The Pennsylvania Verbal Behavior Project

A Beginning Guide to the
Intensive Teaching Process of the Verbal Operants

Table of Contents

Introduction

Thank you for taking the time to review the accompanying DVD and these training materials. It is our hope that you will be better teachers and consultants as a result of the time you spend engaged with this package.

The content of this training has been prepared to help teachers of children with autism and other disabilities refine skills for teaching specific pragmatic language skills. The model presented is based on instructional procedures developed by Mark Sundberg, Jim Partington, Vince Carbone, Jack Michael, Ivar Lovaas, Brian Iwata, and others. The conceptual basis for this model is derived from the science of applied behavior analysis including the analysis of verbal behavior (Skinner, 1957).

Although there are many effective procedures for teaching verbal behavior, this training will focus primarily on one-to-one instructional methodology. This training will provide specific guidance in the process of providing one-on-one discrete trial instruction using a mixed and varied format of item presentation. The methods are applicable for use with students of varying ages. The techniques will be most useful in teaching language to children who have acquired some competence in communicating but who do not yet engage in sustained conversational interactions. Although the focus of this training will be on the process of teaching children with autism, the teaching methods are relevant for teaching verbal skills to other students who present significant deficits in the acquisition of functional language.

This training was developed by the Pennsylvania Verbal Behavior Project (PA VB Project.)

The PA VB Project seeks to implement quality teaching programs in classes for students with autism within the Commonwealth of Pennsylvania. The instructional methodology is derived from the field of applied behavior analysis (Baer, Wolf & Risley, 1968) with an emphasis on teaching communication through the analysis of verbal behavior. (Skinner, 1957; Sundberg and Michael, 2001; Sundberg and Partington, 1998.)

Quality teaching is developed within the PA VB Project through:
- Skilled behavioral consultation provided to participating sites
- Training opportunities for participating sites
- Site review processes
- Collaborative implementation with local school personnel and parents.

The PA VB Project operates through funding from the Pennsylvania Department of Education, Bureau of Special Education. The Project is administered through the Tuscarora Intermediate Unit 11. The Pennsylvania Training and Technical Assistance Network (PaTTAN) provides collaborative support to the Project.

The Project is dedicated to helping foster the independence of the children we serve; to supporting families in the process of education for their children with autism; and to extending positive behavioral interventions within public education programs for students with autism.

How to Use These Materials

These materials, along with the accompanying training video, are developed to be used as a guide to the intensive teaching of the verbal operants. The materials and training video are not meant to replace coaching from trained consultants. Such coaching will be necessary to apply the methods described in this training to real life instructional settings and to help instructors make instructional adjustments based on particular student and situational variables. The training does require some basic level of previous experience in relation to the concepts of applied behavior analysis; however, materials are provided that may assist in reviewing relevant terminology and concepts.

The advantages of current video technology as a teaching technology are considerable. This training package includes several features that we hope will allow you the opportunity to pace learning according to your level of need and to the time you have available for viewing. The titles and scene selection options will allow you to pause the DVD in order to make notes, to more carefully review charts, and to skip forward or back among the sections in order to preview or review content. You may also pause the video in order to practice the described procedures with a friend or colleague. Several of the demonstrations in the training video include embedded labels to help clarify the content represented in the demonstration. Pausing the DVD to review the demonstrations with embedded labels may help the viewer pinpoint observable variables related to the concepts and procedures discussed. In a later section of this guidebook, a number of training activities are provided. Where appropriate, the training activities will be referenced to relevant sections of the video content.

The following suggestions may help you in getting the most out of this training package:

1. Review the DVD
    a. Pause when necessary to use supporting materials or to complete accompanying training activities
    b. View sections of the DVD repeatedly to review content or to better note content within a demonstration.
2. Refer to the charts of the operant analysis and verbal operants. Use the glossary in order to review any unfamiliar terms.
3. Complete training activities included in this packet of materials.
    a. Training activities are designed to be used as you complete various sections of the training DVD.
    b. It may be helpful to view the training DVD with a colleague and to work as a team to complete training activities (especially those activities involving practicing specific teaching skills.)

The Operant Analysis

ANTECEDENT	BEHAVIOR	CONSEQUENCE
Motivative Operation (UMO; CMO-t; CMO-r; CMO-s)	Response (Dimensions: topography; temporal; magnitude; location)	Reinforcement (Positive Social, Positive Automatic and Negative)
Stimulus (Discriminative, Neutral, Delta)	No Response	Punishment (Type I and II)
Prompts (a procedural use of discriminative stimuli)		Schedule of Reinforcement (Extinction; continuous; VR; FR; VI; FI)

The Mand

Antecedent	Behavior	Consequence
No specific antecedent (discriminative stimulus) Specific Motivative Operation	Verbal behavior: Specifies Reinforcer	Direct Reinforcement (The speaker receives whatever they asked for)
Student wants cookie.	Student says "cookie."	Student gets cookie.

The Tact

Antecedent	Behavior	Consequence
Sensory stimulus serves as discriminative stimulus. Seeing, hearing, feeling, touching, tasting, smelling.	Verbal behavior: Usually involves "labeling"	Non-Specific Reinforcement
Student sees (smells, tastes, or hears) cookie.	Student says "cookie."	Student gets reinforced by some non-specific event, like praise or attention.

The Echoic

Antecedent	Behavior	Consequence
Vocal Verbal Stimulus	Verbal behavior: Usually involves a vocal duplication of the verbal antecedent stimulus (The person repeats all or part of what has been said)	Non-Specific Reinforcement
Student hears someone say "cookie."	Student says "cookie."	Student gets reinforced by some non-specific event, like praise or attention.

The Intraverbal

Antecedent	Behavior	Consequence
Verbal Stimulus (For intraverbal, both antecedent and response verbal behavior can be in any form: does not have to be vocal)	Verbal behavior: Does not duplicate the verbal antecedent stimulus (does not share point to point correspondence) The speaker answers questions, fills in statements, makes word associations, etc.	Non-Specific Reinforcement
Someone asks a question, i.e., "What do you eat?"	Student says "cookie."	Student gets reinforced by some non-specific event, like praise or attention.

Listener Responding
(Receptive)

Antecedent	Behavior	Consequence
Vocal Verbal Stimulus	Non-Verbal behavior: Usually involves following directions or conditional discrimination (a selection response: touching something when it is named)	Non-Specific Reinforcement
Student hears someone say "cookie."	Student touches a picture of a cookie.	Student gets reinforced by some non-specific event, like praise or attention.

Match to Sample

Antecedent	Behavior	Consequence
Non-verbal stimulus	Non-verbal behavior: Involves a conditional discrimination (in presence of one or more stimuli, a second stimuli is selected with shared properties)	Non-Specific Reinforcement
Student is given a cookie.	Student places the cookie next to another cookie on a table and not near any other item on the table.	Student gets reinforced by some non-specific event, like praise or attention.

Motor Imitation (Mimetic)

Antecedent	Behavior	Consequence
Stimulus involving some motor movement	Non-verbal behavior: The response mimics the behavior presented in the antecedent condition. The behavior imitates what was done.	Non-Specific Reinforcement
Student sees someone clap their hands.	Student claps hands.	Student gets reinforced by some non-specific event, like praise or attention.

Two Examples of Multiple Control

Antecedent	Behavior	Consequence
1. Verbal behavior: Instructor says "do this" and Stimulus involving some motor movement	Non-verbal behavior Controlled partially by verbal stimulus (part Listener response) Controlled partially by verbal stimulus (part imitation)	Non-Specific Reinforcement
2. Sensory stimulus serves as discriminative stimulus. Seeing, hearing, feeling, touching, tasting, smelling. (Instructor holds up a picture of a cookie) and Verbal Stimulus (Instructor says "what do you eat?")	Verbal Behavior "cookie" Controlled partially by sensory stimulus (part tact) Controlled partially by verbal stimulus (part intraverbal)	Non-Specific Reinforcement

Variables Related to the Matching Law: Response Allocation

Variable	Implication
Value of reinforcement	The student will engage in behavior that is associated with a stronger motivative operation. *Be sure to establish motivation!*
Effort (needed to respond)	The student will engage in behavior that involves less effort. *Make responding easy: use errorless procedures!*
Rate of Reinforcement	The student will engage in behavior that most consistently obtains reinforcement. *Reinforce on an appropriate variable ratio schedule!*
Magnitude of Reinforcement	The student will engage in behavior that obtains the greatest degree (quality and/or quantity) of reinforcement. *Provide more reinforcement for better responding!*
Immediacy of Reinforcement	The student will engage behavior that produces reinforcement quickly. *Reinforce best responding immediately!*

"Hard" Item Initial Presentation of Stimulus
Initial Trial Stimulus 1 (0-second delay prompt) ------------- correct response… **Transfer Trial** Stimulus 1 -------- (2-second delay prompt)----------correct response…. (if incorrect or no response: see error correction procedures) **Several trials later**: Stimulus 1 -------- (2-second delay prompt)--------correct response….reinforcement Future presentations of Stimulus 1 will be presented with a 2-second delay Note: After errors on two transfer trials, leave at prompted level and move on. If this pattern continues, evaluate why student is making errors and consider denser practice with multiple 0-second prompt trials.

"Hard" Item Initial Presentation of Stimulus: Concise Review
1. Prompted trial 2. Transfer Trial 3. Distracter Trial(s) 4. Check Trial

"Easy" Item; Error Correction Procedure
Initial Trial Stimulus 1 -------- (2-second delay)---------- incorrect or no response **Correction Trial** Stimulus 1 (0-second delay prompt: immediate prompt) ------ correct   response… **Transfer Trial** Stimulus 1 -------- (2-second delay)---------- correct **Several Responses Later**: present 2-second delay trial (check trial) OR **Transfer Trial** Stimulus 1 -------- (2-second delay)---------- incorrect or no response (if correct, see above) **Several Responses Later**: present 0-second delay trial with transfer trial (hard trial procedure) Note: After errors on two transfer trials, leave at prompted level and move on. If this pattern continues, evaluate why student is making errors and consider denser practice with multiple 0-second prompt trials.

"Easy" Item; Error Correction Procedure: Concise Review
1. Error Response 2. Prompted trial 3. Transfer Trial 4. Distracter Trial(s) 5. Check Trial

Summary of Intensive Teaching Procedures

Purpose and Overview

This training video provides a demonstration of some basic techniques related to language instruction for children with autism. It covers one specific teaching process referred to as intensive teaching (IT). This training will not cover in-depth basic principles of Applied Behavior Analysis (ABA): it will be most relevant to those who already have some working knowledge of the principles of stimulus control, reinforcement, details of schedules of reinforcement, motivative operations, and the operant analysis. For further information or review, viewers can refer to the glossary and resources provided in this packet of accompanying materials.

IT is an important component of many teaching programs for children with autism. Because children with autism often do not learn effectively through incidental exposure or require much more frequent practice, IT provides direct instruction of relevant skills and dense practice of those skills that will lead to the student being better able to control their own environment through development of communicative competencies.

IT is only one part of effective teaching for these students. Other effective components of a well-designed instructional program can include Natural Environment Training, Precision Teaching, and Scripted Instructional Technologies (such as Direct Instruction). Effective teaching also requires that systematic steps be taken to generalize skills learned through the IT process to the natural environment. This program will not directly teach specific protocols for teaching complex multiply controlled responding or verbal relations involving the speaker modifying their own verbal responses (autoclitics or grammar). It will also not focus on teaching children how to make requests to control their environment (mand). While such protocols are recognized as being central to refining linguistic competence, a thorough review of such teaching procedures is beyond the scope of this introductory training.

A Preview Demonstration of Intensive Teaching of the Verbal Operants

This demonstration will model several characteristics of IT including fast-paced instruction, mixing and varying type of response, reducing student errors, and error correction procedures. This demonstration is presented to allow the viewer to preview application of the concepts and procedures that are presented throughout the rest of the training.

The demonstrations you will see in this training video are only examples. Instructional design and practice will vary with each individual student. IT carried out with actual students may vary significantly from what is demonstrated here.

An Introduction to the Verbal Operants

Applied Behavior Analysis (ABA) is the science that implements behavior procedures to improve socially significant behavior.

Verbal Behavior is the actions of a person that are reinforced by a listener. The term is similar to language; however, it more closely describes why someone says something when they say it. Verbal behavior can include talking, using sign language, and writing, using augmentative devices or picture systems. Verbal behavior can be easily observed (overt or public) or can be more difficult to detect (covert or private events). As B.F. Skinner

has noted, "Sometimes the speaker and the listener share the same skin." (Skinner, 1957). The principles of an analysis of verbal behavior were first described in B.F. Skinner's 1957 book "Verbal Behavior."

Over the past 20 years ABA treatments for students with autism have been increasingly supported (Drash & Tudor, 2006; Howard, et al., 2005; Lovaas, 1987; Maine Administrators, 1999; Matson, et al. 1996; NY State Department of Health, 1999; Swallows & Graupner, 2005). The application of the analysis of verbal behavior and consideration of motivation has further refined instruction based on ABA (Sundberg & Michael, 2001).

