

Overview of the 24 Evidence-based Practices

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Antecedent-Based Intervention

Antecedent-based interventions (ABI) are a collection of practices in which environmental modifications are used to change the conditions in the setting that prompt a learner with ASD to engage in an interfering behavior.

The goal of ABI is to identify the conditions in the setting that are reinforcing the interfering behavior and then to modify the environment or activity so that the environmental conditions no longer elicit the interfering behavior.

Descriptions and Examples of ABI Strategies

ABI strategy	Description	Functions addressed	Examples
Using learner preferences	Tasks/activities are modified to increase interest.	Escape/avoid	<ul style="list-style-type: none"> • Incorporating dinosaurs into a finger painting activity • Using a Spiderman notebook for journal entries
Altering the environment	Routines and schedules are changed to decrease interfering behaviors.	Escape/avoid	<ul style="list-style-type: none"> • Changing seating • Changing line up procedures • Providing activities during wait time • Providing snack after non-preferred activity • Providing sufficient space between students • Clearly marking areas of the classroom (e.g., work, leisure) • Providing study carrels • Providing a kitchen timer during non-preferred tasks

Descriptions and Examples of ABI Strategies

ABI strategy	Description	Functions addressed	Examples
Implementing pre-activity interventions	Intervention is implemented before a task associated with the interfering behavior.	Escape/avoid	<ul style="list-style-type: none">• Incorporating dinosaurs into a finger painting activity• Using a Spiderman notebook for journal entries
Altering the environment	Routines and schedules are changed to decrease interfering behaviors.	Escape/avoid	<ul style="list-style-type: none">• Providing a warning about an upcoming activity• Going over an assignment before class starts• Providing information about schedule changes• Using activity schedules

Descriptions and Examples of ABI Strategies

ABI strategy	Description	Functions addressed	Examples
Using choice-making	Choice of materials or tasks is offered during activities or settings where the interfering behavior occurs.	Escape/avoid	<ul style="list-style-type: none"> • Choosing where to sit at snack • Choosing which activity to complete first • Choosing which toy to play with during free play • Choosing whether to write with a pencil or a pen
Altering how instruction is delivered	Instruction is modified so that learner clearly understands what is expected.	Escape/avoid	<ul style="list-style-type: none"> • Providing written rather than verbal instructions • Providing instructions in a checklist rather than paragraph
Enriching the environment	Providing access to appropriate behaviors (rocking chair)	Get/obtain	<ul style="list-style-type: none"> • Allowing quiet play with clay or doodling during lectures • Allowing chewing gum instead of playing with

FAQs

- **Q. How do I know which ABI strategy to use?**

- **A.** First, you will need to conduct a functional behavior assessment (FBA) to determine the function of the interfering behavior. This information will help you choose which strategy might be most helpful in addressing the function of the interfering behavior as well as the appropriate strategy for reducing its occurrence.

- **Q. How do I go about implementing ABI strategies across daily routines and activities?**

- **A.** The FBA will help you identify when and where the interfering behavior is occurring. As a result, you will know when to implement the appropriate ABI strategy. Creating an activity matrix will help you plan the intervention, including when and where it should occur as well as the person(s) responsible for implementing it.

- **Q. What do I do if the learner with ASD uses the interfering behavior when I begin implementing ABI during a particular activity?**

- **A.** Antecedent-based intervention strategies are often used along with other evidence-based practices such as extinction and reinforcement. When a learner with ASD begins engaging in the interfering behavior when first implementing an ABI strategy, it is best to use extinction. This practice focuses on no longer providing reinforcement when a learner engages in an interfering behavior. The goal is to eliminate the source of reinforcement for the interfering behavior through the use of extinction and ABI.

- **Q. Are there any other evidence-based practices that I should use when implementing ABI?**

- **A.** First, an FBA should always be conducted prior to implementing ABI. The FBA will help you identify the function of the interfering behavior as well as which ABI strategies would be most effective at addressing the function of the behavior. Additional evidence-based practices that often are used along with ABI include extinction, reinforcement, structured work systems, and visual supports.

Computer-Aided Instruction

Computer-aided instruction can be used effectively to address academic and communication/language skills. In the academic domain, evidence-based research focused on **vocabulary and grammar**. Within the communication domain, evidence-based studies targeted communicative functions and initiations. One study taught the recognition and prediction of **emotions** in others.

Computer Aided Instruction

- The first step in implementing computer-aided instruction is to identify the skills or behaviors that you want to teach via the computer.
- The learner's Individualized Family Service Plan (IFSP) or Individualized Education Program (IEP) will specify priorities and specific goals.
- From a review of the listed goals and discussion with learners and their families and team members, a specific skill (e.g., improved spelling, increased vocabulary) or behavior (e.g., recognizing the emotions of other people during conversations) should be identified as the target of instruction. It is important to operationalize the behavior or skill so that it is observable and measurable.

Prior to investing time, money, and effort in acquiring software that addresses the target of instruction, identify and schedule computers for learners to use.

Gather the following information:

- What type of computer (Mac or PC) is available?
- What type of operating system is on the computer (e.g., Windows XP for PCs, OS X Leopard v 10.5 for Macs)?
- Where is the computer located (e.g., classroom, library, lab)?
- What types of drives does the computer have (e.g., CD, DVD, CD/DVD combination, floppy, ISB Port)?
- Does the computer have internet access?
- Is the computer on a network (i.e., linked to other computers on the same server)?
- Does the computer have access to a printer and is it connected?
- Are the computer's keyboard and mouse in good working order?
- Does the computer have special adaptations (e.g., voice activated, large print monitor for individuals with visual impairments)?

FAQs

- **Q. Where do I start when selecting software for a learner with ASD?**
- **A.** It really can be overwhelming when one realizes how much software is "out there." The best place to start, of course, is by focusing on the specific goal for which you would use the software. In other words, for what do you want to use CAI? If you still feel stuck, try narrowing your goal.
For example, if the goal is for the learner to improve his or her math skills, try specifying exactly which math skills. Does the learner need practice with basic math facts (e.g., addition, subtraction, multiplication, division) or practice with computation?
Once you have a specific skill or set of skills identified, talk to the people you work with to find out with what programs they are familiar and which may already be available. You can also go online and conduct an internet search or even go into a store that sells software and talk to the sales staff. Remember to always include learners in the process. Ask them what software, if any, they have used before. If there is a choice of theme for the software (e.g., cars, animals), show it to the learners and find out if they have a preference

FAQs

- **Q. Is it okay to get a learner started with the computer program and then go assist other students at their desks?**
- **A.** The answer to this question depends on the learners and how familiar they are with the software and the computer. For younger learners, you may find that they will do better if they have an adult nearby at all times. For older learners, or learners who are more experienced with computers, you may find that you will not need to stay as close. The important thing to ask yourself is, "What will the learner do if he/she encounters a problem and no one is there to help?" Particularly in the acquisition or early learning stages of computer/software use, you want to minimize the chances of the learner becoming frustrated or overwhelmed. You also want to avoid having a learner sit at the computer doing nothing because she is waiting for someone to help her.
- **Q. I introduced my student to a computer program with games for math and now he only wants to play on the computer. When I try to get him to do something else, he throws a fit. What should I do?**
- **A.** Well, first, congratulate yourself on finding CAI that is a good match for your student and that helps him learn the math skills he needs. Next, you will likely need to set up a regular routine or structure for his use of the program. If he knows when he will be able to use the software, he may be more willing to wait. Also, consider whether or not he can earn extra time at the computer for other work or behavior or if he may choose computer use during school or home free-choice time. Another thing to think about is whether or not there may be other CAI applications or opportunities. That is, are there other skills or behaviors that your student can be taught via the computer? With careful and creative planning and structure, your student will likely learn that there is a time and place for computer use.

FAQs

- **Q. Is it appropriate to offer CAI as a positive reinforcer for other activities? Similarly, should I take away computer time as punishment, even if the CAI is being used to target academic goals?**
- **A.** There is no right or wrong answer to this question. It simply depends on the learner, his or her goals, what you are using CAI for already, how much time is being spent on the computer, etc. So, to answer your first question, yes, it is appropriate to offer CAI as a positive reinforcer for other activities. Just be careful not to go overboard and satiate learners with CAI so that they never want to see another computer again! The answer to your second question is trickier. In general, it is better to go with positive strategies that do not involve punishment. The danger in taking away computer time is exactly what you stated in your question. If CAI is being used to teach academic goals, you want to avoid limiting the learner's use of it. There is the possibility that your learner has figured out how to "get out" of school work by behaving in such a way as to have that time taken away. If you have not already done so, conduct a Functional Behavioral Assessment (FBA) to determine the function of the learner's behavior (i.e., to find out why they are acting the way they are). This will help you address the behavior in a meaningful and productive way and will likely help you avoid having to use punishment.

