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THE EVERGREEN Report

THE EFFECTIVE PRACTICES NEWSLETTER OF THE EVERGREEN CENTER

THE EVERGREEN REPORT is published by the Evergreen Center, a non-profit organization committed to providing day and residential treatment services for children and adolescents with developmental challenges.

Evergreen's standard for successful instruction is social competence and community participation. We believe children will develop to their maximum potential when instruction is woven through daily activities and living environments. Evergreen uses Applied Behavior Analysis as the cornerstone of its instruction.

THE EVERGREEN REPORT is an informational resource for special education professionals and behavior analysts that provides updates on empirically validated developments in the education and community living of children and adults with intellectual disabilities.

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The Evergreen Center was founded in 1982 by Dr. Robert F. Littleton, Jr.

Evaluating the Impact of Prerequisite Skills on the Outcomes of Receptive Labeling Tasks

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ABSTRACT: Auditory-visual conditional discriminations (AVCD) are important language skills that many individuals with autism spectrum disorders (ASD) struggle to learn. Assessment of a learner's prerequisite skills may help clinicians design more effective programing for teaching AVCDs. The current study assessed six prerequisite skills for two students with ASD followed by a treatment comparison to determine if the prerequisite skills were related to differential outcomes during the treatment analysis. The results indicated that the presence of strong identity matching, imitation, and echoic repertoires were associated with mastery of AVCDs but did not relate to the efficiency of either procedure.

Listener behaviors, or receptive language skills, require an individual to respond to the verbal behavior of others, while speaker behaviors impact the behavior of others by requiring a response from the listener, typically another person. Without the acquisition of listener behavior, the individual cannot participate in their social environment and is completely dependent on others. Auditory-visual conditional discriminations (AVCDs) are a listener skill because they require the individual to listen to the auditory cue or direction, and then select the appropriate visual stimulus from an array of stimuli. AVCD instruction often takes the form of a matching task, where the teacher presents pictures and asks the student to identify the one that she named. AVCD is a necessary repertoire for a variety of contexts (e.g., social interactions, community outings) and for following verbal directions, especially when the direction is to get an item from the environment (e.g., "bring me your backpack," "pass the salt"). If an individual does not have AVCDs within their repertoire, they may struggle to make progress or may take significantly more time to acquire receptive language skills. Given the importance of AVCDs, it is pivotal for practitioners to identify the prerequisite skills that a learner needs before acquiring AVCDs, yet there is limited research regarding the prerequisite skills.

This study began by replicating and extending the findings of Kodak et al. (2015) and Kodak et al. (2022) by evaluating whether the prerequisite skills assessment outcomes are related to performance during AVCD tasks, then compared the effectiveness and efficiency of two presentation methods for matching-to-sample procedures, sample-first and comparison-first. Two Evergreen students participated in this study; both had a diagnosis of ASD and were 17-20 years old at the beginning of this study.

Prerequisite Skills Assessment

The skills assessed during the prerequisite skills assessment included auditory discrimination, auditory matching, visual discrimination, identity matching, generalized motor imitation, and echoic repertoire.

Generalized motor imitation was assessed by cueing students to "do this" while providing a model of the action (e.g., touching one's foot, putting one's hands on the table). Echoics were assessed by the experimenter cueing the student to "do this" and modeling the sound or word (e.g., "fermata"). Identity matching was assessed by presenting a sample 2-dimensional picture and a comparison array of three 2-dimensional pictures, requiring the student to match the sample to the same stimulus in the array. Auditory discrimination was assessed by having an auditory cue played on a tablet with a blank screen and continue playing as a blue square appeared. The participants were required to either touch the square or not touch the square, depending on the auditory sample. Visual discrimination was evaluated with two pictures appearing on the tablet in either the left or right position. Participants were required to touch one picture, which had a history of reinforcement established during the prompted sessions.

Auditory matching was assessed on the tablet with three green rectangles arranged on the screen, one on top and two on the bottom (left and right positions). Each rectangle was associated with a sound and after playing each sound while the corresponding rectangle was highlighted the auditory sample was played without any highlight. The participant then had six seconds to click on the rectangle associated with the same auditory sample.

Table 1 depicts the average correct responses for each skill within the prerequisite skills assessment across each participant. Both participants demonstrated mastery of identity matching and imitation & echoics. Martin also demonstrated mastery of visual discrimination, and Peter demonstrated mastery of auditory discrimination.

