

An Evaluation of a Self-Instructional Manual for Teaching Individuals to Administer the Revised
ABLA Test to Persons with Developmental Disabilities

by

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Abstract

The Assessment of Basic Learning Abilities (ABLA) is a valuable tool that is used to assess the learning ability of individuals with developmental disabilities (DD). The ABLA was recently revised and is now referred to as the ABLA-R. A self-instructional manual was recently prepared to teach individuals how to administer the ABLA-R (DeWiele, Martin, Martin, Yu, & Thomson, 2011). Using a modified multiple-baseline design across a pair of university students, and replicated across four pairs, I evaluated the effectiveness of the ABLA-R self-instructional manual for teaching the students to administer the ABLA-R to individuals with DD. Each student: (a) after studying a brief description of the ABLA-R, attempted to administer the ABLA-R to a confederate role-playing an individual with DD (Baseline); (b) studied the ABLA-R self-instructional manual (Training); and (c) once again, attempted to administer the ABLA-R to a confederate (Post-Training Assessment). Participants who achieved at least 90% accuracy in conducting the ABLA-R in their Post-Training Assessment with a confederate then administered the ABLA-R to an individual with DD in a Generalization phase. In Baseline, Post-training, and Generalization phases I scored each participant's performance using the ABLA-R Tester Evaluation Form. The overall results indicate that the self-instructional manual is an effective method for training individuals to accurately administer the ABLA-R.

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An Evaluation of a Self-Instructional Manual for Teaching Individuals to Administer the Revised
ABLA Test to Persons with Developmental Disabilities

Introduction

The Assessment of Basic Learning Abilities (ABLA) is a valuable tool for assessing the learning ability of individuals with developmental disabilities (DD). The creation of the ABLA began when Kerr, Meyerson, and Flora (1977) questioned why a task that can be taught easily to one individual with DD may be exceedingly difficult to teach to another individual with DD. Kerr et al. began to analyze the different types of discriminations (e.g., auditory, visual) that were required to perform tasks in the programs taught to the individuals with DD with whom they worked. Based on their observations, they developed the ABLA (previously called the AVC test) which consists of an attempt to teach an individual, using standardized prompting and reinforcement procedures, each of six tasks (called levels) until each task is either passed or failed (according to standardized criteria). The six tasks or levels include: (a) Level 1: Imitation, where the learner's ability to imitate the tester's demonstration is tested; (b) Level 2: Position Discrimination, which tests the learner's ability to discriminate one item versus another item based on their stable positions; (c) Level 3: Visual Discrimination, which tests the learner's ability to visually locate a specific item among an array of two items that randomly alternate positions; (d) Level 4: Visual Match-to-Sample Discrimination, which assesses the learner's ability to match an object to a similar-looking object versus a dissimilar-looking object; (e) Level 5: Auditory Discrimination, a test of the ability to distinguish two vastly different auditory cues; and (f) Level 6: Auditory-Visual Combined Discrimination, a combination of Levels 3 and 5, in which one's ability to distinguish different auditory cues, and visually locate an object identified by the cue, is determined.

Research on the ABLA (which will be discussed later) has indicated that the levels of the ABLA are hierarchically ordered in difficulty (Kerr et al., 1977), and that an individual's pass/fail performance on the ABLA is very useful for matching the learning ability of the individual to the difficulty of training tasks (Martin, Thorsteinsson, Yu, Martin, & Vause, 2008). Research has also indicated that the majority of individuals who pass Level 5 also pass Level 6 (Martin & Yu, 2000). Thus, Level 5 generally does not provide unique information about the individual's learning ability. Sakko, Martin, Vause, and Martin (2004) investigated a visual-visual nonidentity matching (VVNM) task as a possible replacement for the original Level 5. Based on the results of their research, they recommended that the current Level 5 auditory discrimination task be replaced with a VVNM task. The ABLA has since been revised (and is now referred to as the Assessment of Basic Learning Abilities- Revised, or ABLA-R) with a two-choice VVNM discrimination task replacing the original Level 5 auditory discrimination task. A self-instructional manual was recently prepared to teach individuals who wish to administer the ABLA-R how to do so correctly (DeWiele, Martin, Martin, Yu, & Thomson, 2011). The purpose of my research was to evaluate the effectiveness of the self-instructional manual for teaching individuals how to apply the ABLA-R to persons with DD.

ABLA Test Materials

The materials needed to conduct the ABLA test are very simple and easy to find or make. In all six levels, the two containers that are used are a large yellow can, and a shorter square box with red-on-red stripes. In all but one level, the object that the learner must place into a container is a small piece of irregularly-shaped white foam. In the match-to-sample task (Level 4), a small, yellow wooden cylinder and a small red cube with red-on-red stripes are the objects to be put in either the can or the box. Edible reinforcers, such as small candies, potato chips, and

juice are needed for reinforcing the learner's correct responses (in addition to praise).

Additionally, data sheets designed for the ABLA indicate the positioning of test materials presented to the learner, and are used to keep track of correct and incorrect responses (Kerr et al., 1977).

Administering the ABLA

As stated previously, the ABLA test has six levels, each consisting of either an imitation task (Level 1), or a two-choice discrimination task (Levels 2 – 6). At each level the required response is for the testee to put an object into the correct container. At the start of testing of a level, the tester first conducts a demonstration of the correct response, followed by a guided trial (where the tester helps the learner accomplish the task), and then a trial where the learner has a chance to perform the task independently. The tester also uses a simple verbal instruction, such as “Where does it go?” Once the learner has independently responded correctly on a level, testing of that level begins.

To test Level 1 (Imitation), the box is placed in front of the learner. On every trial, the tester says “Where does it go?”, models placing the foam into the box, and then gives the foam to the student, while saying, “Where does it go?” After four correct trials with putting the foam into the box, the process is repeated with imitation of putting the foam into the can. For Level 2 (Position Discrimination), the tester says, “Where does it go?” and the learner must place the foam inside of the yellow can, while the red box and yellow can remain in stable left-right positions. Level 3 (Visual Discrimination) is very similar to Level 2 in that the foam must be placed in the can, except that the can and the box are placed in randomly alternated left-right positions. Level 4 (Visual Match-to-Sample Discrimination) requires that the learner must place either a small yellow cylinder or a red cube (randomly alternated) into its matching receptacle

(the yellow can or red box, which are placed in randomly alternated left-right positions) when the tester says “Where does it go?” In Level 5 (Auditory Discrimination), the yellow can and red box are placed in front of the learner and remain in a stable position. The tester gives the learner a piece of foam, and either says “Red box” in a low-pitched voice, separating each sound, or “Yellow can” in a drawn-out manner with a higher pitch at the end. The learner must then place the foam in the receptacle named by the tester. Level 6 (Auditory-Visual Combined Discrimination) is identical to Level 5, except that in Level 6 the can and box are placed in randomly alternated left-right positions.

Each correct independent response or incorrect response is followed with a consequence. After a correct response, the tester praises the learner and gives the learner a preferred edible. After an incorrect response, the tester says, “No, that’s not where it goes,” or some variation of that phrase, and once again performs a demonstration of the response, a prompted trial, and then gives the learner a chance to respond independently. At each level, testing continues until the learner achieves eight consecutive correct responses, which defines a pass, or eight cumulative errors, which defines a fail, whichever comes first.

Previous Research on the ABLA

Research has consistently demonstrated a number of basic findings concerning the ABLA. First, the six tasks in the ABLA progressively increase in difficulty from Levels 1 to 6, so that if a learner does not pass a certain level, he/she will not likely pass subsequent levels at that time. In one of the first studies to examine the hierarchical difficulty of the levels of the ABLA, approximately ninety-five percent (111 out of 117) of the participants with DD followed the expected pattern of passing all levels below, and failing all levels above, the first level failed (Kerr et al., 1977). In another study (Martin, Yu, Quinn, & Patterson, 1983), 98.5 percent of

participants with DD (133 out of 135) followed the expected pattern, and maintained this pattern at a retest three months later. A number of other studies have also demonstrated the hierarchical difficulty of the ABLA levels with children and adults with intellectual disabilities and children with autism, as well as typically developing children (as reviewed by Vause, Yu, and Martin, 2007).

The ABLA has been shown to have high test-retest and inter-tester reliability (Martin et al., 1983). In one study, researchers administered the ABLA to a sample of 42 individuals with intellectually disabilities; three months later, the researchers again tested the participants. The data demonstrated no change in ABLA level from the first to the second assessment for all of the participants, showing high test-retest reliability, and several different testers were involved in administering the test on the first and second assessments, demonstrating high inter-tester reliability.

The performance of individuals on the ABLA has high predictive validity for the ease or difficulty with which they learn a variety of training tasks (Martin, et al., 2008). In one study, researchers sought to determine whether, and to what degree, the ABLA test performance or the predictions of teaching staff in an education program for individuals with DD was a better predictor of whether a client with DD would be able to learn a task (Stubbings & Martin, 1998). ABLA experts classified twelve typical training tasks in the education program (e.g. sorting kitchen cutlery) according to the highest ABLA level needed to complete the tasks. The ABLA levels of the individuals with DD were assessed by a trained tester, and then student participants attempted to teach each of the twelve previously classified tasks to the individuals with DD. Teaching staff from the education program who were unaware of the clients' ABLA level, but who had: (a) extensive knowledge about the clients with DD, or (b) 30 minutes of interaction

with the clients with DD, were asked to predict which of the twelve tasks the clients with DD would be able to learn when exposed to the ABLA testing procedures and pass/fail criteria. For each client with DD, the researchers predicted that they would only be able to pass each task that was equal to or less than their highest-passed ABLA level. The researchers found that 90% of the predictions of client performance that were made based on their ABLA performance were confirmed. This was superior to the percentage of confirmed predictions (81%) made by the group of teaching staff with extensive knowledge about the clients, and the confirmed predictions (73%) made by the teaching staff with only a limited interaction with the clients. The increasing complexity of the task at each level in the ABLA and the usefulness of the test to predict an individual's ability to learn specific types of tasks have been beneficial for service providers in selecting training tasks that are of an appropriate difficulty for their students. Once an individual's learning level has been assessed, the service provider will have the information required to select tasks that are neither too challenging nor too easy for the learner to complete.