FAQs

- **Q. My student does well on the computer games that we use to help him with vocabulary, but we're not seeing him use the vocabulary in real life. How can we help with generalization?**
- **A.** For all learners, including learners with Autism, generalization of learned skills or behaviors can be a challenge. There are a number of ways to promote generalization. A simple one for vocabulary use is to structure situations in which the learner will practice learned vocabulary. This could be an informal conversation between teacher and learner, or scripted to target specific word use. It might involve both verbal and written use of words. Small groups of learners could practice using new vocabulary in the context of a "round robin" type of game. Peer-mediated instruction and intervention strategies could be employed by teaching a classmate the right questions to ask or a strategy for leading a conversation in which the learner would be prompted to use learned words. In terms of generalizing use from school to home, sending a list of learned words home with the learner, along with some suggestions for promoting the use of the words with family members, is a strategy commonly used when teaching spelling. The same strategy can work for word use as well.

FAQs

- **Q. How can I help parents understand that appropriate use of educational software is not the same as the learner "spending all day playing video games"?**
- **A.** First, you might share information from this module on the evidence base supporting the use of CAI as an instructional strategy. In addition, you might provide a demonstration of the software you would like to use or are using with the learner. In this way, you can show how the software works and relate it directly to the specific target goal that you are applying it to. It might also help to share with parents any data sheets that you have created to track learner progress. Finally, the best proof is in the learning of new skills or behaviors. Once their child begins to show progress (which you can document via data collection), the parents may begin to see the value of spending school time on the computer.

Differential Reinforcement

Differential reinforcement (DR) is a special application of reinforcement designed to reduce the occurrence of interfering behaviors (e.g., tantrums, aggression, self-injury, stereotypic behavior). The rationale for DR is that by reinforcing behaviors that are more functional than the interfering behavior or that are incompatible with the interfering behavior, the functional behavior will increase, and the interfering behavior will decrease. A variety of differential reinforcement strategies can be used to increase positive behaviors and decrease interfering behaviors. DR includes the following steps.

Function of Interfering Behavior	Differential Reinforcement Procedure	Example	Other Potential Behavioral Procedures
ATTENTION	Reinforce appropriate and desired attempts to get attention.	Teach learner to use pictures and/or hand gestures to get attention. Reinforce the desired behavior by immediately responding to the appropriate attempt.	Functional Communication Training (FCT) Extinction Non-contingent Reinforcement
ESCAPE	Reinforce requests for breaks.	Create a system for requesting breaks (e.g., picture cards) and reinforce attempts by giving a break as soon as desired behavior is demonstrated.	Functional Communication Training (FCT) Extinction Non-contingent Reinforcement

Function of Interfering Behavior	Differential Reinforcement Procedure	Example	Other Potential Behavioral Procedures
<p>SENSORY/AUTOMATIC (Behavior is reinforced because it feels good or because learner can escape discomfort.)</p>	<p>Identify movement, sounds or actions that are reinforcing. Find ways that those sounds or movements can occur without the interfering behavior and reinforce those activities.</p>	<p>Teach a learner who bangs his head on the wall to put his head in a soft space where he can not hurt himself and reinforce him for using the appropriate space.</p>	<p>Response Redirection and Interruption Functional Communication Training (FCT) Extinction Non-contingent Reinforcement</p>
<p>TANGIBLE (to gain items, toys, etc.)</p>	<p>Reinforce the learner for requesting appropriately.</p>	<p>Teach learner who screams for the computer to wait quietly for a timer to buzz. Reinforce by allowing him/her to use the computer.</p>	<p>Functional Communication Training (FCT) Extinction Non-contingent Reinforcement</p>

- **Who Would Benefit Most from Differential Reinforcement?**

- Learners with ASD range from preschool ages through high school and into adulthood. These learners exhibit challenging or other inappropriate behaviors can benefit from differential reinforcement procedures. Examples of specific skills that have been the focus of differential reinforcement interventions in evidence-based studies include:
 - ✓ *phobias* (Jones & Friman, 1999; Shabani & Fisher, 2006);
 - ✓ *stereotypies, repetitive behavior* (Patel, Carr, & Kim, 2000; Taylor et al., 2005);
 - ✓ *disruptive, aggressive behavior* (Adelinis et al., 2001; Newman et al., 1997; Piazza et al., 1996);
 - ✓ *compliance* (Lalli et al., 1999);
 - ✓ *verbal responding* (Lee et al., 2002; Schwartz, 1982; Shabani et al., 2002; Williams et al., 2000); and
 - ✓ *play skills* (Miller & Neuringer, 2000).

Discrete Trial Training

Discrete trial training (DTT) is a one-to-one instructional approach used to teach skills in a planned, controlled, and systematic manner. DTT is used when a learner needs to learn a skill best taught in small repeated steps. Each trial or teaching opportunity has a definite beginning and end, thus the descriptor discrete trial.

Within DTT, the use of antecedents and consequences is carefully planned and implemented. Positive praise and/or tangible rewards are used to reinforce desired skills or behaviors.

Data collection is an important part of DTT and supports decision making by providing teachers/practitioners with information about beginning skill level, progress and challenges, skill acquisition and maintenance, and generalization of learned skills or behaviors.

With what ages is DTT effective?

DTT can be used to teach students from early childhood through elementary school at all ability levels. Due to the intensive and repetitive nature of DTT, there is more evidence for using DTT with younger children (i.e., 2 to 9 years of age).

What skills or intervention goals can be addressed by DTT?

DTT has been shown to have positive effects on children's academic, cognitive, communication/language, social, and behavioral skills. DTT can also be used to teach attending, imitation, and symbolic play skills.

Extinction

Extinction is a strategy based on applied behavior analysis that is used to reduce or eliminate unwanted behavior.

Extinction involves withdrawing or terminating the positive reinforcer that maintains an inappropriate interfering behavior. This withdrawal results in the stopping or extinction of behavior.

The interfering behavior is likely to increase in frequency and intensity (extinction burst) before it is extinguished as the learner seeks to elicit the reinforcers previously provided. Extinction is often used with differential reinforcement to increase appropriate behaviors while discouraging the use of inappropriate behaviors.

- **With what ages is extinction effective?**
- Extinction can be used effectively with children and youth in early childhood, elementary, and middle school settings.

- **What skills or intervention goals can be addressed by extinction?**
- Extinction procedures are most commonly used to reduce challenging or interfering behaviors. Within the articles that comprise the evidence base, extinction has been used to successfully reduce interfering behaviors (disruptive or restricted behaviors that interfere with optimal development, learning, and/or achievement).

- **In what settings can extinction be effectively used?**
- Extinction procedures should only be used after other more positive interventions have been tried and shown not to work. Extinction procedures should only be used by an individual who is familiar with the learner and who can create a plan for dealing with an extinction burst should the behaviors get worse.

Function of Behavior	Extinction Procedure	Example	Other Procedures Useful in Conjunction with Extinction
To gain attention	Planned ignoring	Learner is calling out to get the teacher's attention, and the teacher does not respond to the calls.	<ul style="list-style-type: none"> • Functional Communication Training (FCT) • Differential reinforcement • Non-contingent reinforcement
To escape/ avoid demands or interaction	Deny opportunity for breaks	Learner screams whenever he is asked to complete a new task to avoid the demand. The teacher/practitioner continues with task even though the learner is screaming.	<ul style="list-style-type: none"> • Functional Communication Training (FCT) • Differential reinforcement • Non-contingent reinforcement

Function of Behavior	Extinction Procedure	Example	Other Procedures Useful in Conjunction with Extinction
To gain sensory stimulation or to avoid unwanted stimulation	Interrupt and re-direct the behavior <i>OR</i> change the consequence (from the sensory behavior) so it is no longer reinforcing	Learner bangs his head on a desk so the teacher puts a soft pillow to block the reinforcing sensation.	<ul style="list-style-type: none"> • Response interruption/redirecti on • Functional Communication Training (FCT) • Differential reinforcement • Non-contingent reinforcement
To gain tangible items	Deny access to materials	Learner screams to get time on a computer and is denied access.	<ul style="list-style-type: none"> • Functional Communication Training (FCT) • Differential reinforcement • Non-contingent reinforcement

Functional Behavior Assessment

Functional behavior assessment (FBA) is a systematic set of strategies that is used to determine the underlying function or purpose of a behavior, so that an effective intervention plan can be developed.

FBA consists of describing the interfering or problem behavior, identifying antecedent or consequent events that control the behavior, developing a hypothesis of the behavior, and testing the hypothesis.

Data collection is an important part of the FBA process. Often, teachers/practitioners use functional communication training (FCT), differential reinforcement, response interruption/redirection, extinction, and stimulus control/environmental modification to address these behaviors in learners with ASD.

- **With what ages is FBA effective?**

According to the evidence-based studies, learners with ASD ranged in age from 3 to 15 years with the majority of studies showing the effectiveness of functional behavior assessment with elementary age learners.

- **What skills or intervention goals can be addressed by FBA?**

FBA targets skills in the domains of behavior and communication, usually with a focus of decreasing inappropriate behavior and teaching or increasing appropriate communicative alternatives. The studies in the evidence base targeted behaviors described as severe, stereotypical, disruptive, escape-motivated, rejecting, and leading. Replacement skills included more appropriate forms of communication such as signing, pointing, talking, and the use of alternative and augmentative communication (AAC) devices.

