Transforming Training in Orientation and Mobility: Examining the Effect Using an Audio-Link on the Distance Between Trainer and Trainee

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Increased distances between instructor and trainee during orientation and mobility (O&M) training is purported to be associated with improved outcomes of heightened independence, self-efficacy, and preparation for real-world experience as a traveller. However, there is currently no research that identifies standard or optimal instructor-trainee distances or effective strategies to increase distances that enhance training outcomes. This exploratory, qualitative study compared the distance between two instructor-trainee dyads over ten 1.5-hour lessons. The first five lessons were conducted without an Audio-link device, and the second five occurred using the device. Results indicated that use of an Audio-link system significantly increased training distances between teacher/student dyads beyond proximities measured without the device. The implications for training and research are discussed.

In teaching persons who are vision impaired, and when training specialists in orientation and mobility (O&M), the distance in teacher-student or trainer-trainee dyads is often adjusted to vary the level of support provided during training sessions or lessons across settings. Close proximity of teacher to student has been used in schools to improve performance and manage behaviour (Colvin, Sugai, Good, & Lee, 1997; Lewis, Colvin, & Sugai, 2000; McIntosh, Herman, Stanford, McGraw, & Florence, 2004), and to address the special needs of learners with significant challenges in general education activities (Conroy, Asmus, Ladwig, Sellers, & Valcante, 2004; DePry & Sugai, 2002; Gunter, Shores, Jack, Rasmussen, & Flowers, 1995). Even in higher education, students and instructors are seeking more interaction, and employ closer proximity between instructor and student as a method to build connections and improve outcomes (Owu, 1992). Across these varied classroom settings, it has been shown that having an instructor close improves outcomes by enabling the student to have increased support and assistance as s/he completes tasks.

In much the same manner, a person who is receiving O&M training, either as a trainee under blindfold or as a client who is blind or vision impaired, will often benefit from

the closeness as s/he begins the process of learning independent travel. Proximity to an instructor may provide reassurance and support as the individual begins blindfold training and/or cane travel. This support might be especially important during initial instruction, where students/clients might need encouragement, feedback, or to have concerns about their safety addressed by the instructor (Bina, Naimy, Fazzi, & Crouse, 2010). Closeness might help the instructor and trainee establish a responsive interrelationship and the necessary level of trust upon which to build further instruction (Fazzi & Petersmeyer, 2001).

Interestingly, a topic that is not quantifiably addressed in the literature or instructional manuals, but is meaningful to those who are most experienced in training, is the optimal physical distance a trainer should be from his or her trainee. The establishment and measurement of recommended training distances have been resisted by the field for very practical reasons. Though mandated Clinical Practical Competencies include the requirement to monitor and ensure the safety of trainees (Academy for Certification of Vision Rehabilitation & Education Professionals, 2012), the competencies fail to identify the optimal proximity necessary to achieve this standard. In practice, this distance can be influenced by many factors, including: situation, traffic, trainee experience and ability, and general environmental danger. A commonly accepted belief in the field defines this standard as "being close enough to intervene, but far enough away to not interfere" (B. Bryant, personal communication, July 14, 2011). The establishment of a safe proximity from which to intervene when needed is justifiably left to the discretion of practitioners. Novice trainers may have increased anxiety about the wellbeing of trainees new to the blind-fold experience, and may hover near their students as a demonstration of overprotection. The trainees' experience and self-efficacy may be significantly linked to the distance that has been deemed "safe" for learning to occur. The inclusion of an Audio-link might help increase that safe instructional distance and provide another tool for practitioners, experienced and novice, to use in the determination of the training distance that is safe for each student.

Regardless of the initial importance of proximity in early training experiences, as O&M training progresses, the distance between trainer and trainee should, in most cases, increase as instruction continues. If the instructor does not increase the distance, the student may become inhibited, and exhibit an inappropriate degree of dependence on the instructor. This would render him or her ineffective in future manoeuvers and decisions that require independence. Hovering around, or remaining too close to the trainee might in effect: convey a lack of trust and confidence in the ability of the trainee; delay the transfer of responsibility for decision making from instructor to trainee; slow the trainee's ability to conceptualise instructional concepts, and consequently, inhibit the development of trainee's efficacy as a traveller. If the distance from instructor to trainee is increased, the trainee might benefit from a better simulation of the experiences encountered by an independent traveller who is vision impaired. This ability to perform in a real-world situation would help to improve the confidence and independence of the traveller who is vision impaired.