Presenting an individual with DD with a task that is not matched to his/ her highest-passed ABLA level has been associated with a higher percentage of aberrant behaviors than selecting a task matched to the individual's highest-passed level. Vause et al. (2000) observed aberrant behaviors (i.e., inappropriate speech, hyperactivity, rocking, and waving objects) of adult students in three classrooms for people with DD as they worked on tasks that were assigned to them by the course instructors. Eighty-seven percent of the tasks assigned to the students were mismatched to their highest-passed ABLA level. Subsequently, the class instructors underwent self-instructional training on how to perform the ABLA, which consisted of studying a manual developed by DeWiele and Martin (1998), testing two or three clients on the ABLA, and receiving feedback and prompts on selecting training tasks that matched the ABLA level of

the students. The experimenters then observed the students working on the tasks that the instructors selected following training; on average, 78% of the tasks were matched to the students' highest-passed levels. Nine out of 13 students showed a decrease in aberrant behavior when working on matched tasks than mismatched tasks, and the mean percentage of aberrant behavior decreased across all three classrooms. This study shows how selecting a training task that complements an individual's highest-passed ABLA level can result in less disruptive behavior than selecting a mismatched task, and may consequently lead to more effective learning opportunities.

Knowing an individual's ABLA level can also help with selecting a prompting strategy to help the learner accomplish a task. It has been found that individuals with DD, when asked to complete a task via verbal instruction without extra prompts, were significantly less likely to comply with completing the task when their discrimination abilities were at visual levels (i.e., ABLA Levels 2 to 4), or lower than the discrimination abilities necessary to comprehend verbal instructions (i.e., ABLA Levels 5 and 6; Laforce & Feldman, 2000). Individuals at visual ABLA levels were significantly more likely to comply with verbal instructions when paired with a visual prompt, versus no prompt. For example, an individual who can discriminate up to ABLA Level 3 may not comply when simply asked by a teacher to wipe the table, but when the teacher says, "Wipe the table," *and* points to a cloth and a table, the individual will likely comply as he/she is able to understand this type of discrimination (Laforce & Feldman, 2000). Therefore, issuing an instruction in a manner that is consistent with the learner's discrimination ability, or ABLA level, will increase the amount of cooperation on behalf of the student.

Level 5 of the ABLA (Auditory Discrimination)

The original Level 5 of the ABLA was intended to test an easier type of discrimination than Level 6. However, the two levels are very similar in procedure, and the value of Level 5 has been questioned by researchers. Martin and Yu (2000) examined six studies testing a total of 197 participants, and found that 96% of participants who passed Level 5 also passed Level 6. Therefore, it appears that Level 5 is not effective in providing unique information about one's learning abilities, for the great majority of individuals. DeWiele, Martin, and Garinger (2000) proposed omitting Level 5 from the ABLA. Considering that Level 4 assesses visual-visual identity matching skills (the ability to match identical objects), Martin and Yu (2000) suggested testing a visual-visual *nonidentity* matching task (VVNM) as a possible replacement for Level 5. VVNM is a task that requires matching one item (e.g., a fork) with another item that is physically different (e.g., a knife), yet both are related in some way (i.e., both are utensils).

Sakko et al. (2004) investigated a VVNM prototype task as a possible replacement for Level 5. The VVNM task required participants to place either a silver-colored piece of wood that formed the word "BOX" into the red box, or a purple piece of wood forming the word "Can" into the yellow can when asked by the tester, "Where does it go?" The left-right position of the box and can, and the manipulandum given to the learner, were randomly alternated throughout trials. All other procedures were the same as the testing of Level 4 in the original ABLA test, such as the initial 3-step sequence at the beginning of the level (presenting a demonstration, guided trial, and a chance for a correct independent response), the error correction and reinforcement procedures, and the pass/fail criteria. After assessing 23 adult participants with DD, researchers found that the VVNM prototype task was more difficult than Level 4 (visual-visual identity matching), yet easier than Level 6 (auditory-visual discrimination). They also demonstrated that the prototype task had high predictive validity for other VVNM tasks, and

high test–retest reliability one month after the original assessment. Hence, it appears that replacing the original Level 5 task with the VVNM prototype task could provide valuable insight into the learning abilities for individuals who pass Level 4 but not Level 6.

Learning How to Conduct the ABLA

The original description of the ABLA. Researchers and service providers who wanted to learn how to perform the ABLA previously used the original description of procedures published by Kerr et al. in 1977. The original description from the monograph issue of *Rehabilitation Psychology* was intended for viewing by researchers. It was not easily accessible to the average service provider, and some of the testing instructions were somewhat vague. In the description of test procedures, for example, the authors gave vague instructions such as, “Offer food intermittently (whatever it takes to keep child responding)” (p. 186), and, “Use whatever verbal explanation seems comfortable” (p. 186). The description of the verbal instructions to be issued by the tester in Level 5 may have also been confusing for readers. For example, the authors stated, “Speak clearly and draw out "y-e-l-l-o-w c-a-n" raising voice slightly at end. Say "red box" slowly but in staccato fashion in lower voice” (p. 189). Without the experience of observing the ABLA administered by a trained person, a direct-care staff member might find it difficult to replicate the verbal instructions as intended by the authors from reading the description alone.

A self-instructional manual for learning how to conduct the ABLA. In response to the need for a method to train direct care service providers on how to conduct the ABLA, DeWiele and Martin (1998) designed a self-instructional training manual. The manual, which was written at a Grade 8.8 reading level, contained an introduction to the ABLA, general

instructions on administering the test, specific instructions on testing each level, study questions, and a section on classifying training tasks according to the levels of the ABLA.

To evaluate the effectiveness of the self-instructional manual, researchers conducted two studies (DeWiele, Martin, & Garinger, 2000). In the first study, researchers compared the ABLA manual to an information package by Kerr et al. (1977), consisting of an introduction to the ABLA, the original description of test procedures (as described earlier), a summary of research findings from the ABLA, and Appendices A, B, and C from the monograph by Kerr et al. (1977). Twenty-one undergraduate university students were randomly assigned to study either the self-instructional manual or the information package. When comparing the results of the two groups, researchers found that the self-instructional manual was more effective than the information package in teaching the students how to correctly administer the ABLA to a confederate role-playing an individual with DD. The self-instructional manual group also scored higher than the information package group on all five other measures, including a comprehension exam, a speed exam, a task classification exam, a test of classifying tasks according to ABLA levels, and accuracy recording ABLA test trials. Though the results were promising, the authors of the manual believed there to be some room for improvement.

Based on the results of Study 1, DeWiele et al. (2000) revised the self-instructional manual and tested it with direct-care service providers in Study 2. Changes made to the manual included introducing role-play exercises, re-wording phrases, and simplifying the data sheets. Other changes to the manual affected the ABLA test procedure, such as simplifying the verbal instructions given by the tester during Levels 1 through 4 and, most notably, removing Level 5. In a field test of the revised manual, participants spent an average of 5 hours and 55 minutes studying the manual and role-playing administering the ABLA to a partner. After achieving

mastery (90%) on comprehension, speed, and task classification exams, participants each administered the ABLA to three individuals with DD. The average procedural reliability with which participants conducted the ABLA was 82%, and, on average, they accurately recorded data from test trials 84% of the time. The results of this study showed that the self-instructional manual can teach direct-care service workers sufficiently to apply the ABLA.

A revised self-instructional manual for learning how to conduct the ABLA-R. As stated previously, the ABLA was revised with a VVNM prototype task replacing Level 5 (Sakko et al., 2004), and there is now a revised version of the ABLA self-instructional manual titled, “The Assessment of Basic Learning Abilities – Revised,” or ABLA-R (DeWiele et al., 2011). The revised manual describes in detail useful information on the ABLA-R test in Part I, beginning with an introduction to the ABLA-R levels and how they relate to everyday tasks, followed by general guidelines including information on test materials, the testing environment, prompting, reinforcement, and error corrections. The manual then goes on to describe, in detail, how to test each level of the ABLA-R, including the new Level 5, and how to avoid frequent errors that testers make. The new manual also includes revised and, presumably, improved score forms for each of the ABLA-R levels. Study questions and role-play exercises are interspersed throughout the manual to help readers master the material. Part II was devoted to teaching the reader how to classify training tasks (e.g., setting a table) according to the ABLA-R level required to complete them. The ABLA-R score forms and a summary of steps to follow are also part of the manual.

Statement of the Problem

In the current study, I evaluated the effectiveness of the ABLA-R self-instructional manual for training university students to administer the ABLA-R with a confederate role-

playing a person with DD. To assess whether the skills learned from the manual would generalize to a more natural scenario, participants who achieved a mean of at least 90% accuracy across the three levels assessed with a confederate in the Post-Training Assessment then assessed an adult with DD. Based on the results of DeWiele et al.'s (2000) study on the previous version of the manual, and on the general improvements upon the manual, I predicted that accuracy in administering the ABLA- R would increase from below 50% in Baseline to above 90% in the Post-Training Assessment for participants, and that all participants included in Generalization would maintain high accuracy when testing an individual with DD by scoring over 80% ABLA-R accuracy.

Method

Participants and Setting

The protocol for this study was approved by the University of Manitoba Psychology/Sociology Research Ethics Board, and the St. Amant Decision of Research Access Committee. Eight undergraduate university students were recruited from a behavior modification course at the University of Manitoba by a letter from the class instructor. Students who volunteered first were chosen as participants, and informed consent was obtained prior to beginning the study. Students were given the option to participate in the study in place of assigned practica that were to be completed throughout the year, and that were worth 10% of the students' grade. Full credit was given to the students, all of whom completed all phases of the study for which they qualified. Participants who achieved mastery in the Post-Training Assessment and participated in Generalization also received a \$40.00 cash honorarium.