Function of Interfering Behavior	Other Potential Behavioral Procedures
Attention	Functional communication training (FCT) Extinction Differential reinforcement
Escape/Avoid	Functional communication training (FCT) Extinction Differential reinforcement Stimulus control
Sensory/ autonomic (behavior is reinforced because it feels good or because learner can escape discomfort)	Response interruption/redirection (RIR) Functional communication training (FCT) Extinction Differential reinforcement Stimulus control
Tangible (e.g., to gain items, toys)	Functional communication training (FCT) Extinction Differential reinforcement Stimulus control

Functional Communication Training

Functional communication training (FCT) emerged from the literature on functional behavioral assessment (FBA) as a systematic practice to replace inappropriate behavior or subtle communicative acts with more appropriate and effective communicative behaviors or skills.

FCT is always implemented after an FBA has been conducted to identify the function of an interfering behavior. When using FCT, teachers/practitioners analyze the interfering behavior to determine what the learner is trying to communicate. For example, is the learner biting peers when she wants a toy that another child has? Or is the learner yelling out in class so that he will be sent out of the room? After teachers/practitioners have identified the function of the interfering behavior, they then implement FCT to identify and teach a replacement behavior that is easy for the learner to use and serves the same purpose as the interfering behavior, but in a more appropriate way.

With what ages is FCT effective?

- FCT can be used effectively with children with ASD, regardless of cognitive level and/or expressive communicative abilities. The evidence base shows that FCT is an effective intervention for learners at the early childhood and elementary levels. It is reasonable to assume that it would be an effective practice for older learners as well.

What skills or intervention goals can be addressed by FCT?

- FCT targets skills that help children and youth with ASD effectively communicate with others in a variety of situations and settings. In the evidence base, FCT was used to decrease the incidence of interfering behaviors and to replace subtle, less-clear communicative forms (e.g., leading an adult by the hand to a desired item) with clearer communicative forms (e.g., pointing).

Are Assessments Necessary Before Initiating an FCT Program?

- ✓ A high-quality FBA should be completed prior to initiating FCT. Without an FBA, there is no way to identify a communicative behavior that serves the same purpose as the interfering behavior.
- ✓ It is also important to know what methods of communication are easiest for the learner to use. For example, even though a learner is verbal, it may be difficult for him to use a verbal response in the heat of the moment. A verbal learner may find it easier to hand over a sentence strip saying, "I need a break," to the teacher when he becomes frustrated rather than speaking the same words.
- ✓ Other communicative methods include signs, speech-generating devices (SGD), gestures, picture exchange, or picture pointing. Conversations with other professionals and family members who are close to the learner, as well as observations of the learner, are needed to obtain information regarding the most effective communicative method.

Frequently Asked Questions

- Q. If I teach my student to request a break, won't he constantly be requesting breaks and not do any work?**
- Q. My student is verbal, and we have been teaching him to say, "Snack, please" instead of grabbing fruit snacks from the shelf. However, he has continued to grab the snacks and only uses the verbal request when we ask him to.**
- Q. My student exhibits many interfering behaviors. How can I possibly teach her to communicate instead of engaging in all of these behaviors?**
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- Q. My student hits all the time with no rhyme or reason. It is not serving any function for him. Why shouldn't I just use time outs to punish him for hitting as I would with any other student?**

FAQs

Q. If I teach my student to request a break, won't he constantly be requesting breaks and not do any work?

A. It is important to keep in mind the primary goal of the intervention. For example, the goal may be for the learner to reduce self-injurious behaviors. To accomplish this, he is taught to request a break from the work that he is avoiding. At first, it may be that he does less work than you, as his teacher, want him to do. But, remember, the work is not the primary goal (and he wasn't doing the work when he was exhibiting those behaviors, either!). The prevention of self-injurious behaviors is the goal. As the training progresses, you will be able to increase the length of time between the request and the break, shorten the length of the break, and/or limit the number of requests the student may make. However, at first, it is important that the communication be honored and that he is given the reinforcement (the break) quickly and consistently.

Q. My student is verbal, and we have been teaching him to say, "Snack, please" instead of grabbing fruit snacks from the shelf. However, he has continued to grab the snacks and only uses the verbal request when we ask him to.

A. You may want to look at a couple of things. Are you sure that he is grabbing the fruit snacks because he wants to eat them? Or might he be looking for attention from staff? Look again at your FBA and be sure you correctly identified the function of the behavior. If you are sure the student wants a snack, look at how reinforcement is provided. For example, are the fruit snacks given quickly and consistently following his request? Finally, have you determined that the target behavior has no function? In the example of grabbing, you may need to put the fruit snacks out of reach so that the student is unable to obtain reinforcement from grabbing the snacks. (Simply ignoring the behavior won't do, as he will be happily eating the fruit snacks he has grabbed.)

Q. My student exhibits many interfering behaviors. How can I possibly teach her to communicate instead of engaging in all of these behaviors?

A. It can be overwhelming to face an entire day's worth of interfering behaviors and not know where to start. The FBA process will break this up into different behaviors and allow you to look at each one. You may find that the student engages in a response class of behaviors that all serve the same function. For example, she may hit, spit, scream, and flap her hands, but all of these behaviors are used to escape environments where other students get too close to her. Teaching a single message (for example, hitting a Big Mac switch to request, "Step back, please.") and teaching peers how to respond to the message may result in a significant reduction in interfering behaviors. Again, the FBA process is crucial and will help your team make sense of what you are observing.

Q. My student hits all the time with no rhyme or reason. It is not serving any function for him. Why shouldn't I just use time outs to punish him for hitting as I would with any other student?

A. Interfering behaviors always serve some purpose, even if the student does not intend for the behavior to specifically communicate something. Completing an FBA will help identify the reason for the behavior. Because students with ASD interact with their environment differently than other students, something typically considered punishing, such as a time out, may actually be reinforcing for the student and result in increased use of the undesired behavior. If this turns out to be the case, you may be able to teach the student to request some alone time to prevent the hitting behaviors.

Naturalistic Interventions

Naturalistic intervention is a collection of practices including environmental arrangement, interaction techniques, and strategies based on applied behavior analysis principles. These practices are designed to encourage specific target behaviors based on learners' interests by building more complex skills that are naturally reinforcing and appropriate to the interaction.

With what ages is naturalistic intervention effective?

- Naturalistic intervention can be used effectively with learners with ASD regardless of cognitive level and/or expressive language skills. The evidence base shows that naturalistic intervention is effective for learners at the preschool, elementary school, and middle/high school levels.

What skills or intervention goals can be addressed by naturalistic intervention?

- The evidence base demonstrates that naturalistic intervention can be used to facilitate communication and social skills, which may include things like expressive vocabulary, speech intelligibility, use of gesture, shared attention, and turn-taking.

Q. How can I target skills across the day if I'm not with my student all day?

A. A key feature of naturalistic intervention is to train people who are with the learner during the day to use techniques to bring out the skill. Adults who may need this training include related service providers, classroom teachers, paraprofessionals, childcare providers, and/or parents. Training can be done through a variety of methods; the National Professional Development Center (NPDC) brief on parent implemented training may be helpful (please refer to *Parent Implemented Interventions: Steps for Implementation* (National Professional Development Center on ASD, 2008)). Other methods may include inservice training for school staff, regular written contact like email, coaching/mentoring programs, and/or modeling of the skills. The step-by-step directions in this module may be given to team members in order for them to learn the intervention. In addition, the teacher, practitioner, or team member can help arrange environments in such a way to bring out the target behavior.

Q. How can I take data on the intervention, when it happens all day, everywhere?

A. One important consideration in data collection is finding a system that is manageable for you. This may mean that you have multiple data collection sheets that are easily accessible around the room/school. Another idea is to video record some parts of the day and go back to collect the data. Still another option is to have other team members watch the interaction and take data for you. Taking data online by yourself can be challenging, but with proper preparation and materials it can certainly be done!

Another thing to remember is that one does not need to take data all day, every day. Rather, taking data one day per week, or one week per month, is often a very appropriate way to track the progress of an individual student!

Q. How do I know if naturalistic intervention is appropriate for my student? He does well with table work, but should I be doing more?

A. If you are concerned with generalization of skills and have a team that is willing to cooperate with a naturalistic intervention, then naturalistic intervention may be a good choice! Even if parents are able to minimally participate in the intervention, working on target skills throughout the school day and across environments may result in the learner's ability to use the skills more naturally. In addition, naturalistic intervention does not need to replace traditional one-on-one teaching (discrete trial training, or DTT, for example), but can be used alongside it. For example, a student may work on number concepts through DTT for 30 minutes each morning, and then spend the rest of the day in a naturalistic intervention program focusing on language skills.

Q. I have students who are included in general education classrooms, and I can't ask the teacher to rearrange her whole room in order to manipulate the environment. Do I have to do this in order to do the intervention?

