

AER Journal

Research and Practice in Visual Impairment and Blindness

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Association for Education and Rehabilitation of the Blind and Visually Impaired

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Association for Education and Rehabilitation of the Blind and Visually Impaired

AER Journal: Research and Practice in Visual Impairment and Blindness

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The AER Journal is a peer-reviewed member journal that is focused on excellent research that can be applied in a practical setting. The Journal publishes material of interest to people concerned with services to individuals of all ages with visual disabilities, including those who are multiply disabled and/or deafblind. Published submissions include Original Research, Practice Report, Book Review, Professional Corner, and Conference Proceedings papers.

Original Research papers reflect the latest scientific discoveries in the fields of education and rehabilitation in vision impairment and blindness (maximum length: 4,000 words).

Practice Report papers reflect examples of best practice in the fields of education and rehabilitation of persons with visual impairments or who are blind. We expect not only academics but also practitioners to benefit from the contents (maximum length: 3,000 words).

Book Review papers are brief reviews of recently published books which will include a review of both the content and structure of the book (maximum length: 1,500 words).

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AER Journal: Research and Practice in Visual Impairment and Blindness

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Submission Deadline: **April 10, 2010**

Spring 2011 Special Issue: Falls and Falls Prevention

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**AER Journal:
Research and Practice
in Visual Impairment and
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**A quarterly journal in the field of education and
rehabilitation of persons of all ages with low
vision or blindness**



AER Journal: Research and Practice in Visual Impairment and Blindness

Is extremely pleased to welcome J. Vernon Odom, PhD, as Guest Editor for a ***Special Theme Issue on Falls and Falls Prevention***, to be published in Spring, 2011.

J. Vernon Odom is Professor of Ophthalmology, Professor of Physiology and Pharmacology, and Adjunct Professor of Psychology at West Virginia University where he heads the West Virginia Lions Visual Function Laboratory. Dr. Odom has authored more than 200 articles, book chapters, and published abstracts. His research has centered on assessment of visual function using electrophysiology and psychophysics in normal and abnormal aging. His current research investigates higher order visual perception in older patients with low vision. His specific interest is in optic flow as a means of controlling locomotion and navigation in patients with reduced visual abilities. Related topics that are actively being pursued in his laboratory include strategies to assess quality of life in patients with reduced vision and development of strategies to noninvasively assess systemic diseases and toxic exposures.

Dr. Odom's research has been supported by grants from several governmental agencies, including the National Institutes of Health, the Department of Defense, the National Science Foundation, Center for Medicare and Medicaid Services, and the Social Security Administration. He was awarded the Francqui International Interuniversity Chair in 1996 by Belgium's Francqui Foundation.

Dr. Odom has served in a number of leadership roles within WVU and the WVU Eye Institute. He directed the Center for Vision Enhancement Technology and served as Director of Research at the WVU Eye Institute. Dr. Odom is the past editor-in-chief of *Documenta Ophthalmologica*, former member of the Board of Directors of the International Society for Clinical Electrophysiology of Vision (ISCEV), and chaired the ISCEV VEP standardization committee. He has served the Association for Vision and Ophthalmology on its program committee and on its long range planning committee. Dr. Odom also organized the research panel on Falls and Falls Prevention for the Envision Conference, September, 2009 in San Antonio, Texas. Dr. Odom holds two patents and has three patents pending.

**Submission Deadline for the Special Issue on
Falls and Falls Prevention is November 10, 2010.**

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AER Journal: Research and Practice in Visual Impairment and Blindness
A quarterly journal in the field of education and rehabilitation of persons of all
ages with low vision or blindness

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**AER Journal: Research and Practice in Visual
Impairment and Blindness**

Call for Manuscripts

Special Theme Issue

on Falls and Falls Prevention



Submit papers reporting on research results and practice outcomes related to falls and falls prevention for people with vision loss. The theme issue will focus on positive practical approaches to rehabilitation that are shown to prevent falls. Authors are invited to include implications for the vision rehabilitation professional.

Manuscript submission deadline: November 10, 2010. Publication date: Spring 2011.

The AER Journal welcomes Guest Editor: Dr. J. Vernon Odom, Professor of Ophthalmology, Professor of Physiology and Pharmacology, and Adjunct Professor of Psychology at West Virginia University where he heads the West Virginia Lions Visual Function Laboratory.

Visit www.aerbvi.org for submission information.

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***AER Journal*—Broadly Defining “Education” in the Year 2010...**

The term “education” is often simply assumed to mean the schooling of children. I would argue, however, that our field is devoted to education in its broadest sense. This issue of the *Journal* recounts research and practice stories about the teaching and learning of skills on many fronts, and by and for many different individuals and groups. In our first Original Research article, Dr. Tollerson Parker and her colleagues tell the story of Molly, a student with both visual impairment and autism, who successfully used an adapted form of the Picture Exchange Communication System to communicate with multiple partners in her educational settings. Molly’s learning progress was measured for this study, and her success, given the challenges with her case, is instructive not only for her own teachers, but for all those teachers who read this research story.

Another aspect of education that is taking place for students with complex disabilities at the college level, is explored in our second Original Research article. Dr. Arndt describes a very unique research project qualitatively investigating the perspectives of college students who are deafblind about their experiences in college. The lived experience of people who are deafblind is rarely documented in research papers, so we welcomed the opportunity to do so with this article. As is often the case, this article demonstrates that there is a great deal more to learn in order to properly accommodate students who are deafblind at colleges and universities.

And what about professional continuing education for our field’s expert instructors? Our first Practice Report article describes an evaluation of a master trainer course on the use and teaching of an electronic orientation aid. Dr. Penrod and his colleagues compile enough detail so that others might duplicate their efforts. In a field where continuing education opportunities are not so frequent, and where proper evaluation of those opportunities is almost nonexistent—and definitely unpublished—I am very pleased we can publish this article and hope it is instructive for readers who want

to provide continuing education opportunities on other devices and aids.

Our second Practice Report article is a brief clinical case study of the early introduction of the long cane to a very young child. It describes how a little girl used the long cane from the age of 14 months to 4.5 years. In this article, we see one clear example of how a case report can demonstrate the practical implementation of an education program, involving a life-long aid to independence such as the long cane. The author, Ms. Scott, is able to depict her experience as the teacher, and to reflect on how her instruction through the years has assisted this young child (and her sighted schoolmates).

Our Book Review is also about teaching important skills, this time to teenagers who are visually impaired or blind. Dr. Rosenblum ably reviews the book *Looking Good*, authored by Anne Corn, Michael Bina, and Sharon Zell Sacks. Dr. Rosenblum’s review is written from both a professional and personal perspective, and permits the teacher (whether in an education or rehabilitation setting) to know if this is a book that will help in their professional practice with adolescents and young adults.

In this field, we are all involved in some aspect of learning and teaching, every day. This is what we do. How wonderful to have five excellent examples together in one issue, highlighting many diverse aspects of this thing we call “education and rehabilitation”... formalized approaches to what we all know as the teaching and learning that is our daily work. I am pleased that the *AER Journal* can offer an issue containing such excellent reinforcement for our members’ everyday contribution to the lives of people who are blind or visually impaired, and the professionals who work with them.

Until next time,



Deborah Gold, PhD
Editor-in-Chief

Adapting the Picture Exchange Communication System for a Student with Visual Impairment and Autism: A Case Study

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Abstract

In this case study, a student with visual impairment and autism successfully used an adapted form of the Picture Exchange Communication System to communicate with multiple partners in her educational setting. A changing-criterion design measured the child's progress in learning 24 different object symbols within 21 intervention sessions. The student's learning rate, acquisition of symbols, and learning of sentence construction offers a teaching strategy for educators as well as suggestions for future researchers.

Keywords: autism, Leber's, communication, augmentative or alternative communication, adapted PECS

Practitioners in the field of visual impairments have been challenged to create effective strategies for students with severe visual impairments and autism (Gense & Gense, 2005). The prevalence of autism spectrum disorders (ASD) may be higher in persons with visual impairment (11.6 percent) compared with the general population (0.6 percent) (Centers for Disease Control and Prevention, 2007). Recent studies also suggest that the risk of autism increases with the severity of visual impairments (Mukaddes, Kilincaslan, Kucucyazici, Sevketoglu, & Truncer, 2007).

Communication deficits have been identified as a hallmark problem for both students with ASD (Odom, Brown, Frey, Karasu, Smith-Canter, & Strain, 2003) and students with visual impairments who have additional disabilities (Rowland & Schweigert, 2000).

Communication interventions with students who have autism rely heavily upon visual input through

pictures for teaching strategies such as modeling and prompting, as well as communication (Odom et al., 2003). Adapting strategies that have established evidence from the field of autism and have embedded knowledge from the field of visual impairments may be supportive of student progress.

Originally developed by Andrew Bondy and Lori Frost in 1985, the Picture Exchange Communication System (PECS) was used primarily with young children with ASD who had limited or no functional speech (Frost & Bondy, 2002). Blending applied behavioral analysis principles with communication principles (such as learning to intentionally send a message to a listener), PECS was designed to support the development of functional communication (Frost & Bondy). PECS, due to both its visual communication and its basis in behavioral principles, particularly identifying potential reinforcers, has been characterized as a strategy that lends itself to meeting the communication needs of some students with ASD (see Tien, 2008). There are six phases in the PECS teaching protocol: how to communicate; distance and

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persistence; picture discrimination; sentence structure; responding to questions; and commenting (Frost & Bondy). Within each phase there are subcomponents for teaching students to engage in exchanges with a communication partner for items or activities that the student desires (Frost & Bondy). Unlike some other augmentative or alternative communication approaches (e.g., teaching labeling using sign language), PECS was designed to teach students to initiate communication, based upon the most reinforcing items for the individual.

Researchers in several studies have demonstrated the efficacy of teaching PECS to children who have ASD as well as to children and adults with developmental disabilities (see Tien, 2008, for review). Due to the pattern of replication from several experimental studies, PECS is considered to have an established base for building the functional communication skills of some nonverbal students with ASD (Tien, 2008). For students with visual impairments—either with autism or intellectual disabilities—there is a lack of research demonstrating how PECS, when adapted to compensate for severe vision loss, may be useful for building functional communication. Although some studies have evaluated the use of three-dimensional (3D) object symbols for developing communication for individuals with visual impairments (e.g., Rowland & Schweigert, 2000; Trief, 2007; Turnell & Carter, 1994), few have been designed around the PECS protocol, which teaches initiation using the most reinforcing items for each participant. An extensive search produced two studies that were based on the PECS intervention for students with significant visual impairments (Finkel, Weber, & Derby, 2004; Lund & Troha, 2008).

In a study with a 24-year-old participant who was congenitally blind and had developmental delays, Finkel and colleagues (2004) developed braille cards to use in communication exchanges. These authors reported that the participant was already able to use uncontracted braille before beginning the study and that the goal was to improve her articulation, making her requests more recognizable to communication partners. Finkel and collaborators referred to the intervention as the Braille Exchange Communication System (BECS). The PECS intervention framework was not followed closely nor was the use of pictures or referent objects included in the study. It is not clear from Finkel's report that the development of the braille cards was based upon an assessment of the

participant's interests and preferences, which is a departure from the PECS program.