The Operant Analysis

B. F. Skinner (1953) described two primary ways in which higher organisms respond to their environment. Behavior that is evoked by an antecedent and is generally related to a reflex is termed respondent behavior. Respondent behavior is not shaped by consequences. Although respondent behavior is an important component of human learning, we will not be covering respondent learning in this training. Most learning that takes place in educational setting is acquired primarily as the result of consequences or how things change in the environment immediately following a response. Behavior that is learned as a result of consequences is termed operant behavior. The operant analysis is the process of classifying the contingencies between antecedent, response, and consequence. In operant analysis, behavior is viewed as being maintained by the environmental consequences that immediately follow it. It is an analysis of the way behavior is changed through its consequences.

When we look at student behavior, we consider not only what the child does, but also what happens in the environment before and after the behavior. How we as teachers respond to behavior matters because our responses can arrange consequences that make certain behaviors more or less probable in the future. In other words, we look at the antecedents that precede the behaviors as well as the consequences that follow because they can help predict how well the student will learn. This is true for verbal behavior (language) as well as for behaviors that do not involve social interaction. Skinner used the operant analysis to describe what happens before and after people talk or otherwise use language.

Consequences that increase the future probability of the behavior are called reinforcement. Consequences that decrease the future probability of behavior are called punishment. The operant analysis used in the IT process focuses on techniques to build new behavior; therefore, emphasis is placed on an operant analysis involving reinforcement.

Discrete Trial Instruction

Intensive teaching is based on controlled presentation of antecedent, behavior, and consequence relations. Each response is preceded by the presentation of an antecedent stimulus known as the *discriminative stimulus or Sd.* In the same manner, each response is followed by a *reinforcing event*. The IT process involves use of a well-established behavioral technology referred to as discrete trial instruction (Celiberti, 2000a; Celiberti, 2000b; Koegel & Koegel, 1995; Leaf & McEachin, 1999; Lovaas, 1981; Maurice, et al., 1996). In discrete trial instruction, instruction is presented in a series of distinct trials, each of which involves a single response with a clearly defined antecedent (Sd). Each trial has a clearly defined beginning and ending. In discrete trial instruction specific decision rules are established regarding instructional responses that will be classified as correct responses, non-responses, and error responses. Each trial ends with reinforcement, an error correction procedure, or the delivery of the next trial. In the model presented here, often a correct response is reinforced by presentation of the next trial. Each trial can serve as reinforcement for the next trial because, as in a behavior chain, it functions to bring about an ultimate reinforcer delivered at the end of the chain of trials. Behavior changes used in IT are referred to as run-throughs and will be discussed in detail later.

Verbal Operants

In this section we will review how one can classify what is "said" based on environmental variables in the antecedent and consequent conditions. Remember that verbal behavior can include vocal responses, but also includes sign language, gestures, writing, and various forms of augmentative communication. The analysis presented here describes the basic concepts on which a functional analysis of language can be built.

The Mand

The first verbal operant to be discussed is the mand. Some common terms for the mand are *request, ask, command, and/or demand*. The mand develops early in children.
By asking for what one wants and then as a result, getting it, conditions directly improve for the speaker. Mand training is a central part of verbal behavior interventions; however, how to teach the mand will not be taught in this training because it requires a set of teaching procedures that are somewhat different than those used during IT. Mand training is more effectively done in the natural environment where there are more opportunities for contact with a variety of reinforcers.

Please refer to the Mand chart presented above to see a summary of the antecedent-behavior-consequence relations for the mand. In the antecedent condition, the child wants something. In behavior analysis wanting is referred to as a Motivative Operation. Motivative operations are conditions in the environment that temporarily alter the value of reinforcers; and, therefore, increase the likelihood of behaviors that have produced those reinforcers in the past. For example, someone who has not eaten in a while will be more likely to do things that have resulted in getting food; whereas, a person who has eaten a big meal will be less likely to do things that result in getting food.

The consequence for the mand is direct reinforcement. In other words, the speaker gets what they want, or has an undesirable condition removed. The reinforcer correlates directly with the motivative operation. Asking questions, calling out for attention, making choices, or saying "stop that" are all mands.

Although mands often result in tangible reinforcement, mands can also be reinforced by events such as obtaining attention or information.

The Tact

Some common terms for emitting a tact are labeling or naming. Please take a minute to review the chart presented earlier regarding the antecedent and consequences for tact behavior. In the antecedent condition for the tact, there is always a stimulus present that comes into "contact" with one of our senses. In other words, one can see, hear, smell, feel or taste something that is followed by a specific verbal response.

Some examples of tacts are: saying "cookie" when you see a cookie; saying "cookie" when you smell a cookie; or, saying "cookie" when you taste a cookie. When we label actions or features of objects, we are also emitting tacts. We can also tact properties of our internal status such as labeling pain, fear, joy, and so forth.

Unlike the mand, tacts do not result in specific reinforcement such as obtaining what has been labeled. The consequence for the tact is non-specific reinforcement. Non-specific reinforcement can include events such as praise, head nods, or other forms of social attention.

So, when one says "cookie" when seeing a cookie, it may be followed by "that's right, it is a cookie." Reinforcement may be as subtle as a turn of the head from a listener or as tangible as receiving a bit of food.

Non-specific reinforcement may also be of an automatic nature. In other words by saying a word, the speaker may be reinforced by making some other response more likely (for instance, when asked to label a color such as "blue," a child may say "blue...Blues Clues!" an expression associated with an enjoyable activity; for adults, saying a word may be reinforced by allowing the person to match aspects of the environment to the word, for instance saying "keys" as one finds keys that have been misplaced (see Lowenkron, 2004.)

The Echoic

Echoic behavior is repeating what someone else says. Again, the operant relations for echoic behavior can be seen in the chart presented earlier. The antecedent for the echoic is someone else's vocal behavior and the response is also vocal. The response duplicates features of what is said. Echoic behavior is useful for teaching other forms of verbal behavior such as mands, tacts, and intraverbals. Echoic behavior, according to B.F. Skinner (1957), occurs only as a vocal response with an acoustical response product. Repeating sign language is more accurately referred to as imitation or mimetic behavior (see Imitation description below.)

The consequence for echoic behavior is non-specific reinforcement. The response does not specify its reinforcement.

Intraverbal

Conversational responses and answering questions are common terms used to describe intraverbal behavior. Again, review the chart presented above. Like echoic behavior, the antecedent for intraverbal behavior is a verbal stimulus, although not necessarily vocal. The response is also verbal behavior that can be in the same form (i.e., both vocal or both sign) as the antecedent or in a different form (vocal antecedent, signed response, etc.). For instance, answering a question is intraverbal behavior, whether the question is asked in sign language, in writing, or in vocal form and whether it is answered in sign language, writing, or vocally. The intraverbal response does not duplicate the antecedent verbal behavior. In other words, the response is different than what is said in the antecedent.
Filling in responses, completing phrases, word associations, and answering questions are all forms of intraverbal behavior

The consequence for the intraverbal is also non-specific reinforcement.

Listener Responding

Listener responding generally involves people following directions. A common name for listener responding is receptive language; however, the term receptive language may not imply a behavioral response (the person may hear language without responding in any discernable manner.) The antecedent for listener responding is someone else's verbal behavior but the response is a non-verbal response (it does not necessarily require an audience or listener.) For example, standing up following someone saying or signing "stand up" is a listener response. The listener's response does not include vocal talking, sign language or any other form of verbal behavior. Other examples of listener response or receptive behavior include touching a picture or object when it is named, looking at an item when it is named, or following simple one-step directions or multiple component directions.

The consequence for listener responding is also non-specific reinforcement.

Match to Sample

The ability to compare similarities and differences is a critical skill needed for most academic learning. An early skill in the process of learning sameness is being able to match objects that have similar properties. Although matching skills are not technically verbal behavior, being able to make comparisons will assist learners in developing verbal skills. To effectively match items, students need to develop scanning skills and the ability to discriminate items based on their shared properties. This is similar to verbal responses where discrimination is required.

For match to sample skills the student is presented with a stimulus (usually an object or picture) and is generally given a verbal direction to "match" or "put with same." The student then responds by placing the stimulus near or on another item that shares relevant characteristics. Match to sample responses always involve a conditional discrimination (i.e., in the presence of one particular stimulus, responding to some other stimulus will be reinforced: when shown a ball and told "match", the student will be reinforced for selecting another ball.)

The consequence for match to sample behavior is also non-specific reinforcement.

Imitation (Mimetic)

Motor imitation involves copying someone else's movements. The chart reviewing the operant analysis for imitation skills is presented above. Like echoic behavior, imitation responses duplicate an aspect of the antecedent stimulus. However, the antecedent condition is not a vocal verbal response but rather specific movements. Developing the ability to imitate others allows students to learn indirectly by copying a model.

The consequence for motor imitation is also non-specific reinforcement.

Multiple Control of Verbal Behavior

Most naturally occurring verbal behavior is multiply controlled. This means that several types of conditions may occur simultaneously before people verbally respond (i.e., in the antecedent condition there may be sensory stimuli and verbal stimuli.) Please see the charts presented above for a review of two examples of verbal behavior under the control of multiple antecedent stimuli.

Knowledge of the individual verbal operants provides us with a way to assess complex verbal behavior. Students with autism often fail to use a word for a variety of purposes. They may learn to use the word as a tact but not as a mand. Therefore, when the student responds to a complex antecedent stimuli, it is difficult to determine whether they are responding to one or several of the antecedent conditions. We must determine if responding can be emitted under each of the antecedent conditions independent of the others. If a learner only asks to "pet a dog" when the dog is present and the adult says "what do you want?" we will need to determine if the child asks to pet the dog only when the dog is present (so the question is a tact), only when asked, "What do you want? (no dog present with the response controlled through an intraverbal process) and also in the condition when the dog is not present and a question has not been asked (i.e., to mand for an item that is not immediately present). The learner may be able to say "dog" when they see a dog, but not when they want to pet a dog. The learner may be able to ask for dog when someone asks him to but not when they want to do so when not asked. Discriminating under which conditions the student is likely to say or not say "dog" will help us know what skills the student needs to be taught in order for the student to use the word "dog" across a variety of conditions.

In other words, when a student is presented with a complex antecedent condition it is hard to tell what aspect of that antecedent condition controls the response. A student with a good ability to tact may say "soda" in the

23

presence of a can of soda with the result of being given the soda. The response may appear to be a mand; however, it may only be controlled by the presence of the can of soda as a tact.

We can systematically fade multiple control in order to help the student learn how to use the same word for many functions. This is important because in order to be a competent speaker, people need to be able to use words for a variety of reasons.

Children also need to learn to use language for more precise functions: they will need to tell about how an object is used, to describe various features of the object or situation, and to demonstrate the ability to classify objects and concepts based upon their relation to other objects and concepts. IT can be used to help students respond using features, functions, and classes of objects. Likewise, students will need to modify primary verbal responses using adverbs, adjectives, prepositions and pronouns. Teaching the secondary verbal operants (autoclitics) can be incorporated into the intensive teaching process.

The Intensive Teaching Process

Establishing Instructional Control and Cooperation

We cannot teach effectively unless we have a cooperative learner. Therefore, the first component of effective teaching is building instructional control. This means having the student respond when presented with tasks and then maintaining those responses throughout the teaching session. Motivation to respond is the key to obtaining instructional control. Cooperation is a pre-requisite for discrete trial instruction. Therefore, instruction should be correlated with reinforcement.

One challenge teachers face is maintaining the value of reinforcement throughout a teaching session. How valuable a reinforcer is at any particular time is determined by several variables. The variables that influence value of reinforcers are related to the principle of the matching law (Davison and McCarthy, 1988; Hernstein, 1970). The matching law states that relative rates of responding tend to equal the relative rates of reinforcement that they produce. In other words, if a child can engage in one behavior or some other behavior, the behavior that has obtained more consistent or better reinforcement will be more likely to occur.

A chart presented above summarizes some characteristics of reinforcement that are components of the matching law. Those characteristics may be better recalled by learning the acronym VERMI. VERMI stands for:

V: Value (of reinforcement): this term refers to the strength of the motivative operation for a reinforcement (how much the students "wants it"). A student will engage in behaviors that result in events that they are more motivated to obtain. A student will be more likely to respond if the response is correlated with getting to see a video when they want to see a video. They will be less likely to perform if responding is reinforced with a toy when what they want is a video (even if they do occasionally like the particular toy.)

E: Effort (of response necessary to produce reinforcement): This term refers to how much work the child must do to obtain a particular reinforcer. A student will be much more likely to emit cooperative responses if the tasks are relatively easy than if the tasks are relatively hard. This principle suggests that a student will cooperate more if instruction is provided in a manner that makes responding less effortful. (Note: this principle does not negate the fact that students will need to gradually build endurance for tasks; rather it suggests that such endurance should be built gradually as a result of successful performance.)

R: Rate (of reinforcement): Behaviors that are reinforced more often than others will be more likely to occur. If reinforcement is delivered infrequently, student responding may decrease or desist. This principle suggests

that when beginning a teaching program, reinforcement should be provided on a rather rich schedule (for almost every response). The schedule of reinforcement will be able to be thinned as responding becomes easier or less effortful.