A. A teacher shouldn't have to change her whole classroom! However, some minor changes may make it more likely that she can bring out the target behavior. For example, if the target behavior is to increase interactions with peers, she may make a new rule that computer play during free choice is a two-person activity, thus allowing an opportunity for the student with ASD to ask a peer to play on the computer with him. If the target behavior is for the student to use words to request, she may have one person in the group be in charge of the markers, another person in the group in charge of the glue, etc. This way, all students will need to use words to request supplies each time they are needed.

Parent Implemented Intervention

In parent-implemented intervention, parents use intervention practices with their child to teach positive skills and/or reduce interfering behaviors in the home or community. Parents collaborate with practitioners to develop goals and a corresponding intervention plan. Parents learn how to implement the intervention through a structured training program.

Parent Implemented Intervention

- Parent-implemented intervention is a system that consists of six essential steps:
- 1. determine the needs of the family;
- 2. outline goals;
- 3. develop the intervention plan;
- 4. train parents;
- 5. implement the intervention; and
- 6. monitor progress.
- *Each step contains specific practices and procedures designed to successfully guide parents and practitioners.*

Goals of Parent Implemented Intervention

- **increasing social communication skills** (*Aldred, Green, & Adams, 2004; McConachie, Randle, Hammal, & Le Couteur, 2005; Symon, 2005*);
- **initiating communication** (*Aldred, Green, & Adams, 2004; Koegel, Symon, & Koegel, 2002*);
- **increasing conversation skills** (*McConachie, Randle, Hammal, & Le Couteur, 2005*);
- **increasing spontaneous language** (*Charlop-Christy & Carpenter, 2000; Symon, 2005*);
- **increasing joint attention** (*Rocha, Schreibman, & Stahmer, 2007*);
- **increasing language in play** (*Gillett & LeBlanc, 2007; and*
- **promoting the use of functional communication** (*Moes & Frea, 2002*)
- **improving compliance** (*Ducharme & Drain, 2004*);
- **increasing on-task behavior** (*Ducharme & Drain, 2004; Ozonoff & Cathcart, 1998*);
- **reducing aggression** (*Moes & Frea, 2002*);
- **increasing eating** (*Gentry & Luiselli, 2008*); and
- **reducing disruptive behaviors** (*Moes & Frea, 2002*).
- **increasing positive affect in parents** (*Koegel, Symon, & Koegel, 2002*); and
- **increasing parent-child interactions** (*Aldred, Green, & Adams, 2004*).

FAQs

Q. How do I ensure that I am using family-centered planning when using parent-implemented intervention?

- A.** Practitioners ensure the use of family-centered planning by involving parents in all parts of the intervention process, including:
- identification of strengths, needs, and priorities;
 - goal development;
 - intervention plan development;
 - parent training;
 - intervention delivery; and
 - progress monitoring.
- Practitioners collaborate with families to ensure they are providing input and are empowered to make meaningful decisions. Practitioners gain thorough knowledge of the child with ASD and family needs through interviews, observations, and ongoing discussion.

Q. How do I know if the outlined goals for parent-implemented instruction are clear enough?

A. The best way to be sure you have clearly defined the goal you are targeting is by putting it to the test with another adult. If the definition is precise and clear, you and another adult should be able to observe the child using the behavior and consistently agree on whether or not the child is correctly demonstrating the target behavior. If you and another adult do not agree on the target behavior, then the description of the behavior should be modified to eliminate any discrepancies.

Q. What areas are appropriate to target through parent-implemented intervention?

A. Parent-implemented intervention can be used to increase/improve communication skills and/or reduce interfering behaviors. In the area of communication, parent-implemented intervention has been used to increase social communication skills, conversation skills, spontaneous language, use of augmentative and alternative communication, joint attention, and interaction in play. In the area of behavior, parent-implemented intervention has been used to improve compliance, reduce aggression, increase eating, and reduce disruptive behaviors.

Q. How do I determine the child's goals to target during parent-implemented intervention?

- A.** There are a number of factors that must be considered when determining child goals. Each child with ASD is unique. Additionally, each family has its own specific circumstances and needs. Therefore, every effort must be made to ensure goals are individualized and address parents' areas of concern. Practitioners gain a thorough understanding of family concerns by conducting interviews, observations, and engaging in ongoing discussions. Behaviors impacting family functioning should be of high priority. Teams should consider targeting those behaviors that:
- are a safety concern;
 - cause disruption in the home;
 - would result in increased interaction (type, frequency, nature, and reciprocity of interactions);
 - would increase access to the community; and
 - require instruction in the home for generalization.
 - The child's Individualized Education Plan or Individualized Family Service Plan should be reviewed to identify goals that are appropriate for parents to implement in home and/or community settings.

Q. What types of intervention strategies should parents use in the home with their child with ASD?

A. It is best for parents to use evidence-based practices that have been shown to be effective when implemented by parents. Consult peer reviewed journals to determine appropriate strategies and gain information regarding the specific features of the strategy. Further, care should be taken to recommend practices that will not cause additional stress and that are compatible with parent knowledge, characteristics, and preferences. Strategies that can be incorporated into typical home routines and activities should be used whenever possible.

Q. How often should parent-implemented intervention occur?

A. There is not an absolute amount of intervention parents should implement with their child. The frequency and duration of intervention will be highly individualized and be based on the unique needs of the family. To the maximum extent possible, parents are to implement the intervention daily within naturally occurring routines, activities, and interactions. The practitioner works with parents to develop an intervention plan they can implement consistently. The intervention plan will outline specifically when and for how long intervention should take place.

Q. How do I monitor child progress to ensure the parent-implemented intervention is effective?

A. Parents need to focus on their child. Therefore, a data collection system must be simple and easy to implement in the context of natural routines while collecting enough information to determine whether the intervention strategy is effective. To track progress on acquisition of a skill or reduction of an interfering behavior, there are three recommended types of data collection appropriate for parents. Log book entries allow parents to track the implementation of intervention and document changes in behavior through a brief narrative. Occurrence data allow the parent to document whether the behavior occurred or did not occur during a specified interval of time. Frequency data allow parents to document how many times the behavior occurred during a specified interval of time. Each of these data collection systems require minimal time by the parents to record pertinent information about the child's performance.

Q. How much training should a parent receive when conducting parent-implemented intervention?

A. Due to each family having a unique set of circumstances, the duration of training will vary considerably. Training is to be based on family characteristics as well as any specific preferences the parents express. For example, family commitments, convenience, travel considerations, costs, as well as other personal factors may impact the training schedule. Parental learning style, ability to retain knowledge, application, and generalization of skills will also impact the optimal training program. Another consideration is the complexity of the intervention plan as some interventions may require more intensive instruction than others.

Q. How do I reduce training with parents who are showing mastery over the intervention?

A. As parents demonstrate mastery over training content, practitioners systematically and slowly reduce the frequency of parent training sessions. As training is decreased, it is important for practitioners to continue to monitor parent performance to ensure they are able to provide effective intervention with less support. Once training ends, practitioners provide ongoing supervision through a variety of strategies designed to help parents generalize their skills to other behaviors. Such strategies include providing intermittent training sessions, reviewing written documentation, analyzing videos of intervention sessions, observing intervention sessions, as well as engaging in ongoing email or phone correspondence.

Peer Mediated Instruction & Intervention (PMII)

Peer-mediated instruction is used to teach typically developing peers ways to interact with and help learners with ASD **acquire new social skills** by **increasing social opportunities** within natural environments.

With PMII, peers are systematically taught ways of engaging learners with ASD in social interactions in both teacher-directed and learner-initiated activities (English et al., 1997; Odom et al., 1999; Strain & Odom, 1986).

With what ages is PMII effective?

PMII can be implemented with pairs or small groups of learners across the age range. With young children (i.e., 3 to 8 years of age), practitioners can use peer-initiation training to help learners with ASD acquire communication/language and social skills.

Social networking strategies are more appropriate for older learners (i.e., 9 to 18 years of age).

PMII has been shown to have positive effects on academic, interpersonal, and personal-social development, and may be the largest and most empirically supported type of social intervention for learners with ASD (Bass & Mulick, 2007; Maheady, Harper, & Mallette, 2001; McConnell, 2002).

What skills or intervention goals can be addressed by PMII?

PMII targets social skills that include the following: responding to others, reciprocity, understanding others, and interacting with others or in groups.

Video from OCALI

Frequently Asked Questions (FAQ)

During what activities and settings should peers and the focal child work on the skill?

Initially, peer-mediated activities should take place in a quiet area of the classroom that is free from distraction. As learners with ASD become more proficient at interacting with one another, peer-mediated intervention strategies can be implemented during most daily routines and activities.

What prompting strategies will be used to engage learners with ASD in the social interactions?

Practitioners can use verbal prompts (e.g., "Joshua is giving you the puzzle piece," "Taylor, ask Micah for a turn"), gestures (e.g., directing focal student's attention to what peer is doing), and pictures (e.g., picture of two students playing together) to assist learners with ASD in participating in social activities. Fading of prompting strategies should begin when children are engaging in social interactions consistently.