Table 1

Participant	Identity Matching	Imitation & Echoics	Auditory Discrimination	Auditory Matching	Visual Discrimination
Martin	100*	98*	53	60	70*
Peter	83*	100*	72*	40	71

* Denotes skill demonstrated at mastery criteria at the conclusion of skills assessment condition.

AVCD Training

During AVCD training, the experimenter presented an array of three images in front of the participant and delivered the auditory cue (e.g., "whole note," "quarter rest"). During baseline for sample-first, the auditory stimulus was presented followed by the comparison stimuli, and during comparison-first, the comparison array was presented first followed by the auditory stimulus. The two different training procedures were conducted consecutively and the only difference between training procedures was the order in which the sample and comparison stimuli were presented.

Both prompted and unprompted correct responses resulted in reinforcement, a bite of a preferred edible. Incorrect responses resulted in the error correction procedure (covering the materials, re-presenting the materials with an immediate model prompt). Mastery criterion was 89% correct, unprompted responses for two consecutive sessions across the set of images. A replication phase was conducted for one participant, Martin, to evaluate the outcomes of the first phase. The procedures for the replication phase were the same as the first AVCD phase; the only difference were the images presented in the sets.

During AVCD training, both Martin and Peter met mastery criteria for both sets of images across the two different arrangements. Table 2 depicts the number of prerequisite skills that met mastery criteria and the number of sessions to mastery during AVCD training. Martin and Peter demonstrated three prerequisite skills

and were able to acquire both sets during AVCD training. For Peter, there was no difference in efficiency between the two arrangements. For Martin, sample-first was more efficient, and this result was replicated during the second phase.

Table 2

Participant	Number of Prerequisite Skills	Sessions to Mastery Comparison-First	Sessions to Mastery Sample-First
Martin	3	21	10
		9	7
Peter	3	6	6

The results of the study suggest that there may be correspondence between demonstrated mastery of prerequisite skills and acquisition outcomes on AVCD tasks. This replicates the results of Kodak et al. (2015) and Kodak et al. (2022), which demonstrated some degree of prediction of outcomes on AVCD tasks based on the results of the prerequisite skills assessment. The results were similar to other studies that suggested the effectiveness of different stimulus formats may be idiosyncratic across learners (Cubicciotti et al. 2021). Future research should continue to evaluate if one arrangement is more efficient than the other or if differences in efficiency are based upon other individual factors, such as one's skill repertoire or learning history. Additionally, future research should continue to evaluate the correspondence between the prerequisite skills assessed and outcomes on AVCD tasks to further support these results and assist clinicians in determining skills to target prior to teaching using AVCD tasks.

* This project was completed in partial fulfillment of the first author's Ph.D. in Applied Behavior Analysis at Cambridge College

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Self-Injurious Behavior: Understanding Why It Occurs

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ABSTRACT: Some individuals with autism spectrum disorders (ASD) or intellectual disabilities (ID) engage in self-injurious behavior (SIB) that can be potentially dangerous. It is imperative that clinicians thoroughly assess SIB to better understand why the behavior occurs and in what situations it is more likely to occur. The present case study developed a highly individualized assessment for a 22-year-old student who engaged in a high rate of SIB. After the initial assessment yielded unclear results, a modified assessment was implemented to better understand the variables affecting the student's behavior.

Self-injurious behavior (SIB) is the occurrence of a repetitive action or responses that produces physical injury to oneself (Kahng, Iwata, Lewin, 2002; Shawler, Becraft, & Hagopian, 2022). Examples of SIB include head hitting, banging one's head against hard surfaces, body hitting, skin picking, rumination, self-biting, eye poking, and hair-pulling. There is a relatively high prevalence of SIB (approximate range of 10 – 20%) among individuals with intellectual and developmental disabilities and, in some cases, SIB can be resistant to treatment (Hagopian, 2015). SIB can produce significant injuries, such as swelling, bleeding, concussions, and disfigurement (Rooker, 2020). In addition to physical injury, SIB can affect a student's participation in social activities and require more restrictive care, and it can have a significant impact on family members and caretakers.