The sample of student participants included two males and six females with a mean age of 28 years (range: 19–78 years), all of whom learned English as their first language. On average,

the participants had attended university for 4 years (range: 3–5 years). Six participants' major area of study was psychology, one participant had not declared a major subject area, and one participant did not specify a major subject area. Four participants had previously worked with or taken care of an individual with a developmental disability; the nature of their experience included volunteering and working as a child/personal care assistant. None of the participants had ever been trained to administer the ABLA-R, nor had any participants previously encountered the ABLA-R in their work or volunteer experience.

I also recruited one adult with DD who received services from St.Amant, a residential and treatment facility for individuals with DD. Given her diagnosis, consent was obtained from her legal guardian. The Privacy Officer at St.Amant mailed letters to the parents/legal guardians of potential participants, outlining the nature and purpose of the study. The letter emphasized that decision makers as well as participants were free to decline at any time and that this would not affect any services they are receiving now or in the future from St.Amant or from the University of Manitoba.

All sessions were conducted at St.Amant in a private, soundproof testing room with a table and chairs.

Materials

During the first phase (Baseline), participants received four pages of abbreviated instructions for administering the ABLA-R to individuals with DD (see Appendix A). The abbreviated instructions provided a short description of the tasks that the tester would attempt to administer for each level, the pass and fail criteria, a brief table describing the testing set-up and response required for each level, as well as a list of steps to follow during the assessment. The materials needed to conduct the ABLA-R test were also provided and, depending on the levels

that were selected for the participant to assess, may have included: a red and white striped box and cube, a yellow can and cylinder, a piece of white foam, the word “BOX” cut out from cardboard and painted silver, and the word “CAN” cut out from cardboard and painted purple. The participants also received data sheets for recording the confederate’s responses during the ABLA-R. Edibles were provided for each participant to distribute to the confederate as a reinforcer for correct responses.

During the second phase (Training), the self-instructional manual, a highlighter, a pen, scrap paper, and photocopies of the Study Exercises in the manual were given to participants. All of the above-mentioned materials necessary to conduct the ABLA-R were available to the participant during Training (as the practice exercises in the manual required a participant to role-play levels of the ABLA-R), and for the Post-Training and Generalization assessments. Data sheets and edible reinforcers were also used by a participant during Post-Training and Generalization. All Baseline, Post-training, and Generalization assessments were recorded with a video camera or a laptop equipped with a built-in camera.

During Baseline and Post-Training assessments where a participant attempted to test a confederate role-playing a person with DD, the confederate followed a script of response patterns. A different script was created for each ABLA-R level, and followed for every participant. All scripts included a mixture of errors and correct responses that a confederate would perform, and whether the confederate would “pass” or “fail” differed for each level. The confederate “passed” Levels 1, 2, and 5, and “failed” Levels 3, 4, and 6. The reasoning behind whether the confederate would meet the pass or fail criteria for each specific level was based on the counterbalanced order in which the levels were tested in Baseline, as described later.

Most assessments were videotaped, but the majority of sessions were scored live for participants' accuracy in carrying out the ABLA-R, using the ABLA-R Tester Evaluation Form (ABLA-R TEF; Martin, Martin, Yu, Thomson, & DeWiele, 2011; see Appendix B). A pilot test, in which two or more observers used the ABLA-R TEF to independently score the performance of participants administering the ABLA to a confederate role-playing a person with DD, was conducted. In the pilot test, the ABLA-R TEF was found to have high inter-observer reliability (IOR) for live scoring and high face validity when the form was evaluated by experts with extensive experience administering the ABLA-R.

Research Design

The research design I used to assess the self-instructional manual was a modified multiple-baseline design across a pair of participants, and replicated across four pairs. The independent variable was exposure to the self-instructional ABLA-R manual, and the dependent variable was participants' accuracy in administering the ABLA-R. The first participant of each pair was scheduled for one six-hour session, which included Baseline, Training, and a Post-Training Assessment. The second participant of each pair was scheduled for a one-hour Baseline session that occurred at approximately the same time as the Baseline for the first participant, followed by a six-hour session the next day for a second Baseline session, and for Training and a Post-Training Assessment. All participants who qualified for Generalization participated in one half-hour session, approximately one week after the Post-Training Assessment.

Procedure

Phase 1: Baseline. A participant was asked to read a written overview and informed consent letter, and sign the consent form if he/she agreed to participate. I then distributed the abbreviated instructions (see Appendix A) and allowed the participant 10 minutes to read them

before the participant attempted to assess the confederate (role-playing a person with DD) on three levels of the ABLA-R.

As time constraints would not allow for all six levels of the ABLA-R to be tested for each participant during a Baseline session, three levels were selected for each participant to perform. The selected levels were chosen to separate ABLA-R levels that have a very similar set-up; specifically, a participant did not test the confederate on Levels 2 and 3, or Levels 4 and 5 in the same session. This precaution was taken to avoid any practice effects from administering similar levels in one session, and to test a variety of levels that are dissimilar. In the first pair, Participant 1 attempted to administer Levels 1, 3, and 5 in Baseline; Participant 2 attempted to administer Levels 2, 4, and 6 in the first Baseline session, and Levels 5, 3, and 1 in the second Baseline session. In the second pair, Participant 3 attempted to assess the confederate on Levels 6, 2, and 4 in Baseline; Participant 4 attempted to assess Levels 3, 5, and 1 in the first Baseline session, and Levels 4, 6, 2 in the second Baseline session. Lastly, in the third pair, Participant 5 was assigned Levels 1, 6, and 3 in Baseline; in the first Baseline session, Participant 6 was assigned Levels 2, 5, 4, and in the second session, he or she attempted to administer Levels 3, 1, and 6. Assessing the participants on the same three levels in Baseline and the Post-Training Assessment allowed a direct comparison of a participant's performance on each ABLA-R level across phases.

During the Baseline assessments, the confederate, who role-played a person with DD, sat at a table across from a participant. All of the ABLA-R testing materials were placed on the table, along with edible reinforcers (e.g., Smarties), a data sheet, and the Abbreviated Instructions (see Appendix A). The participant was then instructed to attempt to assess the

confederate on each of the three levels previously chosen, to the best of their current ability, while the confederate followed the script for responding.

Phase 2: Training. The training was primarily self-instructional; the manual that participants read covers vital information on administering the ABLA-R. Specifically, the manual includes: (a) an introduction to the ABLA-R, briefly describing how each level is relevant to everyday activities, (b) general information on administering the ABLA-R (e.g., gathering the required testing materials, preparing the testing environment, how to reinforce correct responses, how to perform an error correction for an incorrect response, etc.), (c) detailed guidelines for testing each of the six ABLA-R levels, and, (d) an explanation of frequent errors that new testers occasionally make and how to avoid making these error during testing. The self-instructional manual contains 11 Study Exercises (for a total of 88 study questions) consisting of fill-in-the-blank, true/false, and multiple-choice questions to help the reader learn the material fully, as well as role-play exercises for practicing each level that can be completed with a partner, or (as in this case) by oneself. The manual also contains material on how to classify training tasks in accordance with the levels of the ABLA-R. Given that I was evaluating the participants' abilities to learn how to conduct the ABLA-R, the participants were only required to read up to page 43, and the section on classifying tasks was omitted.

Although the manual is self-instructional, contingencies were put in place to ensure that the participants followed all directions and completed all exercises in the manual. Participants were advised to highlight the answers to the questions in the Study Exercises in the manual. Photocopies of the Study Exercises in the manual were given to the participants who were asked to write their answers to the questions in the Study Exercises on the photocopies provided. I collected the photocopied Study Exercise at the end of each chapter after a participant had

written in his/her answers to the questions. When a participant had completed the manual, he/she was asked to write a mastery test consisting of 22 questions randomly selected from all chapters. A participant was asked to re-study and re-write the answers to any questions that he/she did not answer correctly. The manual also includes three exercises instructing a participant to role-play administering the levels of the ABLA-R with an imaginary or actual partner acting as the person being assessed. To ensure that the participants followed through with the role-play exercises, I played the role of the testee during practice role-play of the ABLA-R, but no feedback was given to the participants regarding their performance.

Phase 3: Post-Training Assessment. After a participant completed the required reading, a Post-Training Assessment was conducted. In the Post-Training Assessment, the participant attempted to teach the confederate, role-playing an individual with DD, the same three levels of the ABLA-R as in Baseline. For the second participant in each pair who underwent two Baseline sessions, the three levels from the first Baseline session were tested. The Post-Training Assessment procedure was the same as in Baseline, except that the participants were only allowed to refer to a copy of Table 2 from the Abbreviated Instructions used during Baseline, not the entire instructional package.

Phase 4: Generalization. All participants who scored a mean of 90% across three levels in the Post-Training Assessment with least 80% accuracy on each level also conducted a full ABLA-R session with an adult with DD. The same materials were used as in the Post-Training Assessment, except for the reinforcers given to the participant with DD. Prior to beginning the Generalization session, direct-care staff who cared for the participant with DD completed a short questionnaire indicating what types of edibles or activities were typically reinforcing for the participant, in addition to any health issues or dietary restrictions to be considered. At the

beginning of a Generalization session and frequently throughout the session, the student participant and the researchers conducted a preference assessment by offering the participant with DD a choice of edibles and asking the participant to select one. A selected edible was used as a reinforcer during the ABLA-R assessment. The student participant began administering the ABLA-R from Level 1 and continued until the participant with DD failed a level. All Generalization sessions were supervised by a person who has experience in ABA and working with individuals with DD.