Unfortunately, the discussions and conclusions regarding distance detailed here are based on anecdotal reports. Currently, there is no research to measure, define, or detail the impact of the distance between O&M instructors and trainees.

Why Progressively Increased Distance is Developmentally Important in Training

The significance of proximity and backing away from the trainee over the course of instruction can be analysed through the use of two established concepts: (a) Vygotsky's Zone of Proximal Development (ZPD), and (b) the associated concept of scaffolding. Vygotsky (1978) defined ZPD as: "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Initial training and the initial close proximity help establish the difference between what a learner can do without help and what s/he can do with help. For a trainee receiving O&M instruction, the ZPD is represented by the challenging zone of skills beyond what s/he has mastered, but less than that which becomes overly frustrating. By increasing the distance from trainer to trainee, the instructor moves this zone to a more advanced level by requiring more independent problem solving. If the trainer was still able to provide support at this advanced level of learning and expectation, then the trainee might be able to increase his or her overall skill and development.

Scaffolding is a metaphorical concept that describes a highly interactive and responsive intervention based on students' progress. Three key concepts of scaffolding are: (i) contingency (the appropriately modified and adjusted type and amount of support delivered to learners based on their current needs and abilities), (ii) fading (the measured removal of the scaffolded support over the training period based on the client's ability), and (iii) the transfer of responsibility (pull-back of support to allow the learner to take more control of what is learned) (Van de Pol, Volman, & Bieshuizen, 2010). Pearson and Gallagher (1983) further delineated the process of release of responsibility as being a transition from teacher responsibility to joint responsibility, and finally to student responsibility. Scaffolding, and the associated components, can be used to explain the import of increasing the distance between instructor and trainee in O&M. Research findings in this area support the conclusion that this practice, if generalised to O&M practica and internships, or direct instruction to individuals who are blind or vision impaired, will increase the probability of optimal training outcomes.

Proximity is often determined by student ability. Inexperienced trainees require close proximity to allow for immediate intervention to address safety issues. As skills are developed, the instructor must work to facilitate the maximum opportunity for the trainee's independent completion of skills while still being able to intervene (Bina, Naimy, Fazzi, & Crouse, 2010). However, there are a number of factors involved in O&M training impeding the implementation of practices that gradually increase the distance between trainer and trainee. These factors include safety concerns, noise limitations, hovering by the instructor, or excessive need for feedback

and reinforcement. Each of these factors may result in the lack of independent decision-making by the trainee. Consequently, without some strategic intervention, the efficacy of training will be limited by the need to maintain trainer-trainee proximity in spite of the collective, professional sense of "knowing" that this practice will not result in the best training outcomes.

As in many disciplines, the use of technology in training is one possible means of addressing this important issue that will enhance training in O&M. An Audio-link is a device commonly used for communication of verbal information in tour-guide situations. The Audio-link will provide support at the trainee's most advanced zone of performance, be available at a time of frustration, and act as one of the final pieces of scaffolded support provided to the trainee. The Audio-link can provide the opportunity to efficiently intervene in matters of safety even at distances and in high-noise situations. The one-way nature of the device would impede the trainee's ability to repeatedly ask for feedback, and prompt them to make independent decisions. The Audio-link would essentially work as a catalyst to both promote independent trainee decision-making and as a way for the trainer to back away and avoid hovering. This study will specifically address the impact of the use of a one-way audio communication device referred to as an Audio-link, on the distance between O&M instructors and trainees. The identified hypothesis is that the use of the Audio-link will increase the distance between instructor and trainee from a baseline established without the use of the technology. It is hypothesised that the use of an Audio-link device will result in instructors engaging trainees at the highest levels of performance while simultaneously providing optimal levels of support for undeveloped or deficient skills. This study is an important first step in the development of a supplementary tool to promote independent decision-making, deliver real-world training experiences, and improve trainee outcomes for all individuals receiving O&M training.

Method

Participants

The study included four participants currently enrolled in a clinical practicum course in an O&M program located in a medium-sized state university (student population of approximately 13,000). Participants were Caucasian, sighted, female, and ranged in age from 21 to 42 years. Two randomly selected dyads were identified for inclusion in the study. Each dyad consisted of one participant serving in the role as instructor (trainer) and the second member of the dyad (trainee), an undergraduate student, served as the recipient of instruction, while wearing a blindfold. Both participants who served as O&M trainers/instructors had 60 hours of teaching experience. Both participants receiving instruction had 20 hours of blindfold experience. The researcher, who was the course instructor, served in the role as observer, and measured and noted the distance between trainer and trainee during each of 10, 1.5-hour, consecutive, pre-scripted, mobility lessons. The lessons were based on an established programing sequence in the training of O&M Specialists (COMS) and required of all students enrolled in the course and in the program.