Recently, Lund and Troha (2008) conducted a multiple-baseline design study that included three students with autism and congenital blindness in which 3D object symbols (parts of items based on student preferences) were developed as PECS material. In the study, the investigators drew from Rowland and Schweigert (2000) as well as Turnell and Carter (1994) to create the object symbols and implement their use within PECS phases. Of three participants, only one reached Phase III of the PECS intervention (discrimination between two symbols). Lund and Troha's study indicated the participants acquired very few object symbols. Although this research provides evidence of efficacy in using 3D objects within the process, it also encourages replication as well as examination of more advanced symbol arrays and complex requesting behaviors.

In order to further substantiate the use of adapted PECS for students with combined autism and visual impairment, additional examination is required, exploring both the materials used to shape successful communication and protocol adaptations to encourage students to advance to more complex communication. At this point, an adapted approach using 3D object symbols, though successful, has shown modest results in terms of the numbers of items a child with visual impairment and autism may request. It also does not demonstrate that children with concomitant autism and blindness may advance to more complex forms of requesting, such as creating sentences. The current case study examines a 7-year-old's response to adapted PECS for teaching a variety of symbols, as well as for shaping more complex communication behaviors with multiple partners at school. The following question was answered in this study:

Can an adapted version of the PECS intervention be successfully implemented with a student who has severe visual impairments and autism to enhance the array of symbols that a child may request, as well as more complex discrimination among symbols?

Method

Participant

"Molly" is a 7-year-old girl identified as having Leber's congenital amaurosis, nystagmus, and

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classic autism. Her ophthalmological reports offer little information as to her visual acuity, stating that she is legally blind and that her uncooperative behaviors prevented in-depth testing. Molly's functional vision evaluation did not indicate that she responded to color but described her as preferring to stare at lights and orienting her face toward the sun when playing outside. Data from her learning media assessment (LMA) (Koenig & Holbrook, 1995) did show that she had the ability to discriminate among textures and that her preferred learning modality was tactile. Her orientation and mobility (O&M) assessment, conducted by a certified orientation and mobility specialist (COMS), described her as having limited awareness/anticipation of drop-offs or changes in terrain. The O&M report described her strength in localizing toward environmental sounds and her ability to use landmarks; however, she did not travel independently outside of the classroom. She had no indication of hearing loss. When she was 6 years old, Molly was tested using the Gilliam Autism Rating Scale (Gilliam, 1995), the Childhood Autism Rating Scale (Schopler, Reichler, & Remler, 1986), and the Autism Behavior Checklist (Krug, Arick, & Almond, 1993) and was found to be in the severe range for autism. Although formal intelligence testing was not administered, it was suggested in clinical reports that Molly has an intellectual disability. Molly was known to have aggressive and self-abusive behaviors (e.g., biting, punching her head). Her noncompliant/disruptive behaviors included dropping to the floor when being guided to a new location, hiding under her desk, chewing objects, and wailing. Molly was not toilet trained at the time of this study. Molly's communication age equivalence, as measured using the Communication Matrix (Rowland, 2004), was shown to be about 12 months of age; she used unconventional expressive forms such as vocalization as well as rocking back and forth on a swing to indicate "more."

Setting

The study was conducted in a self-contained classroom within a rural elementary school. Molly was one of six students in a class taught by a certified special education teacher and supported by two full-time paraprofessionals. Molly was seen on a weekly basis by a variety of service providers, including a certified teacher of the visually impaired, COMS, speech and language pathologist (SLP), occupational therapist (OT), and an adaptive physical education

teacher. Molly traveled outside of the classroom for speech, mobility, physical education, and OT instruction.

Assessment and Materials Development

A person-centered planning approach with her family and service providers was used to learn what types of activities, foods, materials, and objects were motivating for Molly (O'Brien & Lyle-O'Brien, 2002). A reinforcement assessment also was conducted to determine the edible/nonedible items Molly enjoyed. This included a videotaped, forced-choice, item-by-item assessment of edible and nonedible reinforcers (Mithaug & Hanawalt, 1978). A combination of familiar and novel items/foods was used; the assessment was conducted over 4 days. Two items were presented to Molly simultaneously by having each choice touch her elbows or arms. Molly was given a 15-second interval to respond to either item. The object or food she selected as "preferred" (deemed by her holding the item, smiling while playing with the item, manipulating the object, or smelling or tasting the food) was used in the next trial to compare with a new object or food option. Out of the assessment, Molly preferred a shape sorter, a mouse pad, a light-up molecule ball, a music keyboard, a duck toy, and several other items. Using person-centered planning, as well as observation of Molly in her routines, it was determined that she also responded positively to rocking on a large plastic frog on the playground; jumping on a mini trampoline; swinging on a therapy swing; playing in water at the sink; listening to music; hiding in a large cardboard box; and riding on a tricycle on an outdoor track.

Object symbols were created using parts of actual objects that were glued to laminate squares and were based on Molly's most preferred items. Uncontracted braille labels were placed at the bottom of each object symbol (with labels in print on the back for the communication partners) in order to expose her to word labels during communication sessions. Sample representation of referents included a 2 × 2-inch piece of a mouse pad glued to the square, representing the pad; the lid to a small Play-Doh container to represent Play-Doh; a metal spring identical to the mini-trampoline springs attached to the laminate square to represent the mini trampoline; a large metal clasp that was identical to the swing to request swinging; and real Goldfish crackers sealed in glue on the laminate to represent Goldfish. It is important to note that items selected were ones that Molly had interacted with

tactually. For example, the clasp used to represent a swing was the exact shape, weight, and size of the metal clasp that she had handled numerous times with the OT to attach her therapy swing to the swing stand.

Dependent Variables

The percentage of unprompted communication exchanges out of the total number of exchanges was measured for each session. Molly only got credit for an unprompted exchange if she required no form of touch prompts to complete the exchange. Additional sound cues were made for Molly due to her visual impairment.

Design

This study used a changing-criterion design (Osborne & Himadi, 1990) across the successive PECS phases. When Molly reached a criterion of 80 percent or better of unprompted exchanges per session within a phase, she was introduced to the next PECS phase.

Procedure

All baseline and intervention sessions were coded using PECS data forms (Frost & Bondy, 2002). All sessions were conducted by the first author within Molly's school routine, embedding communication opportunities within her regular schedule (such as teaching adapted PECS with edibles during snack time or offering outdoor activity symbols during recess). More than 60 percent of the sessions were videotaped. There were 21 sessions, and Molly had an average of 31 exchange opportunities for each session. Sessions lasted from 30 to 40 minutes each and occurred over 10 weeks within the semester.

Baseline

Three days of baseline data were drawn examining Molly's unprompted communication exchanges within her daily routines, interacting with known objects and with familiar partners. In addition to not using objects to communicate, Molly made no verbal requests. Any of Molly's word approximations were the result of extensive verbal prompting on the part of staff.

PECS Phases and Adaptations Made Based upon Visual Impairments

Phase I of PECS included symbol exchange to teach her to request one item (only one presented). A second communication partner was engaged to shape

Molly's response, so that when she reached to grasp the preferred item, she was guided physically from behind to pick up the object symbol and hand it to the first communication partner, who held the preferred item. Physical prompts were faded until the exchange was independent. In the traditional PECS protocol, the communication partner is to silently "tempt" the student to reach for the item. When the child reaches for the preferred object or food, a second partner physically guides the student to reach for the picture to hand to the person holding the desired item to complete the exchange. In Molly's case, we adapted the protocol to maximize her other senses as well as her residual vision. Molly was seated in a position where she typically worked with staff. The first partner enticed her by using auditory cues or exaggerated visual cues, such as moving the item vigorously. For food items, olfactory and auditory cues were used, such as purposefully rattling the wrapper or shaking the bag of the preferred foods. Just as with traditional PECS, a second partner shaped her initial exchanging behavior, fading the level of prompting as she learned to independently exchange symbols.

Phase II of the PECS intervention included having Molly travel to her communication partner in the room to make the exchange using one symbol. In traditional PECS, the partner gradually distances herself from the student and concomitantly increases the space between the communication book and the student, encouraging the student to travel to the book and then to the partner to make the request. In PECS, there is an emphasis on not enticing verbally. For Molly, this was adapted both in offering her speech cues, such as "I am going to your desk with the mouse pad," as well as in giving exaggerated sound cues, such as pushing the chair loudly or walking loudly to cue movement away from her. She was never required to search for her book, because it was always kept in front of her. At the onset of Phase II, Molly needed a second partner to prompt her to stand up to move toward the communication partner; however, Molly quickly began to independently locate her partner within her classroom setting using the sound cues in combination with her residual vision. During the day, her communication book and object symbols were always kept in the same location so she could retrieve them easily.

Phase III included discrimination among referents, starting with highly preferred and nonpreferred,

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gradually increasing the array of symbol choices to six. In typical PECS, the student's choosing behavior is taught by using highly preferred items in contrast to neutral or disliked objects. It is based upon a person's visual discrimination between pictures and shaping responses. For Molly, we adapted this phase by tactually introducing her to the object symbols and offering her the items' names as she touched the cues and braille labels prior to initiating her request. We also enticed her with exaggerated auditory cues when we had the items in our hands. When she chose the wrong cue, the communication partner modeled the correct item using hand-under-hand support within the four-step error-correction protocol recommended in PECS.

"Correspondence checks"—recommended in Phase III for assessing whether the student knows what she has requested—were adapted so that objects were in close range and incorporated high contrast so that Molly could use her residual vision. For example, when Molly requested Goldfish crackers during snack time, a correspondence check involved making sure the yellow Goldfish was on a dark piece of construction paper next to the nonrequested item and within 1 foot of her body, so she could choose what she requested.

Phase IV included sentence construction, teaching her to place the "I want" card in large raised print and braille on a sentence strip in front of the desired object symbol and make the exchange. The only adaptation that was made for her was the use of "I want" in 48-point black, bold font on a white background with added black puff paint enhancing the letters on the laminate square and braille for this portion of sentence building. The traditional PECS protocol for teaching the use of the sentence starter was strictly followed, with it being placed initially by the communication partner on the sentence strip before Molly selected her preferred cue. Molly was taught to move both the sentence starter and referent for her desired item down to the sentence strip and hand it to her partner. Enticement using exaggerated auditory, visual, and olfactory cues provided Molly with the access for making requests.

Interobserver Agreement and Procedural Integrity

Interobserver agreement on Molly's performance was determined by measuring her percentage of unprompted (independent) exchanges for each

session. Two raters judged 30 percent of total sessions by reviewing video data and using PECS coding forms. Typically within single-subject design studies, determination of interrater reliability is based upon one third of the observed intervention sessions (Kennedy, 2005). Interobserver agreement was calculated by dividing the number of agreements by the number of disagreements and multiplying by 100. Interobserver agreement for this study was 100 percent. Fidelity of implementation was based upon an independent coding process, by reviewing video footage of sessions using a specific protocol that outlined each procedural step the communication partner was to follow for each exchange. This was based upon PECS procedures with adaptations made for Molly based upon her visual impairments (see description of PECS phases and adaptations). Fidelity of implementation was calculated for 30 percent of the total sessions to be 94 percent.