Inter-Observer Agreement (IOA)

To assess the IOA on participants' ABLA-R performance, I used the ABLA-R TEF to score each participant's live sessions of administering the ABLA-R in Baseline, Post-Training Assessment, and Generalization. Another trained experimenter independently scored 100% of the sessions from live observation using the ABLA-R TEF. An agreement occurred when the observer and I scored an item the same (i.e., both scored an item as correct or both scored an item as incorrect). A disagreement occurred when the observer and I scored an item differently from each other (i.e., one scored the item as correct and the other scored it as incorrect or vice versa). Percent agreement was computed for each observed session by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100% (Martin & Pear, 2011). The mean percent agreement across all phases and sessions was 93.85% (range: 67.00%-100.00%).

Procedural Integrity (PI)

The procedural integrity of 68% of sessions was scored from live observation by a trained observer, which included at least one session during each phase of the study across participants. For each observed session, the observer recorded whether the experimenter followed the

procedure as planned using a checklist (see Appendix C). Procedural integrity was 100% for all observed sessions.

Results

Participants' Individual ABLA-R Accuracy

The effects of the self-instructional manual on participants' accuracy in administering the ABLA-R are shown in Figure 1. Each multiple-baseline design graph depicts the performance of a pair of participants, measured by percentage correct on the ABLA-R TEF, on each ABLA-R level administered across sessions and phases.

Pair 1. In Baseline, P1 administered Levels 3, 6, and 5 of the ABLA-R to a confederate, in that order, and correspondingly scored 26%, 19%, and 22% accuracy on the ABLA-R TEF. In a Post-Training Assessment, P1 administered Levels 3, 5, and 6 in that order, and respectively scored 86%, 93%, and 90% ABLA-R accuracy. Thus P1's ABLA-R accuracy improved from a mean of 22% in Baseline to a Post-Training mean of 90%, for a 67% improvement. Since P1 scored over 90% in the Post-Training Assessment, this participant subsequently assessed an individual with DD on the ABLA-R in a Generalization phase. In Generalization, P1 administered Levels 1 through 5 of the ABLA-R, at which point the participant with DD failed Level 5 and P1 ended the ABLA-R session accordingly. In the Generalization assessment, P1 obtained a high mean accuracy score of 87% across the five levels (Level 1, 74%; Level 2, 97%; Level 3, 93%; Level 4, 86%; and Level 5, 86%).

During Baseline 1, P2 administered Levels 3, 5, and 6 of the ABLA-R to a confederate and achieved ABLA-R accuracy scores of 24%, 24%, and 29%, respectively. During Baseline 2, P2 administered the same three levels as in Baseline 1, but in a different, randomized order of Levels 3, 6, and 5. In Baseline 2 P2 scored 19%, 20%, and 14% accuracy, respectively. Thus,

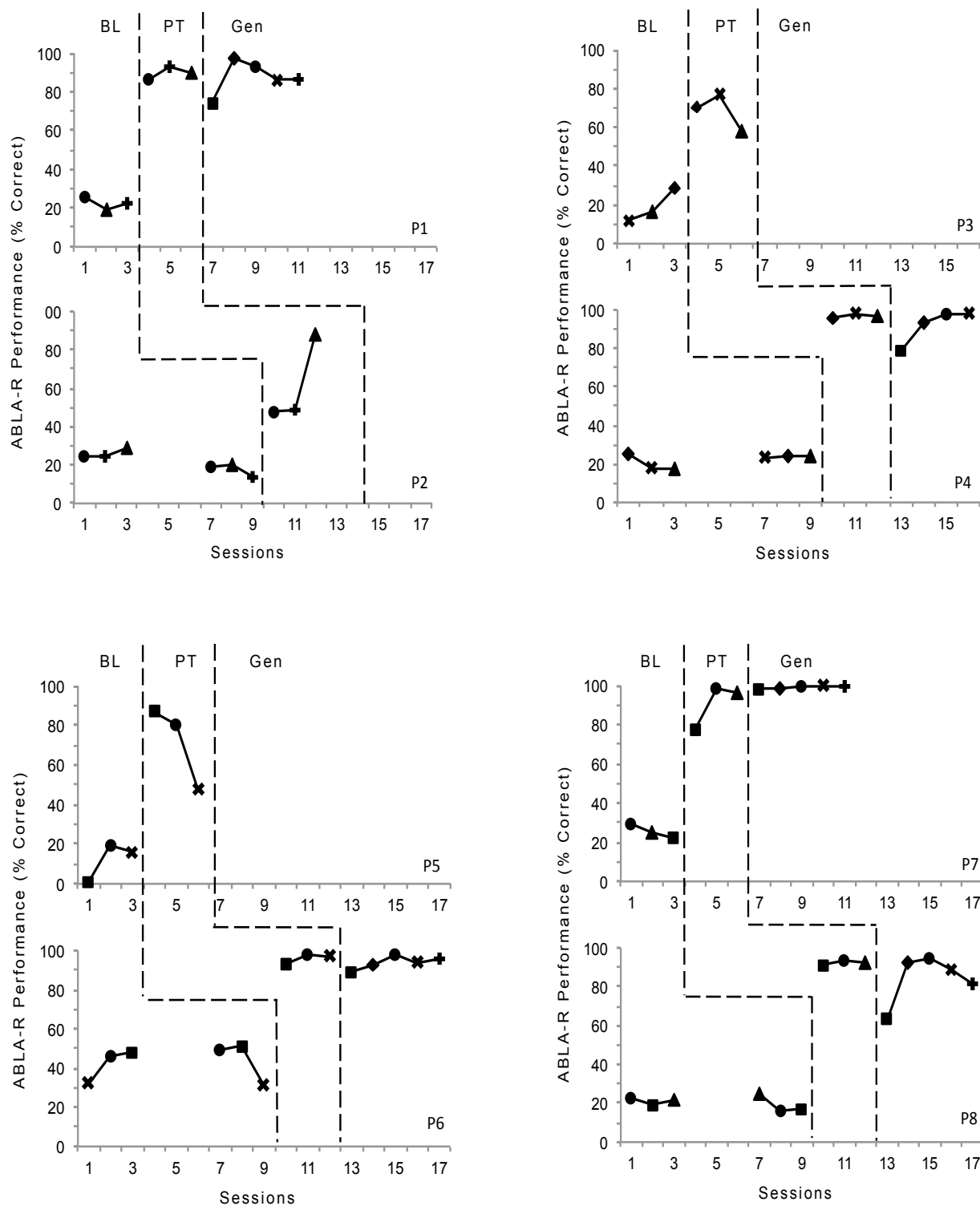


Figure 1. Accuracy in administering the ABLA-R, shown as percent correct on the ABLA-R TEF across all phases and Levels for each pair of participants. ABLA-R levels are represented as follows: Level 1 (■), Level 2 (◆), Level 3 (●), Level 4 (✕), Level 5 (+), and Level 6 (▲).

P2's ABLA-R accuracy improved from a mean of 22% in Baseline to a Post-Training Assessment mean of 62% across levels, for a 40% improvement. In a Post-Training Assessment P2 administered Levels 3, 5, and 6 to a confederate and obtained 48%, 49%, and 88% accuracy on those respective levels.

Pair 2. In Baseline, P3 administered Levels 4, 6, and 2 of the ABLA-R to a confederate, in that order, and correspondingly achieved 12%, 16%, and 29% accuracy with the ABLA-R TEF. P3 administered ABLA-R Levels 3, 5, and 6, in that order, in a Post-Training Assessment, with respective accuracy scores of 70%, 77%, and 58%. Thus, P3's ABLA-R accuracy increased from a mean of 19% in Baseline to a mean of 68% in a Post-Training Assessment, for a 49% improvement.

P4 administered the ABLA-R with a mean accuracy score of 22% in the Baseline phase. In Baseline 1, P4 administered Levels 2, 4, and 6, in that order, and obtained ABLA-R accuracy scores of 25%, 18%, and 17%, respectively. In Baseline 2, P4 administered Levels 4, 2, and 6 with respective accuracy scores of 23%, 24%, and 24%. In a Post-Training Assessment, P4 administered Levels 2, 4, and 6 with corresponding ABLA-R TEF scores of 96%, 98%, and 97%. Thus, P4's ABLA-R accuracy improved from a mean of 22% in Baseline to a Post-Training mean of 97%, which is a 75% increase. In a Generalization assessment, P4 obtained a mean ABLA-R accuracy of 92% (Level 1, 70%; Level 2, 93%; Level 3, 98%; and Level 4, 98%).

Pair 3. In a Baseline assessment, P5 administered levels 1, 3, and 4 to a confederate, in that order, with respective ABLA-R accuracy scores of 1%, 19%, and 16%. In a Post-Training Assessment, P5 administered Levels 1, 3, and 4 to a confederate, in that order, with 87%, 80%, and 48% ABLA-R accuracy. Thus, P5's ABLA-R accuracy improved from a Baseline mean of 12% to a Post-Training mean of 72%, for a 60% increase.

In Baseline 1, P6 administered Levels 4, 3, and 1, in that order, to a confederate and respectively scored 32%, 46%, and 48% on the ABLA-R TEF. In Baseline 2, P6 administered Levels 3, 1, and 4, in that order, and scored 49%, 51%, and 31% ABLA-R accuracy. In a Post-Training Assessment, P6 administered Levels 1, 3, and 4, in that order, and respectively scored 93%, 98%, and 97% ABLA-R accuracy. Thus, P6's ABLA-R accuracy improved from a mean of 43% in Baseline to a Post-Training mean of 96%, for an overall improvement of 53%. In a Generalization assessment, P6 obtained a mean accuracy score of 94% (Level 1, 89%; Level 2, 93%; Level 3, 98%; Level 4, 94%; and Level 5, 96%).

