☑ CE Article

Using the System of Least Prompts to Teach Personal Hygiene Skills to a High School Student with Comorbid Visual Impairment and Autism Spectrum Disorder

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Structured abstract: *Introduction:* This study evaluated the effectiveness of a workshop and follow-up coaching sessions on the implementation of the system of least prompts procedure by classroom team members and explored whether this intervention resulted in personal hygiene skill acquisition by a male high school student with comorbid visual impairment and autism spectrum disorder. *Methods:* Implementation fidelity data were analyzed descriptively through visual analysis. A multiple baseline design across behaviors was utilized to evaluate the effectiveness of the system of least prompts procedure on student skill acquisition. *Results:* Implementation fidelity was high and increased over the course of the study: paraeducator 1: 93.9% (range, 70 to 100%); paraeducator 2: 78.2% (range, 11 to 90%); and special education teacher: 94.1% (range, 35 to 100%). In addition, the student's independent performance improved from baseline to intervention across each targeted skill, with Tau-*U* scores as follows: cleaning the augmentative and alternative communication device: 0.78; washing hands: 0.76; and brushing teeth: 0.92. Classroom team members found both the training procedures and the system of least prompts intervention to be of value and effective. *Discussion:* During intervention, classroom team members implemented the system of least prompts with fidelity and the student mastered each skill. These results are promising and add to the significantly limited literature on instructional interventions for students with comorbid visual impairment and autism spectrum disorder. *Implications for practitioners:* Classroom team members can effectively be taught to use the system of least prompts with students with comorbid visual impairment and autism spectrum disorder. Furthermore, the intervention might be used to increase independent functioning for students with these comorbid conditions.

Researchers have suggested that the prevalence of autism spectrum disorder in individuals with visual impairment may be higher (11.6%; Lund & Troha, 2008) than in the general population (0.6%; Centers for Disease Control and Prevention [CDC], 2012). However, the exact prevalence rate is difficult to determine

(Mukkaddes, Kilincaslan, Kucucyazici, Sevketoglu, & Tuncer, 2007). A strong foundation of both evidence-based practices and pre- and in-service training opportunities relevant to supporting individuals with autism spectrum disorder exists (National Professional Development Center on Autism Spectrum Disorder [NPDC], 2014). However, far less research has been conducted to explore instructional practices and effective training methods of those working with learners with comorbid diagnoses of visual impairment and autism spectrum disorders.

A few literature reviews have been conducted to identify effective interventions for individuals with autism spectrum disorder and sensory impairments (Banda, Griffin-Shirley, Okungu, Ogot, & Meeks, 2014), communication development of children with visual impairments (Parker & Ivy, 2014), and literacy of students with visual impairments and additional disabilities (Parker & Pogrund, 2009). Not surprisingly, many of the identified interventions among these reviews incorporated components of evidence-based practices from the field of autism spectrum disorder (for example, prompting or reinforcement; NPDC, 2014). Ivy and Hatton (2014) conducted a systematic review of 22 single-case intervention studies to determine if prompting procedures could be identified as an evidence-based practice for individuals with visual impairments. The system of least prompts was the most frequently used procedure among studies, though none of the literature targeted daily living skills instruction. Although only 12 studies met the quality indicators for single-case research set forth by Horner and colleagues (2005), the results of the review support prompting as an evidence-based practice that is effective when teaching new skills to individuals with visual impairments. These studies provide promising results. However, additional intervention research is necessary to identify instructional practices that can be used to develop strong educational programs encompassing a wide range of skills relevant for learners with comorbid visual impairment and autism spectrum disorder (for example, life skills, academic skills, and embedded skills such as communication) across a broad spectrum of age groups.

Gense and Gense (2011) suggest that the best way to develop a learning environment that meets the unique needs for support of individuals with comorbid visual impairment and autism spectrum disorder is to address:

1. sensory and biological needs;
2. appropriate reinforcement;
3. opportunities to communicate and functional communication systems;
4. concrete supports to assist with participation and understanding;
5. task demands;
6. systematic, thoughtful instruction;
7. data-driven decision making; and
8. appropriate-level instruction (p. 331).