How often should learners be reinforced?

Peers should be reinforced during training sessions and throughout the intervention activities by using informal reinforcers such as pats on the back, smiles, and thumbs up.

It is important to provide these after an interaction has ended rather than during peer interactions with focal students to avoid redirecting their attention to the adult.

At the conclusion of the training sessions and intervention activities, practitioners can use reinforcement and feedback that is more explicit in nature. For example, a teacher might say, "You kept trying to get Taylor's attention when you wanted to give him a block and he finally took it. Way to go."

More tangible or formal reinforcers such as stickers or extra time on the computer also can be offered initially to peers following training sessions and activities to increase motivation to participate.

How often should intervention activities occur?

Structured learning activities should take place at least once per day. As PMII is embedded in ongoing classroom routines and activities, practitioners should plan to implement at least three learning opportunities per day.

What strategies can be used to increase the likelihood that generalization and maintenance will occur?

Practitioners can increase the likelihood that peers and focal students will generalize the use of skills by (1) incorporating multiple peers in the training and intervention activities, (2) embedding opportunities for social interaction in ongoing classroom routines and activities, and (3) fading the use of prompting strategies and reinforcement (Odom et al., 1993).

Should small groups of learners or dyads be used to promote social interaction skills?

PMII can be used with both small groups of learners or with dyads. However, it is critical that practitioners balance the contexts for intervention. By planning for a balance between structured small group activities and more naturalistic interactions between two learners during ongoing routines and activities, practitioners provide learners with ASD more opportunities to become proficient in their social interactions and generalize newly acquired skills across activities and peers.

Picture Exchange Communication System (PECS)

The Picture Exchange Communication System (PECS) was developed at the Delaware Autistic Program (DAP) and was designed to teach young children to communicate in a social context (Bondy & Frost, 1994; Frost & Bondy, 2002). Using PECS, learners are taught to give a picture of a desired item to a communicative partner in exchange for the item.

There are six phases of PECS instruction, with each phase building on the last. The phases are: (1) Teaching the physically assisted exchange, (2) Expanding spontaneity, (3) Simultaneous discrimination of pictures, (4) Building sentence structure, (5) Responding to, “What do you want?” and (6) Commenting in response to a question.

PECS training involves the following phases and steps:

- Phase 1: Teaching the Physically Assisted Exchange
- Phase 2: Expanding Spontaneity
- Phase 3: Simultaneous Discrimination of Pictures
 - Phase 3A: Discrimination between a Highly Preferred Icon and a Distracter Icon
 - Phase 3B: Teaching Simultaneous Discrimination of Pictures – Discrimination Correction Procedure
- Phase 4: Building Sentence Structure
- Phase 5: Responding to “What do you want?”
- Phase 6: Commenting in Response to a Question
- Phase 6: Commenting in Response to a Question – Differentiating Responses to Questions

Question. *Why can't I ask, "What do you want?" when teaching a child to use PECS?*

Answer. One of the unique aspects of PECS is that from the very beginning the child is taught to **initiate communication**. If the child were to give the picture to his partner after the partner said "What do you want?," he would be responding to the question. When the child puts the picture in his partner's hand, he is, in a sense, the first one to "talk." This is called initiating a request and is very different from responding to a question.

Another reason for not asking the child what he wants is that the **question often becomes a verbal cue**. It is common for children and youth with ASD to become dependent on cues used by teachers and parents to teach them things. Prompts are a very useful teaching strategy and, when used effectively, often speed up the learning process significantly. It is important when using prompts to fade them as quickly as possible so the learner does not develop dependence. You will know a learner has developed a prompt dependency if he tends to sit and wait until either told or given some other cue before doing something. In PECS, physical prompts (guiding the child's hand to pick up a picture) or visual prompts (pointing to a picture in the child's communication book) are used rather than verbal prompts (verbally telling the child what to do) because verbal prompts are much more difficult to fade. It is much easier to go from totally guiding the child's hand, to giving the arm an initiating nudge to no physical contact than it is to go from telling the child "What do you want, pick up the picture, give it to me" to silence.

- **Question.** *What is the difference between pictures and symbols? Can you use both?*
- **Answer.** Pictures are just what you would expect--they may be photographs or drawings of objects. They leave no question as to what is being requested. Symbols are more representational; individuals must be able to look at a symbol, interpret what it means, and then generalize and apply it to an actual situation.
- It is important to individualize according to the child's learning style. Some begin training with photos because they are so specific, then move on to more general symbols when they learn how to use descriptors. Also, some individuals respond better to color pictures while others respond more readily to black-and-white line drawing symbols. Computer programs are available that provide photos and symbols to print out for use with PECS books. Pictures and symbols can be used together. Professionals who are trained in the system regularly evaluate and make changes to promote success.

- **Question.** *What size pictures or symbols should I use for the learner I am working with?*
- **Answer.** It depends on the child. During the initial stages of PECS it is very important that the child is able to pick up the picture or symbol as easily as possible so you may want to begin with pictures that are 2-3 inches square. The child's fine-motor abilities are a factor as are visual discrimination skills. As the learner develops a vocabulary of 25-30 symbols and becomes proficient in manipulating the symbols, it may be a good idea to reduce the size of the symbols to 1-inch square. Reducing the size of the symbols makes it easier for the learner to find the symbol she is looking for, as the small size allows for fewer pages in the book and/or more space between the symbols on a page.

- **Question.** *My child doesn't want to use PECS. He just goes and gets what he wants. What do I do?*
- **Answer.** Children with ASD who do not have a communication system are often very determined and persistent in getting what they want by themselves. Their parents and caregivers often learn to "read the signs" of the child's behavior and know what the child wants without the child actually communicating anything. By introducing PECS, you are basically changing the rules, and that can be very uncomfortable in the beginning. It takes effort on the part of parents and teachers to make sure that a few highly desired items are available to the child only during PECS training to make this initial learning as quick and easy as possible. Once the child learns how quickly he can go tell the important people in his life what he wants, it becomes much easier to use the system.

- **Question.** *Won't my child become dependent on using symbols? Will my child ever learn to talk?*
- **Answer.** There are many factors involved in learning to use spoken language and functional communication. One major factor is a child's ability to produce a variety of vocalizations even if she is not using words. Another factor is the child's understanding that her vocalizations can have meaning to another person. A third factor is the child's cognitive abilities. One or all of these may be significantly affected in young children with ASD. It is impossible to predict the rate of progress in any of these factors when a child is very young. What is known, however, is that the earlier a communication system is taught to the child, the more practice she will get in successfully communicating with and learning from others. Many children who began to communicate using PECS start to say words and begin talking. These children tend to gradually use their communication books less and less and become more skilled in communicating with spoken language. A few children never develop the verbal skills needed for spoken language. For these children PECS continues to be an effective way to communicate. There is no evidence that use of PECS prevents children from developing spoken language.

- **Question.** *The learner I am working with is continually losing his PECS symbols when he is not at school. How can I expect his family to use the system when they are unable to keep track of his symbols and book?*
- **Answer.** Keeping track of symbols and communication books at home can be a challenge for some families, especially if they have young children. One strategy that you can use to support PECS use at home is to provide the family with a CD of the child's symbols in PDF format. Assuming they have a computer and printer (preferably color), they can easily and affordably replace symbols as needed.
- **Question.** *The young girl that I am working with has done quite well with PECS until recently. Now she no longer seems interested in participating in the training sessions. She often gets up and walks away. What can we do?*
- **Answer.** The first thing to check is your supply of reinforcing items. She may simply be bored (i.e., satiated) with the limited number of items you are using for the exchange. It pays to continually update your supply of reinforcers and to regularly rotate their use.

- **Question.** *Is it okay to use reinforcing items that are known self-stimulation objects (e.g., a playing card that is used for flapping)?*
- **Answer.** This is a question best answered by those who know the individual the best. For some individuals, access to a stimulation item will deter further progress in the training for that session. For others, the highly motivating object will support faster learning and use of the exchange system. Consideration should also be given to behavior support plans that may be in place to minimize self-stimulating behavior.
- **Question.** *When implementing the four-step discrimination training procedure, why, in Step 3, do I not give the learner the object shown in the picture? I find this step a bit confusing and don't see how it is relevant to the training.*
- **Answer.** This step is necessary as the goal of the discrimination training is to confirm that the learner understands the association between the picture and the object and that he can choose the picture of the desired object from more than one picture. By acknowledging what the picture represents and then "distracting" the learner with a simple, non-related request, you can be confident that the next time he hands you the picture, he knows what he is asking for.

Pivotal Response Training

PRT is a method of systematically applying the scientific principles of applied behavior analysis (ABA) to teach learners with autism spectrum disorders (ASD).

PRT builds on learner initiative and interests, and is particularly effective for developing communication, language, play, and social behaviors.