Pair 4. In Baseline, P7 assessed the confederate on Levels 3, 6, and 1 of the ABLA-R, in that order, with 29%, 25%, and 22% accuracy, respectively. In a Post-Training Assessment, P7 administered Levels 1, 3, and 6, in that order, with respective ABLA-R accuracy scores of 77%, 98%, and 96%. Thus, P7's ABLA-R accuracy improved from a mean of 25% in Baseline to a Post-Training mean of 90%, for a 65% improvement. In Generalization, P7's mean accuracy was 99% (Level 1, 98%; Level 2, 98%; Level 3, 100%; Level 4, 100%; and Level 5, 99%).

In Baseline 1, P8 administered Levels 3, 1, and 6 of the ABLA-R, in that order, with 23%, 19%, and 22% accuracy, respectively. In Baseline 2, P8 administered Levels 6, 3, and 1, in that order, with respective accuracy scores of 25%, 16%, and 17%. In a Post-Training Assessment, P8 assessed the confederate on Levels 1, 3, and 6, in that order, and scored 91%, 94%, and 92% ABLA-R accuracy, respectively. Thus, P8's ABLA-R accuracy increased from a mean of 20% in Baseline to a Post-Training mean of 92%, for a 72% improvement. In Generalization, P8 administered five levels of the ABLA-R with a mean ABLA-R accuracy score of 84% (Level 1, 63%; Level 2, 92%; Level 3, 95%; Level 4, 89%; and Level 5, 81%).

Internal Validity of the Results

Based on the single-case design visual-inspection guidelines described by Martin and Pear (2011), the results show high internal validity. First, can be seen in Figure 1, ABLA-R accuracy scores were relatively stable across Baseline sessions for all participants except P3. Second, there was a large, immediate effect visible in the graphs from Baseline to Post-Training Assessments for all participants with zero overlapping points. Third, the modified multiple-baseline design across a pair of participants, replicated across four pairs, clearly demonstrates experimental control of the treatment over the dependent variable. Thus, the improvement in ABLA-R accuracy was clearly due to mastering the ABLA-R self-instructional manual.

External Validity of the Results

All eight participants improved their accuracy in administering the ABLA-R to a confederate role-playing a person with DD, with a mean improvement from Baseline to Post-Training Assessment of 60%. On average, participants administered the ABLA-R to a confederate role-playing a person with DD with 23% accuracy in Baseline (range: 12%-43%). After mastering the manual, participants administered the ABLA-R to a confederate with 83% accuracy during a Post-Training Assessment (range: 62%-96%). Five out of 8 participants achieved 90% or greater ABLA-R accuracy in a Post-Training Assessment and consequently participated in a Generalization assessment. The mean ABLA-R accuracy score across participants in Generalization was 91% (range: 84%-99%), which is an 8% improvement from participants' mean Post-Training Assessment ABLA-R accuracy score, although this mean increase is accounted for largely by P7's low ABLA-R accuracy in the Post-Training Assessment. Thus, while the results need to be replicated with additional participants, this initial evaluation of the ABLA-R self-instructional manual shows good external validity.

Performance on ABLAR-TEF Components

To further examine the participants' ABLA-R performance during the Post-Training Assessment I examined the average number of correct responses for each item of the ABLA-R TEF within each of the six levels. The mean percentage of correct responses was calculated by dividing the number of instances that an ABLA-R TEF item was performed correctly out of the total number of opportunities for that item across all ABLA-R levels and across all participants (see Table 1). As can be seen in Table 1, after Training, the ABLA-R TEF items with the lowest scores included Items 10 ("Switch containers"), 7.b. ("Praise for correct" during the initial opportunity for an independent response with the second manipulandum), and 8.c. ("Correct instruction + model"). The mean percentage correct on ABLA-R TEF items across phases per level are presented in Appendices D-I.

Amount of Training Time Required

The average amount of time that participants required to master the self-instructional ABLA-R manual included time spent reading the manual and engaging in the role-play practice exercises with a partner. Participants spent an average of 2 hours and 43 minutes on Training, with a range of 1 hour and 35 minutes to 4 hours and 47 minutes.

Discussion

The purpose of this study was to examine the effectiveness of a self-instructional manual for teaching individuals how to correctly administer the ABLA-R to individuals with DD. I hypothesized that participants would improve from below 50% ABLA-R accuracy in Baseline to above 90% in a Post-Training Assessment. All participants showed a large improvement and 5 out of 8 participants (62.5%) achieved the mastery criterion, and only 2 out of 5 participants who mastered the Post-Training Assessment had previous experience with individuals with DD.

Table 1

Mean Percentage Correct on ABLA-R TEF Items Across Phases

ABLA-R TEF Items	BL	PT	G*
Initial Prompting Sequence			
1. Proper set-up	88.89	100.00	100.00
2. Initial demonstration:			
a. Correct instruction	0.00	75.00	88.89
b. Demo	16.67	91.67	100.00
3. Initial guided trial:			
a. Correct instruction	0.00	66.67	66.67
b. Guidance	5.56	100.00	100.00
c. Praise	5.56	83.33	90.00
4. Initial opportunity for independent response:			
a. Correct instruction + model**	0.00	75.00	75.00
b. Correct instruction	0.00	75.00	77.78
c. Praise for correct	18.75	58.33	22.22
d. and e.***	-	-	-
5. Initial demonstration:****			
a. Correct instruction	0.00	66.67	87.50
b. Demo	16.67	75.00	100.00
6. Initial guided trial:****			
a. Correct instruction	0.00	66.67	66.67
b. Guidance	5.56	66.67	100.00
c. Praise	5.56	66.67	100.00
7. Initial opportunity for independent response:****			
a. Correct instruction	0.00	66.67	88.89
b. Praise for correct	17.65	25.00	22.22
c. and d.***	-	-	-
Test Trials			
8. Discrete trial:			
a. Container position	67.26	94.83	92.05
b. Correct manipulandum*****	70.55	96.05	92.66
c. Correct instruction + model**	0.00	42.86	58.97
d. Correct instruction	41.16	83.98	98.69
e. Praise and reinforcer for correct	38.22	84.55	99.03
f. "No. That's not where it goes" for error	33.13	91.67	96.88
g. If error:			
i. Demo	1.27	69.63	86.67
ii. Guided trial	3.77	61.48	63.33
iii. Opportunity for independent response	13.38	92.44	86.67
9. Response recorded immediately/accurately	8.80	96.71	93.33
10. Switch containers**	0.00	25.00	40.00
11. Pass or fail criterion was met	9.38	62.50	77.27

Note. BL = Baseline, PT = Post-training, and G = Generalization. *, Levels 1-5 were assessed.

** , This applies to Level 1 only. ***, 4.d., 4.e, 7.c., and 7.d. refer to items for errors on the opportunity for an independent response, but such errors never occurred. ****, Items 5, 6, and 7 refer to Levels 4 and 5 because of the second manipulandum, and to Level 6 because of the two instructions ("REDBOX") or ("Y-e-l-l-o-w...c-a-n"). ***** , This applies to Levels 4 and 5 only.

Furthermore, I predicted that participants would maintain high ABLA-R accuracy scores above at least 80% in Generalization. This hypothesis was supported as all participants who administered the ABLA-R to an individual with DD demonstrated ABLA-R accuracy above 80%, and one participant administered the ABLA-R with greater accuracy in Generalization than in a Post-Training Assessment. The results of this research contribute to the literature on effective self-instructional training tools.

These findings are consistent with DeWiele et al.'s (2000) results in their evaluation of an ABLA self-instructional manual which indicated that university students more accurately administered the original ABLA after studying a self-instructional manual versus an information package, and direct-care workers improved after studying a revised self-instructional manual for administering the ABLA without Level 5.

Although all of the participants demonstrated a clear effect from Baseline to Post-Training Assessment, as illustrated in Figure 1, the Post-Training Assessment data for P2 shows an overall smaller effect than was observed for the other participants. P2 administered the first two levels (Levels 3 and 5) in the Post-Training Assessment with medium accuracy and the last level (Level 6) with high accuracy. The reason for this large difference between the first two levels and the last level tested is evident upon inspection of the ABLA-R TEF scores for P2's Post-Training Assessment. When administering the initial prompting sequence at the beginning of Levels 3 and 5 and on each trial, the tester must ask the testee, "Where does it go?" and hand the testee the manipulandum (either a piece of foam or the words *Can* and *BOX* cut from cardboard) to be placed in a container, according to the self-instructional manual. However, when administering Level 3 to a confederate P2 consistently asked, "Where does the foam piece go?" instead of, "Where does it go?" In clinical practice, this deviation may be considered

acceptable if used consistently as it does not contain an auditory discrimination cue that could confound the visual discrimination task assessed in Level 3. For the purpose of consistent scoring across participants in this study, the verbal S^D that the participant issued to the confederate had to identically match the verbal S^D described in the manual in order to be scored as correct on the ABLA-R TEF (see the ABLA-R TEF for Level 3 in Appendix B). Therefore, P2 consistently erred on the items designed to assess whether the participant delivered the correct S^D , which greatly affected the participant's accuracy score for Level 3. Similarly, when administering Level 5 (in which the tester hands the testee the word *Can* or *Box* cut out of cardboard) to a confederate in the Post-Training Assessment, P2 consistently said, "Where does the can/box sign go?" instead of "Where does it go?" This alternative S^D potentially adds an auditory discrimination component to Level 5, which was intended to assess only VVNM; therefore, the S^D "Where does the can/box sign go?" was not scored as a correct S^D in this study. As with Level 3, this type of error dramatically reduced the accuracy score for P2. Level 6, the third level that P2 administered during the Post-Training Assessment, does not require the testee to ask, "Where does it go?" Level 6 requires the testee to deliver a different verbal instruction, which P2 most often delivered correctly, hence the higher ABLA-R accuracy score compared to the previous two levels that P2 administered in the Post-Training Assessment. Perhaps the manual could be revised to emphasize the importance of delivering the S^D for each trial as it is described in the manual. This modification might improve the likelihood that direct-care staff who may administer the ABLA-R in the future to a person with DD will conduct a valid ABLA-R assessment by delivering the correct S^D .