Doctoral students in special education who had attended a 2-day PECS workshop determined both fidelity of implementation and interrater reliability. Each determined coding procedures based upon PECS protocol and forms. Once procedures were clearly defined, raters viewed videotaped sessions independently to code the child's responses (reliability) as well as the researcher's adherence to the PECS intervention protocol.

Results

Molly had zero percent of unprompted exchanges among three 10-minute videotaped samples in her baseline phase. In Phase I, Molly reached criterion within three sessions, starting from 56 percent unprompted in her first session and attaining 87 percent unprompted exchanges in her third session. In Phase II, Molly attained criteria during her first day of implementation (86 percent unprompted exchanges) and achieved 100 percent unprompted exchanges during her second session. In Phase III, it took Molly three sessions to discriminate between two symbols at criterion. She then systematically progressed to discriminating successfully among three, four, five, and six symbols in her communication book. In Phase IV, Molly achieved criterion during her second session (96 percent unprompted exchanges) and continued at high levels of performance in subsequent sessions (see Figure 1 for visual analysis).

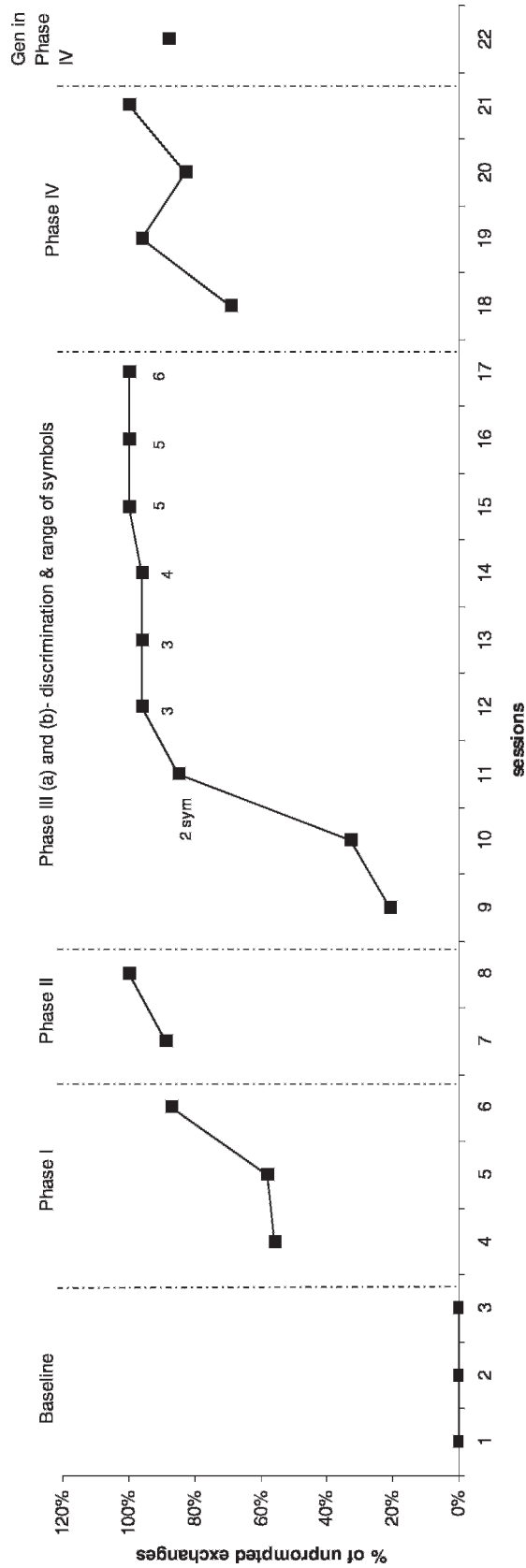


Fig. 1. Results of adapted Picture Exchange Communication System with Molly.

Adapting PECS

Array of Symbols and Communication Partners

Molly acquired 24 object symbols within the adapted protocol. Nonedible symbols included trampoline, swing, tricycle, rocking frog, shapes, mat, music CD, duck toy, toothbrush, Play-Doh, mouse pad, Lego, ball, molecule ball, keyboard, bell, and box. Referents for edibles included cotton candy, Goldfish crackers, Oreos, water, milk, Nerds candy, and gum. Data were collected on her use of the symbols in these locations (see Table 1): in playground, self-contained class, OT room, and in a community setting (retail shop). Molly was able to use these symbols consistently with six partners: her paraprofessional, teacher, OT, SLP, and two members of the research team. On one occasion Molly was encouraged to use PECS with her peers on the playground.

Molly's team was primarily trained to support the use of adapted PECS through observation of the intervention sessions and review of video data with the researchers. Molly's paraeducator had attended a formal PECS workshop and was well aware of the PECS protocol. All intervention sessions were conducted with members of Molly's team present.

Generalization

One generalization measure in a community retail shop showed Molly's performance at criterion. Within this context, Molly had access to her communication book and could make requests for snacks that were offered in a section of the store.

Social Validity

In response to treatment acceptability questions (Tarnowski & Simonian, 1992) that were rated on a 5-point Likert scale, Molly's paraprofessional and teacher individually answered "strongly agree" to all the efficacy and acceptability questions. Additional comments from the respondents included "This has worked wonders for our student"; and "Immediately Molly's expressive communication improved (when using the symbols). We have had a little trouble getting her to use verbal approximations to words; she has been primarily giving random grunts (especially to me) instead of word approximations."

Discussion

Molly's success offers an example of the power of adapted PECS, for students as well as for her

communication partners. There is a promising trend in this particular child's progress to Phase IV in PECS and in the number of symbols she acquired. Molly's acquisition of PECS is believed to be based upon several factors, including the readiness and support of her educational team to begin this intervention; embedding adapted PECS training within her school routines; Molly's proclivity for tactile discrimination as indicated in her LMA; using formal and informal reinforcement evaluation to outline the array of Molly's preferences; and adapting the PECS protocol, using parts of objects, sounds, smells, and exaggerated visual cues, to compensate for Molly's visual impairment.

Molly successfully used adapted PECS with several communication partners in her classroom, which was not reported in some other PECS (e.g., Lund & Troha, 2008) or object symbol (e.g., Rowland & Schweigert, 2000) studies. Molly rapidly acquired the use of PECS through Phase IV, independently constructing sentence strips to make requests in 21 formal teaching sessions with an average of 31 trials per session. Her acquisition rate exceeds previous studies with sighted children with multiple disabilities (Schwartz, Garfinkle, & Bauer, 1998). Additionally, Molly learned the use of 24 distinct symbols (including edibles and nonedibles). It is important to note that her performance exceeds the progress made by students in previous studies such as Lund and Troha's (2008), which reported the use of only one preferred symbol for requesting. Molly may have been able to acquire more symbols because the team knew what items were the most reinforcing to tempt her to request a larger variety of things, given that an extensive informal and formal reinforcement assessment was used. Additionally, her LMA clearly showed Molly's strength in tactile discrimination over auditory or residual visual information.

Implications for Practitioners and Families

It is time-intensive to create durable object symbols for communication. Materials that were selected for Molly, laminate squares with items attached using Gorilla Glue, were based upon her predilection for chewing objects. Through systematic assessment, it was determined which objects would be most motivating to her. In accordance with traditional PECS, nonpreferred and neutral items also were created to provide her with opportunities for discriminating

Table 1. Adapted Picture Exchange Communication System (PECS) Symbols Used by Molly

Desired Item	Adapted PECS Symbol	Setting	Desired Edible	Adapted PECS Symbol	Setting
Mouse pad	2 × 2-inch mouse pad glued on laminate	Classroom/SLP ^a	Water	Water bottle cap glued onto laminate	Classroom, community retail shop
Mat (bumpy shelf liner)	2 × 2-inch shelf liner glued on laminate	Classroom/SLP	Milk	Milk carton top glued to laminate	Classroom
Music	Half a music CD glued on laminate	Classroom/SLP	Goldfish crackers	Two Goldfish crackers sealed in Gorilla Glue on laminate	Classroom
Keyboard	Microphone piece to keyboard glued on laminate	Classroom/SLP	Oreos	Oreo wrapper and miniature Oreos sealed in glue on laminate	Classroom, community retail shop
Rubber ball	Identical ball on laminate	Classroom	Gum	Square piece of gum glued on laminate	Classroom
Trampoline	Trampoline spring glued on laminate	Classroom/OT	Nerds candy	Nerds candy box glued on laminate	Classroom, community retail shop
Duck toy	Fabric of duck toy on laminate	Classroom	Cotton candy	Lid of cotton candy container glued on laminate	Classroom
Lego	Lego glued on laminate	Classroom/OT			
Molecule ball	Ball covered in plastic glued on laminate	Classroom/OT			
Play-Doh	Play-Doh lid glued on laminate	Classroom/OT			
Christmas bells	One bell glued on laminate	Classroom			
Large refrigerator box for playing in	2 × 2-inch cardboard box glued on laminate	Classroom			
Shape sorter toy	One shape from the set glued on laminate	Classroom			
Rocking frog	Identical handle from frog toy glued on laminate	Playground			
Tricycle	Identical tricycle pedal glued on laminate	Playground			
Therapy swing	Identical swing clasp	OT			

^a SLP = speech language pathologist; OT = occupational therapist.

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meaningfully when she was working on Phase III. Because these symbols were parts of objects glued on laminate squares, they were particularly large. They were stored within the classroom inside plastic drawers. The communication book with the most frequently chosen symbols was placed near the drawers of referent symbols. Heavy-duty Velcro was used to attach the symbols to the book. Molly was made aware of the area where her symbols and book were kept, so she could travel easily to this area to retrieve what she desired beyond her PECS training sessions.

Implications for Future Research

Most PECS research typically has been conducted with sighted children (Tien, 2008). Molly's case study offers a basis for exploring modifications that are specific to nonverbal children with visual impairments as well as offering some foundation for basic O&M intervention by promoting initiation and travel to a communication partner.

This study incorporates uncontracted braille for exposure to corresponding words with objects. This area needs more exploration to develop studies that might link this type of communication training with more formal literacy development. The student was encouraged to explore both the object symbol and the braille label as she was making requests; however, the intervention emphasized communication rather than reading behaviors. Formal testing and incorporation of braille instruction with object symbols could complement or advance a student's progress using a communication system.

In Phase IV, Molly was able to discriminate the sentence starter "I want," which was in 48-point, high-contrast print with black puff paint and an uncontracted braille label, from her object symbols. It is not known if Molly was beginning to recognize the words "I want" other than being able to tactually discriminate this cue from the other object symbols. It is significant that Molly verbally demonstrated the use of "I want" in combination with words. Both her mother and teachers reported that this was the first use of unprompted multiword phrases that were non-echolalic.