M: Magnitude (of reinforcement): A student will be more likely to emit behaviors that earn more reinforcement than behaviors that earn less reinforcement. This principle suggests that behaviors that are important and that the teacher wants to see increase should be provided more reinforcement. The term used to describe providing more reinforcement for one response class than another is differential reinforcement.

I: Immediacy (of reinforcement): responses that result in more immediate delivery of reinforcement are more likely to occur than responses that result in delayed reinforcement. This suggests that instructors need to be ready to provide immediate delivery of reinforcement following responses that they want to see increase.

Many students with autism have a strong history of conditions in their environment getting worse in the instructional setting. If not carefully planned, instruction for these students can occur in a way that involves responses that are too difficult or do not result in immediate or adequate amounts of reinforcement. Often these students have learned that engaging in problem behavior results in more immediate or better reinforcement than cooperative behavior. Such inadvertent instructional design problems may not be explicitly addressed in instructional design or behavior management procedures. Instruction needs to be adjusted so that it clearly results in things getting better for the student. When designing instruction this may mean having to adjust either instructional levels (task difficulty) or reinforcement procedures.

The first step in developing instructional control is pairing the teaching environment with reinforcement so that the instructors, teaching materials and instructional setting acquire reinforcing properties. This means the student learns to "like" being with the teacher and "likes" to learn. However, the reinforcement is only delivered in the absence of problem behavior. In other words, the conditions will improve for the student in the instructional setting as long as the student is not engaging in problem behavior. Instructors need to be careful to consistently avoid reinforcing any behavior pattern that they do not want to see become strengthened (such as whining, grabbing, aggression, etc.) Initially, this process may involve presenting only very easy responses such as accepting a reinforcer or approaching another person. Instructors must be skilled at this point in being able to recognize what aspects of their behavior serve as demands and what aspects do not. The instructor must also be skilled in identifying what specific events can serve as reinforcement for particular students.

Pairing involves the correlation of a neutral stimulus (or sometimes an aversive stimulus) with an established reinforcing stimulus. By presenting both at the same time, the neutral stimulus takes on, through the conditioning process, reinforcing properties. In the teaching setting we repeatedly present reinforcement to the student with very little required response effort. In so doing, the instructor begins to be established as a conditioned reinforcer.

In order to pair reinforcers with teaching conditions we must first assess student preferences. Knowing what students like and don't like is important. We accomplish this by using reinforcer assessment surveys, preference assessments, or directly observing the students (whatever the student chooses to approach or stay with the longest is likely to serve as a reinforcer.)

Remember that not all things the child prefers can be used as reinforcement because they may not be able to be controlled by the teacher. It is best to select reinforcers that can be delivered in small quantities (to avoid satiation or habituation); that can be presented repeatedly (allowing for more frequent reinforcement); that are dependent for delivery upon another person (can be controlled by a teacher); and do not require the teacher to remove the reinforcement. The ideal reinforcers are those that are easily controlled, have natural termination,

can be delivered multiple times and in small amounts, and are better with you than without you (serve to establish the teacher as a conditioned reinforcer.)

During the pairing process instructors should say the name of the reinforcer as it is being delivered. This process will correlate the instructor's voice, and the "name" of the item or event with reinforcement. The child's name should also occasionally be used as reinforcement is delivered (so that hearing his or her name becomes correlated with good things.) Avoid saying the student's name as part of instructions or Sds. Instructors will also want to make sure that what is being offered as possible reinforcement is something that is "better" or "more fun" than what the student can access without social interactions.

It is necessary to limit free access to reinforcers. This process is sometimes referred to as "sanitizing the environment." This is different from limiting the visibility of reinforcers. The importance of limiting free access to reinforcers is that it allows the student to learn to correlate the availability of reinforcement with social interaction. Students learn that their favorite things are more likely to be available through interactions with people. The goal is to correlate interaction with improving conditions. This will, of course, make instructors more valuable. It will also make cooperation more likely. In other words, when the student cooperates, things get better. It also has the effect of increasing the likelihood of social interaction and; therefore, verbal behavior. Students can only learn to communicate if interactions with other people have value.

During the pairing process, reinforcers are teacher controlled and they are delivered based on the student successfully approaching or staying in close proximity to a teacher. The teacher does not put any demands on the student until the student is demonstrating strong approach behavior and no escape behavior (or problem behavior). Note that the student learning the value of teachers can occur in a very short time for some students but for others it may take a longer time. There is no specific time frame for conditioning the teaching environment as a reinforcer; the time necessary to successfully pair can vary from minutes to months.

Once teachers have successfully paired the teaching environment with reinforcement, instruction can include gradually fading in the number of demands as well as response effort. The goal is to teach responding behavior (teaching the student that "If I respond---things get better"). So, initially, the sessions will resemble a pairing session, only now we will require a few responses that are easy for the student to engage in. The response requirements in the early stages of this process are usually mands or other easy tasks. Easy tasks may include having the student complete tasks that are somewhat reinforcing to them (i.e., putting a puzzle piece in if the student enjoys puzzles).

Reducing Student Errors

A basic principle of instruction is that correct responses result in reinforcement. Recall that responses that contact reinforcement will be more likely to occur. Whenever a student makes an error we have allowed another opportunity at practicing the "wrong answer." Often wrong answers result in inadvertent reinforcement, such as teacher attention, making tasks easier, terminating tasks, or allowing access to other activities. Errors also slow the pace of instruction. It is a reasonable goal to significantly reduce the number of times that the student is wrong. Implementing errorless teaching procedures can effectively improve learning (Touchette & Howard, 1984.) Effective prompting and transfer procedures can help ensure correct responding.

Procedures for "Hard Trials" (Teaching trials):

Even though one goal of effective instruction is to reduce student errors, there will be times when we expect a correct response and the student makes an error. In these instances, we immediately correct the child through the use of a specific error correction procedure. Error corrections will be discussed later, but first let's look at

the basic prompt and transfer procedure that can be used to reduce student errors when presenting a task that is new or not known by the student. Such trials are referred to as hard trials.

A hard trial is any trial on which a student has not been able to perform without a prompt or an error. Since the correct response is unable to be emitted independently by the student, when presenting these trials, prompts are provided to increase the likelihood that the student will respond correctly. In order to help the student acquire independent performance on hard tasks, prompts are systematically faded through use of graduated time delay procedures and/or prompt fading. On the first presentation of the trial, the teacher prompts immediately. If the type of prompt used has been selected carefully, the student will almost certainly be able to emit a correct response. Since no time elapses between presentation of the discriminative stimulus and the prompt, this trial is called a 0-second prompted trial. Immediately following the 0-second prompted trial, a second trial of the same skill is presented. On this trial; however, the instructor will pause up to two seconds before prompting. The 2-second time delay trial is referred to as a transfer trial because stimulus controls (the antecedents that evoke correct responses) are transferred from a prompted to an unprompted condition. If, in that 2-second interval the student responds correctly, the instructor does not provide a prompt and moves on to the next trial. If the student does not emit a response or responds with an error response during the 2-second interval, the instructor will immediately re-present the stimulus, prompt correct performance and then move on to the next trial.

In the case with correct responding within two seconds on the transfer trial, the instructor will then present one or more distracter trials. Distracter trials are easy or known trials (any trial on which a student performs without a prompt.). The distracter trials are instructionally valuable for several reasons. First, they allow a student to practice known skills, they serve to maintain momentum of fast paced responding, build fluent responding, and also provide trials that interfere with the student's tendency to respond inflexibly. In this case the easy trials distract the student or interrupt the tendency to emit the same response that was recently prompted or reinforced. Following a few distracter trials, the instructor again presents the target teaching trial, this time using a 2-second time delay prompt. This trial is referred to as a check or probe trial because it is a check of the degree to which the student is able to emit the correct response without immediate prompting and under the appropriate stimulus condition following other events (the distracter trials). Check trials provide a measure of the effectiveness of the 0-second prompt and transfer trial in teaching the particular instructional target response. If the student makes an error on the check trial, follow error correction procedures as listed below.

Remember the steps to teaching a "hard item": prompted trial, transfer trial, distracter trial(s), check trial.

Part of the process of delivering effective teaching during intensive teaching also involves appropriate timing of reinforcement. Since correct responding on a check trial represents a very close approximation of the behavior we would like to see the student emit more often in the future, correct responding on the check trial should obtain differential reinforcement. If responses are chained together (as described later), the ultimate reinforcer should be delivered following successful performance on a check trial.

Procedures for "Easy Trials" (Maintenance trials):

As noted above, even with careful use of prompted trials and transfer procedures, errors will occur. If an error occurs on a 2-second delay prompt trial (an easy trial), the first step is to re-present the discriminative stimulus (Sd, in this case the verbal direction) and then immediately prompt. The Sd should be re-presented in order to be sure that the correct response immediately follows the direction rather than follow the error response. Again, if appropriate prompting is used, the student is highly likely to respond correctly. After the student emits the correct response on the 0-second time delay prompt trial, present a transfer trial as described above, followed by one or more distracter trials, and finally a check trial.

Remember the steps to teaching when an error occurs: error, prompted trial, transfer trial, distracter trial(s), check trial.

Procedures for teaching trials that require denser schedules of prompting (Prompt Fading):

There will be some teaching items for some students that cannot be transferred to independent (unprompted) conditions following a single prompted trial. In such circumstances, instructors will need to systematically transfer stimulus control from one level of prompt to a lesser level of prompt. For such trials, a 0-second prompt is provided on the initial trial. That trial is immediately followed by another 0-second prompt trial; however, the level of prompt provided is lessened. For example, with physical prompts; less physical guidance will be used with the prompt transfer. For visual prompts, a shorter duration of exposure will occur on the transfer trial. For positional prompts, the target item to be selected will be moved closer to the distracter items in the array. Again distracter trials are provided; however, the check trial involves a 0-second prompt in which the instructor checks whether the lesser level of prompt effectively promotes appropriate responding. The check trial is then followed, if appropriate, by a transfer trial to either an even less intrusive level of prompt or an unprompted 2-second time delay prompt trial.

Procedures for items that require repeated practice at a prompted level:

Although the above errorless and prompt fading procedures will likely lead to successful student performance, certain teaching items may require more frequent prompting and practice. Generally such items can be identified during instruction by the student failing to demonstrate successful performance (or prompt reduction) on transfer trials. When such patterns of performance are noted, instructors will need to decide whether to drop the item because it is too hard or provide more practice under prompted conditions. In order to make such decisions, instructors should consider whether the skill in question can be taught through teaching a pre-cursor skill (in which case a "slice back" or teaching the easier precursor skill is presented); whether the precursor skills are known thus indicating more successful practice is needed; and through a review of other variables related to the student's pattern of learning including the student's tendency to become prompt dependent (i.e., emitting a response only when prompted) and the student's level of resistance to prompt procedures. Providing denser practice for a student who is cooperative and does not readily become prompt dependent may be an appropriate instructional strategy. If a student resists prompts or easily becomes prompt dependent, repeated prompt presentation may be not be appropriate.

In following the repeated prompt protocol, the instructor will present the target item on a 0-second time delay prompt trial. The 0-second prompt trial is followed by one or more easy (distracter) trials. Following these trials the item is again presented as 0-second time delay prompt trial. This process can be followed for some predetermined number of 0-second prompt trials and then followed by a 0-second prompt, time delay, distracter, check trial sequence. One model for doing so, described by Dr. Vincent Carbone, of the Carbone Clinic, (Carbone, 2005) involves presenting 10 0-second prompt trials, followed by a transfer trial. If the student is correct on the transfer trial, 5 more 0-second prompt trials are presented followed by a transfer trial. If the student is correct on that transfer trial, two more 0-second prompt trials are presented followed by a transfer trial. If the student is correct on the transfer trial, several distracters are run followed by a check trial. If the check trial is correct, the item is presented as an "easy" item on subsequent presentations. Note that if errors occur on the transfer trials, the instructor continues to provide prompts at the same ratio (10, 5, or 2). Likewise, it should be noted that the 10/five/ or two prompted trial sequences do not have to occur within a single run-through. A run-through, as described later, is a series of discrete trials that are run consecutively in which the consequence of one trial is reinforced by the presentation of the next trial. The consecutive trials serve as reinforcement because the student has been taught that cooperative performance leads to more frequent

reinforcement. A run-through ends with the last trial (usually a check trial) followed by delivery of a reinforcing item or activity.

Transferring Stimulus Control Across Verbal Operants

A key component of successful language training for students with autism is teaching students to use particular words across the many conditions in which the word may be needed. This simply means that the student will need to learn to use words appropriately as mands, tacts, echoics, and intraverbals as well as to respond to the word as a listener when someone else speaks it. Keep in mind that simply because the learner can label a ball does not mean that it will be used when the student wants to ask for a ball. Because the student can tact "ball" when a ball is present does not mean that the student can respond "ball" as an intraverbal when asked, "What do you bounce?"