Device

The Audio-link used was an FM system, consisting of a transmitter (worn by the student teacher) and an over-the-ear receiver (worn by the student wearing the blindfold). Both transmitter and receiver were battery operated, had a roll dial for volume, and a press-and-hold On/Off button. This device was chosen because it was a one-way communication system that allowed the instructor to offer corrective action and guidance without providing trainees with the opportunity for consultation or verification from the trainer. It was hypothesised that use of a one-way device would facilitate the transfer of decision-making responsibility solely to the trainee after receiving instruction.

Procedure

All participants received instruction on the use of the device with and without blindfold (i.e., transmitter, receiver, volume control) to ensure they were able to efficiently and effectively operate the device during any given lesson without interference or interruption. From that point forward, the practicum experience proceeded in the well-established, traditional manner for training (Hill & Ponder, 1976; Jacobson, 1993; Pogrund, et al., 2012), and in which the difficulty-level increases with each lesson (La Grow & Long, 2011).

A sonic-wave, precision measuring laser device was used to measure the distance between trainer and trainee. Ten measurements were taken during each 90 minute lesson, for a total of 100 measurements at a rate of one measurement every eight minutes. The Audio-link was not used during the first five lessons that provided a baseline for training in a low traffic, residential neighborhood. During the last five lessons, the Audio-link was used, however, the setting was changed to a moderately travelled, downtown area, which increased difficulty of the tasks required (i.e., increased traffic, noise, sidewalk hardware). To avoid participant bias, no prompts were offered by the instructor regarding the purpose of the Audio-link or the reason for measuring the distance between trainer and trainee.

Results

A repeated measures design was used to gauge the impact of the Audio-link on the instructional distance between trainer and trainee across a 10-lesson cycle. As described, researchers collected 10 distance measurements during the progression of each of the lessons. The measurements between each of the trainer and trainee dyads were averaged for each of the lessons in the training sequence. A mean was established for each of the dyads for lessons without the Audio-link (Table 1) and with the use of the Audio-link device (Table 2). After feedback from the data presentation, researchers measured a third dyad across the

Table 1. Measurements before introduction of the Audio-link (in feet).

Lesson	1	2	3	4	5	Average	Combined Dyad Ave.
Dyad 1	2.15	2.19	2.63	2.47	2.42	2.375	2.55
Dyad 2	2.39	2.72	2.42	3.38	2.73	2.73	
Control					2.49		

Table 2. Measurements after introduction of the Audio-Link (in feet).

Lesson	6	7	8	9	10	Average	Combined Dyad Ave.
Dyad 1	11.2	19.54	13.72	17.4	19.23	16.22	16.10
Dyad 2	17.77	18.13	14.75	11.07	18.23	15.99	
Control	2.71	2.6	2.21	2.37	2.32	2.44	

intervention portion of the training sequence to establish a baseline mean for trainer-trainee distance across the lessons where the Audio-link was used (Table 2).

Data collected demonstrated that the use of the Audio-link increased the instructional distance in both of the dyads where it was introduced (Figure 1). The combined average distance between trainer and trainee for the two dyads increased from a mean of 2.55 feet to 16.10 feet during the study. Without any prompting, the trainers in both dyads increased the trainer/trainee distance immediately after the Audio-link was introduced. Both trainers made adjustments in their instructional distance to address student needs during more complex lessons. Both dyads showed similar narrowing of the instructional distance through the more challenging lesson sequence, but returned to or beyond their originally established distance toward the end of the assessment period (Figure 2).

The baseline mean distance collected for the final five lessons was similar to the distance demonstrated by the two trainer and trainee dyads across the pre-intervention five-lesson sequence. It was evident that