Limitations

Limited conclusions may be drawn from this study due to its lack of experimental control across participants or settings; however, data indicate that this intervention had practical and social value for the

participant in her school setting. The study was limited by the school term and by unforeseen circumstances with Molly's family that prohibited some data collection in her home setting. It is important to note that Molly's mother was involved in initial person-centered planning, review of video progress throughout the intervention, and in having the team visit Molly's home to collect baseline data. The original study design involved a second phase of implementation within Molly's home, but this was prevented due to extenuating life events for Molly's family.

Conclusions

This study's outcomes, conjoined with evidence from Lund and Troha's study (2008), offer suggestions to practitioners on how PECS may be adapted for individuals with severe visual impairments and autism. In order to meet the demands for research-based practices for students with disabilities, more replications for students with visual impairment and autism across settings and age groups are needed. More important, finding effective teaching strategies for this population is critical for giving students a vehicle for making progress in communication and language and for sharing their voices with their families and educators.

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College Students Who Are Deafblind: Perceptions of Adjustment and Academic Supports

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Abstract

This descriptive qualitative interview study investigates the perspectives of college students who are deafblind. The purpose of the research was to investigate participants' perceptions about being college students and deafblind and to gain insights into their experiences. Qualitative methods were used to conduct videotaped interviews with 11 students. Interviews were transcribed and analyzed. Results of the study indicate that students had to manage both adjustments to visual impairment and academic supports. Implications for practice include being knowledgeable about deafblindness and supporting self-determination skills.

Keywords: deafblind, college, adjustments, supports

Introduction

Students with disabilities are attending college in increasing numbers. In a report on the changes between 1987 and 2003 in the postsecondary education participation of youth with disabilities, youth classified as having multiple handicaps or being deafblind demonstrated increases of participation in 2-year and 4-year colleges (Wagner, Newman, Cameto, & Levine, 2005). However, there is very little research about college students who are deafblind. Petroff (2001) noted "only limited research has been conducted to date on the postschool outcomes and community adjustment of young adults with severe disabilities and even less for the subset population of youth who are deaf-blind" (p. 38).

College students who are deafblind are a small and unique group, and there is little research reporting their perspectives. A search of the literature

specifically about college-age students revealed first-person reports of those who are deafblind in college (Leclair, 2001; Talbot-Williams, 1996), recommendations for students and colleges (Bhattacharyya, 1997; Everson & Enos, 1995; Ingraham, Belanich, & Lascek, 1998; Lago-Avery, 2001/2002; Nelson, 2005), and information on self-determination and transition (National Consortium on Deaf-Blindness [NCDB], 2009; National Family Association for Deaf-Blind, 2002). Related work about younger students who are deafblind includes examinations of social experiences in educational settings (Correa-Torres, 2008; Romer & Haring, 1994). This relative paucity of research may be because many people who are deafblind also are affected by other disabilities, and their schooling often includes "life skills" training and attention to transition planning from the school setting to community involvement (Huvén & Siegel, 1995) instead of trajectories toward higher education.

A possible negative outcome associated with the lack of research on the needs of college students who are deafblind is that service providers may not have the knowledge and skills they need to provide

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adequate services to this population of students. In 1979 Yoken commented that “a primary shortcoming of rehabilitation services for deafblind people is the lack of specific training for the counselor or social worker entering the field” (p. 2). This continues, and the literature has consistently maintained that deafblindness is not generally understood (McInnes, 1999; McInnes & Treffry, 1982; Riggio, 2009; Sauerburger, 1995); efforts must be made to inform people who are deafblind and their communities about deafblindness and how to provide supports.

Understanding deafblindness and the needs of students who are deafblind is especially important for supporting inclusive educational opportunities. Killoran (2007) reported that based on the National Deaf-Blind Child Count, the number of students who are deafblind in inclusive settings has not increased substantially between 1998 and 2005:

On the average, only 8% of school-aged students with deafblindness have been served in regular classrooms and only 7% in resource settings. Interestingly there has been little variability in these settings throughout the years, despite the federal emphasis on the provision of services to students in least restrictive settings and the inclusion of students in the general education curriculum. These data indicate that more intensive and effective efforts to include children with deafblindness within the general education setting are very necessary. (p. 12)

Educating school professionals about how to successfully integrate students who are deafblind must happen: Students who are deafblind need to have access to their peers, to high standards, and to high expectations about educational achievement. The result of such efforts, it is hoped, will be inclusive educational opportunities in colleges and universities. To this end, Correa-Torres (2008) called for more research to be undertaken with students beyond elementary school age who are deafblind; this study is one response to that need.

The purpose of this study was to investigate participants' perceptions about being college students and deafblind and to gain insights into that experience. The findings presented here are taken from a 2-year interview study and report on student experiences with adjusting to deafblindness and accessing supports. The research question ad-

ressed in this article is the following: What do college students who are deafblind report about their adjustment to deafblindness and their experiences with academic supports?

Method

Methodological decisions were based on several assumptions of the qualitative tradition. Theoretical assumptions of the qualitative tradition grounding this work include (a) that the meaning people use to describe their lives is crucial to understanding human action, (b) that interviewing is a dynamic process, (c) that analysis is inductive, and (d) that being present in the research is not a barrier to conducting research.

Participants

Eleven participants were interviewed for this study: eight men and three women. Ten participants ranged in age from 18 to 23, whereas one participant was 35 years old, having returned to college after a career in the workforce. Among participants, 10 have Usher syndrome and one has cortical deafness and blindness. Racial identity was predominantly European American; eight participants were White. Two participants were Asian American, and one was African American.

Of the participants with Usher syndrome, four knew they had Usher syndrome before entering high school. Three learned about Usher syndrome in high school, and two learned about Usher syndrome after entering college, when they noticed their visual fields changing. One participant did not report when he learned about having Usher syndrome, but it was clear that he had been aware of having the syndrome for some time.

Usher syndrome affects both hearing and vision. Three types of Usher syndrome have been identified, all involving varying degrees of hearing loss and vision loss caused by retinitis pigmentosa. Retinitis pigmentosa causes night blindness and an ongoing and progressive loss of peripheral vision. Many people with Usher syndrome also have severe balance problems (National Institutes of Health, n.d., p. 1).

Setting

Maintaining confidentiality in the field of deafblindness is challenging due to the limited number of people involved in the field (Jones, 2001, p. 41). However, the college is not named here in an effort to maintain as much confidentiality as possible.

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The setting for this study was a technical college (“Sunnyside College”) for students in the northeast United States who are deaf or hard of hearing. Sunnyside College is housed on the campus of “Parent University.” The campus population includes 13,000 students who are hearing and 1,100 who are deaf. Students who are deaf typically enter Sunnyside College, completing an associate degree. Transferring to Parent University for coursework toward a bachelor degree is common.

Procedure

The procedures used in this study, as reported in Arndt (2005), were reviewed and approved by the institutional review board of the researcher’s institution and Sunnyside College. Participants were solicited through an initial contact on campus, and then interviews were arranged by e-mail. Snowball sampling—getting to know participants and then having them introduce the researcher to others (Taylor & Bogdan, 1998)—was used to add new participants.

Participants were interviewed and videotaped in a room equipped with split-screen videotape-recording capacity, and all interviews were conducted in the language and mode the participant chose. Language forms included American Sign Language (ASL), signed English, spoken English, or a combination. An interview guide was used (Taylor & Bogdan, 1998, p. 106) and opened with “tell me about college,” with follow-up questions. The conversation dictated the topics discussed, following Bogdan and Biklen’s (1998) tenet that interview schedules “generally allow for open-ended responses and are flexible enough for the observer to note and collect data on unexpected dimensions of the topic” (p. 71). Interviews ranged in length from 20 minutes to 1 hour.

All participants were interviewed at least once; two were interviewed twice each, one individual was interviewed three times, and one was interviewed four times. The number of interviews was determined by participant interest and availability. All interviews were transcribed by the researcher into English text, in some cases interpreting them from ASL to English. Transcripts comprised 400 pages of data.

Data Analysis

Interviews were completed in three batches over an 8-week period, followed by a break of several months for transcription and data analysis before the fourth and final batch of interviews was conducted.

This process allowed for an inductive process of close reading and analysis; during each analysis cycle all data were read in undisturbed periods by the author to gain a sense of the totality of the data (Bogdan & Biklen, 1998). Analysis included careful reading of field notes and interview transcripts, writing and analyzing comments within the field notes and interviews, writing and analyzing reflective memos, and frequent discussion with participants and fellow researchers familiar with the field notes and interview transcripts. Member checks were used when participants were available to ensure the accuracy of transcripts. This included providing a transcript of the interview to the student, either electronically or in print according to his or her preference, for review and correction.

Data were coded and trustworthiness established using inductive analysis to develop themes that reflected relationships represented in the data (Hatch, 2002, p. 164). Themes were refined and the data evaluated for quality, including counter-evidence (Hatch). In addition, two peer researchers participated in the development of themes and confirmed the analysis.

Discussion

Finding that participants were concerned about their vision and accessing academic supports was not surprising: Participants were strongly affected by their daily life experience with visual impairment, which included both psychological adjustment and adaptation to their daily lives and the search for supports to be successful in the academic environment. This confirms Aitken, Buultjens, Clark, Eyre, and Pease (2000), who assert that deafblindness significantly affects access to information and engagement with people and things in the environment.

Adjusting to Visual Impairment

Brennan (1994) noted that “deteriorating vision presents the overwhelming task of developing skills and resources necessary to maintain independent living. Many people who become Deaf-Blind experience a ‘grieving’ process that can span many years” (p. 7). This was confirmed by participants in this study, who spent time and energy learning about their vision loss and accommodating to it. One participant, who had learned about his visual impairment just months before being interviewed, said, “I refused to believe that I was legally blind....

I'm trying to accept it. I have ups and downs sometimes. I want to yank my eyeball out, and kind of polish it." Denial is an important part of grieving the loss of vision; however, Brennan warns that denial "is perhaps the easiest [phase] to become stuck in" (2002, p. 28). Emerging from denial may allow a focus on learning skills necessary for independent living. This was evident in participants who had learned about their visual impairment before coming to college; they were well past initial grief and denial and had matter-of-fact attitudes about their abilities and plans.

As participants' visual acuity changed, so did their need to adapt to their environments, including the people around them, in new ways. For example, one young man felt strongly about planning for an independent life. His mother was concerned, however, and was not sure this was possible. Miner (1995), in her interviews with people with Usher syndrome type I and their families, also found that parents were concerned about their child's future. In this case, the participant was frustrated with his mother's perception that he would not be able to live independently:

Can't can't can't. That's wrong. I know that I can do many things. I can learn to do each thing in a different way. I can cook, I can clean, I can wash, and I can do a whole list of things. I can be independent in my own house. I will be just fine.

He believed that he could learn the skills he needed, even though he might complete tasks in a "different way" than people who are hearing and sighted. This conflicted with his mother's perspective. He adapted to his changing vision by planning to learn new strategies; this attitude of coping and finding solutions instead of accepting living at home was common.