PRT was developed to create a more efficient and effective intervention by enhancing four pivotal learning variables: motivation, responding to multiple cues, self-management, and self-initiations. According to theory, these skills are pivotal because they are the foundational skills upon which learners with ASD can make widespread and generalized improvements in many other areas.

One primary goal of PRT is to promote generalization and maintenance of mastered skills. A successful strategy for addressing this goal is to focus on skill deficits in the natural environment, in as many naturally occurring opportunities as possible, and with multiple intervention partners (National Research Council, 2001).

For example, it is much more likely that learners will maintain newly acquired skills such as buttoning and generalize to different types of buttons if they button pajamas at night, coats when going outside, or a doll's dress during play—all naturally occurring opportunities that take place throughout the daily routine.

- **Q: How do I embed reinforcers into the daily program?**

- A: It is important to build reinforcers that are obvious, immediate, and frequent into teaching activities. Sometimes there can be a direct relationship between the reinforcer and the activity, such as selecting favorite words to spell or preferred topics as the focus of research. At other times, external reinforcers may need to be used as incentives. For example, placing a preferred item on the corner of the student's desk can serve as an incentive for what the student can do next following completion of the activity.
- Over time, as the student becomes more motivated by the reinforcer of task completion, an alternative reinforcement system may be introduced. Attaching a paper grid to the corner of the student's desk can serve as a self-management tool in which the student earns a check for each completed task. When the grid is filled, the student can exchange it for his/her choice of an item from a reward box in the teacher's desk. This item can also help bridge social connections between the student and his/her typically developing classmates as age-appropriate items and/or activities can be included (e.g., extra time on the computer or at recess, eating lunch with the teacher, board games, comic books, videos, magazines). The key is to select items and/or activities that are of high value to the student but would also be accepted by typically developing students of the same age.

- **Q: Aren't reinforcement programs equivalent to bribery?**
- A: Bribes are generally made before people act, and they are often used to encourage people to do something that they should **not** do. On the other hand, reinforcements are given after people do things that they **should** do. Everyone exerts efforts for reinforcers; everyone is motivated and encouraged by incentives. People work very hard to earn an income in order to purchase things that they want. Students with ASD also need to be rewarded for good work. Making learning enjoyable and fun so that the student does not realize it is "work" is more feasible when providing reinforcers. However, it is important to consider changing the nature of the rewards over time so that the student also appreciates the positive social consequences of task completion. That is, rather than earning toys, the student works hard because of the social incentives received from doing good work (e.g., sense of competency, peers' words of encouragement, teacher's positive comments, parents' praise).

- **Q: Isn't it unfair to the other students in the classroom who do not receive reinforcers?**
- A: All students work for reinforcers: good grades, teacher praise, self esteem, and so on. The use of different reinforcers for different students does not have to be viewed as unfair.
- Instead, the concept of individualization should be stressed. In addition, an environment can be created whereby added bonuses exist for the entire class.
- For example, rewards can translate into social interactions in which the student with ASD invites peers to join in playing with the reinforcer. This can help increase the student's popularity among the peers and provide more learning opportunities to develop age-appropriate social behaviors. It can also open a dialogue about how the other students can help support the target student's learning needs and be a better friend.

- **Q: The student seems to require additional time to understand the lesson, regardless of embedding PRT strategies. What else can I do?**
- A: For students who have difficulty beginning an assignment due to lack of comprehension, the first strategy may be to incorporate priming. Priming is a method of intervention that introduces information or activities that might be difficult for the student to initially complete. This is typically done the afternoon or evening before new material is presented and is conducted as closely as possible to the way it will be presented in the classroom. Thus, the goal is to elicit similar responses that will be required from the other students. For example, in circle time, priming might consist of having the student participate in "mock" activities, such as reciting the days of the week or listening to the story a few times. In another example, if an older student does not understand or produce complex sentences, but the assignment involves retelling the story, the student might be primed the day before by learning the names of the items through pictures. By previewing information or activities that the student is likely to have difficulty with, the student's competence is more likely to increase in the given area before problem behaviors have a chance to develop.

Prompting

Prompting procedures include any help given to learners that assist them in using a specific skill.

These procedures are often used in conjunction with other evidence-based practices including time delay and reinforcement.

Prompting procedures are integral to Prompts are generally given by an adult or peer before or as a learner attempts to use a skill.

A variety of prompting procedures support the learning and development of children and youth with autism spectrum disorders (ASD).

Prompt Type	Description	Example
Full Physical	Teacher/practitioner leads a learner through the task by providing full physical assistance (e.g., hand-over-hand) to ensure correct use of the target skill.	When teaching a learner how to write his name, the teacher takes the learner's hand and guides him through the process of writing his name.
Partial Physical	Teacher/practitioner provides minimal physical assistance to help the learner use the target skill correctly. Taps, nudges, and light pushes are used.	When teaching a learner how to write his name, the teacher nudges the learner's elbow so that he begins writing his name.
Full Model	Teacher/practitioner models the target skill for the learner with ASD. Full model prompts can be verbal if the skill being taught is verbal, or they can be motor responses, if the skill being taught involves moving	When teaching a learner how to raise his hand during class, the teacher raises her hand while saying, "Raise hand." When teaching a learner how to request more, the teacher

Prompt Type	Description	Example
Partial Model	Teacher/practitioner models only part of the target skill for the learner with ASD – either verbal or motor.	When teaching a learner how to raise his hand during class, the teacher raises her hand part of the way.
Verbal Prompts	Teacher/practitioner verbally gives a hint, a clue, or a direction.	When teaching a child to read the word “dog,” the teacher might give a hint (e.g., “It says bow wow”) or some other clue (e.g., “It starts with d.”).
Gestural	Teacher/practitioner makes some kind of gesture to prompt the learner to use the target skill.	When teaching a learner how to write his name, the teacher mimics hand writing for the learner with ASD, or points to the faucet when teaching the child to turn on the water to wash his hands.

Reinforcement

Positive reinforcement refers to the presentation of a reinforcer after a learner uses a target behavior.

Positive reinforcers can be either primary (e.g., food, liquids, comfort) or secondary (e.g., verbal praise, highly preferred activities, stickers, toys). Because primary reinforcers are often naturally reinforcing to learners with ASD, the value of secondary reinforcers must be learned by pairing primary reinforcers with other types of reinforcement (e.g., pairing "Good job" with getting a sticker).

Reinforcement

A **token economy program** is another type of positive reinforcement strategy that can be used effectively with learners with ASD. Token economy programs are referred to as such because they are based upon a monetary system in which tokens are used to acquire desired reinforcers, also known as backup reinforcers. For example, learners with ASD receive tokens when they use target behaviors appropriately. When they acquire a certain number of tokens, these can be exchanged for objects or activities that are reinforcing to the learner (i.e., backup reinforcers).

Reinforcement

Negative reinforcement is the removal of a stimulus (i.e., something that is aversive to the learner) after a learner with ASD uses a target skill/behavior or skill. When used effectively, negative reinforcement increases a learner's use and/or maintenance of the target skill/behavior (Alberto & Troutman, 1999; Zirpoli, 2005).

It is important to note that negative reinforcement is not the same as punishment. The difference between the two is that negative reinforcement is used to increase the target skill/behavior, whereas punishment is used to decrease a behavior.

FAQs

- **Q. What is the difference between negative reinforcement and punishment?**
- **A.** The difference between these two procedures is that negative reinforcement is used to *increase* behaviors whereas punishment is used to *decrease* behaviors.

- **Q. How do I know which type of reinforcement to use?**
- **A.** Positive reinforcement (including token economy programs) may be used to teach virtually any skill. Negative reinforcement often is used to teach self-help skills and replacement behaviors to take the place of interfering behaviors. Negative reinforcement is often used only after other reinforcement strategies have not been effective at increasing the target skill.

- **Q. How do I know when to switch from continuous reinforcement to intermittent reinforcement?**
- **A.** Generally, you switch from a continuous reinforcement schedule to an intermittent schedule of reinforcement when a learner has reached a preestablished performance criterion. For example, a learner with ASD is now able to stay seated for 5 minutes during class. Rather than providing reinforcement after the 5-minute period, the teacher may provide reinforcement after 4 minutes or after 7 minutes.
- **Q. With what ages can token economy programs be used?**
- **A.** Token economy programs are most appropriate for learners in elementary, middle, and high school. Although they can be used with young learners with ASD, they may be too abstract to comprehend.

Response Interruption/Redirection

Response interruption/redirection (RIR) is an evidence-based practice used to decrease interfering behaviors, predominantly those that are repetitive, stereotypical, and/or self-injurious.

RIR often is implemented after a functional behavior assessment (FBA) has been conducted to identify the function of the interfering behavior. RIR is particularly useful with persistent interfering behaviors that occur in the absence of other people, in a number of different settings, and during a variety of tasks. **These behaviors often are not maintained by attention or escape.** Instead, they are more likely **maintained by sensory reinforcement and are often resistant to intervention attempts.** RIR is particularly effective with sensory-maintained behaviors because teachers/practitioners interrupt learners from engaging in interfering behaviors and redirect them to more appropriate, alternative behaviors.