Although this framework establishes an overall approach for delivering instruction,

specific interventions and evidence-based practices have not been thoroughly researched for the population of students with this dual diagnosis. Gense and Gense (2011) argue that, to efficaciously address the needs of students with comorbid visual impairment and autism spectrum disorder, the program of instruction must be wide-ranging and deliberately designed, and must integrate an expanded core curriculum (for example, communication, play and social, adaptive, organizational, orientation and mobility, or career and life education skills). Moreover, Li (2009) emphasized the importance of both combining and adapting interventions developed for students with comorbid autism spectrum disorder and visual impairment in order to meet the specific needs for support of this population. Li suggests that an education program developed for these students should include strategies that target daily living skills (for example, personal hygiene and money management) in addition to a number of other important skill areas (for example, communication, orientation and mobility, social, engagement in appropriate tasks, and visual efficiency). Li also advocated for strategies based on applied behavior analysis, since much of the literature on evidence-based practices for learners with autism spectrum disorder is characterized by such practices (NPDC, 2014). Systematic instruction is an approach that is derived from the principles of applied behavior analysis and relies on methodical prompting, reinforcement, and fading procedures. Different prompting procedures much like those reviewed by Ivy and Hatton (2014), including the system of least prompts, may be viable instructional practices for learners with comorbid visual impairment and autism spectrum disorder, given the well-established research base documenting the efficacy and social validity of such practices across a wide range of skills and learner-support needs (Browder, Wood, Thompson, & Ribuffo, 2014; Spooner, Knight, Browder, & Smith, 2012).

Another consideration when planning instruction for these learners is the extent to which support providers are equipped to deliver instruction and other related services to this population. The reliance on paraeducators to support students with autism spectrum disorder has continued to increase but, unfortunately, these paraeducators often have not received adequate training to do so, thus placing the educational responsibility for students who often have the most intense needs for support in the hands of the least prepared individuals (Rispoli, Neely, Lang, & Ganz, 2011). Researchers have identified various effective paraeducator training strategies but have yet to explore paraeducator-implemented interventions among learners with visual impairments and autism spectrum disorder (Brock & Carter, 2013; Walker & Smith, 2015). This area clearly requires more investigation, given the unique needs for support of this population and the important role of paraeducators in the provision of instruction and related services under the supervision of teachers and other professionals.

The purpose of the current study was to train classroom team members to implement an intervention based on evidence-based practices from the field of autism spectrum disorder that was based on evidence-based practices to teach a student with a comorbid diagnosis of visual impairment and autism spectrum disorder

personal hygiene skills, which are an integral part of daily living skills. Although education personnel had attempted to teach these skills for many years to the participant, none of the interventions had relied upon systematic instruction and the student never achieved independent functioning. The following research questions were addressed:

1. Are classroom team members able to implement the system of least prompts procedure with high levels of fidelity after participating in a workshop and follow-up coaching sessions?
2. Does implementation of the system of least prompts result in an improvement in the acquisition of personal hygiene skills for a student with comorbid visual impairment and autism spectrum disorder?
3. Are the training procedures (workshop and follow-up coaching) and the system of least prompts procedure considered socially valid?

Methods

Setting and participants

The system of least prompts intervention was implemented across three settings in a public high school in the Midwest of the United States. The student participant received instruction in a special education program focused on the development of life skills to promote effective transition from school to the community. The first set of tasks or routine, cleaning the student's augmentative and alternative communication device, took place in a self-contained special education classroom in which the student regularly utilized such a device to communicate with peers and classroom team members and to engage in instructional activities. The classroom was composed of six students, ages 14 to 21 years, with a variety of disabilities (intellectual disability, autism, and physical disabilities). A special education teacher, peers with disabilities, and paraeducators were present during the first routine. The second and third routines, brushing teeth and washing hands, took place in bathrooms that were not accessible to the general school population. Typically, adults other than classroom team members were not present in the bathroom settings. All training workshops occurred in the classroom when students were not present and coaching sessions were delivered either in the bathroom or in the classroom where the student naturally performed the targeted skill. Prior to the study, informed consent was obtained from all classroom team members and the student's parent; the student also gave assent.