A second example of finding solutions involves a participant who had difficulty seeing in the dark, which limited her participation in crew (which involved practice before dawn). Her coach urged her not to quit when her vision changed, and she continued with crew for a time. What she found, though, was that getting to practice and then trying to synchronize rowing with her teammates was exhausting and took more energy than she was willing to expend. Instead, she quit the team and found other outlets for physical activity. Her decision was deliberate and matter-of-fact: She noted that although she enjoyed being on the team and the camaraderie of her teammates, the

energy it took to navigate getting to the boathouse, then trying to match her teammates' motion, was simply not worth it.

A final example of ways that participants adjusted to visual impairment is a young woman who left an independent living program to attend college. In describing her decision to leave a residential independent living program to come to college, she noted:

I will get more training about blindness later, but I want to have the time for my education first, then maybe I'll be blind . . . and transfer into independent living programs later if I want. Right now I want to get my degree before my vision deteriorates.

In this example, as in the first two, the participant is deliberate and matter-of-fact about the vision she has now and how she can make the best use of the resources around her.

Academic Supports

The second finding was the importance of academic supports in participants' lives. All participants discussed academic supports and negotiating with their instructors at Sunnyside College. Although Sunnyside College serves a population of students who are audiotically deaf, the population of students who are deafblind is small, and supports were individually determined. This aligns with best practice recommendations of individualized supports (Lago-Avery, 2001/2002; Lieberman & Stuart, 2002; Miles, 2003; NCDB, 2009; Riggio & McLetchie, 2008).

Adaptations for individuals who are deafblind are different from those used for people who are primarily or only deaf (Correa-Torres, 2008). At Sunnyside College and Parent University, academic supports included one-to-one interpreters, small personal televisions that reproduced images from a PowerPoint presentation or overhead projector, C-Print, and note-takers. The range of supports reported by participants is similar to the range listed in 2001 by Jordan; that list also includes assistive listening devices, tutors, readers, large-print and braille texts, and reading machines. In a review of how New York University supported a student who is deafblind, Bourquin (1994) noted there were two major factors that led to successful service delivery. First, planning was integral: needs were anticipated when possible and identified as early as possible. Second, and harder to quantify, was the attitude of

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the university. Bourquin noted that “the employees of the university were consistently cooperative, understanding, and willing to assist” (p. 37). These two factors continue to be essential to responsive and flexible service provision.

Participants in this study discussed the supports they used and how their instructors responded to them; comments were largely positive and included statements that instructors provided large-print copies of materials and copies of PowerPoint presentations and were accepting of students selecting seating that best supported their vision needs. One participant was pleased with the supports he accessed and responses he had from instructors:

I’ve informed all my teachers that I have Usher syndrome, so I might have a hard time reading normal print or something like that. Teachers will say, “Oh, fine!” and they have things ready for me. Or if they use the overhead and I can’t see it, they make a copy and give it to me. Some teachers are really motivated and willing to help me out to improve my education.

In this instance, the participant was supported in positive ways and had access to materials; this was not always the case.

Several students were vehement that supports were difficult to get, difficult to sustain, and limited their ability to achieve in their classes. One issue was the need to educate instructors about deafblindness. This is not unusual; given the low incidence of deafblindness, most college instructors will not have had a student who is deafblind.

A participant’s comments about the difficulties he faced illustrates why this can be problematic:

Understanding Usher syndrome means knowing what you need to do to provide support, knowing how to help with tactile sign, or lighting, or things like that. But others don’t understand, and have no idea, no understanding of what to do with a person who has Usher syndrome. . . . Some teachers had no idea what to do, or how to do it. It was hard, I had to teach them. I felt like I was always explaining all the different variables.

A tip sheet for teaching students who are deafblind (Jordan, 2001) states that every student has different needs and that it is important for

teachers to meet with the student to determine what supports are useful. Student experiences highlight the need for service provision to be responsive and timely, as well as the need to be flexible about timelines for course completion.

All participants managed having a visual impairment and progressing through college in ways that can inform practice for future students. The need to individualize accommodations through discussion with the student who is deafblind and treating him or her as expert in what he or she needs are recommendations from this study and are confirmed in the literature (Bhattacharyya, 1997; Jordan, 2001; NCDB, 2009; Olson, 1999).

Implications for Practice

This study provides confirmation that many recommendations align with what students themselves report about their experience. Riggio (2009) noted that service providers must be knowledgeable about deafblindness, must solicit guidance from a deafblind specialist, and must treat communication with the student who is deafblind as a primary need. Participants in this study managed adjusting to visual impairment and accessing supports in ways that demonstrate the importance of supportive family and service providers.

The challenge for practitioners in the collegiate setting is to adopt strategies that support both the individual and the surroundings. In her comprehensive review of guidelines for working with people who are deafblind, Smith (2002) recommended that professionals remember that “Deaf-Blind people are competent to run their own lives” and that “help without understanding and involvement of Deaf-Blind people is just more oppression” (p. 6).

Implications from this study include four recommendations for service providers (Table 1). First, service providers need to be willing and able to provide assistance to students in accessing supports within the college and with agencies beyond the college. Young adults who are deafblind are not always fluent in expressing their needs or even in understanding what they might need; Lago-Avery (2001/2002) suggested, in fact, not assuming that young adults with Usher syndrome have a strong familiarity about the syndrome or possible services and recommended a series of questions to ask to help a student understand what services might be helpful. Knowledgeable resources include the Helen

Table 1. Recommendations for Service Providers

Provide assistance in accessing supports within the college and with agencies beyond the college
Be flexible in expectation of time it takes to earn a degree
Be knowledgeable about deafblindness
Foster self-determination and advocacy skills

Keller National Center (HKNC) and the NCDB. The HKNC Web address is <http://www.hknc.org>, and the NCDB Web site is <http://www.nationaldb.org>.

Second, service providers need to be flexible in expectations of the time it takes to earn a degree. That is, a student who is deafblind may need to take a reduced course load to effectively balance the demands of college coursework with time and energy. The time it takes a student who is deafblind to complete a degree may be extended beyond a typical student progression or may be interrupted by periods of time that might include training at the HKNC or travel while vision is good.

Third, college personnel need to be knowledgeable about deafblindness and, just as important, disseminate this information on campus to faculty, staff, and students. Becoming familiar with Usher syndrome or deafblindness is possible now through online resources, including NCDB's information services, DB-LINK, at <http://www.nationaldb.org/ISDefault.php>; 800-438-9376 (voice); or 800-854-7013 TTY.

Finally, Smith noted that it is possible for people who are deafblind to appear "less competent than they actually are because of a lack of information or confidence [or] because of a lack of appropriate support" (Smith, 2002, p. 6). College personnel must be aware of this possibility and actively work to foster the self-determination and advocacy skills of students. Practical ways to do this include being available to provide support, being flexible and trusting the student, and building strong connections with other agencies.

Limitations of the Study

There are two primary limitations of this study. First is the nature of the analysis, which was conducted primarily by a single researcher. The strategy of reviewing the development of themes supported inductive data analysis. An alternate way of completing this research, and a possible direction for future

research, would be to gather multiple forms of data, such as interviews from participants, their teachers, and their families. This triangulation of several perspectives could further strengthen the findings.

A second limitation is that the unique nature of Sunnyside College and Parent University made student experience a similarly unique one; there are college students who are deafblind in institutions of higher education all over the world without access to a student population of students who are deaf. Those students may face different experiences and levels of familiarity with deafblindness.

Suggestions for Future Research

Directions for future research include continuing this study, following a small group of young adults as they graduate, relocate, and begin to explore working. This direction is informed by the experiences of one student in this study; as he entered an internship setting, it was clear that challenges were present in identifying and securing needed supports (Arndt, 2008). Information from a range of young adults entering the workplace could inform practice; understanding service provision from the perspective of the consumer is essential, and this type of investigation might add to the literature around workplace supports for adults who are deafblind.

A second direction for future research would be to explore the experiences of college students who are deafblind before they enter college; understanding the school, community, and family experiences that helped young adults who are deafblind in their planning toward higher education might aid in refining our understanding of best practices for service providers and families.

A third suggestion for future research is to conduct interview research about life experience with students who are deafblind in colleges that do not include a strong deaf community; the particular circumstances of students in this study limit the ways that information can be applied to other campuses. As students who are deafblind consider college, it may be that they select a college that is unused to providing services for someone who uses sign language and is even less familiar with someone who uses sign language and has needs related to visual impairment as well. The experiences of these students would be a useful addition to existing research about supporting students who are deafblind in college.

College Students Who Are Deafblind

Finally, future research might include surveying service providers at colleges throughout the United States and internationally to determine where students who are deafblind are attending college, what services are currently in use, and what needs exist for information or training. The general census information that could be gathered would be a useful source of information for students who are deafblind and considering college, for service providers advising high school students, and for the colleges themselves to network with each other about ways to support students who are deafblind on campus.

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The Effectiveness of Master Trainer Courses to Teach Electronic Mobility Aids

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Abstract

Master trainer courses have been used for some time to convey needed information to the field regarding new and emergent technologies and teaching methods. The University of Louisville, Leader Dogs[®], and the Association for the Education and Rehabilitation of the Blind and Visually Impaired (AER) collaborated with Humanware[®] to offer a master trainer course at the association's International Conference in Chicago, Illinois, on the use and teaching of the Trekker Breeze[™]. Data indicate that this is an effective tool for disseminating knowledge to the field.

Keywords: electronic travel aids, electronic orientation aids, blind, orientation and mobility, master trainer courses

Introduction

Master trainer courses (MTCs) have been used by the United States Armed Forces for many years to train tank gunners, tank commanders, and both individual- and crew-served weapons marksmanship. The concept is fairly simple: Pick the best candidates available and give them extensive training on a particular system; when they are proficient, let them return to their individual units to train both subordinates and peers. This training model has been replicated and has shown promise for training orientation and mobility (O&M) instructors who are interested in evaluating and teaching clients, consumers, and school children about particular electronic travel aids (ETAs) and electronic orientation aids (EOAs).

The model differs from traditional ETA classes in that the successful completer usually will be provided with the devices and instructional manuals necessary to evaluate and train students immediately at no or reduced cost; the training site has been chosen for appropriateness; and group instruction is possible because all participants are already competent O&M instructors. Thus, the MTC meets a very important need. It offers a cost-efficient way to train up to 35 O&M instructors at a time and give them the tools to train their clients, consumers, and students on new and emerging technology that may lead to increased independence.

Penrod, Corbett, and Blasch (2005) reported on the effectiveness of an MTC that they designed to teach selected university professors and agency personnel about the then-new UltraCane[™], a primary ETA developed by Sound Foresight (Barnsley, UK). A primary ETA is an electronic travel aid that, when used properly, may not require a primary mobility system (e.g., long cane, dog guide, or human guide for safe travel) (Farmer, 1980; Farmer & Smith, 1997; La Grow,

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1999; Penrod, Bauder, Simmons, Belcher, & Corley, 2006; Penrod & Simmons, 2005). The event was sponsored by Sound Foresight and was hosted at the University of Louisville. It was the first attempt to replicate and modify a model commonly used by the United States military with the objective being that successful completers would return to their respective schools, agencies, and universities to share that expertise with colleagues, consumers, and students. Those authors used this concept effectively and participants reported a high degree of satisfaction.