In the preceding section of this guidebook, prompting procedures were discussed in relation to errorless teaching procedures. How to select appropriate prompts was only minimally discussed. For most trials, the form of the prompt will be based upon skills that the student can already use for some other operant function. The prompt will serve to transfer the use of the skill for one function for use as another function. This means that if a student can emit a particular word as a tact but not as an intraverbal, the trial will be presented with an antecedent condition in which a picture (sensory stimulation) is presented simultaneously with a verbal stimulus (such as a question). Since the presence of the picture will likely lead to the student labeling the picture (tact), the picture can be used to prompt a response related to the question about the picture (intraverbal). For instance, if a student can label a picture of a bus, that label can be used to teach an intraverbal response to the question, "what has wheels?" On the first trial the instructor would present the picture of the bus while saying "what has wheels?" On the next trial, a transfer trial, the teacher would eliminate the tact component of the trial, by not holding up the picture of the bus while asking "what has wheels?" Operant control has thus been transferred from a multiply controlled antecedent condition (tact and intraverbal) to a response controlled only by a verbal stimulus (intraverbal).

Having a good basic knowledge and practice of transfer procedures will allow us to successfully teach all of the operants by transferring from multiply controlled operants to a single operant. In other words, successful instruction involves getting the student who knows how to use a word for one purpose to be able to use it for another purpose.

In order to decide what operant control to transfer, the instructor will rely on awareness of the skills the student is already known to demonstrate. Generally speaking, mands may be the first operant acquired for many students. Therefore, often mand to tact trials or mand to listener responding (receptive) trials are the first transfer of operant control procedures used with early learners. Remember that in order to transfer operant control from a mand to a tact, the motivative operation must be removed. This process then would involve teaching the child to tact an item or activity (that has in the past been said as a mand) at a time when the student does not want the item or activity.

Some types of transfers across verbal operants may include:

Tact to Mand: The student can label a ball when they see it, the student is then taught to label the ball at a time when there is motivation to obtain the ball.

Imitation to Mand: This transfer is used primarily with students who are using sign language as their response form. The student is first taught to accurately imitate the motions of a specific sign. The student is then asked to

imitate the sign at a time when they want the particular item. A mand transfer trial would then be presented in which the student is tempted with the item but no imitative prompt is given.

Tact to Intraverbal: As described above. The student is asked to tact an item while a question is presented. On the transfer trial the item is removed and the response will likely occur only under the control of the verbal question.

Tact to Receptive: On the prompted trial the student is asked to label an item or a picture. The transfer trial involves placing the same item in an array of other items in view of the student and saying "find the (item)."

Receptive to Tact: This procedure involves asking the student to select an item in view. The transfer trial then involves the instructor pointing to the same item while stating, "What is it?"

Echoic to Tact: While holding up a picture or object, the teacher says, "what is it?" and immediately labels the item. The student responds by echoing the name of the object or item. The transfer trial involves simply saying "what is it?" thus fading the echoic prompt.

Echoic to Intraverbal: In this transfer the instructor would present a question and immediately answer the question as an echoic prompt; for instance, "What has wheels? Bus." The student would respond by echoing the word "bus." The transfer trial would include asking the question but omitting the echoic prompt.

The Variable Ratio Schedule of Reinforcement

For reinforcement to be effective, every response does not need to be reinforced. Schedules of reinforcement refer to the specification of which responses will be reinforced including how often and at what rate. Reinforcing every response is important when teaching new skills. When every response is reinforced, a continuous schedule of reinforcement is in place. If a behavior has been learned under continuous reinforcement, responding quickly fades if reinforcement is not delivered. Continuous schedules help students acquire skills but the skills are not maintained well if reinforcement is removed. Once a skill is acquired, responding will occur more consistently and at a higher rate if the response is not reinforced every time. When only some responses are reinforced, an intermittent schedule of reinforcement is in place. Since one particular schedule of reinforcement has been associated with strong response maintenance and high rates of response performance, we will focus on that schedule for use in the intensive teaching process. On a variable ratio (VR) schedule of reinforcement responses are reinforced based on an average number of occurrences.

Reinforcement provided based on an average number of responses (versus every response) will lead to strong, rapid student responding (Skinner, 1953; Van Houten & Nau, 1980; Clark & Sherman, 1975; Guess & Baer, 1973; Vollmer, et. al., 1999).

During the demonstrations of intensive teaching presented in the training video, reinforcement is not delivered after every response, but rather after an average number of responses. The average number of responses prior to reinforcement is the numerical measure of the VR schedule. When a student is said to be on a VR schedule of 5, it means that the student will be provided reinforcement on an average of 5 responses. In layman's terms, on a VR schedule, the student never "knows" when reinforcement will occur.

At this point, it is important to remember several points. As noted earlier, within each run-through, each trial becomes reinforcing because the next trial serves as the reinforcer for the previous response. This, as you recall, is because it ultimately leads to the reinforcer presented following the last response in the run-through. Each response serves as a promise that the ultimate reinforcer will soon be delivered. If too many responses are presented in a run-through, reinforcement will not be provided often enough to maintain the reinforcement

value of each response, therefore, setting the VR for when the ultimate reinforcer will occur is an important consideration in maintaining student motivation and fast paced responding.

Use of an appropriate VR schedule also allows the instructor to differentially reinforce independent target responses. In other words, the teacher can arrange presentation of items so that the last item in a run-through, as described above, is a check trial. The decision to use differential reinforcement in a run-through can be based on the target behavior the teacher is most interested in having the student learn.

Within a VR schedule, the rate of reinforcement can be gradually thinned. This allows the instructor to shape longer strings of responses. To thin a VR schedule, the instructor would gradually increase the VR number. Remember that the higher the VR number, the less often reinforcement occurs. It is important that this thinning occur gradually so as not to reduce motivative variables (and thus reduce cooperative responding.)

How do we select the number of average responses for a VR schedule? This will depend on each individual learner. We initially start with a VR that is representative of the average number of responses the student will typically emit without problem behavior. The goal is to insure that the student continues to be successful. The VR is then gradually increased as the student meets predetermined criteria. For example, we may set a criteria for 5 consecutive days of no problem behavior during IT sessions before increasing the VR from, as an example a VR of 3 to a VR of 4.

Initially, the increase in VR schedule is minimal (from 1 to 2, 2 to 3, 3 to 4). However, when the student is demonstrating higher numbers of cooperative responses, the increments can be increased in chunks (10 to 12, 12 to 15). This can be done because the average ratio of decrease in reinforcement remains constant (or even lessens.) Remember that when you increase a VR from 1 to 2, you have cut the ratio of reinforcement in half. A reduction from a VR of 4 to a VR of 6, indicates a reinforcement cut of one third. With longer VRs, the ratio of reduction is even less. For instance reducing a VR of 10 to a VR of 15 is still only a reduction of one third.

We need to make sure that all instructional staff is being consistent with implementing the VR. Students may emit variable patterns of cooperation if the VR varies across instructors.

A common mistake is to ignore the VR when students are engaging in cooperative responding. In other words, when the student is appropriately responding, reinforcement occurs less often and thus the student actually gets less reinforcement for appropriate responding! When this happens, we inadvertently signal to the student that better responding results in less reinforcement and we risk having the student revert to problem behavior, since it is at those times when there is an opportunity for denser reinforcement for problem behavior. Remember to reinforce more often for the performance you want to see increase!

To calculate the VR schedule, we count the number of trials from the first instruction given to the instruction that precedes delivery of reinforcement (run-through). We then add up the total number of trials and divide by the number of run-throughs. This will yield the VR number. As an instructor, this may be difficult to do by yourself so you may want to have someone else calculate it for you. Another option is to videotape the session and calculate it afterwards. Remember that when counting demands in a run-through, mand trials used as reinforcement are counted as trials.

When calculating the VR we suggest considering errorless and correction procedures as single incidents of teaching. In other words the 0-second prompt trial followed by the transfer trial or the error trial, the 0-second prompt trial and the transfer trial are all counted as one trial. This is because procedurally, each of these individual trials occurs in a dependent relation: if procedures are followed, you cannot have a transfer trial stand alone; they are always followed by a prompted trial. Therefore, when there is a prompted trial followed by a transfer, both trials are counted as one trial in calculating the VR. The same occurs when the student makes an error followed by the correction (prompted response) and then a transfer they are also counted as one trial.

Intersperse Easy and Hard Tasks

As noted in the discussion of the matching law, students will be more likely to respond if tasks involve lesser effort. In teaching situations, new tasks and all prompted tasks (both teaching items and error responses) involve more effort for the student. They are hard tasks. If the ratio of hard tasks is too high, students will likely reduce rate of responding or will stop responding altogether. When tasks get too hard, students may be more likely to engage in problem behavior in order to escape demands. Due to this phenomena, it is suggested that the ratio of easy to hard tasks favor higher rates of easy responding. In the model presented here it is generally suggested that 80% of all trials be unprompted (easy) and that 20% of all trials be teaching trials (prompted.) This suggested ratio may vary based on the response patterns of individual students. Some students may acquire skills faster with a 60% easy to 40% hard ratio. For other students, a 90% easy to 10% hard ratio may be better due to the student's reactivity to response effort.

There are several potential benefits to interspersing easy and hard tasks. The higher density of easy tasks will provide opportunities to maintain acquired skills. As noted, keeping instruction less effortful will serve to keep motivation high. When responding to easy tasks, instruction can be fast paced and thus the process helps to build fluent task performance.

Mix and Vary Type of Operant

During run-throughs the type of verbal operant presented on each trial should, on average, vary from the other proximate trials in the run-through. In other words, the student should be asked to emit tacts, echoic, listener responses, intraverbals, and imitative behaviors in a rather randomized sequence. Mixing and varying type of operants presented during intensive teaching allows the student to learn to respond flexibly, thus avoiding rote patterns of response that may be shaped if more similar types of trials are presented consecutively. Although it lacks the thematic consistency that occurs in at least some conversations, mixing and varying the type of operant allows the student to develop flexible responding similar to what may occur in the natural flow of conversation. Likewise, mixing and varying the presentation of type of trial will promote the generalization of skills across the order of presentation. In other words, the child learns to emit the correct response regardless of the type of trial that precedes it. Mixing and varying the operants may also be more interesting for some students, thus further decreasing the value of escape from instructional demands.

Remember that for some students and some skills, massed trials (repeating similar types of trials) may be necessary due to the student's pattern of responding better with repetitive practice. If massed trials are used, it will likely be necessary to later insert acquired items into a mixed and varied format.

In addition to mixing and varying between the type of verbal operant trial, within any verbal operant instructors can vary the verbal Sd. This means, for instance, on receptive trials, sometimes saying "where is it?" sometimes saying "can you find," and so forth. Mixing and varying the wording of the Sd may be contra-indicated for some students who have difficulty learning to discriminate the various verbal directions. For the most part instructors will be better off using a variety of wordings since it promotes better generalization.

The Card Sort System

In order to organize the mixing and varying of verbal operants, as well as to promote the appropriate ratio of presentation of maintenance to teaching trials (easy-hard ratio), use of a card sort system is suggested. To use the card sort system, the instructor needs to be familiar with teaching programs that are in place for the student (active instruction items) and also be familiar with skills the student has acquired (maintenance or active review items.) The first step in using the card sort system is to obtain 3x5 index cards. It is suggested that cards of

various colors be used. Each color of card can be used for separate operants. In other words, all blue cards can represent listener response items; all red cards indicate imitation items, green cards intraverbals, etc. On each individual card the instructor writes the name of the task item from that operant category to be presented to the student. For items that involve use of picture stimuli, the actual picture card can serve as the index card. The picture card can be coded on the back with a colored dot to indicate if the picture is to be used as a tact or listener response item. The instructor can then organize the cards into piles based on whether the items are known (easy or maintenance) or unknown (hard or teaching items). As the instructor presents trials, the cards are placed in piles representing correct responses; responses that require further teaching; and items that need to be repeatedly presented. The card sort system helps to insure that trials are presented in a randomized fashion; it reduces the necessity of having to recall what has or has not been presented; allows teachers to track error responses; and also may allow instruction to occur at a somewhat faster pace.

Fast Paced Instruction

Fast paced instruction has been correlated with certain desirable student outcomes. For instance, fast paced instruction has been shown to reduce problem behavior (Weeks and Gaylord-Ross, 1981). Fast paced instruction is achieved through presenting short latency between the discriminative stimulus, student response and the presentation of the next trial. Shorter inter-trial intervals (ITI) allow students to learn to respond fluently. Short ITI, when used in conjunction with an appropriate variable ratio schedule of reinforcement (VR), allows the student to access reinforcement more frequently. Fast paced responding is crucial for the student in developing effective socialization. Fast paced responding allows the student to become fluent responders. Only when the student responds fluently will the skill be able to be used when it is needed in the natural environment. We all need to be fluent in discrimination of the stimuli that evoke specific responses. In other words, it is important for students to say what they need to say, when they need to say it and without long delays in time.