Classroom team participants

Two paraeducators and one special education teacher participated in training sessions and implemented intervention throughout the duration of the study. The team members were selected to participate in the study because of their daily involvement with the student participant. All three team members were familiar with the concept of prompting but had reported no formal training in the system of least prompts procedure prior to the study. As such, participants indicated that the system of least prompts was not used prior to the onset of the study. Paraeducator 1 was a 26-year-old Caucasian female with a bachelor's degree in special education. She had not completed the course work necessary to obtain her teaching license in the state in which she

resided, but had four years of experience as a special education teacher in a different state. At the time of the study, she had four years of experience as a paraeducator. Paraeducator 2 was a 60-year-old Caucasian female with a bachelor's degree in special education. She had worked as a special education teacher and elementary general education teacher before working as a paraeducator for two years. The special education teacher was a 44-year-old Caucasian female who had a bachelor's degree in special education and a master's degree in teaching and leadership. At the time of the study, she had 22 years of experience as a special education teacher, 11 of which were spent working with students with severe disabilities.

Student participant

Garrett (a pseudonym) was a 17-year-old boy with a diagnosis of visual impairment, autism spectrum disorder, and intellectual disability. He was selected as a participant based on the following inclusion criteria: documented diagnosis of visual impairment and autism spectrum disorder, targeted skills aligned with the student's Individualized Education Program (IEP), and an average daily school attendance of 90%. At the time of the study, Garrett wore glasses throughout the duration of the school day due to his visual impairment (cortical visual impairment, astigmatism corrected by his prescribed glasses, amblyopia, and hyperopia); no exact acuity or field restrictions were reported due to an inability to obtain an accurate assessment.

Overall, his functional vision negatively affected his access to the curriculum, and he required modifications to interact with curricular materials (reduced visual clutter and complexity, increased visual response time, illumination, and consistent routines to provide consistency for fluctuating vision) and received an annual consultation with a teacher of visually impaired students. Due to the nature of Garrett's disabilities, he required specialized instruction with frequent and intense levels of support to participate in academic and life skills instruction (for example, frequent repetition, ongoing supervision, and slower pacing of educational content). During academic instruction, Garrett often engaged in challenging behavior (for example, hitting, biting himself, screaming, and spitting) when directed to engage in a task. At the time of the study, Garrett utilized a DynaVox speech-generation device and picture communication symbols to communicate at a multiword level (non-rote combination of two or more words or symbols).

Dependent measures

To determine the effectiveness of the workshop and training sessions, an implementation fidelity checklist was used to measure the accuracy with which team members applied the intervention strategies across all intervention sessions. This list included the following components that were specific to the system of least prompts procedure: delivered task direction; provided student with a three-second response interval to perform steps in the task analysis; provided reinforcement if the student performed the step correctly within the response interval; and provided the next prompt in the hierarchy if the student did not perform the step correctly within the response interval.

Table 1
Task analyses.

Skill		
Cleaning AAC device	Washing hands	Brushing teeth
1. Remove one wipe from container	1. Pump soap onto one hand	1. Retrieve storage box
2. Place wipe on AAC device	2. Rub front of hands together	2. Pick up toothpaste
3. Wipe "face" of AAC device, touching all 4 corners (cleaning 80% or more of the screen)	3. Rub back of hands together	3. Open toothpaste
	4. Turn on water	4. Pick up toothbrush
	5. Place both hands under water	5. Squeeze toothpaste on brush
4. Carry wipe to trash can	6. Turn off water	6. Close toothpaste
5. Drop wipe in trash can	7. Retrieve paper towel(s)	7. Put toothpaste in storage box
	8. Dry both hands	8. Turn on water
	9. Throw paper towel(s) into trash can	9. Put brush under water
		10. Turn water off
		11. Bring toothbrush to mouth
		12. Brush top left back teeth
		13. Brush bottom left back teeth
		14. Brush front top teeth
		15. Brush front bottom teeth
		16. Brush back top right teeth
		17. Brush back bottom right teeth
		18. Put toothbrush in storage box
		19. Put storage box away