The effect of the self-instructional manual on ABLA-R accuracy was slightly less clear for P3 in Pair 2 because P3 conducted the last level in Baseline (Level 2) with greater accuracy

than the previous two levels, causing a slightly upward trend across the Baseline sessions. It is possible that this demonstrates a practice effect in which administering Levels 4 and 6 resulted in learning that generalized to the last level, improving P3's performance on Level 2. It would have been beneficial to clarify whether or not P3's performance would have continued to improve without training by extending P3's Baseline phase to include additional levels; however, time constraints did not allow for a lengthier Baseline phase. Assessing the participants on only three levels in Baseline (and in a Post-Training Assessment) increased the likelihood that practice effects would be observed in the Baseline phase for the second participant in each pair who repeated the Baseline assessment twice, however an increasing trend in Baseline was not observed for any of the other participants.

Evaluation of the mean percentage correct on each ABLA-R TEF item for each level of the ABLA-R provides valuable information in regard to specific items of the ABLA-R TEF that were challenging for the participants to master. For example, providing praise during the initial prompting sequence was often carried out incorrectly or not carried out at all during the Post-Training Assessment and Generalization (see Tables 1, 2, 3, 4, 5, and 6). Another item that participants often did not perform correctly during the Post-Training Assessment and Generalization was Item 5.a. in Level 1, which requires the tester to provide the correct instruction while modeling the correct response (see Table 1). Additionally, for the initial prompting sequence and/or test trials for all levels, Tables 3 and 5 show a low percentage of correct responses for items measuring the accuracy of the instruction that the tester delivers. On the other hand, Item 1 ("Proper set-up") was performed 100% correctly in the Post-Training Assessment and in Generalization for all six levels. Future revisions of the ABLA-R self-instructional manual should address the items of the ABLA-R TEF for which participants most

often achieved a low score, possibly by providing additional instruction on how to perform those items correctly.

The amount of time required by participants to master the manual was relatively short compared to the amount of time required to study DeWiele and Martin's (1998) self-instructional manual on the ABLA, subsequent to deletion of Level 5 in Study 2 of the experiment by DeWiele et al. (2000) described earlier. This is an important finding for treatment facilities that will potentially implement the self-instructional manual to train their employees to administer the ABLA-R. When comparing training tools to be utilized in a treatment facility, such as a self-instructional manual versus the original description of the ABLA (Kerr et al., 1977), a tool that requires the least amount of time yet effectively trains employees is desirable for two important reasons: (a) a training tool that requires a minimal time commitment results in less cost to train competent employees, and; (b) a short training time allows quick implementation of trained individuals' skills in the workplace and community which may improve the effectiveness of treatment programs for individuals with DD.

There are some limitations to the current study that should be considered. First, not all participants achieved the mastery criterion. It would have been informative to implement other training tools such as video-modeling or performance feedback in addition to the self-instructional manual for these participants to determine whether further training, and which types of training, would be effective in improving their accuracy in conducting the ABLA-R. For example, researchers evaluated the effectiveness of two self-instructional packages in training parents to conduct discrete-trials teaching (DTT) with their children with autism (Young, Boris, Thomson, Martin, & Yu, 2012). The first package combined a self-instructional manual with a self-instructional video, and was only sufficient in producing a large improvement in DTT

accuracy for three out of five parents who conducted DTT with their children. The self-instructional manual and video were then combined with role-play and feedback in a second package, which was assessed with five new parent participants. The results indicated that all five parents improved significantly from Baseline to Post-Training in conducting DTT with their children with the second training package. Perhaps a similar type of training package would be beneficial for individuals learning to administer the ABLA-R who do not achieve mastery level after studying the self-instructional manual.

A second limitation to this study is that participants' accuracy in conducting the ABLA-R was assessed with a confederate role-playing a person with DD, and was not assessed with an individual with DD in Baseline. It was not ethically responsible to ask untrained participants to assess an individual with DD; therefore we reserved this task for a Generalization assessment. Unfortunately, not all participants advanced to the Generalization phase due to achieving a Post-Training Assessment score below mastery. However, the performance of five participants who did achieve mastery and therefore advanced to the Generalization phase demonstrated that the self-instructional manual was effective in training those participants how to accurately assess an individual with DD.

Thirdly, this study was conducted with university students in a controlled environment, which may limit the external validity to direct-care workers administering the ABLA-R in a clinical setting or a client's home. There are several potential differences between the university students recruited in this study and direct-care workers that may influence the effectiveness of the manual and the amount of time required to master the manual, including level of education, degree of experience with individuals with DD, and motivation to attain high ABLA-R accuracy when conducting assessments. The experimental setting in which the participants in this study

were assessed is very different from a clinical facility or a client's home where direct-care workers may conduct the ABLA-R, and environmental influences such as noise level and the presence of a supervisor or a client's family members may affect the accuracy with which individuals conduct the ABLA-R.

A fourth limitation of this study is that, after training, the average performance on some of the ABLA-R TEF items was lower than 80%. The authors of the ABLA-R training manual might consider revising the manual with respect to those items, and reevaluating the revised manual to see if performance on those items improves.

A fifth limitation of this study is that although the ABLA-R training manual was designed to be self-instructional, contingencies were implemented that reduced the self-instructional nature of the training that participants received. As described in the Procedure, I collected participants' written answers to the Study Exercise questions in the manual, and participants were given a mastery test after completion of the manual. These contingencies were applied in an attempt to improve the internal validity of this study. In controlling potential confounds by ensuring that the participants studied the entire manual, completed all Study and Self-Practice Exercises, and achieved 100% on the written mastery test, it is most likely that the results of this study accurately reflect the effectiveness of the manual.

A sixth limitation is that participants' Baseline ABLA-R accuracy scores and IOA scores were not examined prior to a participant beginning Training. It would have been valuable to examine participants' Baseline scores and the IOA scores before participants began Training so that increasing trends in Baseline could be detected, as in the case P3. If this pattern had been detected before P3 began Training, I would have extended P3's Baseline so as to ensure that

ABLA-R accuracy would not continue to increase without exposure to the self-instructional manual.

In order to expand on the evidence that the self-instructional ABLA-R manual is an effective and time-efficient training tool, future research should address the above-mentioned limitations of this study. Researchers should investigate implementation of training tools in addition to the self-instructional manual, such as video-modeling, live modeling, and feedback, with individuals who do not achieve a mastery criterion after studying the manual to determine to what extent this would further improve their ABLA-R accuracy. Research should also be conducted to assess the efficacy of the manual with direct-care workers who would typically administer the ABLA-R to clients with DD to improve the generalizability of the results. Additionally, it would be a positive addition to the literature for researchers to conduct a replication of this study that assesses the effectiveness of the manual if training is entirely self-instructional, without the contingencies implemented in this study to ensure that the participants completed the Study Exercises and Practice Exercises.

Although the participants mastered the self-instructional manual, on average, in less than three hours, it would be worthwhile for researchers to attempt to reduce this amount of time. Considering the urgent need for individuals trained to assess individuals with DD so that a treatment plan can be developed, an abbreviated yet effective version of the ABLA-R manual may be a valuable alternative to the full-length manual.

In summary, the current research provides support that the self-instructional manual is a time-efficient and effective training tool for teaching individuals how to administer the ABLA-R, with all participants showing a large improvement and 5 out of 8 participants achieving 90% accuracy or higher when assessing a confederate with a relatively short amount of training time.

Some limitations of this study, such as the limited generalizability due to recruiting students as participants, should be addressed by future researchers as suggested. The results of this study may encourage directors of treatment facilities to implement the self-instructional manual to efficiently and effectively train direct-care workers. As a result, direct-care workers trained in the ABLA-R may improve the quality of life of persons with DD by accurately assessing the learning ability of clients. The results of a valid ABLA-R assessment may assist therapists in designing appropriate programs to teach clients academic and daily living skills that correspond to their learning ability, thus resulting in successful learning.

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Appendix A

Abbreviated Instructions for Administering the Assessment of Basic Learning Abilities - Revised (ABLA-R)

The ABLA is made up of six separate tasks (or levels) which are presented to a client, one task at a time, to assess the client's ability to readily learn those tasks. The first task is an imitation task. Each of the remaining tasks requires a student to make the correct response when given two options. Each level requires only that a student be able to put an item into a container. Let's first consider ABLA Levels 1, 2, and 3. First, examine the testing materials, then carefully study the description of the first three levels.

A Brief Description of ABLA Levels 1, 2, and 3

LEVEL	TEST TASK
Level 1 Imitation	When given a piece of foam, can the student imitate the teacher placing the foam into a container?
Level 2 Position Discrimination	When presented with a yellow can and a red box in a stable position, can a student consistently place a piece of foam into the container on the left?
Level 3 Visual Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a piece of foam into the can?

Now that you have had a brief introduction to ABLA Levels 1, 2, and 3, let's briefly consider Levels 4, 5, and 6. With the testing materials in front of you, carefully study the description of Levels 4, 5, and 6 presented below.

A Brief Description of ABLA Levels 4, 5, and 6

LEVEL	TEST TASK
Level 4 Visual Identity Match-to-Sample Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a small yellow cylinder into the can, and a small red cube into the box?
Level 5 Visual Non-Identity Match-to-Sample Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a purple-colored piece of wood shaped like the word <i>Can</i> into the can, and a piece of silver-colored wood shape like the word <i>BOX</i> into the box?
Level 6 Auditory-Visual Combined Discrimination	When presented with a yellow can and a red box in randomly alternated left-right positions, can a student consistently place a piece of foam into the correct container when the teacher requests either "red box" or "yellow can"?