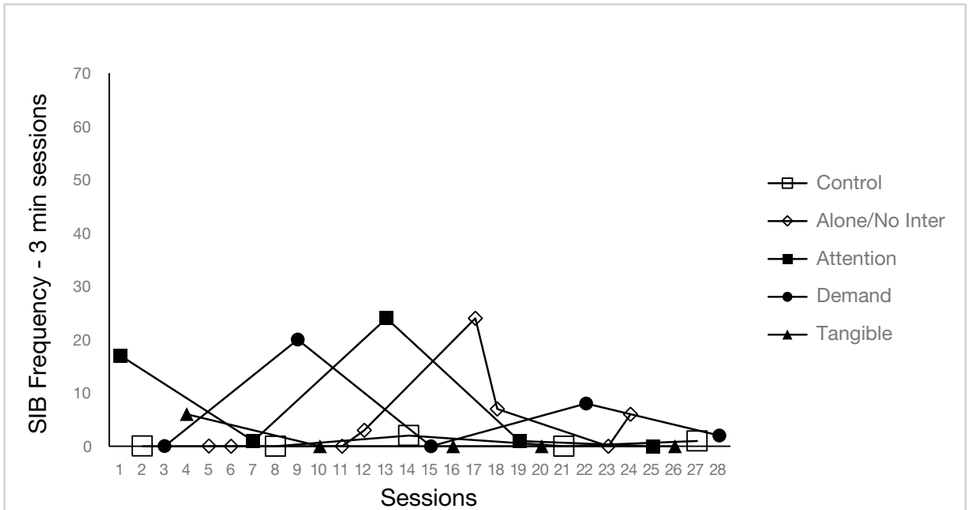
An important first step to treatment is understanding the variables that cause SIB. Research has demonstrated that environmental variables are often responsible for the emergence and maintenance of SIB, and a functional analysis is considered the "gold standard" assessment procedure for identifying environmental variables associated with the occurrence of SIB. In a recent literature review, functional analysis methods identified variables associated with problem behavior over 90% of the time (Melanson & Famie, 2023). Nevertheless, there are situations in which the outcome of these assessments is ambiguous and require modification and additional assessment (e.g., Kuhn, Hardesty, Luczynski, 2009.). The following is a case example of a functional analysis of SIB, and the steps the clinical team took when the initial outcome was ambiguous.

Jack was a 22-year-old student who had a history of engaging in head-directed SIB. He wore protective gloves and a helmet to reduce the likelihood of injury from SIB. A previous functional analysis suggested that SIB was maintained, in part, by access to protective gloves and by the sensations produced when engaging in SIB. Prior to initiating the functional analysis parental consent was obtained and several safeguards were established. These safeguards included wearing a helmet with a face shield to prevent head directed SIB, reinforcing instances of hand raising in addition to SIB, and limiting session duration to three minutes.

The initial functional analysis consisted of evaluating the frequency of SIB across three conditions. The control condition involved a staff person sitting next to Jack and providing him with free access to preferred activities. This condition was designed to serve as an enriched environment in which challenging behavior would not be expected to occur. The attention, demand, and tangible conditions involved providing attention, escape from instruction, and access to preferred snacks, respectively, following instances of SIB but not at other times. The purpose of these conditions was to test whether SIB would occur more often based on the type of outcome it produced. The alone condition involved observing Jack through a one-way mirror to determine if SIB would continue in the absence of social interactions.

Figure 1 displays the outcome of the initial functional analysis. SIB occurred least often in the control and tangible conditions and more often in the attention, demand, and alone conditions; however, the overlap in frequency of SIB across these conditions and the control condition make the outcome difficult to interpret. Therefore, a second functional analysis was completed to clarify the outcome of the first analysis.