When using fast paced instruction, remember to maintain a short latency between the response and the next trial. As noted above, fast paced responding can be achieved by organizing teaching materials in advance through the card sort system. Although fast paced instruction is necessary, instruction is not a race. Be sure to provide clear instructions (Sds) to the student and **wait** for a response before moving on. Instruction does need to be precise. Going fast does not mean presenting sloppy instruction. Instructors need to adjust procedures based on student performance. Going faster than necessary can result in instructor errors such as inadvertently accepting weak responses, reinforcing errors, or missing transfer trials or other errorless procedures. Instructors can only go fast as they become skilled at teaching procedures and familiar with individual student programs.

Use of Extinction

When responding fades because it has failed to contact reinforcement it is called extinction. In spite of implementation of the teaching procedures we have reviewed in this training video, there will still be some students who will continue to engage in problem behavior during the teaching sessions or at other times. If behaviors are reinforced, by definition, they will increase in frequency. Therefore, it is critical that problem behaviors do not contact reinforcement. When problem behaviors are no longer reinforced they are on an extinction schedule of reinforcement.

Although it is beyond the scope of this guidebook and training video to cover in detail problem behavior reduction procedures, it is important that we mention that problem behaviors serve specific functions (in other words, they access certain classes of reinforcement.) In order to put a problem behavior on extinction, in almost all cases the instructor must be able to identify and control the reinforcer that maintains the problem behavior. Only through consistently withholding the specific reinforcement that maintains problem behaviors, will extinction procedures reduce responding. Problem behaviors during instruction are maintained by three main

33

types of reinforcement. Through problem behavior the child may obtain preferred items, activities, or attention (socially mediated positive reinforcement); the student may terminate an aversive condition, that is, escape from unwanted demands (socially mediated negative reinforcement); or the student may gain access to reinforcers that are not controlled by other people, such as engaging in stereotypical behaviors (automatic reinforcement).

The functional classes maintaining problem behavior during instruction need to be addressed. Remember that problem behavior may include behaviors such as aggression, self injurious actions, off task behaviors, and any other response that impedes learning. For problem behaviors maintained by escape, instructors will need to use extinction procedures that involve a failure to remove the demand (i.e., escape extinction). Escape extinction is a decrease or cessation in the frequency of responding due to a failure to remove some aversive event or worsening condition. Escape extinction is used for behaviors maintained by negative reinforcement. During instruction, escape extinction generally involves the failure to remove an instructional demand. In using this procedure, the direction is repeated and other reinforcers are briefly withheld until the student responds to the instructional demand. This procedure should not be used for student failure to respond to trials that the student does not have firmly established, in such cases, error correction procedures are recommended.

If extinction is used for behaviors maintained by socially mediated positive reinforcers, access to those reinforcers is blocked following problem behaviors.

It is difficult to place behaviors that are maintained by automatic reinforcement on extinction. This is because the reinforcers are not under the control of the instructor. Rather than attempting to put automatically reinforced behaviors on extinction, it is generally better to increase the value of other reinforcers that will compete with the value of behaviors such as self-stimulation.

Whenever extinction procedures are used, instructors should be aware that the student may demonstrate a temporary increase in the magnitude and type of problem behavior emitted. Safety and child protection is always the first priority. Do not use any procedure that will endanger the welfare of the student or others. If extinction procedures clearly increase any risk factors, procedural safeguards such as parental notification and permission and IEP revision should be in place prior to use of extinction.

Whenever extinction is used, it is imperative that the instructional sequence that led to the occurrence of problem behavior be analyzed. In other words, when extinction is used, instructors should ask, "why was it necessary to use extinction?" Remember that there are many ways to reduce the likelihood of problem behavior before extinction procedures are necessary. In order to analyze the conditions that led to the use of extinction, review your teaching and ask:

- Did I have in place valuable reinforcement for appropriate responding?
- Was the response effort too high?
- Did I not provide enough reinforcement for appropriate responding?
- Did I inadvertently reinforce undesired behaviors?
- Are all staff consistent in reinforcing appropriate behaviors?
- Are all staff avoiding reinforcing problem behavior?
- Did I use errorless teaching?
- Did I implement appropriate prompting strategies?
- Did I adequately and appropriately mix and vary tasks?
- Have I presented too many difficult tasks?
- Did I exceed the VR for this student?

Some Other Considerations in the Use of Intensive Teaching Procedures

As you present tasks to the student, avoid reminding the student of what they are working for. It is acceptable to present a "promise" reinforcer (indicating at the start of a run-through when reinforcement is available). Giving reminders of the availability of reinforcement during instruction will either slow instruction or the reminder will occur at a time when the student is not performing as well as expected (therefore a promise of reinforcement serves as a consequence that may increase the frequency of behaviors that you would rather see decrease.)

In the situation wherein the student's quality or rate of responding decreases, avoid presenting easier demands to increase quality of responding. Presenting easier demands contingent upon weak performance will likely reinforce weak responding. In such situations, demands should continue to be presented; however, the instructor needs to pay careful attention to improved quality of responding and then provide better reinforcement. Run-throughs with better performance should be shorter (i.e., access more reinforcement.) Run-throughs with weak responding should be somewhat longer (i.e., result in less reinforcement).

This same principle suggests that instructors should save the best reinforcement for the best student responding. Avoid looking for a better reinforcer if the student engages in problem behavior. Although pulling out better reinforcement following problem behavior will temporarily lead to a cessation of problem behavior, it will, in the long run, make problem behavior more likely.

Be organized. Unnecessary wait time for the student will likely result in the student seeking reinforcement elsewhere. If you need to take a pause during instruction, be sure to engage the student in some appropriate activity during the break in instruction. Do not make the student wait while you determine what is next or gather materials for further instruction.

Be careful to identify the function of problem behavior. Many instructors believe that "time out" is a generally effective procedure; however, removing the student from a teaching situation may inadvertently reinforce problem behavior (the problem behavior results in negative reinforcement.) Avoid the use of "time out" or ignoring as an equivalent of extinction for behaviors maintained by an escape function.

Remember that pairing instruction with positive reinforcement never ceases to be a need. Maintaining the instructor as a conditioned positive reinforcer will increase the likelihood of cooperative responding throughout all of the student's school experiences.

Finally, it is important that instructional sessions, if at all possible, end with reinforcement. Avoid ending a session after weak performance or problem behavior. Rather deliberately stop sessions after the student emits their best responses. Such responses will result in the best reinforcers; therefore, the entire session will end with a strong correlation of things getting better for the student. Such results will make the availability of teachings sessions reinforcing: students may even want to run to instruction the next time it is available.

Selecting Instructional Targets and Data Collection

In this section a brief overview of the process of selecting instructional targets and implementing data-based decision making will be reviewed. This review will not provide a complete overview of instructional design tactics and strategies.

When selecting specific areas to be targeted for intensive teaching, several variables need to be considered. General skill domains to be taught should be derived from a skill assessment. Instructors need to use a skills sequence that identifies a student's overall functioning in relation to mand skills, tact skills, intraverbal skills, listener responding skills (receptive), echoic skills, imitation skills, social skills, match to sample skills, and so

forth. Administration of an assessment tool that provides a behavioral assessment of language is necessary. In the Pennsylvania Verbal Behavior Project, the Assessment of Basic Language and Learning Skills (Partington and Sundberg, 1998) and the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP, Sundberg, in press) are used to select instructional programs.

Once specific skill areas are selected for instruction, lists of known and unknown items need to be identified. Known items become a part of programming as "easy trials" and are included in cards used in the card sort organization system. Unknown items are arranged hierarchically by difficulty and listed on a sheet summarizing skill acquisition within a program (this sheet may also describe teaching procedures for the particular skill). This sheet may be referred to as a skill tracking sheet.

When selecting instructional targets, consideration should be given to creating a balance of teaching programs. Target items should be distributed across verbal operants and non-verbal response items. When possible, programming should focus on having relatively more verbal responses than responses that do not involve verbal behavior. In order to insure as much generalization as possible to the conditions of everyday experience, items should be selected for teaching that will be highly likely to occur in the student's day-to-day life.

Once several programs are selected and specific items from each are targeted for instruction, the instructor can develop the materials for the card sort system described earlier and organize daily data collection systems.

Data collection, that is, the collection of a record of responses, is critical for the process of effective instruction. Teachers who collect data and adjust instruction according to represented patterns of performance are more likely to promote student achievement. Data that is collected, however, is only useful when reviewed frequently. Because instructional time is so valuable, data collection procedures should be streamlined so as not to reduce teaching opportunities or otherwise interfere with instruction. Data is absolutely necessary but must be both efficient and effective.

In order to reduce the effect of data collection on instructional interactions, a cold probe format is suggested to assess acquisition of new skills when teaching the verbal operants through intensive teaching. Cold probes allow the teacher to take data on skill acquisition without the need for recording daily trial-by-trial data. Therefore, teacher interactions can be focused on keeping a fast pace of instruction, dynamically adjusting instruction to ongoing student responding, and being able to immediately and differentially reinforce performance. It is not being suggested here that cold probe data is the only data an instructor should take. Appropriate use of applied behavior analytic treatments requires that obtained data adequately represent behaviors and environmental events of concern. For many target behaviors, other types of data collection will be necessary such as rate data, frequency counts, various timings, trial-by-trial data, and so forth. Cold probe trial data will be reviewed here because it represents one efficient way of taking data and assists in the process of helping teachers make many instructional decisions related to IT.

Cold probe data is taken on the first trial that an item is presented for each day.
The first trial of the day should occur before the student has been exposed to the target discriminative stimuli and any prompted response. To cold probe, the instructor presents the Sd and notes whether the student responds correctly or not. For a correct response to be scored the student must emit the correct response behavior within two seconds of the Sd being presented (the response must be both quick and correct). Incorrect responding is scored when the student emits any other response than the target behavior or fails to respond within the 2-second time limit. Note that the 2-second time limit, in certain situations, may be adjusted. For instance, students with motor disabilities may require a slightly longer response time. At any rate; success should be measured by criteria that include relatively quick responding.

All skills targeted for instruction are probed on the first trial. The skills can be probed consecutively or the skills can be probed in a mixed and varied format and thus interspersed with easy tasks. The easy tasks would

generally not be probed (unless skill maintenance data is needed.) Frequently teachers have inquired as to whether error correction procedures should be followed after an error response on a cold probe trial. As a rule of thumb, as long as the response to the very first presentation is recorded as the cold probe (i.e., scored as an error), the instructor can follow through with error correction procedures. Cold probe procedures should be completed in rather short order so that as much allotted instructional time is preserved for active instruction.

The cold probe demonstration presented in the video training covers, on a step-to-step basis, the process for recording cold probe data. Those steps will not be repeated here. In the cold probe process, a target is considered acquired after the criteria are met for a specified number of consecutive days with correct responses. This criteria is usually set at either three or five days.

After cold probe data is taken, instructors should immediately graph how many skills are acquired within each teaching program. Graphing allows teachers the opportunity to evaluate how frequently and quickly skills within programs are being mastered. Such graphs are referred to as representing the cumulative number of acquired responses. Data on how successfully a student is learning must guide selection of items to be taught as well as assist teachers on when to make changes in instructional design. For instance, if a particular item is not mastered after a specified period of time (one week of instruction, for instance), a change in instruction should occur. Some examples of instructional adjustments mentioned in this training and guidebook include: changing type of prompt, changing response criteria, selecting another item for instruction, adjusting motivational strategies (reinforcers used, VR schedule), completing a task analysis of response behavior and shaping specific approximations, providing times trials to build fluency, and providing a denser schedule of prompted trials.

A Brief Review of Key Points

In order to effectively use intensive teaching procedures to teach verbal behavior:

1. Establish cooperation through consideration of motivative variables.
2. Make sure instruction is paired with positive reinforcement.
3. Be sure student is having lots of success.
4. Use effective prompting and errorless procedures. Use error correction procedures when necessary.
5. Be sure prompts are faded by transfer of stimulus control.
6. Take data, graph the data, and review data frequently.
7. Adjust instruction based on data.
8. Check frequently to be sure students are learning and retaining what is taught.
9. Keep instruction fast paced, and, when appropriate, mixed and varied.
10. Be sure to provide enough opportunities to respond but keep within the established variable ratio schedule of reinforcement.
11. End instructional sessions with successful performance.

A Transcription of the Demonstration
of an Actual Teaching Session

The following notes provide a record of each trial presented in the teaching session included in the training video. This transcription will allow you to review each trial and how instruction was organized and adjusted during the session.

