journal of Applied Behavior Analysis*, 46, 465–478. <https://doi.org/10.1002/jaba.50>.
- Mavranetzouli, I., Megnin-Viggars, O., Cheema, N., Howlin, P., Baron-Cohen, S., & Pilling, S. (2014). The cost-effectiveness of supported employment for adults with autism in the United Kingdom. *Autism*, 8(8), 975–984. <https://doi.org/10.1177/1362361313505720>.
- Migliore, A., Mank, D., Grossi, T., & Rogan, P. (2007). Integrated employment or sheltered workshops: preferences of adults with intellectual disabilities, their families, and staff. *Journal of Vocational Rehabilitation*, 26, 5–19. <https://doi.org/10.1352/1934-9556-49.4.248>.