When the Trekker Breeze[®] was developed, faculty from the University of Louisville proposed to Leader Dogs[®], and Humanware[®] that this effort should be replicated in order to train university and agency representatives and disseminate general information to the field. It was decided that the Association for the Education and Rehabilitation of the Blind and Visually Impaired (AER) International Conference in Chicago, Illinois, would be the most appropriate venue for this effort. AER cosponsored the event with Humanware[®] and allowed the team to conduct a 12-hour MTC concurrent with the AER general program. The following is a general overview and description of the event.

Intent

The intent of the MTC was to train professionals in the field of O&M on the new Trekker Breeze[™]. The Trekker Breeze[™] (Figure 1) is a self-contained EOA with auditory output (only) that does not require the use of a PDA. It is much simpler and more user-friendly than the original Trekker[™]. However, it accomplishes these features at a significant cost.

The device is very limited in function when compared with the original Trekker[™] and similar EOAs. For example, the device does not allow the user to learn about significant points of interest (POIs), nor does it plot routes to those POIs upon command. In short, it is designed for the user who is blind and has more basic navigational needs than an extensive traveler who may need POIs in cities all around the world. However, it is a very effective tool for the user who is blind and needs assistance in traveling basic routes and/or constant familiarization when conducting his or her “daily rounds.”

Overview

The MTC for the Trekker Breeze[™] was coordinated and negotiated by Dr. William M. Penrod from the

University of Louisville, designed by Harold Abraham of Leader Dogs[®], taught by Leader Dogs[®] support staff, and sponsored by Humanware[®] and AER.

Role of Participants

Humanware[®]

- Provided each participant who completed the course a Trekker Breeze[™] EOA.
- Provided technical service as needed and ensured there was a factory representative available during the training.
- Provided logistical support for all instructors and Dr. Penrod during the MTC (support included hotel lodging and airline tickets).

Leader Dogs[®]

- Provided instructional expertise in the design and implementation of the MTC.
- Provided five instructors to teach and gave on-site supervision to the participants.
- Provided transportation needed to get participants to the training sites.

AER

- Provided the conference venue and modified the master schedule to accommodate the event.
- Processed continuing education units through the Academy for the Certification of Vision Rehabilitation and Education Professionals for each participant.

University of Louisville

- Developed the concept of MTC and brokered the arrangement with all parties.
- Wrote the application for continuing education units through the Academy for the Certification of Vision Rehabilitation and Education Professionals.
- Collected and analyzed statistical data for the event.

University and agency personnel

- Attended the course and were evenly distributed among university term, tenure track, adjunct professors, and agency representatives.
- Were provided a Trekker Breeze[™] if they agreed to participate fully in the 12-hour MTC and train subordinates, colleagues, and students on the use of the device.



Fig. 1. *Trekker Breeze*TM.

Training Agenda

Welcome Remarks and Sign-In Activities

The MTC began with introductions and acknowledgments of trainers, support staff, participants, and their affiliates.

Pretest

This test was designed to measure specified learning outcomes and general knowledge of global positioning systems (GPS) and specific applications for persons who are blind.

Lesson 1: Learn about the GPS Network and Receiver Technology

Participants were given an overview of GPS systems, GPS receivers, historical development, consumer popularity in general, adapted use for persons who are blind, and other GPS systems marketed for persons who are blind and were exposed briefly to audible characteristics of the device in heavy traffic.

Lesson 2: Learning to Learn

Participants were familiarized with the device and exposed to the reality that the device offered a new layer of information not available to the person who is blind and is traveling with a primary mobility system only (e.g., identification of intersecting streets when approached, increased ability to maintain environmental flow while walking, and notification of POIs as they are encountered). During this exercise the trainer easily can determine whether a student has the comprehensive abilities necessary to use the EOA, the ability to retain what is learned and use it for route travel, and in general, the aptitude necessary to efficiently use the device when answering the three major questions regarding independent travel (Hill & Ponder, 1976):

1. Where am I?
2. Where am I going?
3. How do I get there?

2 hours' duration Lessons 1 and 2

Lesson 3: Become Familiar with Trekker

Product overview is the emphasis of this lesson. Participants are familiarized generally with the capabilities of the device. This lesson is conducted in a classroom setting.

Lesson 4: Become Familiar with the Trekker Breeze Physical Unit While Wearing a Blindfold

The participants are instructed on the location and function of the device's components, how to disassemble and reassemble the device, and how to recharge the device when not in use while wearing a blindfold.

Learn the Basics (Participant Is Not Wearing a Blindfold)

Participant locates the on/off switch, how to reset/restart the Trekker Breeze, how to use the key describer function of the device, adjust the volume and rate, other keys and buttons, and helpful memory aids.

Homework: Know the Keys

Participants are tasked with recharging the device and memorizing the function and location of the keys.

2 hours' duration for Lessons 3 and 4

Lesson 5: Basic Travel

Participants are paired with another student who will act as a human guide. They are given a task of traveling a few blocks while using the device and wearing a blindfold. Upon completion of the task, the participants will exchange roles. Please note that this and all other tasks are conducted with a competent human guide rather than using the participant's preferred primary mobility system. This is done to ensure that the participant is learning about the lesson rather than stressing about cane techniques that may be a little rusty. It must also be emphasized that each and every outdoor setting was preplanned to ensure appropriateness and determine any problems with GPS coverage (e.g., urban canyon effect). Indeed, this task is critical to ensure that the activities end with the desired outcomes.

Lesson 6: Points of Interest

Participants are taught the definition of POIs and how they may be used to expand travel experiences and to maintain environmental flow while traveling. *Environmental flow* is usually defined as the lawful changes in the environment as a person travels, and it is easy to see how this form of spatial updating may be valuable to the traveler who is blind as he or she walks. Please note that a particular POI may not be selected from a menu and a subsequent route planned as the result.

Lesson 7: Routes

The participant is blindfolded and the human guide walks along a preplanned route to a particular destination while the participant creates landmarks along the way. In addition, the participant may include travel instructions along with the recorded route that will cue him on what to do (e.g., turn right at the intersection, cross the street, watch out for the pothole). Upon completion of the exercise, the participants will exchange roles so both will have the opportunity to complete the task. Please note that this setting is preplanned extensively to ensure both appropriateness and adequate GPS coverage.

Lesson 8: Travel Modes

This exercise introduces the "open area" mode to the participant. Succinctly, when in the pedestrian mode the participant is alerted to intersections and the street names are announced without command. The open area mode is reminiscent of a park or

Table 1. Number of Correct Responses for Pre- and Posttest Settings

Question No.	Pretest (11 Participants)	Posttest (9 Participants)
1	0	7
2	0	5
3	10	9
4	4	6
5	1	7
6	1	9
7	1	8
8	7	9
9	1	9
10	1	8
11	8	9
12	0	2
13	1	4
14	2	3

other outdoor area for which maps and street names are virtually nonexistent. However, the device still has some application. The user may wish to find a soccer field located away from a parking lot, independently. If so, the participant may have a human guide walk him directly to the field while he is recording the route. The participant then may select the route when needed and travel to the route as desired. However, the participant must be cognizant of two characteristics: (a) A return route to the parking lot must be recorded, and (b) the navigational instructions offered by the device will be "as the crow flies," meaning it is going to lead straight to the desired location, and if there happens to be a lake or another soccer field in between, one must make allowances.

Lesson 9: Intermodal Travel

Another mode is automobile mode, and it may be used by the participant to spatially update while traveling in a car or train. It is emphasized that in today's mobile society, most persons who are blind travel via a bus (where the automobile mode is preferred) and then use the device as a pedestrian. Someone might go for a walk at lunch in a park or other open area where the open area features of the device are helpful if he or she remembers that the routes are announced in a straight line. Again, this

Effectiveness of MTCs

Table 2. Questions for the Pre- and Posttest

1. Who maintains the “Navigational Center” as a point of contact for civilian GPS users? Answer: The U.S. Coast Guard.
2. How can you practice learning the keys/buttons of the Trekker Breeze™ GPS? Answer: Use the “Help” function to describe what each button does.
3. What action may be necessary if the Trekker Breeze™ fails to initialize or respond? Answer: Reset.
4. How many satellites are required for “good” GPS coverage on the Trekker Breeze™ GPS? Answer: Four.
5. Define a *segment*. Answer: The distance between two intersections.
6. At what distance from an intersection will Trekker Breeze™ GPS provide automatic intersection information? Answer: 100 feet.
7. Describe the sequence order in which the Trekker Breeze™ GPS announces the most verbose intersection information. Answer: Type of intersection, name of the street you are traveling on, and then name of the street that you are crossing.
8. Define *heading*. Answer: Your direction of travel.
9. How do you access the second function of a key on the Trekker Breeze™ GPS? Answer: Push and hold the button.
10. What is the recommended “charging time” to establish a full charge for the Trekker Breeze™ GPS? Answer: 5 hours.
11. What phenomenon causes the disruption of GPS signal in metropolitan areas? Answer: Urban canyon effect.
12. Why was GPS originally developed? Answer: To track military submarines.
13. What are three ways in which a traveler who is blind navigates to a destination using Trekker Breeze™ GPS? Answer: By using a prerecorded route, using the “backtracking” feature, or by selecting a landmark and using the guidance instructions to get there.
14. What is the default mode when Trekker Breeze™ GPS is first turned on? Answer: Explore.

setting must be preplanned extensively if it is actually to be traveled, but it should be noted that due to time constraints this lesson was discussed as theory in a classroom setting.

7 hours duration for Lessons 5 to 9

Wrap-Up

This was a brief time to allow for participant observations, questions and answers, and administration of the posttest. The duration of this period was 1 hour.

Results

Table 1 shows the performance of the participants during the pretest and the posttest phases of the intervention. Column two of Table 1 indicates the number of participants who answered the pretest questions correctly. Column three shows the number of participants who answered the posttest questions correctly. Table 2 lists the pre- and posttest questions. There were two nonrespondents for the posttest.

Statistical Analysis

A dependent *t* test was used to evaluate the improvement of the participants from pre- to posttest. On average, participants in the Trekker Breeze™ MTC experienced a significant improvement from their pretest scores (mean = 3.22, standard error = 0.43) to their posttest scores (mean = 10.56, standard error = 0.86, $t(8) = -9.175$, $p < .01$, $r = .96$).

A discriminate analysis was used to determine the relationship of each question to the final score. This was performed for both the pre- and posttest. The pretest discriminate analysis found that Questions 3 and 9 were too easy, based on an analysis of difficulty (index of difficulty less than .33). Satisfactory discriminate power was found in Questions 5, 6, 7, 9, 10, 11, 13, and 14 (index of discriminability .67 or higher). Poor correct response rate in Questions 13 and 14 may be attributed to verbal differences (e.g., referring to the explore mode as navigation mode). It may be advisable to change the open question format to multiple choice in future efforts.