Examples of potential replacement items include:

- sitting on a therapy ball
- squeezing foam blocks
- watching a plastic prism
- squeezing squeak toys
- chewing on rubber tubing/rings
- chewing gum
- playing with silly putty
- squeezing a squishy ball
- placing a weighted item (e.g., stuffed animal, ball) on a learner's legs
- holding a vibrating object

FAQs

- **Q. How do I know which alternative behaviors to teach when redirecting a learner from engaging in an interfering behavior?**
- **A.** When trying to determine an alternative behavior to take the place of the interfering behavior, the first step is to conduct an FBA. This process will help you identify the reason(s) why the learner with ASD might be engaging in the interfering behavior. Once the function of the interfering behavior has been identified, you can select an alternative behavior that serves the same function as the interfering behavior, does not hinder learning and development, and is more appropriate for the setting where the interfering behavior occurs.

FAQs

- **Q. What alternative behaviors can be taught to learners who use vocal stereotypies?**
- **A.** When trying to reduce vocal stereotypies, researchers suggest that teachers/ practitioners ask learners questions to redirect them from using the vocal stereotypies and to use more appropriate vocalizations. Additionally, teachers/practitioners can teach learners to use alternative vocalizations during routines and activities. For example, a learner might be taught to say, "I don't know" when asked a question or "hello" during peer interactions.

FAQs

- **Q. When do I begin blocking a learner from engaging in an interfering behavior?**
- **A.** The best time to initiate blocking is when the learner begins using the interfering behavior. For example, with physical blocking, the teacher/practitioner might gently place her hands on the learner's hands when he raises them to begin hand flapping. It is best to prevent learners from fully engaging in interfering behaviors, because it stops them from completing the full chain of behaviors. Teachers/practitioners should watch for signs that learners are about to begin using the behaviors.

FAQs

- **Q. What do I do after I block a learner from engaging in an interfering behavior?**
- **A.** After you block a learner's use of the interfering behavior, redirect them to use the alternative behavior that was identified during the FBA. Reinforcement should be provided immediately when the learner begins using the alternative behavior, even if the learner needs full physical assistance to do so. This process teaches learners to use alternative behaviors, while also increasing the likelihood that learners will spontaneously use the new behaviors in the future. When spontaneous use of alternative behaviors does occur, teachers/practitioners should immediately provide reinforcement so that they continue to use the desired behaviors.

Self-Management

Self-management interventions help learners with autism spectrum disorders (ASD) learn to independently **regulate their own behaviors and act appropriately in a variety of home, school, and community-based situations.**

With these interventions, learners with ASD are taught to discriminate between appropriate and inappropriate behaviors, accurately monitor and record their own behaviors, and reward themselves for behaving appropriately. As learners with ASD become more fluent with the self-management system, some of the implementation responsibilities shift from teachers, families, and other practitioners to the learners themselves.

Goals of Self-Management

- giving compliments to others (Apple, Billingsley, & Schwartz, 2005)
- responding to others (Newman, Reinecke, & Meinberg, 2000)
- sharing (Reinecke, Newberg, & Meinberg, 1999)
- increasing on-task behavior (Coyle & Cole, 2004; Newman et al., 1995)
- initiating interactions (Kern, Marder, Boyajian, Elliot, & McElhattan, 1997)
- reducing the occurrence of interfering behaviors (Koegel, R. L. & Koegel, L. K., 1990; Koegel, L. K., Koegel, R. L., Hurley, & Frea, 1992; Mancina, Tankersley, Kamps, Kravits, & Parrett, 2000)
- promoting daily living skills (Pierce & Schreibman, 1994)
- increasing play skills (Stahmer & Schreibman, 1992)
- conversing with others (Koegel, R. L. & Frea, 1993; Newman, Buffington, & Hemmes, 1996)

FAQs

- **Q. How do I know if the description of the target skill that has been developed is clear enough?**
- **A.** The best way to be sure that you have clearly described the skill you are targeting is by putting it to the test with another adult. If the description is well developed, you and another adult should be able to observe the learner and consistently agree on whether or not the learner is correctly demonstrating the target behavior at a given instance or within a given interval of time. If there is not consistent agreement between you and the other adult, the description of the behavior should be modified to clear up any discrepancies.

FAQs

- **Q. How do I decide what materials to use for the self-management system?**
- **A.** First and foremost, materials should be tailored to the needs, skills, and preferences of the learner. Select materials that are simple for the learner to use, yet effective. In addition, you may want to consider the discreetness of the materials you select, especially in an inclusive setting. Discreet cueing and recording devices, for example, will prevent learners from standing out among their peers.

FAQs

- **Q. During what activities and settings should the self-management system be used?**
-
- **A.** The self-management system should be used in any setting in which the target skill is functional. Before implementing the self-management system, it is wise to teach the learner how to use the self-management system in contrived activities/settings that are similar to the actual activities/settings in which the self-management system will be used.

FAQs

- **Q. What prompting strategies can be used to teach learners how to use the self-management system?**
- **A.** Prompting strategies should be individualized based on the learner's skills and needs. Hence, a variety of prompts may be used, including **verbal prompts** (e.g., "It's time to record your behavior," "You did it! Go get a reward!"); **modeling** (e.g., making a tally on the blackboard when learners demonstrate target behaviors just as they should do on the self-recording piece of paper); **gestures** (e.g., pointing to your own pencil to remind the learner it is time to record); and **pictures** (e.g., a pictorial representation of the target skill, a picture sequence showing the learner how to self-record). For each component of the system that you are teaching, prompts should be faded as learners begin to demonstrate the skill more independently.

FAQs

- **Q. What strategies can be used to increase the likelihood that generalization and maintenance will occur?**
- **A.** You can increase the likelihood of generalization and maintenance of the target skill by using the self-management system in every activity/setting in which using the target skill is appropriate. Similarly, you can increase the likelihood of generalization and maintenance of the skills related to using the self-management system by using other self-management systems to teach other target skills in various other activities/settings. The skills required to self-manage (e.g., self-monitoring, self-recording, self-reinforcing) are valuable in and of themselves, and using other systems with other skills will generally lead to generalization and maintenance of self-management skills.

Social Skills Group

Social skills groups are used to teach individuals with autism spectrum disorders (ASD) ways to appropriately interact with typically developing peers. Social skills groups typically involve small groups of two to eight individuals with disabilities and a teacher or adult facilitator. Most social skill group meetings include instruction, role-playing or practice, and feedback to help learners with ASD acquire and practice skills to promote positive social interactions with peers.

What skills or intervention goals can be addressed with social skills groups?

In the evidence base, social skills group training targeted the following: perspective-taking, conversation skills, friendship skills, problem-solving, social competence, emotion recognition, theory of mind, and problem-solving. In addition, specific interaction skills such as initiation, responding, maintaining, greeting, giving/accepting compliments, turn taking, sharing, asking for help, offering help, and including others were also improved through the use of social skills groups.

Social Narratives

Social narratives are interventions that describe social situations in some detail by highlighting **relevant cues and offering examples of appropriate responding**. They are aimed at helping learners adjust to changes in routine and adapt their behaviors based on the social and physical cues of a situation, or to teach specific social skills or behaviors. Social narratives are individualized according to learner needs and typically are quite short, perhaps including pictures or other visual aides. Sentence types that are often used when constructing social narratives include descriptive, directive, perspective, affirmative, control, and cooperative.

What skills or intervention goals can be addressed by social narratives?

Social narratives originated in the behavioral literature and have been used to (1) address behavioral difficulties, (2) teach social skills, and (3) promote effective and appropriate communication. In the evidence base, studies targeted the following skills or behaviors: repetitive behavior, social interactions, disruptive behavior, generalization of independent behavior, expression of frustration, choice-making and play, and on-task behavior.

Speech Generating Devices (SGD)

Speech generating devices (SGD) are electronic devices that are portable in nature and can produce either synthetic or digital speech for the user. SGD may be used with graphic symbols, as well as with alphabet keys.

What skills or intervention goals can be addressed by SGD?

SGD target skills that help children and youth with ASD effectively communicate with others in a variety of situations and settings. The evidence base suggests that within the communication domain, a variety of skills can be targeted for intervention, including initiation, expressive language (verbal), joint attention/gestures (non-verbal), and pragmatics (conversation skills). The research also demonstrates that reading and math skills can be addressed using SGD.

Implementing an SGD is not a step-by-step, sequential process. Unlike more behavioral intervention methods, there are no real rules as to “If X happens, do Y.”

To be successful, this process also will require the use of professional wisdom and skills.

Structured Work Systems

Structured work systems are an element of structured teaching developed by Division TEACCH (**Treatment and Education of Autistic and related Communication handicapped CHildren**).

Structured teaching, as defined by Division TEACCH, is an instructional strategy that emphasizes visual supports. Its aims are to increase and maximize independent functioning and reduce the frequent need for teacher correction and reprimand (Schopler, Mesibov, & Hearshey, 1995).