To evaluate the effectiveness of the system of least prompts intervention, Garrett's completion of each skill was recorded across all sessions. Prior to the study, the first author, in collaboration with Garrett's special education teacher, created a task analysis for each skill in order to permit direct observation and accurate calculation of skill completion. Table 1 contains the task analysis for each targeted skill: cleaning the augmentative and alternative communication device, washing hands, and brushing teeth. During baseline and intervention probe sessions, independent completion of the skill (without prompting) was measured, whereas during the intervention sessions both independent and prompted skill completions were measured. In addition, the outcome of skill completion was measured across all sessions (Iwata & Becksfort, 1981). *Quality outcomes* were defined as follows: cleaning the augmentative and alternative communication device—lack of visible dirt, food, or substances and the scent of soap; washing hands—lack of visible dirt, food, or substances and the scent of soap; and brushing teeth—lack of visible food particles and the scent of toothpaste. The purpose of this supplementary measure of skill completion was to ensure that accurate completion of the skill (that is, performing steps in the task analysis accurately) ultimately produced the intended and desirable outcome.

Data collection and interobserver agreement

The primary observer, a doctoral student in special education and the first author of the current study, observed in person or viewed video recordings of classroom team members and the student during targeted routines two to four times a week. When the primary observer was unable to conduct live observations, the special education teacher used an iPad to record intervention implementation. The individual

recording the session held the iPad to permit close-up recording. Observation sessions never exceeded 30 minutes.

It should be noted that team members were not exposed to the system of least prompts intervention prior to the workshop and coaching sessions and, therefore, implementation fidelity was not measured during baseline. During intervention, the classroom team members provided Garrett with one opportunity to perform the targeted skill during naturally occurring routines. The primary observer recorded whether the team member correctly implemented the intervention by indicating "yes," "no," or "no opportunity" for each intervention component across each step in the task analysis except for delivery of the task direction. Implementation fidelity was calculated as the overall percentage of intervention components implemented correctly during a given session. When implementation fidelity fell below 80% accuracy, the researcher provided additional coaching. Coaching occurred six times over the course of the study, with most sessions ($n = 3$) conducted with paraeducator 2 in response to her lack of provision of reinforcement. Paraeducator 1 and the special education teacher received one and two coaching sessions, respectively. A trained secondary observer, a graduate student in communication disorders, conducted interobserver agreement observations by measuring the extent to which the system of least prompts procedures were applied across 23% of intervention sessions. Overall implementation fidelity agreement was high (96%).

To measure improvements in Garrett's skill completion, the primary observer recorded the accuracy with which he completed each skill and the quality of the outcomes across all baseline and intervention sessions. Accuracy data were converted into a percentage by dividing the total number of independently completed steps by the total number of steps in the analysis. During system of least prompts intervention sessions, the level of prompting necessary to elicit the correct student response was recorded to monitor the effectiveness of the response prompts included in the prompt hierarchy. The secondary observer independently evaluated skill completion across 23% of baseline and intervention sessions using procedures similar to those outlined earlier. Interobserver agreement for student skill completion was 100%.

Design

This study was approved by the Institutional Review Board at Illinois State University. To evaluate the effects of the workshop and coaching sessions on the implementation of the system of least prompts intervention by classroom team members, a descriptive analysis of implementation fidelity data during intervention was conducted. Participants did not implement the intervention during baseline, and thus the design of this study permitted measurement adherence during intervention only (treatment fidelity; Ledford & Wolery, 2013). As such, a functional relation between the training procedures and implementation fidelity could not be established.