The discriminate analysis of the posttest showed that Questions 3, 6, 7, 8, 9, 10, and 11 were too easy based on an analysis of difficulty (index of difficulty less than .33). None of the questions were too hard, based on an analysis of difficulty (index of difficulty greater than .67). Satisfactory discriminate power was found in Questions 1, 4, 5, 12, and 13 (index of discriminability .67 or higher).

Discussion

The *t* test on the improvement from pre- to posttest indicated significance at the .01 level. Data indicate there was significant improvement in participant knowledge as a result of the MTC. The discriminate analysis indicates there was a change from pre- to posttest in questions related to successful completion. Questions 1, 4, 5, 12, and 13 in the posttest seem to discriminate performance, yet these were not a factor in the pretest. This change seems to be due to the questions being directly related to understandings about the Trekker Breeze™.

Conclusion

It seems evident that the MTC is an effective tool for informing the field and disseminating knowledge regarding the characteristics and appropriateness of ETAs and EOAs. The MTC places knowledge at the level where it can be best disseminated to the field—at the university and agency level. It is a highly efficient and cost-effective mode to train O&M instructors as a group because their competencies have already been ascertained, but the authors believe that this model should not be used for consumer/client/student instruction.

Limitations to these data are that they do not reflect to what extent consumers will benefit from their instructors having attended the MTC. However, common sense dictates that having more O&M instructors who are knowledgeable and in possession of these devices may equate to increased evaluations and instructional possibilities. In addition, participants may benefit significantly by having the device provided by the hosting distributors, and those distributors may benefit significantly through increased sales and subsequent profits.

Caution is advised to persons wishing to replicate this model. They should be trained on the device(s)

to be taught and attention to settings, and safety cannot be overemphasized.

It should be noted that AER has agreed to sponsor several more MTCs at a nominal cost to the participant, and the American Printing House for the Blind has unselfishly provided K Sonar Devices™ (K Sonar, Auckland, NZ) for this purpose. To this date, MTCs have been conducted at the Penn-Del AER conference and more that were conducted at the North Central AER conference in Cleveland, Ohio, on November 12, 2009. Although no participant satisfaction data are available for the Penn-Del conference, initial feedback suggests that it was well accepted by those who attended.

It seems clear the MTC is a valuable tool for disseminating information regarding new and any currently available ETAs to the field if universities and agencies serving persons who are blind will agree to infuse this knowledge in their training programs. That knowledge may be used to evaluate ETAs and EOAs for appropriateness to the unique needs of individual students and consumers and then train the individual in usage.

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Early Long Cane Use: A Case Study

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Abstract

This article will present a case study of an Australian child with emphasis on the early use of the long cane. "T," who has no light perception, began orientation and mobility training, including the introduction of the long cane, when she was 14 months of age. The article will discuss the philosophy of introducing the long cane at such a young age and will demonstrate the importance of collaboration between the orientation and mobility specialist and other professionals, such as early childhood teachers. For very young children, a long cane becomes more than just a means of moving around safely. It becomes a tool for exploration, play, and independence. The value of peer support also is discussed, using the example of a weekly group that T attended with other young long cane users.

Keywords: orientation & mobility, young children

"T" was born in 2003 with a diagnosis of Leber's congenital amaurosis and was assessed as having no light perception. She has no other disabilities. She was referred initially for orientation and mobility (O&M) training in 2004 at the age of 14 months, when she was just beginning to walk independently and had good, stable balance. Her fine- and gross-motor skills were also at an age-appropriate level. This article will discuss the use of the long cane with T, from the age of 14 months until the age of 4 years 6 months.

Initially, it is valuable to briefly review the history of the use of long canes with young children. There is no shortage of literature stressing the importance of early intervention in the area of mobility for children with vision impairment. Indeed, as far back as 1957, Norris, Spaulding, and Brodie (as cited in Shon, 1999) stated "that favourable opportunities for early learning by children with visual impairments are more important in determining the child's functioning level than the other factors, including their vision loss" (p. 3). Furthermore, the importance of motor,

concept, and sensory skills development has long been stressed in the literature (Cratty, 1971; Ferrell, 1979; Hill, Rosen, Correa, & Langley, 1984; Warren, 1984). However, it was not until the 1980s that the unique needs of infants and preschoolers began to be considered as a component of the definition of O&M instruction by authors such as Hill, Rosen, Correa, and Langley (1984), Pogrud and Rosen (1989), and Schroeder (1989). Pogrud and Rosen discussed the traditional arguments against the early use of the long cane, including

- Lack of motor control and coordination
- No use for the cane in familiar environments
- Lack of maturity
- Fear of injury to others
- The development of poor cane habits that would be hard to correct in the future

The authors ultimately concluded that "almost any blind child who is able to maintain balance while walking and who is able to hold a cane is a candidate for cane introduction" (p. 436). They also acknowledge that this view "may appear somewhat contradictory to the traditional O&M framework and philosophies" (p. 438).

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In a study on the Connecticut precane, Foy, Von Scheden, and Waiculonis (1992) stated that “children ... need optimal protection to foster confidence in moving but lack the kinaesthetic awareness, motor control, mental discipline, and responsibility to achieve adequate cane usage in a reasonable time” (p. 178). There is still little formal research in this area, but observations of children using long canes are showing these beliefs not to be true in all cases. The difference lies in the way young children are taught—they are not “little adults”; therefore, teaching them with traditional adult-centered techniques will not be successful. My philosophies toward working with very young children changed when I had exposure to the teaching skills and philosophies of early childhood teachers. My O&M training initially included very little on working with children, and my early training with children certainly did come from an adult-centered perspective.

Joseph Cutter (2007) described a new philosophy of O&M: “The goal of O&M is the independent movement and travel in blind children at an age/stage appropriate time so that children develop the perception of themselves as active movers and independent travellers” (p. 2).

Among his philosophies of what he terms the *promotion model*, Cutter (2007) suggested that

- “Child development is built from gain not loss” (p. 11).
- For children who are blind, “success is not measured by how much vision they have, but rather built on how many skills are developed for independent movement and travel” (p. 11).
- With one skill built upon another, the goal is mastery over the environment in order to move and travel safely, confidently, and independently.

When discussing the differences between working with an adult with adventitious blindness and a child with congenital blindness, he notes that adults are traditionally taught using a “top-down” process. Children, on the other hand, need to be taught using a “bottom-up” process. In other words, “out of the experience comes the concept” (p. 11). Of note, Cutter (2007) suggested that children who are blind learn to be responsible for their own travel when they have the opportunity to learn the necessary skills. They can then self-monitor their movement, practice

independent movement and travel skills, and have the opportunity to develop good judgment and decision-making skills.

So how did O&M training commence with T when she was referred at the age of 14 months?

Human guide skills were introduced from the very beginning. This involved T holding my fingers using the palmar grasp. As she got older and taller, the grip progressed to holding my wrist, and eventually will become the traditional grip above the elbow. The reason for introducing guide technique at this young age is that it establishes the technique T will use over her life. It also lets T take control by allowing her to either accept or refuse the offer to be guided. It is not easy to let go of an adult holding your hand! In addition, it develops an appropriate means of mobility at a very young age—holding an adult’s hand becomes less appropriate the older the child is. It is very important that a human guide be seen as a passive, not an active, form of movement and to remember that using a human guide is not independent mobility.

We also developed basic independent travel skills, such as trailing, squaring off, and body protection—a modified “bumper” technique involving having two hands clasped together in front of the body with the arms stretched out straight—a technique we called “safe hands.” These skills were reinforced any time that T was walking independently through space. More formal upper and lower body protection skills were introduced around the age of 3. However, I found that these skills were often tiring and were used inconsistently, in which case the use of safe hands was encouraged. The philosophy behind this was that whenever T was walking through space independently without her long cane, she would use some form of body protection. By the age of 4, she was using upper and lower body protection correctly and when required (generally in indoor areas where the long cane was not being used).

When T was first given a long cane, she was 14 months old. This was at the same time that human guide skills were introduced, and we began by going for walks with T being guided and holding the cane in the other hand. As she became more confident with the cane, she began to let go of my guiding arm and walk independently, usually following my voice. Initially, she also spent a lot of time exploring what the cane is, and what the cane does. She used the

Early Long Cane Use

same strategies that she would use with any new object placed in her hands—she felt it, chewed it, banged it on the ground, and banged it on the walls. Sometimes she would be bored with it in a few seconds; other times she would play with the cane for quite a long period of time. T's cane, with some help from her mother, was christened Tinkerbelle, and we found that it helped to personalize the cane for her and make it part of the family. T's family was encouraged to take Tinkerbelle out with them whenever they went anywhere, whether or not T chose to use the cane. This strategy helped to establish the association of having a cane available, particularly in unfamiliar environments.

As T became more familiar with the cane, a few ground rules were established. Most important was keeping the cane on the ground—most of the time. There were times when T would want to use the cane to reach up (a tree trunk to see how high it was, for example), and this was accepted because it was providing her with an opportunity to problem solve and develop concepts. We also began to refine the grasp so that she had her index finger pointed down the grip. This skill was established and used consistently between the ages of 3 and 4 years. It should be emphasized that T was initially using the cane in a diagonal position. Once she was comfortable walking alone with the cane, constant contact technique was encouraged, but there was no emphasis on keeping in step at this stage. Arc width was monitored, and generally T used the cane with an appropriate arc. These skills will be further refined once touch technique becomes the primary technique used with the cane.

Until around the age of 3, T would still confirm surface changes and drop-offs with her feet, even though the cane was in front of her and was detecting these. I found that initially T, and other young students with whom I was working, would notice the surface change through the cane but would squat to the ground to feel for it with their hands. It varied among children, but they all reached an “aha!” moment when they understood that the cane was detecting a surface change two or three steps in front of them. The understanding that the cane detected obstacles occurred early, although it was not always consistent, which is to be expected when using the cane in a diagonal technique. This behavior was monitored carefully, and T was allowed

to make contact with obstacles providing it would not injure her in any way. These opportunities were used to reinforce that the position of the cane was important in detecting obstacles and was refined over time as cane use improved.

O&M lessons were not formal in any way—the emphasis was on having fun and exploring the environment. T was encouraged to use her cane but was given the choice as to whether she wanted to be guided or to use independent travel skills without the cane. In this way, her O&M skills were established in a very holistic way. Certainly, she did not need to learn a set of “pre-cane” skills prior to the cane being introduced. T was naturally very curious about her environment and enjoyed exploring it. She was highly responsive to sound cues, which were incorporated in orientation and made it easy to encourage her to move independently through space. Over time, she tended to choose to use her cane over other methods; eventually it became automatic for her to pick up her cane when she wanted to travel independently. Lessons were conducted in a variety of environments, including her home neighborhood (from an hour spent “exploring” the front yard to walking the length of the block climbing every tree along the way!) and a sport and recreation center, where I took T exploring with her cane while her mother played sports.