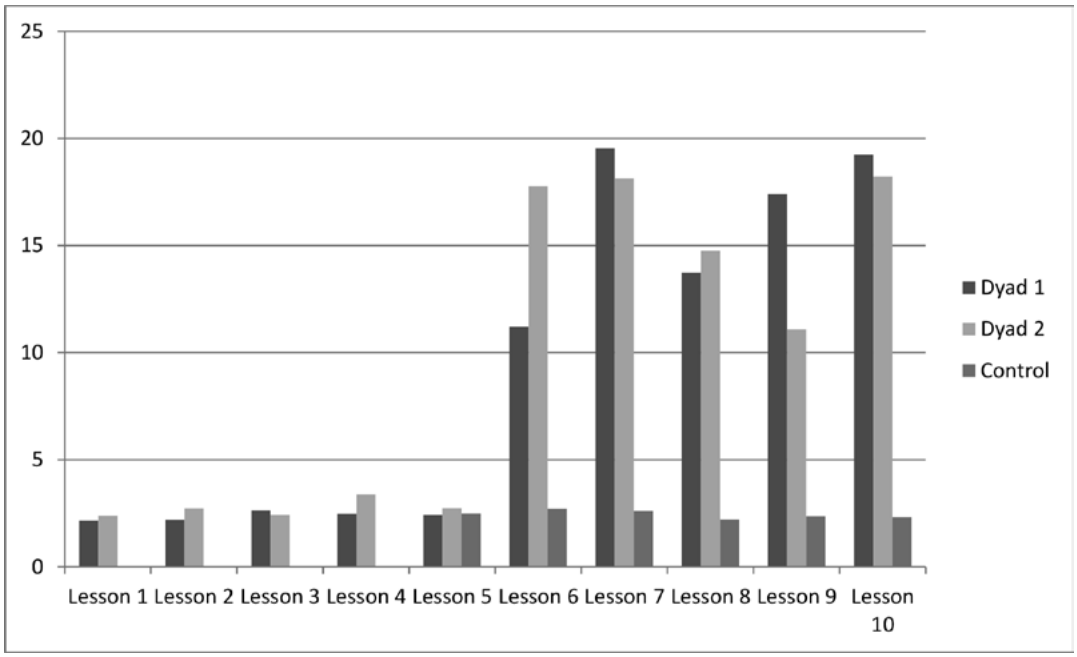

Figure 1. Distance between trainer and trainee on each lesson (in feet).
*(Audio-link introduced after Lesson 5).

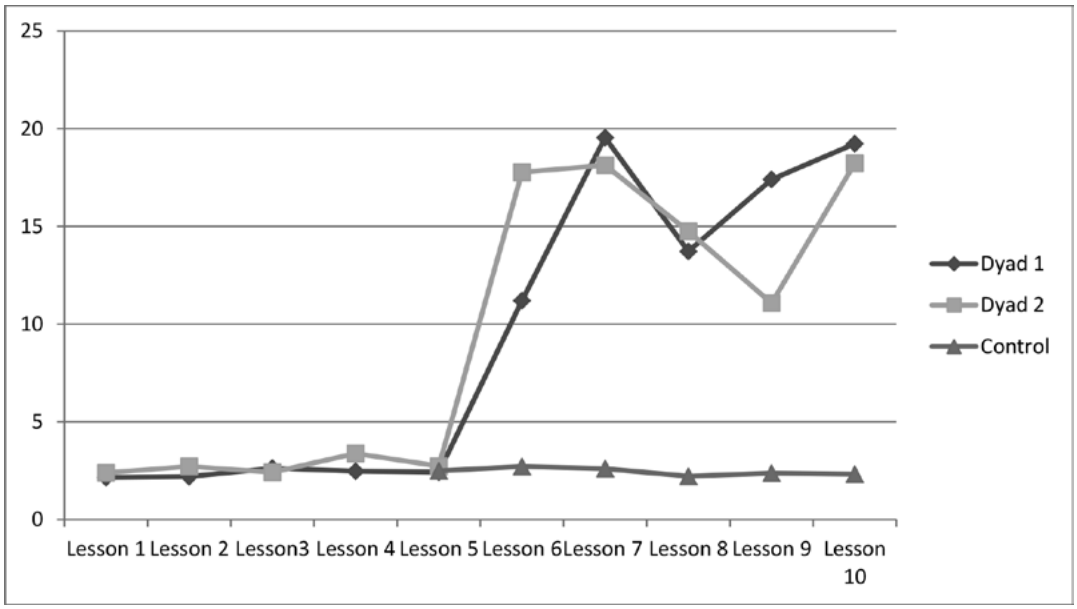

Figure 2. Line graph of distance between trainer and trainee on each lesson (in feet). *(Audio-link introduced after Lesson 5).

without the use of the Audio-link, working distances would not be increased over the lesson sequence.