A multiple baseline across three behaviors (targeted skills; Gast & Ledford, 2014) design was used to measure the effectiveness of the system of least prompts intervention on the acquisition of skills by the student. Baseline data were collected simultaneously for all skills

until a relatively stable trend (for example, low variability in which approximately 80% of data points fell within a 20% range of the median level; Gast & Ledford, 2014) was established. In a staggered fashion, classroom team members participated in a workshop and subsequently implemented the intervention to address each targeted skill. Visual examination of graphed data was used to determine the effects of the intervention for all skills and included an analysis of changes in independent response across baseline phases, changes in level across phases, changes in trend, and latency of change (Gast & Ledford, 2014). To supplement visual analysis, effect sizes were calculated across each routine using Tau-*U*, an effect-size metric appropriate for single-case research (Parker, Vannest, Davis, & Sauber, 2011).

Conditions

Over the course of the study, classroom team members participated in a workshop training session and subsequently implemented the system of least prompts intervention to teach Garrett three personal hygiene skills, while receiving periodic follow-up coaching as needed.

Baseline

Prior to introducing the intervention, classroom team members conducted baseline sessions across the three targeted routines. Each team member delivered a task direction but did not provide instruction to elicit a correct student response. The classroom team was aware that baseline data were being collected for the purposes of a research study focused on prompting, but specific details about the project were unknown to them. Baseline data were collected across a minimum of four sessions until stable and predictable levels of student behavior were observed.

Workshop

Prior to the system of least prompts intervention and after baseline data collection, each classroom team member individually participated in a brief workshop session during which participants received one-on-one training from the first author. The workshop lasted approximately 20 minutes and was delivered via interactive PowerPoint, discussion, and role-playing, with a culminating performance assessment involving role-playing. Although the overall structure of the workshop remained the same across classroom team members, the content was tailored to specifically address each targeted skill. The PowerPoint presentation included general information about procedure, the response prompts that formed the prompt hierarchy, the response interval to be used with the student, and a video of the trainer modeling implementation of the intervention with a different student. In addition, the classroom team members were provided with a written task analysis of the targeted skill and the intervention. The trainer and classroom team members reviewed each written document as part of the workshop. Before moving to the intervention phase of the study, team members were required to achieve 80% on the performance assessment to demonstrate their knowledge and ability to implement the system of least prompts via role-play; all three members met this criterion on the first attempt.

Intervention using the system of least prompts

Following the workshop session, each team member implemented the procedure to teach the following skills: cleaning the augmentative and alternative communication device (paraeducator 1), washing hands (paraeducator 2), and brushing teeth (special education teacher). The system of least prompts involves a well-defined prompting hierarchy, whereby response prompts are systematically delivered from the least amount of support to the most amount of support (controlling prompt; Brown, McDonnell, & Snell, 2015). Typically, reinforcement is delivered contingent on correct responses when implementing the system of least prompts, with continuous schedules of reinforcement being used until the student begins to acquire the skill (Brown et al., 2015). In the current study, team members delivered a task direction (for example, "Your hands are dirty; you need to wash them."), applied a three-second response interval, and delivered a prompt according to the hierarchy for incorrect student responses as follows: verbal (stating the step in the task analysis), gesture (pointing), and partial physical prompt (placing two fingers on the student's wrist to guide him). Reinforcement in the form of verbal praise was delivered contingent on correct student responses. Probe sessions were conducted after every three intervention sessions to monitor the student's progress; these procedures were similar to those used during baseline data collection. The criterion for mastery of each targeted skill was completion of the skill with 100% accuracy (unprompted) across three consecutive sessions. After Garrett reached mastery criteria for cleaning his augmentative and alternative communication device and washing his hands, maintenance data were collected on a weekly basis over the course of six and eight weeks, respectively. Maintenance data were not collected for brushing teeth due to the school year ending. During maintenance sessions, the team member delivered the task direction but did not provide assistance or reinforcement, similar to those procedures applied during baseline and intervention probes.

Coaching

Throughout the intervention, the first author coached team members when implementation fidelity dropped below 80%. Paraeducator 1 required one coaching session, which occurred immediately after the first intervention session. The session lasted approximately 10 minutes and included a review of the written documents previously provided (that is, task analysis of the targeted skill and the system of least prompts procedure), a video review, and a reminder to use verbal reinforcement when Garrett performed each step of the task analysis. The paraeducator and trainer viewed the video of the session, identifying times when reinforcement was necessary but was omitted. Following the video review, the paraeducator and first author reviewed the written documents, clarified the procedure, and identified strengths of the session.