Run-through 1   TEACHING RECEPTIVE TARGET

Trial	Katie:	Alexander:	Response:
1	What is it?	Cat	Tact
2	A cat has a tail and___	Whiskers	Intraverbal
3	Say "Ohio"	Ohio	Echoic
4	Show me laughing	ha ha ha	Receptive
5	Where's the watering can?	Touches WC	Receptive (O sec Prompted)
	Show me the watering can	Touches WC	Receptive (Transfer Trial)
6	French Fries are_____	Salty	Intraverbal
7	Do this (clasp hands)	clasps hands	Imitation
8	Say "happy day"	Happy Day	Echoic
9	Where's the watering can?	Touches WC	Receptive (Check Trial)
	Delivers Reinforcement		

Total time: 25 seconds
Total trials: 9
Easy trials: 8
Hard trials: 1
Total responses: 10
RPM: 24/min

Run-through 2   TEACHING TACT WITH SEVERAL PROMPTED TRIALS AND LEFT AT A PARTIAL PROMPT

Trial	Katie:	Alexander:	Response:
1	What are these?	Scissors	Tact
2	Tell me something that you eat	Pizza	Intraverbal
3	What do you carry when it rains?	Umbrella	Intraverbal
4	Say "white"	White	Echoic
5	Do this (pointers together)	Pointers together	Imitation
6	This is a pepper	Pepper	Tact 0 sec (Prompted)
7	Show me your ears	Touches ear	Receptive
8	Do this (fold hands)	Folds hands	Imitation
9	What's this?	Apple	Tact
10	An apple has a ___	Stem	Intraverbal
11	This is a pepper	Pepper	Tact (0 sec Prompted)
12	A bird says_____	Tweet tweet	Intraverbal
13	Show me waving	Waves	Receptive
14	This is a pepper	Pepper	Tact (0 sec Prompted)
	What is it? P_____	Pepper	Tact (Transfer w/partial prompt)
15	Do this (prayer hands)	Prayer hands	Imitation
16	What's this? P_____	Pepper	Tact (Check trial w/partial prompt)
	Delivers reinforcement		

Total time: 40 seconds
Total trials: 16
Easy trials: 12

Hard trials: 4
Total responses: 17
RPM: 25/min

Run-through 3   TEACHING TACT WITH FADED PROMPT ON TRANSFER

Trial	Katie:	Alexander:	Response:
1	Say "okay"	Okay	Echoic
2	What is it?	Bike	Tact
3	A bike has _____	Handlebars	Intraverbal
4	Find the bubbles	Touches bubbles	Receptive
5	This is a jeep	Jeep	Tact (0 sec Prompted)
	What is it? J____	Jeep	Tact (Transfer w/partial prompt)
6	Do this (clasp hands)	Clasps hands	Imitation
7	You write with a _____	Pencil	Intraverbal
8	What is it? J_____	Jeep	Tact (0 sec Partial prompt)
	What is it?	Jeep	Tact (transfer trial)
9	Do this (wave)	Waves	Imitation
10	What is it?	Jeep	Tact (check trial)
	Delivers Reinforcement		

Total time: 26 seconds
Total trials: 10
Easy trials: 8
Hard trials: 2
Total responses: 12
RPM: 27/min

Run-through 4 TEACHING TACT TARGET

Trial	Katie:	Alexander:	Response:
1	Where's the violin?	Touches violin	Receptive
2	A violin is an _____	Instrument	Intraverbal
3	Do this (sign for cracker)	Signs cracker	Imitation
4	Say "oboe"	Oboe	Echoic
5	This is an escalator	Escalator	Tact (0 sec Prompted)
	What is it?	Escalator	Tact (Transfer)
6	Clap your hands	Claps	Receptive
7	What is it?	Escalator	Tact (check trial)
	Delivers reinforcement		

Total time: 20 seconds
Total trials: 7
Easy trials: 6
Hard trials: 1
Total responses: 8
RPM: 24/min

Run-through 5   TEACHING RECEPTIVE AND TACT TARGETS

Trial	Katie:	Alexander:	Response:
1	Where's the taco?	Touches taco	Receptive
2	Say "okay"	Okay	Echoic
3	Show me the caterpillar	Touches caterpillar	Receptive (0 sec Prompted)
	Where's the caterpillar?	Touches caterpillar	Receptive (Transfer)
4	Once upon a _____	Time	Intraverbal
5	Do this (clap)	Claps	Imitation

6	Where's the caterpillar?	Touches caterpillar	Receptive (Check trial)
5	Tell me an animal	Pig	Intraverbal
6	This is the Pentagon	Pentagon	Tact (0 sec Prompted)
	What is it?	Pentagon	Tact (Transfer)
7	Show me knocking	Knocks	Receptive
8	What is it?	Pentagon	Tact (Check trial)
	Delivers reinforcement		

Total time: 28 seconds
Total trials: 9
Easy trials: 7
Hard trials: 2
Total responses: 11
RPM: 24/min

Run-through 6   TEACHING TACT AND RECEPTIVE TARGETS

Trial	Katie:	Alexander:	Response:
1	Say "happy day"	Happy day	Echoic
2	This is a flower	Flower	Tact (0 sec Prompted)
	What is it?	Flower	Tact (Transfer)
3	Where's the milk?	Touches milk	Receptive
4	What's this?	Flower	Tact (Check trial)
5	What's this?	Oval	Tact
6	Find the pan	Touches pan	Receptive (0 sec Prompted)
	Where's the pan?	Touches pan	Receptive (Transfer)
7	Do this (pointers together)	Pointers together	Imitation
8	Find the pan	Touches pan	Receptive (Check trial)
	Delivers reinforcement		

Total time: 23 seconds
Total trials: 8
Easy trials: 6
Hard trials: 2
Total responses: 10
RPM: 26/min

Total Session Summary:

Total Trials: 59
Total Run-through's: 6
VR: 9.6
Total Hard Trials: 11
Total Easy Trials: 48
Easy/Hard ratio: 80:20

Examples of Some Data Collection Forms

Skill Tracking Sheet

Student Name: _____

Skill Program Area: _____

	Target Skill	Date Introduced	Dates Mastered		
			Acquisition	Maintenance	Generalization
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Weekly Probe Sheet (5 Day School Week)

Student Name: _____
Week of: _____

	Item Code	Target Skill	M	T	W	Th	F	Notes
1			+ -	+ -	+ -	+ -	+ -	
2			+ -	+ -	+ -	+ -	+ -	
3			+ -	+ -	+ -	+ -	+ -	
4			+ -	+ -	+ -	+ -	+ -	
5			+ -	+ -	+ -	+ -	+ -	
6			+ -	+ -	+ -	+ -	+ -	
7			+ -	+ -	+ -	+ -	+ -	
8			+ -	+ -	+ -	+ -	+ -	
9			+ -	+ -	+ -	+ -	+ -	
10			+ -	+ -	+ -	+ -	+ -	
11			+ -	+ -	+ -	+ -	+ -	
12			+ -	+ -	+ -	+ -	+ -	
13			+ -	+ -	+ -	+ -	+ -	
14			+ -	+ -	+ -	+ -	+ -	
15			+ -	+ -	+ -	+ -	+ -	
16			+ -	+ -	+ -	+ -	+ -	
17			+ -	+ -	+ -	+ -	+ -	
18			+ -	+ -	+ -	+ -	+ -	
19			+ -	+ -	+ -	+ -	+ -	
20			+ -	+ -	+ -	+ -	+ -	
21			+ -	+ -	+ -	+ -	+ -	
22			+ -	+ -	+ -	+ -	+ -	
23			+ -	+ -	+ -	+ -	+ -	
24			+ -	+ -	+ -	+ -	+ -	
25			+ -	+ -	+ -	+ -	+ -	

Graph for Data Analysis

Student: _____

Target Area: _____

Graphing Code □ Acquisition
                         □ Deceleration
                                 □ # _____
                                 □ # _____
                                 □ # _____

Program Data Analysis Record

Counted:

_____

_____

Dates

Training Activities

Activity 1

View the first demonstration on the DVD in the section, *A Preview of Teaching the Verbal Operants*, and the *Demonstration of Interspersing Easy and Hard Trials*. As you view this segment, practice naming the type of verbal operant for each trial in the demonstration. Write down what type of verbal behavior is being taught on each trial as it is presented. For instance, note if the trial is a tact, echoic, intraverbal, etc. At first use the pause and review buttons to slow down the pace so that you can review each trial as it is presented to help you determine what variables allow you to classify each verbal operant. Refer to the charts which define the ABCs of the operants if needed. Eventually practice naming the type of trials without pausing the DVD in order to build your fluency.

As a follow up to this activity, prepare about 20 to 50 3x5 cards with various Sds for the verbal operants. Be sure to include tacts, intraverbals, match to sample, receptive, echoic, and imitation trials in about an equal ratio. Have a colleague shuffle the cards and practice delivering the Sds in sequence while you identify what type of trail is presented. Practice this skill until you can name the verbal operants presented at a rate of about 20 to 25 per minute.

Answers:

Types of trials in *A Preview of Teaching the Verbal Operants:*

Tact, Echoic, Imitation, Mand
Receptive, Receptive (error), Echoic, Imitation, Receptive, Reinforcement
Imitation, Tact (teaching trial), Imitation, Imitation, Tact, Reinforcement

Types of trials in *A Demonstration of Interspersing Easy and Hard Tasks*

Intraverbal, Receptive, Tact, Tact (teaching trial), Match to Sample, Tact, Reinforcement
Tact, Intraverbal, Receptive (error), Imitation, Receptive, Reinforcement
Tact (error), Imitation, Imitation, Tact, Reinforcement
Echoic, Receptive (teaching trial), Intraverbal, Intraverbal, Receptive, Reinforcement)

Activity 2

Practice delivering mixed and varied Sds with a colleague as you would in an actual teaching session.

Present at least 10 consecutive trials at a time with at least three verbal operants (tact, intraverbal, echoic) and at least two non-verbal operants (listener response, imitation, match to sample.)

Time your practice. Attempt to increase the pace of your delivery until you can present about 20 to 25 trials per minute.

At first, be sure that the person playing the role of the student makes no errors. In other words, limit your practice to delivering the discriminative stimuli (both the verbal direction and presentation of any needed materials). At this stage you are simply practicing delivering a variety of Sds.

Activity 3

Practice errorless teaching procedures. Team with a friend or colleague and practice delivering teaching trials using a 0-second time delay trial, followed by a transfer trial, several distracter trials, and a check trial with delivery of reinforcement. Practice these procedures across type of verbal operant (echoic, tact, intraverbal) and non-verbal operant (imitation, receptive, match to sample) trials.

Activity 4

Practice error correction procedures. Team with a friend or colleague and practice delivering teaching trials using the 2-second time delay procedure sequence. Recall that the sequence is: error response followed by 0-second prompt trial, transfer trial, several distracter trials, check trial with reinforcement delivery. After you become skilled at this sequence, have your partner make errors on some trails and not on others. Practice procedures in the situation wherein an error occurs on the transfer trial. Again, practice across verbal operant and non-verbal operant trials.

Activity 5

Again, practice with a partner. This time practice running the various types of transfer trials across verbal operants. Be sure to follow the errorless teaching sequence (0-second prompt, transfer trial, distracter trials, check trials). Be sure to practice each of the following:
Echoic to tact transfer.
Tact to receptive transfer
Receptive to tact transfer
Tact to intraverbal transfer
Echoic to intraverbal transfer
Signed imitation to tact transfer
Signed tact to signed intraverbal transfer

Activity 6

With your partner, practice prompt fading techniques with transfer trials.
Practice the following prompt fading procedures:
1. Fading physical prompts from full physical prompts to lesser levels of physical prompts and eventually to no physical prompt.
2. Fading positional prompts (e.g. how close the target pictures or objects are to the student in relation to the other pictures or objects in the array).
3. Fading volume of vocal prompts for echoic, tact and intraverbal trials.
4. Fading the amount of time a visual prompt is exposed to a student.

Activity 7

Consider a student with whom you are familiar. Write down a variety of items and activities that may serve as potential reinforcers for that student. Be sure that you consider how you as an instructor can be paired with each item or activity on the list. For each potential reinforcer on the list, write down how you as an instructor can increase its value (through contriving or capturing motivation), how you can deliver the potential reinforcer immediately following a successful trial (for purposes of differential reinforcement), how densely you can

deliver the item (how often or what rate), and how "much" (magnitude) of the reinforcer can be delivered at any one time (can the amount delivered be varied based on student performance?). Use this activity to identify how you can use the various potential reinforcers during the intensive teaching process to motivate student cooperation. Are all of the identified reinforcers appropriate for use? Can some be more easily controlled by the instructor? Consider various characteristics of each reinforcer listed and attempt to identify other items or activities that share those characteristics in order to identify other potential reinforcers.

Activity 8

Again, practice delivering trials with a partner. This time practice multiple consecutive run-throughs. Practice achieving a series of run-throughs that result in a specific ratio of reinforcement; in other words, practice setting and achieving a set variable ratio schedule of reinforcement (VR). Have a third person tally how many trials you present in each run-through so you can calculate the VR. Practice both short VRs (i.e., VR 2 and VR 3) as well as longer VRs (VR8, VR 14, etc.). Review the tape if needed in order to determine the process for calculating the VR. At first do not include teaching trials (0-second prompts) or error correction procedures in your practice. As you become more skilled begin including the 0-second prompt and error trials in your practice.

Activity 9

Use the cold probe sheet attached to develop some items that you may administer as cold probes to your practice partner. Practice the cold probe procedure. Have your practice partner perform some of the items correctly, incorrectly, and occasionally give no response but be sure your partner does not tell you in advance which items will be practiced as corrects or errors.