Comparisons are offered for the transitions between lessons of the identified training sequence after introduction of the audio device. For the two training dyads, distance increased from Lesson 5 to Lesson 6, demonstrating the immediate impact of the use of the Audio-link. In both dyads the distance again increased from Lesson 6 to Lesson 7. While Lessons 6 and 7 represented an introduction to urban travel, each of the lessons was introductory in nature and did not represent the introduction of new skills. It is supposed that this increase in instructional distance represented an opportunity for the trainer to become accustomed to the use of the distance audio system. Both dyads again followed a similar trend as the working distance decreased from Lesson 7 to Lesson 8. It is hypothesised that this downward trend reflected an increase in complexity and/or an increased need in student support. It is only in the transition between Lesson 8 to Lesson 9 that the data showed a divergence in the trends between the two dyads. In Dyad 1 the trainer/trainee distance increased and in Dyad 2 the trainer/trainee decreased. It is proposed that this pattern difference was based on the individual differences in skill acquisition and student needs represented in the two dyads. Finally, in the transition between Lessons 9 and10, both the dyads returned to a similar trend. In both cases the distances increased to the working distances established in Lesson 7.

The distance between the trainer and trainee in the control group followed a similar trend through the evaluated training sequence. Even though operating at a much closer proximity, the trainer-trainee working distance followed a similar path of narrowing the working distance as more

difficult lessons were taught, with a return to, or nearly to, the distance established in earlier lessons (Figure 3).

Discussion

Limitations

Several limitations were present in this study. First, the design of the study was exploratory in nature and limited in scope. The small number of participant dyads was not sufficient to allow a prediction of generalisation of the result to a larger sample of trainees. Second, the participants were drawn from a narrow, heterogeneous population. All were students currently enrolled in the same university O&M program, each had similar amounts of experience, and all were of similar ages. Third, only one-type of Audio-link was used. Fourth, the study examined only the distance between the trainer and trainee, and did not collect information about participants' affective response to the shift in distance resulting from the use of the Audio-link. While participants reported that they felt safe (trainees) and in control (trainers), this information about the experience was collected informally and approximately six months after the measurements occurred. Finally, all of the trainees were sighted individuals who were receiving training while under blindfold.

Recommendations for Future Research

The researchers strongly recommend replication of this study to address these limitations by: increasing the number of training dyads; including a more diverse body of participants (i.e., levels of training age, gender, training programs); including standardised questions in the design that

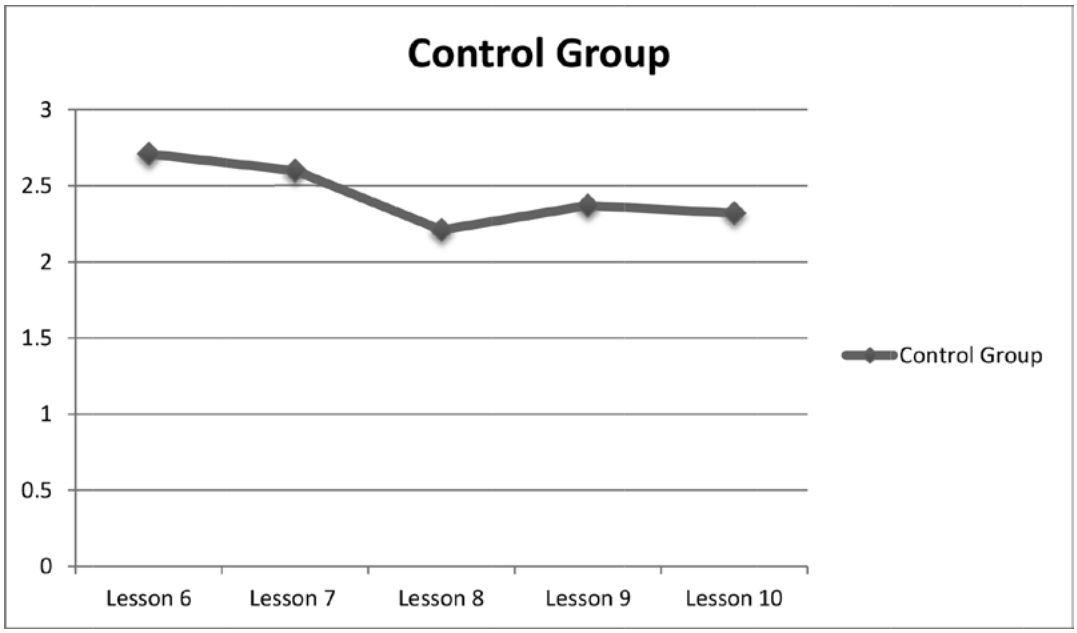

Figure 3. Line graph of dyad distance without the Audio-link over the intervention period (in feet).