Paraeducator 2 and the special education teacher required three and two coaching sessions, respectively, due to a lack of provision of verbal reinforcement, with each session lasting approximately 15 minutes. All coaching sessions were conducted immediately after the intervention

sessions. Team members were coached in the same manner as paraeducator 1 was; however, paraeducator 2 required additional clarification with supplementary role-playing.

Training fidelity

To assess the extent to which workshop and coaching sessions were conducted as intended, the trainer completed a checklist of training elements that was signed by the classroom team member at the conclusion of each training session. Based on these checklists, the trainer followed the workshop training and coaching protocols with 100% accuracy across all workshop and coaching sessions.

Social validity

At the conclusion of the study, classroom team members completed a social validity questionnaire to determine whether the training procedures were effective and if the intervention was useful, produced effective results, and was usable in the classroom. The following open-ended items were included in the questionnaire: (a) How effective do you think the research study was? (b) Was the research study meaningful? Why or why not? (c) Would you use the intervention for other activities or skills? If yes, how? (d) Would the intervention be useful for other students? If yes, how? (e) How easily was the intervention incorporated into your regular classroom routines? and (f) What suggestions would you have for improving the program? Participants received the survey via e-mail and were asked to return it electronically or in written form. Respondents completed the survey in 5 minutes or less.

Results

Implementation fidelity

Figure 1 displays the percentage of procedural elements that were correctly implemented by classroom team members during the system of least prompts intervention. Overall, implementation fidelity was high and improved over the course of intervention. Average fidelity scores were as follows: paraeducator 1: 94% (range, 70 to 100%); paraeducator 2: 78% (range, 11 to 90%); and special education teacher: 94% (range, 35 to 100%). All classroom team members displayed the lowest implementation fidelity during the first three intervention sessions (range, 11 to 77%), which necessitated additional training in the form of coaching for all three team members.

Performance of the student

Figure 1 also displays the percentage of steps performed independently for each targeted skill. Garrett's independent performance improved from baseline to intervention for each targeted skill, and improvement in independent responding was documented during both the probe and intervention sessions. During baseline, Garrett independently completed an average of 70% of the steps (range, 60 to 80%) that were necessary to clean his augmentative and alternative communication device. This percentage increased to 95% (range, 80 to 100%) during intervention probes. Garrett maintained high levels of performance post-intervention: His performance was 100% accurate for a majority of maintenance probes. Similarly, Garrett's handwashing completion improved from baseline to intervention, as evidenced by an average baseline performance