- Work systems are visually structured sequences that provide opportunities to practice previously taught skills, concepts, or activities (Schopler & Mesibov, 1995).
- Work systems can be used across settings and for individuals with ASD of any age.
- Work systems do not only incorporate bins, drawers, and matching. Work systems can include written lists, folders and binders, and many other materials.
- Work systems are meant to promote independence from adult support. If an individual needs adult support to complete the work system, the work activities may be too difficult, the system may need to be adapted, or the individual may need additional teaching.

Task Analysis

Task analysis is the process of breaking a skill into smaller, more manageable steps in order to teach the skill. Other practices, such as reinforcement, video modeling, or time delay, should be used to facilitate learning of the smaller steps. As the smaller steps are mastered, the learner becomes more and more independent in his/her ability to perform the larger skill.

FAQs

Q. What types of skills are appropriate to task analyze?

- **A.** Task analysis is a flexible tool that can be used to teach many different kinds of skills. The evidence base demonstrates effective use of task analysis in teaching social skills, self help skills, and life skills.
- **Q. How many steps should I write down when I do a task analysis?**
- **A.** Because task analysis is a starting place in many teaching practices, it has broad applications in instructional design. There are no set rules on how many steps are involved in a task. An instructor has to use his or her best professional judgment in designing a task analysis that will benefit the targeted learner. It is essential that the task analysis contains all the most important steps needed for the learner to correctly perform the task. If the task design is complex, instructors will often break the analysis down into phases in order to teach the complex task in a series of manageable chunks.

- **Q. My student always forgets to turn in his homework. How would a task analysis help him?**
- **A.** Task analysis can be a useful tool for teaching daily routines. The teacher first needs to determine the student's prerequisite skills in order to write an effective task analysis. In the case of a student forgetting to turn in homework, it is first important to gather information about which steps in the task are being missed or forgotten. A teacher can do this by observing the student, gathering information from teachers and parents, and even interviewing the student. Once the instructor has the information needed, they can create a list of behaviors that are required to complete and turn in homework in the individual setting. After creating and verifying the steps needed, the teacher can select the instructional strategy. Based on their knowledge of the student and their particular difficulty with homework, this might take the form of a social narrative, visual strategy, self management tool, or video model.

Time Delay

Time delay is a practice that focuses on fading the use of prompts during instructional activities. This practice is always used in conjunction with prompting procedures such as least-to-most prompting, simultaneous prompting, and graduated guidance. With this procedure, a brief delay is provided between the initial instruction and any additional instructions or prompts.

- The evidence-based research focuses on two types of time delay procedures: progressive and constant.
- With *constant time delay*, a fixed delay interval of 3 to 5 seconds is used.
- With *progressive time delay*, teachers/practitioners gradually increase the delay between the initial cue and the controlling prompt using 1-second intervals.

With both procedures, the goal is to fade the time delay so that learners begin to independently use target skills.

FAQs

- **Q. How often should intervention activities occur?**
- **A.** Structured learning activities using time delay should take place at least once a day; however, time delay can be implemented whenever teachers/practitioners plan for it, particularly when they embed time delay procedures within ongoing classroom routines and activities.
- **Q. Are any other evidence-based practices used in conjunction with time delay procedures?**
- **A.** Time delay procedures are always used in conjunction with two evidence-based practices: prompting and reinforcement. Teachers/practitioners also might use peer-mediated instruction/intervention (PMII) as well as naturalistic teaching when implementing time delay, particularly when they are looking for additional ways to promote generalization of skills.

Video Modeling

Video modeling is a mode of teaching that uses video recording and display equipment to provide a visual model of the targeted behavior or skill.

Types of video modeling include basic video modeling, video self-modeling, point-of-view video modeling, and video prompting.

Equipment

Two basic devices are used to show videos:

- a) TV with video player or DVD
- b) Computer with a video player (e.g. Real Player, Apple Quicktime Player, Windows Media Player)

FLIP camera, SMART phones (iPhone, Blackberry)

Show sample videos

Visual Supports

Visual supports are any tool presented visually that supports an individual as he or she moves through the day.

Visual supports might include, but are not limited to, pictures, written words, objects within the environment, arrangement of the environment or visual boundaries, schedules, maps, labels, organization systems, timelines, and scripts. They are used across settings to support individuals with ASD (National Research Council, 2001).

FAQs

- **Question: What is a boundary setting?**
- **A:** A boundary setting is an intervention that creates structure at home or school by defining areas that are accessible and/or are appropriate for specific activities.
- **Why use boundary settings?**
- **A:** The structure that is created helps children make good choices and manage their behavior in a safe and appropriate way.
- **Question: When should boundary settings be used?**
- **A:** If a child has trouble staying in one place, transitioning, focusing, or leaving others' belongings alone a boundary setting may be an effective intervention.
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FAQs

- **Question: At what ages can boundary settings be used?**
- **A:** The low-cost interventions can be used for individuals at any age, from toddlers to adults.
- **Question: What materials might be needed for boundary settings?**
- **A:** Most boundary setting materials are readily available and cheap. They include colored tape, cardboard boxes, photos, and carpet squares.
- **Question: Do I have to be a really organized person to implement a label system?**
- **A:** No you don't have to be the most organized person on the block for a labeling system to work. But you might discover that you will benefit as much as the child does when you incorporate a labeling system in your daily routine. It's amazing how much less picking up you will do when there is a "place for everything & everything in its place."

FAQs

- **Question: How do I decide what kinds of labels to use? Should I invest in a computer program, use photos, try to draw?**
- **A:** Use whatever works the best to help the child understand the information easily and quickly. Generally, the more realistic looking, the better. It shouldn't be too complicated or take too much thought to figure out. If you have to think about it too much, it may be too complicated of a system. If the child has difficulty understanding your system, you may inadvertently have added one more stressor to the child's day. Try to keep it as simple as possible.
- **Question: What is important to keep in mind about using labels?**
- **A:** Like any tool, be sure to use it! You can have the neatest, most easily understood labeling system possible but if you don't implement it and use it, what good is it? Does the child easily understand your system? Can the child recognize or be taught to recognize what the label stands for? After you have a system in place, remember to evaluate it every so often to make sure it is still working for the child.

FAQs

- **Question: If I use a camera to make pictures for labels, will I need to be a good photographer?**
- **A:** No. Just remember a few basics and you will be a pro in no time.
 - a.) Be sure you know how to operate your camera correctly! Read the manual to know how your camera operates best. This seems like an unnecessary thing to point out, but the more you know about how your camera works, the better your labels will turn out.
 - b.) Take a close-up of the object for which you are making a label.
 - c.) Be aware of what is behind the object you intend to photograph - try to have a plain, simple background to avoid any distractions.
 - d.) Check the film and batteries before using the camera!
- **Question: Do I have to have good art abilities to make a People Locator for my child?**
- **A:** No, not at all! If you can operate a camera, you can make a People Locator!

FAQs

- **Question: What if my child continues to perseverate on where a favorite person is even after a People Locator is being utilized?**
- **A:** Be patient and continue using the People Locator. It may take time for the child to feel secure that the information on the People Locator is accurate and can be "trusted."
- **Question: Can a People Locator be used for all the students in my classroom?**
- **A:** Sure! It may even be used as a handy way to take roll. Each child could put his or her picture on the "Who Is Here" portion of the locator when they come into the room every morning. At a glance, you and all the students would know who is present and who is absent. A People Locator doesn't have to be limited only to the child with ASD.

FAQs

- **Question: Is a People Locator really helpful in the home setting?**
- **A:** Yes, because it will help the child understand where family members are using a visual format that is more readily processed by the child with ASD. When the child understands where the family member is, it can help lower his/her stress and anxiety levels about the family member's absence.
- **Question: Should the child with ASD be included on the People Locator?**
- **A:** Including the child can help him/her transition between places when the picture of where he/she currently is located is exchanged for the picture of where he/she is going.
- **Question: Why do we use visual schedules?**
- **A:** Visual schedules help individuals understand what they will be doing for a certain period of time and help enhance expected behaviors.

FAQs

- **Question: Who benefits from using a visual schedule.**
- **A:** Almost everyone can benefit from a visual schedule.
- **Question: What do I need to make a visual schedule?**
- **A:** Materials needed for a visual schedule depend on the number of children who will use the schedule, its placement, and need for mobility. Generally, visual schedules requires
- Some type of symbol such as a photograph, line drawing, words, or objects.
- Construction paper, file folder, clipboard, or another medium on which to present the visual schedule.
- A means of adhering the symbols to the backing and something that will allow you to post the schedule. Common items used for this purpose include: glue, Velcro, and putty.

FAQs

- **Question: If my child can talk, can she benefit from a visual schedule?**
- **A:** Yes. Children of all abilities can benefit from a visual schedule. When deciding whether a visual schedule will benefit your child, consider the child's ability to understand rather than the ability to speak.
- **Question: How do I change the schedule to include an activity that is unfamiliar to my child?**
- **A:** A question mark may be used to symbolize a new or different activity.