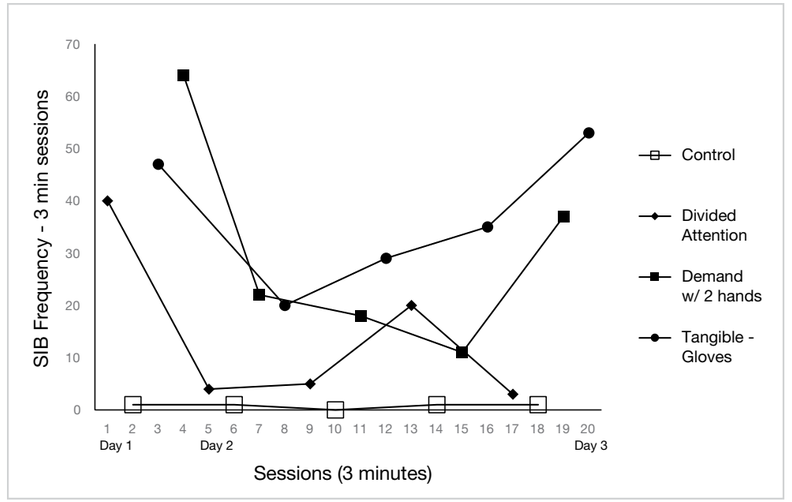
Figure 1



In the second analysis, the attention, demand, and tangible conditions were modified based on anecdotal observation of idiosyncratic variables. For the attention condition, the antecedent context in the second analysis involved another staff speaking to Jack's staff rather than Jack's staff simply not attending to him until SIB occurred. For the demand condition, Jack's access to his gloves was interrupted by requiring him to use two hands to complete a fine motor task that could not be easily completed while wearing the gloves. This differed from the previous demand condition because, in the first functional analysis, Jack was able follow instructions using one hand while wearing gloves. The tangible condition involved providing Jack access to his gloves, instead of food, following SIB. This meant that Jack was asked to take off his gloves at the start of the tangible condition and was provided access to his gloves only when SIB occurred.

Figure 2 displays the outcome of the second functional analysis, which yielded clear results: SIB occurred much more frequently in the attention, demand, and tangible test conditions than it did during the control condition. This outcome demonstrated that there were multiple situations that evoked and maintained SIB (i.e., SIB occurred because it was effective at producing attention, access to gloves, and escape of situations in which academic instruction disrupted access to gloves).

Figure 2



Based on the outcome of the second functional analysis, the clinical team implement interventions modeled after the control condition, which did not support high rates of SIB. Accordingly, Jack's staff provided him with 1:1 attention, avoided divided attention situations, reinforced all requests for snack, and provided free access to gloves. The initial effect of this intervention package was a decrease in the frequency and intensity of SIB, with zero occurrences of high intensity SIB for over the first week following the analysis. Despite this initial success, Jack's SIB has been treatment resistant (as is the case with some individuals who engage in SIB; see Hagopian et al., 2015), and the clinical team has continued to modify interventions to reduce the probability of SIB and to practice modest changes from the control condition.

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Increasing Spontaneous Mands with Speech-Generating Devices Through a Modified PECS Procedure

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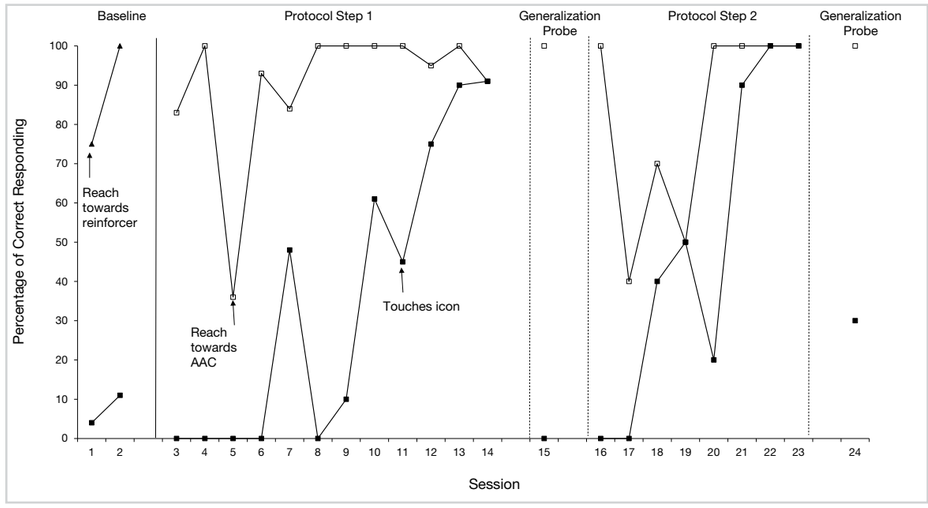
ABSTRACT: There are a variety of methods for teaching individuals with autism spectrum disorder (ASD) to use speech-generating devices (SGD). However, there is no standard protocol that teaches individuals to utilize their devices as they would with the Picture Exchange Communication System (PECS). The purpose of the current study was to assess the use of the PECS protocol to teach a student to communicate with an SGD. The results of the initial phase indicated the PECS protocol was effective at establishing requests for preferred items when presented with a choice of two items.