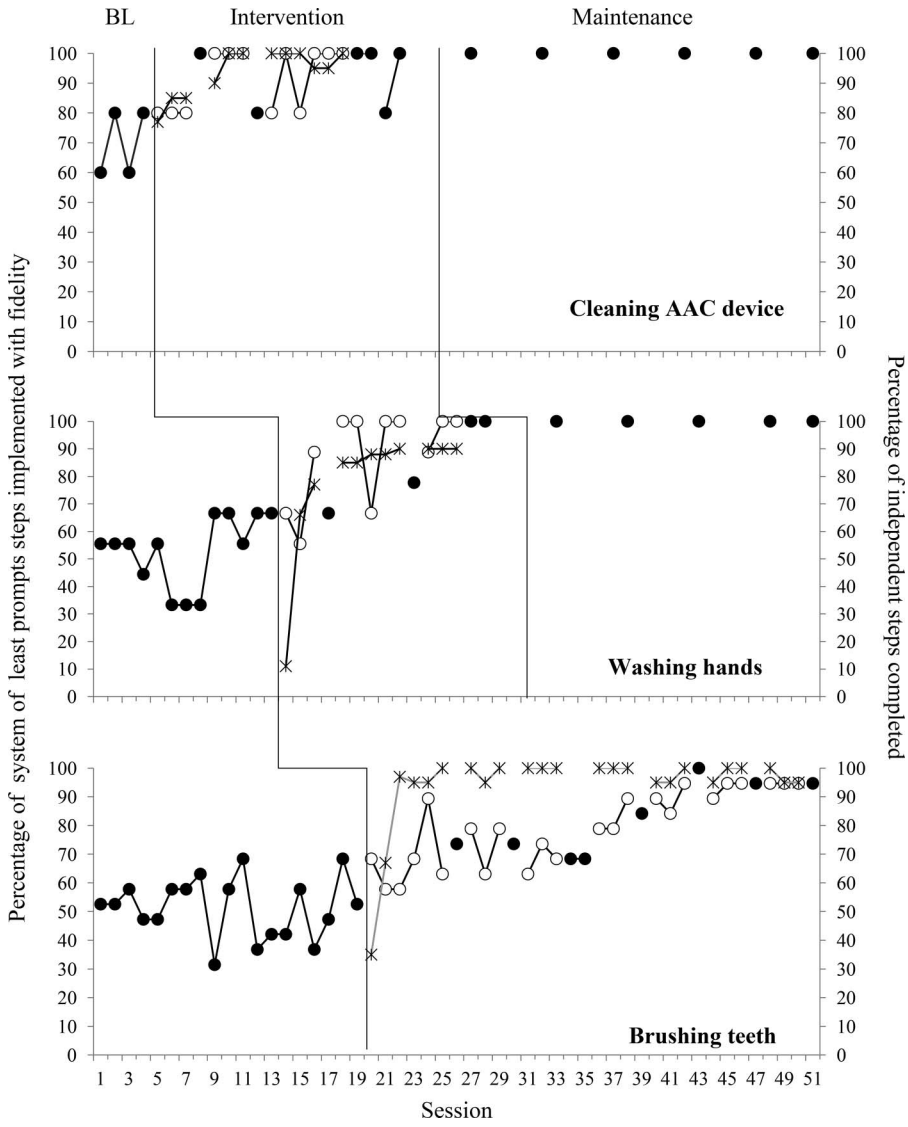

Figure 1. Percentage of system of least prompt strategies implemented by classroom team members and steps independently completed by Garrett. Stars represent implementation fidelity data; black circles represent independent responding during baseline, intervention probes, and maintenance probes; and open circles represent independent responding during system of least prompt sessions.

of 48% (range, 33.3 to 67%) and 81% (range, 67 to 100%) during intervention probes. High levels of independent performance were maintained post-intervention: Garrett performed at 100% accuracy across all maintenance probes. Finally, he independently completed an average of 54% of steps necessary to brush his teeth (range, 32 to 68%) during baseline. During intervention probes, this percentage increased to 82% (range, 68 to 100%). Tau-*U* scores were calculated to supplement visual analysis. These scores suggest that Garrett made large to very large

improvements (Vannest & Ninci, 2015) in each skill as follows: cleaning his augmentative and alternative communication device: 0.78; washing hands: 0.76; and brushing teeth: 0.92.

Data were collected to measure the quality of outcomes associated with each targeted skill. During baseline, no quality indicators were present after the student completed the targeted skills. However, quality improved during intervention probes for all skills, with 100% of quality indicators present for each skill.

Social validity

All three team members completed the six-item questionnaire and reported that the training and system of least prompts intervention were very meaningful and effective, resulting in positive gains by the student for each skill. They also indicated that they would be using this type of intervention in the future to help other students become more independent. Finally, paraeducator 2 noted that she had begun using this intervention with other students at vocational training sites and had seen a vast improvement in their independent job performance.

Discussion

The purposes of this study were to evaluate the effectiveness of a workshop and follow-up coaching sessions on the implementation of the system of least prompts procedure by classroom team members and whether the system of least prompts resulted in personal hygiene skill acquisition by a male high school student with comorbid visual impairment and autism spectrum disorder.