Glossary

A-B-C- ~ An abbreviation for the words Antecedent- Behavior- Consequence. The term is used to describe the relationship between what happens before a response and what happens after a response. A-B-C relations are used to look for patterns in the occurrence of a behavioral response and environmental events.

Acquisition ~ The process in which a student learns a new behavior through reinforcement. Data collected on the number of trials, accuracy of responses during training, and the length of time it takes for the skill to be learned informs the interventionist as to whether the teaching procedures being used need to be adjusted. Acquisition trials refer to specific instances of teaching in which new skills are actively being taught.

Audience~ The discriminative stimuli that set the occasions on which verbal behavior has consequences. Such stimuli are usually listeners that reinforce speakers in a precise manner.

Autoclitic ~ a unit of verbal behavior that depends on other verbal behavior for its occurrence. Autoclitics modify the effects of that other verbal behavior on the listener.

Automatic reinforcement ~ reinforcement that is not dependent upon other people for its delivery. The response generates its own reinforcement. For individuals with autism, the relative level of difficulty related to behaviors that involve socially mediated reinforcement may make the occurrence of behaviors that are maintained by automatic reinforcement (do not involve other people) more frequent. Some examples of behaviors that are usually maintained by automatic behavior include eating food, flicking ones fingers in front of a light, scratching an itch.

Aversive Stimuli ~ A stimulus that either decreases the frequency of a response if it occurs as a consequence or increases the occurrence of behaviors that serve to remove the stimulus (evokes escape responses) if it occurs as an antecedent. Note that aversive stimuli are characterized not by their form but rather by their effect on behavior.

Behavior ~ This term refers to some action made by an individual. It is the movement of a person in their environment. Behavior is observable; it has physical characteristics, it happens in relation to environmental events, and occurs dynamically in relation to measures of time.

Behavior chain ~ a series of behavioral responses that are linked together so that the reinforcement for one behavior serves as a discriminative stimulus for the next behavior. The individual responses are chained together in this manner until some ultimate reinforcing event occurs.

Card Sort Method ~ A method of organizing teaching materials within the intensive teaching procedures for verbal behavior presented within this training. The card sort method generally involves writing on 3x5 inch index cards the discriminative stimulus to be presented to the student (often the side facing the student will be a picture.) The cards are often shuffled to allow random distribution. The cards are marked by verbal operant and whether the item is a maintenance or teaching item. As the items are presented the cards are sorted into correct and incorrect responses.

Chaining ~ A teaching procedure wherein one attempts to link various simple individual responses together to make one, longer complex behavior. Chaining refers to teaching the individual responses that make up a behavior chain. Teaching a student to complete the individual steps in sequence for "setting a table" is an example of chaining.

Check or Probe Trial ~ a discrete trial that generally occurs several trials after a transfer trial. Check trials determine whether the response has been maintained across other demands and other responses. In a check trial, a target skill is presented without prompts.

Check Trial ~ also referred to as a probe trial; a check trial is a discrete trial used to determine if transfer of stimulus control to an unprompted condition has been maintained following presentation of other trials (usually termed distracter trials). In other words you check to see if the student can still demonstrate the skill without being prompted after some different types of trials are presented.

Conditional discrimination~ a response in which the antecedent condition involves two stimuli. Reinforcement is contingent upon responding only when both stimuli occur. For instance, the student selects a picture of a cat when both the picture of a cat and the verbal direction "get cat" are both present.

Conditioned Motivative Operation (CMO) ~ a motivative operation that occurs in relation to a learned or conditioned reinforcer. There are several types of CMO including transitive motivative operation, reflexive motivative operation, and surrogate motivative operation. CMOs do not involve satiation or deprivation.

Conditioned Motivative Operation-reflexive (CMO-r) ~ a motivative operation that occurs when the presentation of a stimulus is correlated with an increase in the value of removing the stimulus. Reflexive motivative operations are warning signals. When a CMO-r is in effect, it leads to a student seeking negative reinforcer (the removal of some event). In other words, when a situation suggests worsening conditions, the value of escaping the situation increases; and, therefore, the student will engage in any behavior that leads to an end of the worsening condition. Some examples of reflexive motivative operations might include, a student is asked to perform a difficult task thus the student will likely be motivated to avoid the teacher in order to get out of doing the task; a timer that is about to go off signals that a student must move from some preferred activity to a lesser preferred task will lead to the student trying to turn the timer off before it rings in order to avoid having to make the transition.

Conditioned Motivative Operation-Surrogate (CMO-s) ~ a motivative operation that occurs upon presentation of a stimulus that in the past has been paired with some other stimulus. The presentation of the first stimulus increases the value of the second stimulus. For instance, a student, upon hearing a song from some movie, may be motivated to watch that movie and will; therefore, be more likely to ask for the DVD or to look for the DVD.

Conditioned Motivative Operation-Transitive (CMO-t) ~ A motivative operation that occurs when the presentation of one stimulus is correlated with an increase in the value of some other stimulus. In other words, the presentation of some event leads to the student doing something to make another event occur. Some examples might include, a student being asked to write their name will likely make a pencil more valuable (and will also lead to the student looking for or asking for a pencil); a student who is given a treat in a container that is difficult to open will likely have a need to have the container opened (and will likely lead to the student asking someone to open it).

Conditioned Reinforcer ~ A stimuli that was previously neutral (has not had an effect on the future probability of behavior) but has become a reinforcer through being paired with other stimuli that already have reinforcing value. Conditioned reinforcers are often referred to as learned reinforcers.

Consequence ~ Events which occur immediately following a particular response. Consequences, like behavior, must be identified in observable terms. They are an aspect of the physical and/or social environment. Consequent events may or may not have behavior-altering properties; in other words consequences may increase the future frequency of behavior, decrease the future frequency of behavior or have no impact on the future frequency of behavior.

Contingency~ a dependent relationship between behavior and stimuli. It can be stated in "if…then…" descriptions.

Continuous Schedule of Reinforcement ~ a schedule of reinforcement in which every response is reinforced. Continuous schedules of reinforcement are associated with rapid learning but are more prone to extinction.

Data ~ Information gathered to guide the decision-making progress or to describe various phenomena including behavior. Data is obtained through the process of observation and recording events. ABA relies upon **data-based decision making.** Teaching and behavior management programs are based upon information that is systematically gathered during the teaching/working process.

Data-Based Decision Making ~ refers to the fact that teaching and behavior management decisions are based upon information that is systematically gathered during the teaching/ intervention process. Data-based decisions are best made by reviewing a visual display of data. Changes in programming are based on some predetermined set of decision rules. For instance, if no progress is seen in the data path for three consecutive sessions, a change in the teaching procedures will be made.

Delta Stimuli ~ a change in the environment that has been paired with the unavailability of reinforcement. In non-technical words it is an antecedent that signals that reinforcement is not available.

Deprivation ~ The period of time in which a primary or unlearned reinforcer has not been available. Deprivation can be used to increase the potency of a reinforcer by not delivering it to the individual for a period of time. Food, for one instance, will become more valuable as a reinforcer if a person has not eaten for some time. Contrast with **satiation.**

Differential reinforcement~ reinforcement of some responses and not others. Differential reinforcement is a critical component of the shaping process.

Direct Instruction ~ A form of teaching that has its origins in behavioral principles. Students are taught individually or in groups that are made up of students at roughly the same academic level; there is scripted and fast-paced presentation of materials; students

respond as a group as well as individually; and there is a very high degree of student-instructor interaction with error correction and **positive reinforcement** for correct responding. There is an emphasis on very well-designed and researched modules that students must master before moving on to the next level (see work by Engleman and Carnine).

Discrete Trial Teaching ~ Discrete trial teaching is the three-term contingency (A-B-C) relationship as applied to teaching new skills. It is "discrete" because each trial involves a clear presentation of a single response opportunity, clearly defined response criteria, and set procedures for teaching consequences in the event that the target response occurs or does not occur. Each "trial" is a separate attempt to teach a new behavior or reinforce a previously learned behavior.

Discriminative Stimulus (Sd) ~ a stimulus that is conditioned to elicit a particular response due to its history of being paired with the availability of reinforcement. Discriminative stimuli occur in the antecedent condition and are associated with the availability of reinforcement. For example, a refrigerator door may be stimulus that evokes "opening the refrigerator door" behavior because the refrigerator likely contains food that serves as a reinforcer.

Distracter Trial ~ a discrete trial that occurs between a teaching or transfer trial and either a check trial or a second teaching trial. Distracter trials are used in order to assist the child in maintaining a response across other demands and other responses. Distracter trials generally involve other type of responses than the item that is being taught. Check trials are most often "easy" trials.

Easy trial ~ any trial on which a student performs without a prompt. Easy trials involve use of a 2-3 second time delay procedure for the model presented in this training.

Echoic ~ verbal behavior wherein a verbal stimulus evokes a verbal response and the stimulus and response share point to point correspondence. In other words, the response "echoes" or duplicates the stimulus.

Edible Reinforcers ~ Food items that may be used as reinforcers in teaching programs. Edible reinforcers are just one class of reinforcer that may be used in a teaching program. Edible reinforcers are usually used in conjunction with other reinforcers such as verbal praise, attention, and tokens, and are faded as the student acquires other reinforcers.

Error Correction ~ Procedures that are used when a student responds incorrectly, or is non-responsive. There are multiple error correction procedures. In the error correction procedure presented in this training, the direction is repeated, followed by a 0-second prompt for the child to respond correctly. Error correction trials are then followed by a transfer trial.

Errorless Learning ~ The process by which student errors are reduced or eliminated by systematically applying prompting and prompt fading strategies. Students are provided prompts that insure an error does not occur and then learning is transferred to an unprompted trial. In general, the student is prevented from making an incorrect response in the first place. This increases the probability that the student will have more opportunities to make a correct response and receive reinforcement.

Escape Extinction ~ A decrease or cessation in the frequency of responding due to a failure to remove some aversive event. Escape extinction is used for behaviors maintained by negative reinforcers. During instruction, escape extinction generally involves the failure to remove an instructional demand.

Extinction~ A decrease or cessation in the frequency of responding due to a cessation in the occurrence of reinforcement. It is the process by which a response is no longer paired with presentation of a reinforcing event. Extinction is a schedule of reinforcement in which the behavior is never reinforced.

Extinction Burst ~ A phenomenon wherein the frequency of a behavior increases for some period (usually a brief period) following a period of time in which the behavior is not reinforced. For problem behavior reduction programs that use extinction, the possibility of an extinction burst must be planned for. During the burst, the behavior will *temporarily* increase in frequency, magnitude, and variability.

Fading ~ A gradual decrease in the observable aspects of a stimulus. Fading is often used as procedure to reduce the level of prompt during instruction.

Fluency ~ a characteristic of responses in which accurate responses are emitted at a relatively high rate. Fluency is a measure of accuracy and speed. The degree to which a skill is fluent may predict the degree to which the skill will be retained and generalized, how strongly the response will occur over time, and the overall ease of responding.

Frequency ~ Refers to the number of target responses counted. For example, "the student made seven initiations to his peers."

Functional Analysis ~ a process in which the class of reinforcers maintaining a particular response or response class is identified. Functional analysis helps to answer questions such as "why does that response occur?" or "under what conditions is that response more likely?"

Generalization ~ Speaking broadly, generalization refers to variation in either response or setting. We strive to generalize across time, setting, people, and instructional materials.

Graphing ~ The representation of data on a grid. When behaviors are represented on a graph they allow visual analysis. In other words the person viewing the graph can easily make a judgment regarding changes in a pattern of behavior over time. Graphs make for easy summarization of trend, level, and variability in behavior. Graphs are used to assess progress in learning and to make teaching/ treatment decisions.

Hard trial ~ any trial on which a student has not been able to perform without a prompt. Hard trials involve use of a 0-second time delay procedure for the model presented in this training.

Imitation ~ To duplicate observed behavior. Motor imitation involves duplicating another person's actions. Echoic behavior is a verbal form of imitation.

Incidental Teaching ~ incidental teaching refers to teaching that involves naturally occurring opportunities to teach, often with student-initiated activities. Incidental teaching, while often involving systematic teacher responses to student behavior, is not carefully planned or scripted.

Intermittent Schedule of reinforcement ~ a schedule of reinforcement in which each not all responses are reinforced. Reinforcement is provided only to some instances of the response.

Inter-trial Interval~ a measure of temporal duration between the presentation of one trial and the presentation of the next trial. In other words, it is a measure of how much time occurs between trials.

Intraverbal ~ Verbal behavior in which a verbal stimulus evokes a verbal response and the stimulus and response do not share point to point correspondence. In other words, the response is not the same as the stimulus. Common names for intraverbal responses may include answering questions, word- associations, fill-ins, conversational responses, etc.

Latency ~ a measure of time between the presentation of a discriminative stimulus and the occurrence of a response or between the occurrence of a response and the presentation of a consequent stimulus (either a reinforcement or punishment.)

Listener Response ~ behavior of a person responding to another person's verbal behavior. Listener responses are acquired through experience and are often highly specified. Listener responses are often called "receptive language."