Communication can occur in many forms, including through spoken language, gestures, pointing, icons, etc. However, most individuals in society communicate through spoken language. As of 2018, about 30% of children with autism were classified as non-verbal, resulting in the need to learn other forms of functional communication (Rega et al.). When alternative communication skills are taught to individuals with autism spectrum disorder, they are typically taught to make requests first (Cowen & Allen, 2007). Teaching this skill first allows individuals to get their basic needs met without engaging in maladaptive behavior to communicate these needs. There are different tools and effective and well-researched teaching methods to teach individuals who are not vocal communicators to communicate (Bondy & Frost, 2001; Durand, 1999; Shillingsburg et al., 2019). PECS, a system in which individuals hand icons to their communicative partners, is a well-established system with a specific teaching protocol. Recent advancements in technology have resulted in many students using SGD's to facilitate communication with others. A standard teaching method for SGD would be beneficial for teaching individuals with ASD to make requests. Since PECS is a standard procedure that has taught individuals to communicate using icons like those on an SGD, the protocol might be adapted and used to teach individuals to communicate with an SGD. The purpose of this study was to pilot an adaptation of the initial phases of the PECS protocol (Bondy & Frost, 2001) with an SGD to evaluate requests, with additional generalization probes for spontaneous requests. The participant was a 10-year-old boy diagnosed with ASD who had not received any prior training with an SGD.

The first phase of the modified PECS procedure consisted of the participant, one prompter, and one communication partner. The prompter stood behind the participant, and their SGD was accessible on the table in front of them. Each session began with the communication partner holding out two preferred items and asking the participant, "what do you want?". The communication partner provided either a full physical, partial physical, or gestural prompt toward the icon on the device. After the participant made a choice, the communicative partner selected the correct page on the SGD which displayed only the icon of the selected item. When the participant gestured or reached for the item, the communication partner immediately provided a prompt toward the icon on the device then prompted to press the icon. The SGD then stated the item name, and the communication partner modeled the full sentence (e.g., "I want chocolate") while handing the participant the requested item. Ten trials were conducted during each session. After meeting mastery criteria (two sessions at 90% correct), the participant moved on to a less restrictive prompt level for that step in the requesting chain. Once the participant progressed through the prompting hierarchy, the participant did not receive any prompting for the target step.

The results indicated the PECS protocol was effective at teaching the student to press the icon on the SGD to indicate which item he wanted. That is, when an instructor presented the student with a preferred item, the student consistently reached towards the SGD and pressed the icon rather than reaching towards the preferred item. This represents an important first step for the student using his SGD to communicate his wants and needs and is analogous to the behavior taught in Step 1 of the PECS protocol. Additional teaching sessions will be conducted to help the student learn to be more persistent with requests, to discriminate among different icons and ask for items when multiple items or activities are present.



* This project was completed in partial fulfillment of the first author's Ph.D. in Applied Behavior Analysis at Cambridge College

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RESIDENTIAL SCHOOL *Program*

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The Evergreen Center improves the quality of life for children and adults with disabilities by providing collaborative, compassionate, and evidence-based services to individuals and their families.

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The Evergreen Center is pleased to announce our partnership with Bridgewater State University (BSU) to offer graduate-level coursework in Special Education with a concentration in Applied Behavior Analysis (ABA).

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Evergreen has a rich history of working with higher education institutions to deliver premier ABA and education programs, preparing professionals for the Board Certified Behavior Analyst (BCBA) certification. Our partnership with BSU ensures that we will continue to build on our academic successes for many years to come. This initiative will be led by our accomplished team of doctoral-level clinicians, who will assume leadership and academic roles at BSU, including program coordination, teaching, and curriculum development.

Evergreen supports our staff with generous tuition assistance as part of our professional development model, which in turn enhances the quality of services we offer to the children and families we serve. We are proud and excited to collaborate with one of the top Special Education programs in Massachusetts, and we look forward to a long and productive relationship. Together, we aim to prepare our students to become the next generation of leaders and practitioners in the education and human services fields.