Implications for practice

The findings from this study provide important information that supports the value of training classroom team members to implement evidence-based practices for learners with severe disabilities. The coach delivered an initial workshop session and follow-up coaching sessions, as were necessary. Although the workshop session alone did not yield a sufficient level of implementation fidelity across participants, the limited and periodic coaching sessions delivered post-workshop resulted in a notable improvement in implementation of the system of least prompts procedure. In addition, participants found these training procedures to be effective and valuable. These outcomes are promising and in alignment with findings from other paraeducator training studies in which workshops and coaching sessions produced high levels of implementation fidelity (Brock & Carter, 2013; Walker & Smith, 2015).

Furthermore, the study yielded important results that add to the limited literature base of instructional practices for learners with a dual diagnosis of visual impairment and autism spectrum disorder. After receiving the system of least prompts intervention, the student demonstrated acquisition in all three personal hygiene skills and high levels of maintenance for two of the skills. This outcome provides evidence that the system of least prompts procedure might be a viable intervention strategy for individuals with comorbid visual impairment and autism spectrum disorder. As such, classroom teams should consider the system of least prompts as a potentially effective strategy for this population of learners, while also

taking into consideration both the degree to which it aligns with students' unique needs for support and other recommendations established to guide instructional planning for this population (Gense & Gense, 2011; Li, 2009).

Limitations and future research

There are several limitations to the current study that should be considered when analyzing the results. First, the trainer, who was a university faculty member, delivered the workshop and follow-up coaching sessions. Although the trainer successfully provided training that consequently resulted in desirable implementation of the system of least prompts among all classroom team members, reliance on professional development provided by an outside expert is not always feasible or practical, especially when schools or entire school districts are faced with limitations regarding the availability of resources (for example, time, funding; Brock & Carter, 2013). In addition, paraeducators may find training sessions given by teachers to be preferable to that provided by experts for various reasons, including discomfort and anxiety induced by the presence of unfamiliar outside observers (Walker, Douglas, & Chung, in press). Few studies have investigated the effectiveness and social validity of teacher-delivered training to improve the implementation of evidence-based practices by paraeducators working with students with severe disabilities (Brock & Carter, 2013). As such, there is a need to further explore this line of research whereby classroom teachers serve as the trainers and paraeducators as the trainees; in a train-the-trainer model, an outside expert might provide initial training to the classroom teacher to ensure competency in the content matter and paraeducator training strategies (see Brock & Carter, 2015). Furthermore, investigation could be conducted to determine to what extent this type of training model could also be utilized by teachers of students who are visually impaired and other vision specialists who may not have prior experience in systematic instruction or with evidence-based practices from the field of autism spectrum disorder.

Second, all classroom team members held degrees in special education and had experience as teachers of students with varying needs for support. These particular characteristics are generally not representative of paraeducators, who often are the least prepared among school personnel who work with learners with disabilities (Giangreco, 2003; Rispoli et al., 2011). Given the unique backgrounds of these classroom team members, it is possible that both experience and education contributed to their successful implementation of the procedure. Future research must include paraeducators who have less experience and expertise in special education to determine whether the results can be generalized to a more representative population of paraeducators.

Third, only one student with visual impairment and autism spectrum disorder participated in the current study. It is important that additional research be conducted to replicate the current study or variations thereof with other students who represent different cultural backgrounds, ages, and genders and who require a variety of needs for support.

Fourth, procedural fidelity data (Ledford & Wolery, 2013) were not collected, since participants were not expected to

implement the system of least prompts procedure during baseline. This lack of data limits the ability to establish a functional relation between the training procedures and implementation of the intervention. Future research needs to explore more rigorous approaches for experimentally evaluating the effectiveness of different training methods on a classroom team's adherence to the system of least prompts.

The fifth and final limitation of this study involves the measurement of generalization. As is the case with most paraeducator-training studies (Walker & Smith, 2015), We did not measure how well the utilization of the system of least prompts by a classroom team would affect the student's ability to generalize the target skills under different conditions. Future research should attempt to determine whether training procedures lead to generalized implementation of the system of least prompts by teachers and paraeducators. It also is critical that the generalizability of the system of least prompts procedure be evaluated for other learners with comorbid visual impairments and autism spectrum disorder.

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