Maintenance Trial~ a discrete trial involving a stimulus that is associated with a response that has been correctly emitted by the student on past trials. It is a trial for a skill that is already "acquired" versus a skill that is still being taught. Maintenance trials are run in order to help the student learn to consistently give the response (in common terms, to help the student 'remember' the response.)

Mand ~ verbal behavior wherein a motivative operation occurs in the antecedent condition, the response specifies its reinforcer, and the response is maintained by consequences that involve direct reinforcement (delivery of what has been specified). Common terms for mands might include ask, demand, request, command, question, etc.

Matching Law ~ a term for the relationship between the probability of a response and the degree to which that response has been reinforced. Specifically, during concurrent schedules of reinforcement, a behavior will be emitted at a ratio that is equivalent to its schedule of reinforcement. Some characteristics of reinforcement that can affect response probability are:

> **Value of Reinforcement~** the degree to which a stimulus is likely to evoke behaviors that result in the delivery or presence of that stimulus. In other words, the strength of the motivative operation in relation to a particular reinforcer will predict the likelihood of a response. For instance, if a person is thirsty, they will be more likely to engage in behaviors that are reinforced by drinking than they will be to engage in behaviors that are reinforced by food.

> **Response Effort~** if two responses can result in reinforcement, the one that involves less physical effort will be more probable. For instance, if one is motivated to change channels on a TV, pressing the remote control button will be more likely than walking to the set to press the control panel button.

Ratio of Reinforcement~ if two responses result in the same reinforcer, but one response obtains reinforcers more often, that response will be more likely to occur. For instance, although a person may sometimes be offered food at a friend's house, if the person is really hungry they will be more likely to go to a store or a restaurant where food is sure to be available.

Magnitude of Reinforcement~ if two responses both access the same reinforcer, but one response obtains a greater amount of the reinforcer, that response will be more likely. For instance, if a high school student has a chance to do odd jobs at one home and be paid $5.00 or to do the same odd jobs at another home for $7.00 and all else is equal, the student will be more likely to work at the home that pays $7.00.

Immediacy of Reinforcement~ if two responses both access the same reinforcer, but one response is delivered more immediately following the response, that response will be more likely. For instance, if a child asks both his mother and his father for a ball and the father tells the child to wait and then later gives the ball to the child and plays with the child. The mother, on the other hand, immediately gives the ball and plays with child. The child will be more likely to ask the mother for the ball in the future.

Matching to Sample~ a response involving a conditional discrimination. In the presence of one stimulus the student selects another stimulus which shares some or all characteristics.

Most-to-Least Prompting ~ This term refers to a prompting and prompt fading strategy wherein one begins prompting at a level guaranteed to get the response to occur. You would fade the intensity of the prompt over time to avoid prompt dependency.

Motivative Operation ~ Sometimes abbreviated as MO, this term refers to an alteration of the environment that affects the power of other stimuli to serve as reinforcers and antecedent stimuli. Motivative operations alter the value of stimuli that serve as reinforcers and also evoke any behavior that has in the past been reinforced by those stimuli. Motivation in a behavioral model lies in the environment (for instance, a particular reinforcer may be valuable not because the student "wants it" but rather because the student has not had access to the item for a period of time). The value of events that may serve as reinforcers will vary according to the current strength of the motivative operation.

Natural Environment Teaching ~ Sometimes abbreviated as NET, this term refers to a teaching approach where the child's current activities and interests determine teaching strategies.

Negative reinforcement ~ A stimulus is removed following a given target behavior, this leads to an *increase* in the future probability of that target behavior. Describes a relationship between events in which the rate of a behavior's occurrence increases when some (usually aversive or unpleasant) environmental condition is removed or reduced in intensity. It leads to an *increase* in the future probability of a given behavior. For example, if a student tantrums after the teacher asked him/her to perform a task, and the teacher withdraws the request as a result of the tantrum it is negative reinforcement. In such a case, the teacher has accidentally negatively reinforced the tantrum and unwittingly made it more likely to happen in the future.

Neutral Stimuli ~ a change in the environment that has no affect on the future frequency of behavior.

Operant Analysis ~ the process of classifying the contingencies between antecedent, response, and consequence. In operant analysis, the behavior of concern is maintained through its effect on the immediate environment. An analysis of the way behavior is changed through its consequences.

Positive reinforcement ~ A stimulus is presented following a given target behavior, this leads to an *increase* in the future probability of that target behavior. As with other consequences, it is important to remember that a stimulus is only a positive reinforcer if, when presented, it leads to an *increase* in the future probability of the behavior.

Precision Teaching ~A method of instruction in which precise teaching behaviors and instructional methodologies are applied and continuously monitored and adjusted based on student performance. Students often self-monitor progress. Data in precision teaching programs are recorded and displayed on the standard celeration chart developed by Ogden Lindsley. Rate measurement is the central data in precision teaching.

Preference (Reinforcer) Assessment ~ A procedure to identify stimuli that may serve as reinforcers. Items or events are presented and the student's response is observed and recorded. Items in which the student approaches, takes or remains in contact with for longer periods of time are likely to be stimuli that can serve as reinforcement. Some preference inventories are completed through third party rating scales; however, such rating scales usually are less reliable than observational preference assessments. Remember: you may think something is a reinforcer but if it does not lead to an *increase* in the future probability of that target behavior, it is not a reinforcer for the child.

Primary reinforcer ~ A reinforcer that is effective without any prior learning (i.e., is in-born). Also known as unlearned reinforcer or unconditioned reinforcer.

Probe ~ A brief assessment of learning for a specific teaching target. Generally in a probe an unprompted learning trial is presented and the student's response is recorded. A cold probe involves presenting the probe trial following a period in which the student has not had exposure to the teaching procedure. Generally cold probes are recorded on a student's first response to an item each day.

Prompts ~ Prompts are ancillary antecedent stimuli that insure that a particular response will occur. In other words, prompts make the occurrence of the target behavior more likely. When prompts are used, procedures to fade the prompts need to be implemented. In the model proposed in this training, transfer trials are used to fade prompts. During instruction, the prompt occurs as part of the antecedent condition.

Punishment ~ a stimulus that occurs immediately following a particular response that decreases the future probability of that response in similar conditions. Punishment is a consequence that decreases the frequency of the behavior that precedes it. Punishment, like reinforcement, is not defined by its form but rather by its effect on behavior.

Rate ~ A measure of frequency across a specific period of time. Rate is usually recorded in number of responses within a set period of time as in "number of responses per minute." For example, a child initiates interactions with other children seven times per hour.

Reinforcement ~ A consequence that increases the future probability of the behavior that immediately preceded it. The only way a reinforcer can be identified is by the effect that the stimulus has on future behavior.

Satiation ~ A physiological phenomena in which contact with a reinforcer is extinguished due to a level of ingestion that does not allow further absorption. In common terms, satiation is synonymous with "being full." Although some people describe the weakening effect of time spent interacting with a conditioned reinforcer (for example, a child "getting tired of playing with a toy") as satiation, such weakening effects are better described as habituation.

Schedule of Reinforcement ~ Schedules of reinforcement specify how often particular reinforcers will result in reinforcement. Remember that not every response needs to be reinforced in order to affect future frequency of responding. Both planned and naturally occurring schedules of reinforcement can be described in terms of how much time passes before availability of reinforcement (interval schedules) or how many responses must occur before availability of reinforcement (ratio schedules).

Shaping ~ Process used to create new behavior by differentially reinforcing successive approximations to a desired behavior (the target response). Shaping involves defining the sequences of movement necessary to complete some target behavior. At first gross approximations to the target behavior are reinforced, then those responses are put on extinction (not reinforced) and only slightly better approximations to the desired behavior are reinforced. This process continues until only the final target behavior is reinforced.

Social reinforcers ~ Reinforcers that consist of interactions with other individuals (for example, high five, thumbs up, wink).

Socially mediated reinforcers~ any reinforcer that is delivered as the result of actions of another person. Socially mediated reinforcement can be contrasted with automatic reinforcement.

Tact ~ Verbal behavior wherein a non-verbal stimulus evokes a verbal response. The behavior is reinforced by non-specific events. Common terms for tacts include labeling or naming.

Target Behavior ~ A response that is selected to be changed in some manner as part of a teaching program. It is pattern of behavior we expect to be demonstrated a result of our teaching. The target behavior may be chosen in order to increase its frequency (an acquisition, fluency or maintenance program) or to decrease its frequency (a reductive program for problem behavior). Target behaviors must be specifically defined in observable terms (as physical, measurable behaviors).

Task Analysis ~ Used most often in discussions of **chaining,** this is a written list specifying the particular steps (series of responses) that must be completed (emitted) in order to perform a particular behavior. For instance, the steps in hand washing may be broken down into a sequence of individual behaviors such as pushing up long sleeves, turning on faucets, adjusting temperature level, wetting hands, putting soap on hands, etc. Depending on the nature of the task and the student's learning history, one task may be analyzed to 10 steps or 100 steps.

Teaching Trial ~ a discrete trial for a target behavior that is selected for acquisition (as opposed to a maintenance or fluency trial). In other words, a trial to teach a new skill. In the model proposed in this training a teaching trial involves an immediately prompted response (see 0-second prompt).

Time Delay ~ a time based procedure for fading prompts. The interval is set to determine the latency between presentation of a discriminative stimulus and presentation of a prompt. In other words, a child is given a direction and a period of time is set in which no prompt will be given. If the behavior does not occur within that time interval, the prompt is given. A graduated time delay procedure is one in which the interval between the discriminative stimulus and the prompt is gradually changed as the student is presented with teaching trials. Usually the interval is lengthened as the student has success responding.

0-second time delay ~ This refers to an immediate prompt. It is an example of a time delay interval within a graduated time delay procedure in which there is no interval of time between the presentation of a discriminative stimulus and a prompt. It is usually the first step in a graduated time delay procedure. In the prompt fading/errorless teaching model presented in this training a 0-second time delay occurs on trials that involve teaching a new skill or on trials in which previous performance required a prompt (a hard trial).

2-3 second time delay ~ This refers to a delay of 2 to 3 seconds after a direction is given before a prompt is delivered. It is an example of a time delay interval within a graduated time delay procedure in which there a 2-3 second interval of time between the presentation of a discriminative stimulus and a prompt. Transfer trials are usually 2-3 second time delay trials. In the prompt fading/errorless teaching model presented in this training a 2- to 3-second time delay occurs on trials that involve presentation of task on which the student has previously performed without prompt (an easy trial)

Time Out from Positive Reinforcement ~ Often called "time out" for short. The general idea of time out is that a given reinforcer is removed for a short period of time, contingent upon some inappropriate behavior being emitted by an individual. While this can take the form of an individual having to go to a different setting (for example, the common "time out chair"), time out need not take this form, and there are may be reasons to avoid this use (e.g., accidentally reinforcing with attention, or accidentally reinforcing avoidance behavior). Time out can be accomplished within the given setting (e.g., a TV set is turned off for 10 seconds following inappropriate hand flapping while watching). Although various formal procedures have been developed, any time reinforcement is not available for a period of time following an instance of problem behavior, time out is being used.

Topography ~. A description of the physical form of the behavior. Topographical descriptions often include describing what the behavior "looks like": a description of the muscles used, the force of the movements, the time duration of the movements, the direction of the movements and so forth.

Transfer Trial ~ An unprompted trial that follows a prompted trial. The word transfer refers to the technical description of the "transfer of stimulus control." In other words, in the prompted trial both the environmental stimulus that controls the behavior (for instance a verbal direction) and the prompt (for instance a gesture such as a point) precede the response (in this case, the student following the direction). The transfer trial involves fading the prompt (eliminating the gesture or fading how much gesture is used) on the trial immediately following a prompted trial. Transfer trials transfer stimulus control to more independent levels of response.

Unconditioned Motivative Operation (UMO) ~ a motivative operation that occurs in relation to an unlearned reinforcer. UMOs usually involve satiation and deprivation.

Variable Ratio Schedule of Reinforcement ~ An intermittent schedule of reinforcement wherein reinforcement becomes available after an average number of responses. In other words the number of responses prior to reinforcement varies but on average occurs at a similar frequency (for instance, a behavior may be reinforced on a variable ratio of 10, abbreviated VR10, meaning that it may be reinforced on average one in 10 times.) This is among the most powerful schedules of reinforcement for maintaining rapid responding and providing resistance to extinction.

Verbal Behavior ~ behavior that is effective only through the mediation of another person who has been conditioned precisely in order to reinforce the behavior. Verbal behavior encompasses terms such as language, speech, talking, comprehension, memory, etc. However, verbal behavior involves an operant analysis of those behaviors that are reinforced by a listener. Verbal behavior can involve speaking but also includes sign language, writing, picture communications systems, Braille, and so forth.

Visual Prompt ~ An antecedent event that is visual and evokes a particular response. Visual prompts can include a border temporarily placed around a picture to be selected, an asterisk placed next to a word that is to be read, etc.

Vocal ~ responses that involve movements of the lungs, larynx, tongue and lips in order to produce a sound (an auditory response product). Vocal responses can include talking out loud, babbling, screaming, singing, etc.

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