Brief Overview of ABLA Testing

When administering the ABLA test to a client, the tester attempts to teach a client to perform each task correctly, one task at a time, using standardized prompting and reinforcement procedures. When testing a task (level), test trials continue until either the pass or fail criterion is met, whichever comes first.

Pass criterion: 8 correct responses in a row on test trials that did not include extra prompts

Fail criterion: 8 total errors (not necessarily in a row) on test trails that did not include extra prompts

Some Summary Guidelines for Testing ABLA Levels

Levels	1	2	3	4	5	6
Containers & Left-Right Positions	Box only (till 4 correct Rs) Then Can only	Box, Can Stable	Box, Can Randomly Alternate	Box, Can Randomly Alternate	Box, Can Randomly Alternate	Box, Can Randomly Alternate
Test Object Presented	Foam	Foam	Foam	Cube and Cylinder Randomly Alternate	<i>BOX</i> and <i>Can</i> Randomly Alternate	Foam
Verbal Question	"Where does it go?"					"Red Box" or "Yellow Can"
Correct Response	Imitates tester by placing foam in container	Place foam in can on right	Place foam in can independ. of position	Place cube in box, or cylinder in can	Place <i>BOX</i> in box or <i>Can</i> in can	Place foam in the requested container

When Assessing a Client on a Level

1. Review the description of that level in Table 1.
2. Review the summary guidelines for testing that level in Table 2.
3. Review the attached data sheet.
4. Conduct test trials until the pass criterion or fail criterion is met.
5. On each trial:
 - a. Arrange the necessary materials.
 - b. Present the correct test object.
 - c. Present the correct verbal question (and provide whatever extra instructions and/or prompts you think are necessary for the client to respond correctly).
 - d. Once the client responds, provide what you consider to be an appropriate consequence for a correct or an incorrect response.
 - e. Record the results of the trial.
 - f. Following an incorrect response, conduct an error correction trial if you think it is necessary.
 - g. Continue in this manner until a pass or fail criterion is met.

Appendix B

ABLA-R TESTER EVALUATION FORM LEVEL 3

Scoring: For each item on each trial performed correctly, place a ✓. For items performed incorrectly, place an ✗.
For items that do not apply, leave blank

Initial Prompting Sequence													
1. Proper set-up													
2. Initial demonstration: a. "When I say, 'Where does it go?' it goes in here".													
b. Demo													
3. Initial guided trial: a. "Let's try together. Where does it go?"													
b. Guidance													
c. Praise													
4. Initial Opp. for Ind. Res.: a. "Now you try. Where does it go?"													
b. Praise for correct													
c. "No, that's not where it goes" for error													
d. If error: i. Demo													
ii. Guided Trial													
iii. Opp. for Ind. Res.													
Test Trials	Trial Number												
5. Test trials: a. Container position													
b. "Where does it go?"													
c. Praise and reinforcer for correct													
d. "No, that's not where it goes" for error													
e. If error: i. Demo													
ii. Guided Trial													
iii. Opp. for Ind. Res.													
6. Response Recorded Immediately/Accurately													
7. Pass or fail criterion was met.													
Scoring for Level 3: Total items scored = ____ Total items scored correctly= ____													

Appendix C

PHASE 2: TRAINING
PROCEDURAL INTEGRITY DATA SHEET
SELF-INSTRUCTIONAL MANUAL

Participant #:

Observer:

Date:

Start Time:

End time:

Mark each box to indicate whether the experimenter followed the script: ✓ = YES ✕ = NO / = not applicable

Score: _____ = _____ %
 32

CHAPTER:		1	2	3
1. Prepare area: Manual, highlighter, pen, paper, reinforcers, "Study Exercises," and ALBA-R materials are on the table.				
2. Sit down with participant and review the outline of activities.				
3. Instruct participant for Ch.1: "I will be timing how long it takes you and other participants to master the manual. We will be observing you but will not be able to help. Please save any questions you have until the end of the study. Throughout the manual you will come across Study Exercises. I advise you to use a highlighter and highlight the answers to the questions in the Study Exercises as you will be tested at the end of the manual. The test will consist of 22 questions randomly selected from all of the chapters. When you come to a Study Exercise in the manual, please write your answers to the questions on the photocopied pages provided, as I will collect the pages for research purposes when you have completed each chapter. Please begin reading Chapter 1 and let me know when you have finished Chapter 1."				
4. Start timer for study time for Chapter 1				
5. Stop timer for study time for Chapter 1				
6. Collect completed Study Exercise pages for Chapter 1				
7. Instruct participant for Ch. 2: "Please begin reading Chapter 2 and let me know when you are finished Chapter 2. Don't forget to record your answers to the Study Exercises on the photocopied pages."				
8. Start timer for study time for Chapter 2				
9. Stop timer for study time for Chapter 2				
10. Collect completed Study Exercise pages for Chapter 2				
11. Instruct participant for Ch. 3: "On the first page of Chapter 3, the manual instructs you to role-play some trials with an imaginary client for each level in the ABLA-R. I will not score your performance while you are practicing, but please make sure that you act out the trials as it is important for our research that you follow all of the directions in the manual. When you come to a section titled, "Stop!!" on p. 24, please let me know and I will give you instructions for what to do next. Please begin reading Chapter 3."				
12. Start timer for study time for Chapter 3				

13. CHAPTER 3 – PRACTICE EXERCISE (P. 24) Give participant Level 1 data say: “Please read the instructions for the section titled, “Stop!!” and let me know when you are ready to begin the practice exercise. I will be your partner and play the part of the student; you will play the tester administering the ABLA-R, as directed in the instructions. You will have a maximum of 30 minutes to complete the practice exercise. We will be unable to answer any questions you might have. Please hand in your practice data sheet to me when you are finished.”			
14. Start another timer for practice time for exercise on p. 24 (max. 30 min)			
15. Record participant’s practice time (p. 24)			
16. Instruct participant for Ch. 3 (pp. 29 & 30): “The manual will soon ask you to do more role-playing trials. This time you will practice with an imaginary client. Again, please make sure that you follow the instructions and act out the trials. When you come to another section titled, “Stop!!” on p. 34, please let me know.”			
17. CHAPTER 3 – PRACTICE EXERCISE (P. 34) Give participant Level 4 data sheet for practice and say: “Please read the instructions for the section titled, “Stop!!” and let me know when you are ready to begin the practice exercise. Again, I will be your partner and play the part of the student; you will play the tester administering the ABLA-R, as directed in the instructions. You will have a maximum of 20 minutes to complete the practice exercise. We will be unable to answer any questions you might have. Please hand in your practice data sheet to me when you are finished.”			
18. Start timer for practice time for exercise on p. 34 (max. 20 min)			
19. Record participant’s practice time (p. 34)			
20. CHAPTER 3 – PRACTICE EXERCISE (P. 43) Give participant a data sheet for each level and say: “Please read the instructions for the section titled, “Stop!!” and let me know when you are ready to begin the practice exercise. I will be your partner and play the part of the student; you will play the tester administering the ABLA-R, as directed in the instructions. We will be unable to answer any questions you may have. I will collect your practice data sheets when you are finished.”			
21. Start timer for practice time for exercise on p. 43 (no time limit)			
22. Record participant’s practice time (p.43)			
23. Record participant’s study time for the chapter			
24. Instruct participant after he/she has finished reading the manual: “Please take a moment to review your answers to the questions in the Study Exercises. When you are ready, I will give you a written test consisting of 22 randomly selected questions from all chapters. Any questions that you do not answer correctly, you will be asked to re-study and re-write the answer to.”			
25. Give participant the ABLA-R Mastery Test			
26. Score participant’s answers			
27. a. If less than 100% accurate, instruct participant: “Please re-study the questions that you got incorrect. When you are ready to try those questions again, please close the manual.” b. If 100% accurate, instruct participant: “Good job, you passed! You have now completed the Training phase of the study.”			
28. When participant has completed the chapter, confirm a brief break or the next scheduled session.			

Appendix D

Mean Percentage Correct on ABLA-R TEF Items for Level 1

Level 1 ABLA-R TEF Items	BL	PT	G
Initial Prompting Sequence			
1. Proper set-up	66.67	100.00	100.00
2. Initial demonstration:			
a. "When I say, 'Where does it go?' it goes in here."	0.00	75.00	80.00
b. Demo	50.00	100.00	100.00
3. Initial guided trial:			
a. "Let's try together. Where does it go?"	0.00	50.00	60.00
b. Guidance	33.33	100.00	80.00
c. Praise	16.67	75.00	100.00
4. Initial opportunity for independent response:			
a. "Where does it go?" + model	0.00	75.00	40.00
b. "Now you try. Where does it go?"	16.67	75.00	80.00
c. Praise for correct	0.00	50.00	0.00
d. "No. That's not where it goes" for error	-	-	-
e. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
Test Trials			
5. Discrete trial:			
a. "Where does it go?" + model	0.00	42.86	58.97
b. "Now you try. Where does it go?"	50.85	97.62	94.74
c. Praise and reinforcer for correct	51.06	91.18	94.87
d. "No. That's not where it goes" for error	40.00	100.00	-
e. If error:			
i. Demo	6.67	75.00	-
ii. Guided trial	13.33	50.00	-
iii. Opportunity for independent response	26.67	100.00	-
6. Response recorded immediately/accurately	21.05	95.24	94.29
7. After 4 correct test trials in a row, switch containers, and repeat starting at Item 5.	0.00	25.00	40.00
8. Pass or fail criterion was met	16.67	50.00	80.00

Note. BL = Baseline, PT = Post-training, and G = Generalization. Items that were not assessed during a phase are indicated with a dash (-).