The exposure to peers who also use long canes was invaluable. Braille Nest is a weekly group for children who will use braille as their primary literacy mode and was set up to enable contact between families and children with vision impairment (Scott, 2008). All children who attend Braille Nest are part of an inclusive education system in their local schools where they are generally the only child with a vision impairment. T attended her local kindergarten and was being enrolled in her local primary school. The majority of the children attending Braille Nest have long canes, and we were able to use the older children as role models for the younger ones. During one lesson with T, we were talking about why I wanted her to have her index finger extended along the grip of the cane. We listened to an older child using touch technique, so I explained to T that we practiced having our finger stretched out because that was important for skills that “bigger kids” used. She was 4 years 6 months at this stage and immediately wanted to try the bigger kids' style, that

is, touch technique. My initial reaction was that she would be unable to do this, but she actually could produce touch technique for short periods of time and continued to do so spontaneously (usually when she heard the older children using the technique).

Collaboration is essential in all early childhood O&M programs (Correa, Fazzi, & Pogrund, 2002). In this case, this was most successfully achieved by having the early childhood teachers and the O&M specialist working alongside one another at Braille Nest. There were also regular joint visits to T at home and later at kindergarten, where the early childhood visiting teacher, the classroom teacher, and the education assistant were active participants in O&M lessons. All early childhood teaching staff who work with T are therefore aware of the O&M techniques and terminology being used and consistently reinforce them. Her family was also closely involved, observing teaching sessions and learning skills themselves so they could reinforce and teach T when required. This program was successful because T's family, her teachers, and other early intervention professionals were strong believers in, and advocates for, the development of early O&M skills, and in particular, the right of young children to learn to use the cane. It also allowed for terminology and techniques to be used consistently.

Good O&M skills help the child become part of the class when he or she goes to preschool/school. T had been using a long cane for close to 4 years before she began to attend kindergarten, ensuring that cane use was already an integral part of her life. Education in the purpose and use of the cane, as well as in human guide techniques, is always provided to peers and school staff, and peers become very used to the cane quickly. This education is particularly important when the child is the only long cane user in the school, as was the case here.

In addition, I have found that the expectation of independence will help foster independence. Chil-

dren quickly take the responsibility for their long cane if you encourage and expect it. The development of these positive skills prior to the child starting school ensures that the child is seen as independent and competent from the very first day.

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Looking Good

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Looking Good: A Curriculum on Physical Appearance and Personal Presentation for Adolescents and Young Adults with Visual Impairments

by Anne L. Corn, Michael J. Bina, and Sharon Zell Sacks. (2008). 248 pp. Paperback. ISBN 9781416403425. US\$ 39.00. Austin, TX: Pro-Ed.

LOOKING GOOD



A Curriculum on Physical Appearance and Personal Presentation for
Adolescents and Young Adults with Visual Impairments

Anne L. Corn • Michael J. Bina
Sharon Zell Sacks

Turn on the television or look in a magazine, and you are bombarded with images that advertise makeup, hair products, clothing, and shoes. Visit a salon or barber shop, and you'll see pictures of the "in styles." The youth of today are immersed in a world where they are shown what "looks good" and

are coerced into developing an image that is "good looking." Move beyond the advertisements and into any high school, and you'll find that the majority of today's teens are checking out what others are wearing, how they are styling their hair, and how they present themselves. For youth and young adults with significant visual impairments, access to this information is limited. They may not observe the way a young woman wears her makeup, how a young man turns the collar on his shirt, or the nonverbal messages facial expressions convey.

As professionals who provide education and rehabilitation to individuals with visual impairments, we are aware of the need to provide instruction in a wide array of areas. The expanded core curriculum (Hatlen, 1996) brought to the forefront the need to address a wealth of skills, including those in the areas of independent living skills and social skills. More recently, the area of self-determination has been included within the expanded core curriculum. Tools to assist us in "teaching" these skills are not abundant, thus, the publication *Looking Good: A Curriculum on Physical Appearance and Personal Presentation for Adolescents and Young Adults with Visual Impairments* is a welcome addition to the field.

Looking Good is a curriculum that joins another Pro-Ed curriculum titled *Finding Wheels: A Curriculum for Non-Drivers with Visual Impairments for Gaining Control of Transportation Needs* (Corn & Rosenblum, 2000). The two use a similar format, though *Looking Good* has a pre- and postassessment tool that is not found in *Finding Wheels*. Written for teachers of students with visual impairments, rehabilitation therapists, and parents, *Looking Good* provides the user with a wealth of information and activities that will engage today's youth with visual impairments as they evaluate their own ability to "look good" and consider how to present themselves in different situations.

This curriculum can be used in a one-to-one setting or in a small group setting. Work with *Looking*

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Good begins by having the youth or young adult complete a preassessment included in the curriculum. The same preassessment is completed by either a parent or professional. Together the two discuss their ratings of the youth in the five areas (e.g., attitudes, physical care, personal presentation) and use this information to determine what sections of *Looking Good* the youth or young adult will emphasize.

In the first section the young person is introduced to six individuals, each of whom shares their experiences about personal appearance and personal presentation. A list of follow-up activities is provided to help the young person evaluate his or her similarities to each of the people in the scenarios.

Section 2 has four units focusing on physical appearance. These units, and the subsequent five units in section 3 on personal presentation, use the same format. Each begins with objectives, a thinking-about-it activity that ties to the six scenarios in section 1, material for the instructor, short scenarios of individuals with visual impairments that illustrate key points, and activities for students. There are activities the student can do alone, some that need to be done with others, and some that involve going out into the community. Not every student will do every activity; the instructor has the flexibility to select activities that will enhance the student's understanding of the content.

A key premise of the curriculum is that the focus is not on having good looks but on helping youth and young adults present themselves so that they look good. The units address a wealth of topics including nonverbal communication, family culture, facial features, physical fitness, emotions, clothing selec-

tion, accents such as jewelry and perfume/cologne, body movements, and ways to get feedback from others. Youth and young adults are encouraged to interview others with visual impairments about their experiences when the topics are covered in the curriculum. Hearing firsthand from others is a valuable tool and one *Looking Good* capitalizes on.

Finally, in section 4 the individual completes the postassessment and is given the opportunity to compare the results with the preassessment. Based on the information gathered, an action plan can be developed for how, if needed, the youth or young adult will continue to work on the material presented in *Looking Good*.

As an adult with low vision, I couldn't help but think back to my own youth and young adult years. Many of the topics *Looking Good* addresses are ones I struggled with. How wonderful it would have been to have such a comprehensive tool available to my teachers and parents as they assisted me in my quest for independence. Had I used this tool, I might have been able to avoid some of the challenges I faced in learning about personal appearance and personal presentation. I am pleased that today's youth and young adults will benefit from this well thought out curriculum.

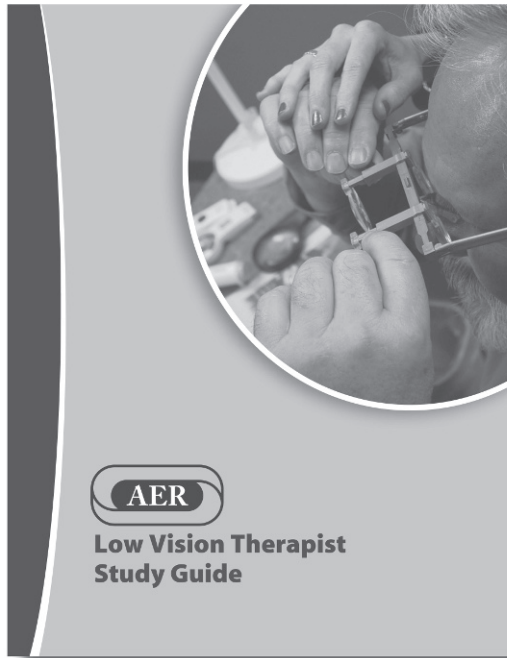
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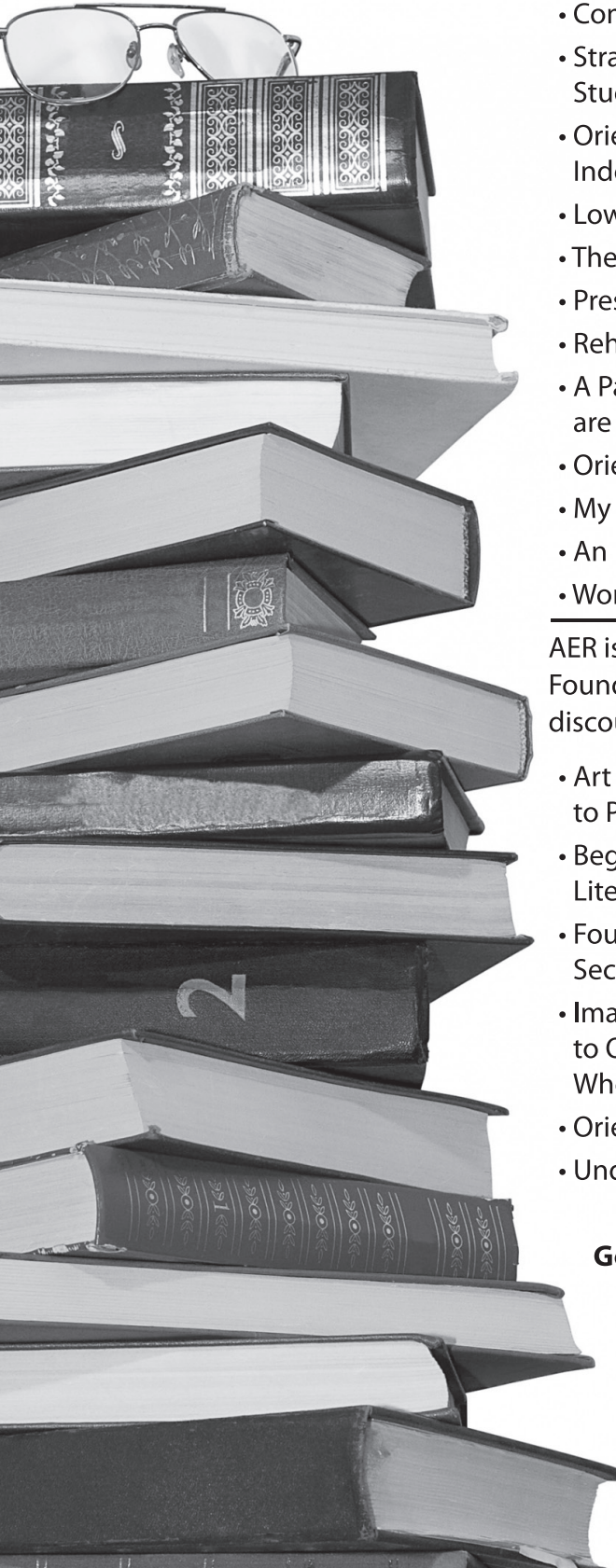


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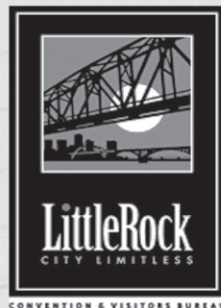
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