assess participants' experiences immediately without and with the use of the Audio-link (i.e., hearing, comfort, anxiety, distraction, and perceived safety); and expanding the criteria for participation to include persons who are vision impaired. This expansion of the use of the Audio-link to participants with vision impairment would help to measure the effectiveness of the device across the field of O&M rather than limit the use to professional training programs. Finally, future researchers might also examine the effectiveness of different types of communication devices. The researchers purposefully selected the one-way communication Audio-link system to ensure that trainees were not able to repeatedly seek feedback and were able to experience a training environment where they were required to make independent decisions without reinforcement or verification. Other systems might prove to be equally as effective in increasing the distance, but currently there is no research-based evidence to support the efficacy of the use of one system over another. For example, participants reported that the use of the Audio-link did not result in any notable decrease in their hearing environmental sounds, including traffic, in spite of the fact that the Audio-link was worn over the ear. Other systems may in time become available to ensure no reduction in the trainee's ability to hear environmental cues while still ensuring the ability to hear commands/ requests from the trainer.

Implications

First, the study results support the use of the Audio-link as a means to increase the working distance between trainer and trainee dyads. The initial hypothesis that without prompt, the use of this form of technology would increase the distance between trainer and trainee was supported. However, further research may be needed to quantifiably verify that this increase in distance enhanced both the trainer's delivery of instruction, (by creating an improved instructional environment), and improved the trainees' functional ability to develop O&M skills (due to increased independence). The use of a distance communication device might have helped to provide an additional level of support from the trainers while still facilitating trainees' assuming increased levels of control in decision-making and skill development. The researchers encourage the continued examination of the impact of Audio-links on the distance between trainer and trainee, but also extend this study to research designs that focus on the effect of the use of such devices on variables such as the results of standardised measures of trainees' evaluation of the training experience, trainees' anxiety, and training outcomes. Doing so would seem imperative in the profession's search to identify best practice with regard to proximity during instruction. It is hoped that the findings from this study will provide some basis to encourage progress in investigations of this critical part of training in O&M.

Second, the results of this study provide some guidelines for trainers' expectations of themselves in training. All three dyads, regardless of lesson, demonstrated similar distance patterns when not using the Audio-link device. For the two dyads that used the Audio-link, the overall trainer-trainees' distance patterns were very similar across both cases and for all lessons (Figure 1). A decrease in distance occurred as the complexity of the setting increased (i.e., noise, pedestrian, and automobile

congestion) and required tasks shifted, and after a time in the new setting an increase in distance emerged once again. This phenomenon across both dyads might be explained in that trainers' may automatically shift distance, based on their own concerns about accessibility to trainees when there is an increase in complexity of the setting and increase in difficulty of tasks required. This finding supports the literature that highlights trainer-perception regarding the importance of proximity in training O&M students. In this case, the use of the Audio-link appeared to mediate the 'need' for accessibility and seemingly frees trainers to allow greater independence (distance) in the completion of tasks even in more challenging environments. However, the adjustment in distance persists and instructors must balance the increased possibility of independence against the mandate to appropriately monitor and ensure the safety of clients (Academy for Certification of Vision Rehabilitation & Education Professionals, 2012). Results suggest that one best practice may be for trainers to anticipate their own distance adjustments during setting and task shifts and to vary proximity based on these shifts.

Third, results suggest that trainers may deviate in distance based on variables that are unique to the dyad. For example, trainers' distance may be influenced by variables other than the complexity of setting or task. Feelings about the trainee, prior experiences with the trainee, confidence in the trainees' skill, familiarity with route/lesson, and years of experience as a trainer are additional variables that might affect trainers' distance adjustments. This factor might reflect the need to consider the impact of these individual differences and provide instruction in training programs that addresses the influence of such variables in training and practice. It is supposed that these personal variables will impact training and in-turn effect training distance.

In summary, it has been demonstrated that the Audio-link provides a trainer with an additional method to safely monitor his or her trainees during O&M lessons. The Audio-link can also be used to facilitate an increase in the instructional distance between these trainer and trainee dyads. Through the use of the audio device trainers can intervene at larger distances even during heavy traffic and high noise situations. It is proposed that the increased distance will allow the trainee the opportunity to independently make decisions as well as simulate real-world travel experiences, as they would while not under supervision. By facilitating the increased distance it is hoped the use of the Audio-link would improve training outcome for the training dyad that employed the device by providing optimal levels of support from distances that promote the highest levels of performance.

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