Appendix E

Mean Percentage Correct on ABLA-R TEF Items for Level 2

Level 2 ABLA-R TEF Items	BL	PT	G
Initial Prompting Sequence			
1. Proper set-up	66.67	100.00	100.00
2. Initial demonstration:			
a. "When I say, 'Where does it go?' it goes in here."	0.00	100.00	80.00
b. Demo	0.00	100.00	100.00
3. Initial guided trial:			
a. "Let's try together. Where does it go?"	0.00	50.00	100.00
b. Guidance	0.00	100.00	100.00
c. Praise	0.00	50.00	100.00
4. Initial opportunity for independent response:			
a. "Now you try. Where does it go?"	0.00	100.00	100.00
b. Praise for correct	0.00	50.00	0.00
c. "No. That's not where it goes" for error	-	-	-
d. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
Test Trials			
5. Discrete trial:			
a. "Where does it go?"	71.88	95.24	100.00
b. Praise and reinforcer for correct	28.57	73.68	100.00
c. "No. That's not where it goes" for error	0.00	75.00	100.00
d. If error:			
i. Demo	0.00	50.00	100.00
ii. Guided trial	0.00	50.00	50.00
iii. Opportunity for independent response	0.00	100.00	100.00
6. Response recorded immediately/accurately	18.75	100.00	100.00
7. Pass or fail criterion was met	33.33	50.00	75.00

Note. BL = Baseline, PT = Post-training, and G = Generalization. Items that were not assessed during a phase are indicated with a dash (-).

Appendix F

Mean Percentage Correct on ABLA-R TEF Items for Level 3

Level 3 ABLA-R TEF Items	BL	PT	G
Initial Prompting Sequence			
1. Proper set-up	100.00	100.00	100.00
2. Initial demonstration:			
a. "When I say, 'Where does it go?' it goes in here."	0.00	66.67	100.00
b. Demo	33.33	83.33	100.00
3. Initial guided trial:			
a. "Let's try together. Where does it go?"	0.00	33.33	60.00
b. Guidance	11.11	83.33	100.00
c. Praise	0.00	83.33	100.00
4. Initial opportunity for independent response:			
a. "Now you try. Where does it go?"	11.11	66.67	100.00
b. Praise for correct	12.50	20.00	40.00
c. "No. That's not where it goes" for error	-	-	-
d. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
Test Trials			
5. Discrete trial:			
a. Container position	77.33	95.00	100.00
b. "Where does it go?"	44.00	85.00	100.00
c. Praise and reinforcer for correct	51.22	94.74	100.00
d. "No. That's not where it goes" for error	48.00	100.00	-
e. If error:			
i. Demo	2.17	66.67	-
ii. Guided trial	0.00	44.44	-
iii. Opportunity for independent response	8.89	84.44	-
6. Response recorded immediately/accurately	10.47	96.83	100.00
7. Pass or fail criterion was met	12.50	66.67	100.00

Note. BL = Baseline, PT = Post-training, and G = Generalization. Items that were not assessed during a phase are indicated with a dash (-).

Appendix G

Mean Percentage Correct on ABLA-R TEF Items for Level 4

Level 4 ABLA-R TEF Items	BL	PT	G
Initial Prompting Sequence			
1. Proper set-up	100.00	100.00	100.00
2. Initial demonstration (cylinder):			
a. "When I say, 'Where does it go?' it goes in here."	0.00	75.00	100.00
b. Demo	16.67	75.00	100.00
3. Initial guided trial (cylinder):			
a. "Let's try together. Where does it go?"	0.00	75.00	80.00
b. Guidance	16.67	100.00	100.00
c. Praise	16.67	75.00	80.00
4. Initial opportunity for independent response (cylinder):			
a. "Now you try. Where does it go?"	0.00	75.00	80.00
b. Praise for correct	0.00	75.00	20.00
c. "No. That's not where it goes" for error	-	-	-
d. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
5. Initial demonstration (cube):			
a. "When I say, 'Where does it go?' it goes in here."	0.00	50.00	100.00
b. Demo	0.00	50.00	100.00
6. Initial guided trial (cube):			
a. "Let's try together. Where does it go?"	0.00	50.00	80.00
b. Guidance	16.67	50.00	100.00
c. Praise	16.67	50.00	100.00
7. Initial opportunity for independent response (cube):			
a. "Now you try. Where does it go?"	0.00	50.00	80.00
b. Praise for correct	16.67	0.00	20.00
c. "No. That's not where it goes" for error	-	-	-
d. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
Test Trials			
8. Discrete trial:			
a. Container position	60.87	92.86	80.65
b. Correct manipulandum	41.30	78.57	87.10
c. "Where does it go?"	60.87	92.86	100.00
d. Praise and reinforcer for correct	30.00	60.00	100.00
e. "No. That's not where it goes" for error	53.66	90.32	100.00
f. If error:			
i. Demo	0.00	75.86	100.00
ii. Guided trial	10.53	75.86	100.00
iii. Opportunity for independent response	18.92	100.00	100.00
9. Response recorded immediately/accurately	5.17	91.18	85.48
10. Pass or fail criterion was met	0.00	75.00	100.00

Note. BL = Baseline, PT = Post-training, and G = Generalization. Items that were not assessed during a phase are indicated with a dash (-).

Appendix H

Mean Percentage Correct on ABLA-R TEF Items for Level 5

Level 5 ABLA-R TEF Items	BL	PT	G
Initial Prompting Sequence			
1. Proper set-up	66.67	100.00	100.00
2. Initial demonstration (purple <i>Can</i>):			
a. "When I say, 'Where does it go?' it goes in here."	0.00	50.00	75.00
b. Demo	33.33	100.00	100.00
3. Initial guided trial (purple <i>Can</i>):			
a. "Let's try together. Where does it go?"	0.00	50.00	50.00
b. Guidance	0.00	100.00	100.00
c. Praise	33.33	50.00	100.00
4. Initial opportunity for independent response (purple <i>Can</i>):			
a. "Now you try. Where does it go?"	0.00	50.00	75.00
b. Praise for correct	50.00	50.00	25.00
c. "No. That's not where it goes" for error	-	-	-
d. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
5. Initial demonstration (silver <i>BOX</i>):			
a. "When I say, 'Where does it go?' it goes in here."	0.00	50.00	75.00
b. Demo	33.33	100.00	100.00
6. Initial guided trial (silver <i>BOX</i>):			
a. "Let's try together. Where does it go?"	0.00	50.00	50.00
b. Guidance	0.00	50.00	100.00
c. Praise	0.00	100.00	100.00
7. Initial opportunity for independent response (silver <i>BOX</i>):			
a. "Now you try. Where does it go?"	0.00	50.00	100.00
b. Praise for correct	33.33	0.00	25.00
c. "No. That's not where it goes" for error	-	-	-
d. If error:			
i. Demo	-	-	-
ii. Guided trial	-	-	-
iii. Opportunity for independent response	-	-	-
Test Trials			
8. Discrete trial:			
a. Container position	64.00	100.00	100.00
b. Correct manipulandum	37.50	100.00	100.00
c. "Where does it go?"	52.38	50.00	98.00
d. Praise and reinforcer for correct	27.27	62.50	100.00
e. "No. That's not where it goes" for error	0.00	100.00	96.30
f. If error:			
i. Demo	0.00	50.00	84.00
ii. Guided trial	0.00	0.00	60.00
iii. Opportunity for independent response	14.29	50.00	84.00
9. Response recorded immediately/accurately	0.00	100.00	91.49
10. Pass or fail criterion was met	0.00	100.00	50.00

Note. BL = Baseline, PT = Post-training, and G = Generalization. Items that were not assessed during a phase are indicated with a dash (-).

Appendix I

Mean Percentage Correct on ABLA-R TEF Items for Level 6

Level 6 ABLA-R TEF Items	BL	PT
Initial Prompting Sequence		
1. Proper set-up	100.00	100.00
2. Initial demonstration ("Yellow can"):		
a. "When I say, 'y-e-l-l-o-w...c-a-n,' it goes in here."	0.00	83.33
b. Demo	11.11	100.00
3. Initial guided trial ("Yellow can"):		
a. "Let's try together. Y-e-l-l-o-w...c-a-n."	0.00	66.67
b. Guidance	0.00	100.00
c. Praise	0.00	100.00
4. Initial opportunity for independent response ("Yellow can"):		
a. "Now you try. Y-e-l-l-o-w...c-a-n."	0.00	83.33
b. Praise for correct	22.22	50.00
c. "No. That's not where it goes" for error	-	-
d. If error:		
i. Demo	-	-
ii. Guided trial	-	-
iii. Opportunity for independent response	-	-
5. Initial demonstration ("REDBOX"):		
a. "When I say, 'REDBOX,' it goes in here."	0.00	83.33
b. Demo	11.11	83.33
6. Initial guided trial ("REDBOX"):		
a. "Let's try together. REDBOX."	0.00	83.33
b. Guidance	0.00	83.33
c. Praise	0.00	66.67
7. Initial opportunity for independent response ("REDBOX"):		
a. "Now you try. REDBOX."	0.00	83.33
b. Praise for correct	12.50	50.00
c. "No. That's not where it goes" for error	-	-
d. If error:		
i. Demo	-	-
ii. Guided trial	-	-
iii. Opportunity for independent response	-	-
Test Trials		
8. Discrete trial:		
a. Container position	62.34	93.18
b. Correct manipulandum	98.68	100.00
c. "REDBOX" or "Y-e-l-l-o-w...c-a-n"	3.85	76.09
d. Praise and reinforcer for correct	25.00	100.00
e. "No. That's not where it goes" for error	7.32	83.33
f. If error:		
i. Demo	0.00	71.11
ii. Guided trial	0.00	77.78
iii. Opportunity for independent response	9.52	100.00
9. Response recorded immediately/accurately	0.00	100.00
10. Pass or fail criterion was met	0.00	50.00

Note. BL = Baseline, PT = Post-training, and G = Generalization. Items that were not assessed during a phase are indicated with a dash (-).