# Pennsylvania Verbal Behavior Project

## FAMILY HANDBOOK
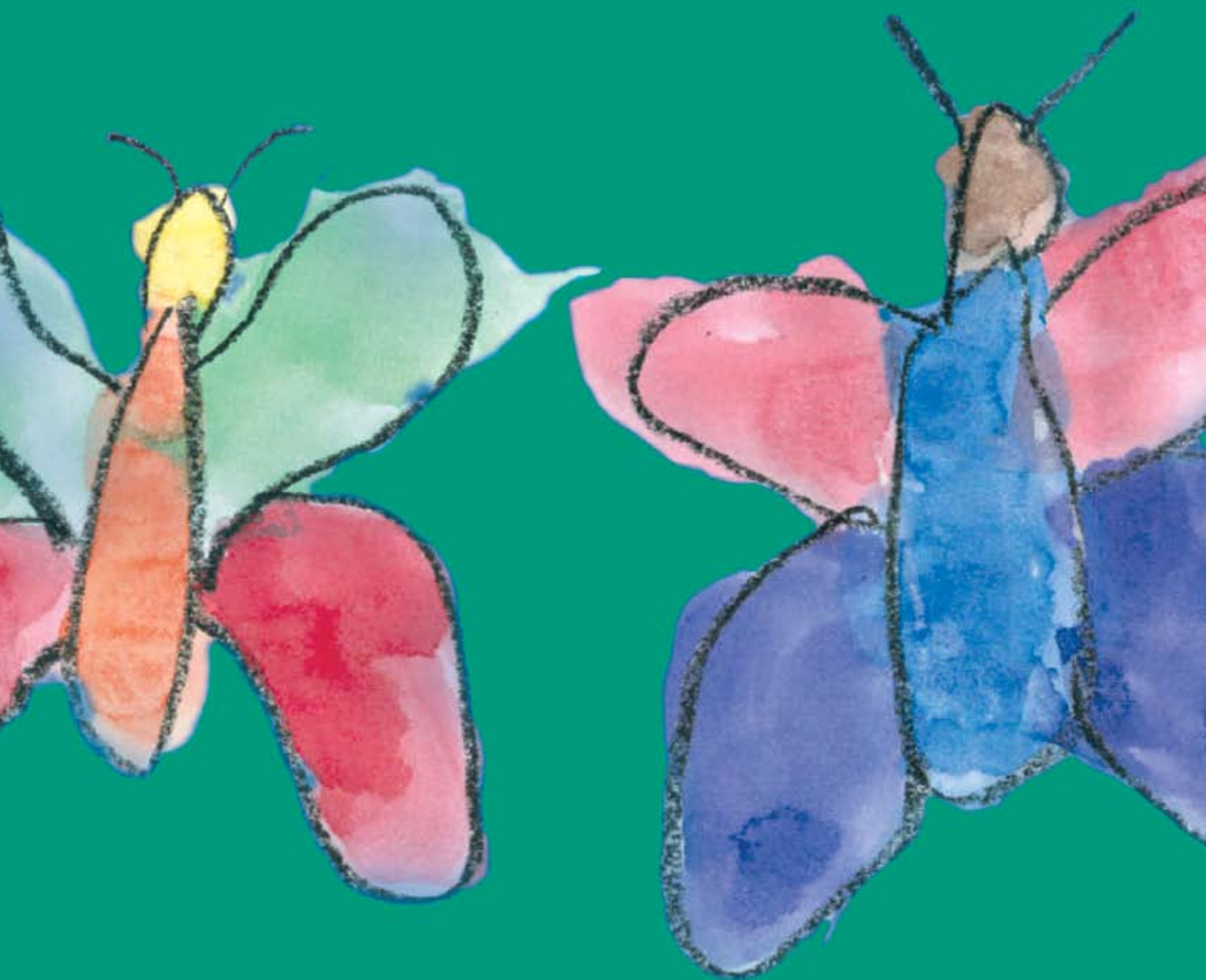
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# WELCOME LETTER TO FAMILIES

Looking back at my first experience with the Pennsylvania Verbal Behavior Project, I am reminded of the dedication and perseverance of a local Parent Support Group in Wilkes-Barre in their quest to include evidence-based practices in public education. This support group (S.A.F.E.) spearheaded the application of Applied Behavior Analysis and Skinner's Analysis of Verbal Behavior into the first two classrooms in Pennsylvania. Today, we see the continuation and growth of our project expand across the state, thanks to the continued support of the Department of Education and Bureau of Special Education.

We remain vigilant in providing the training and technical assistance necessary to apply these scientific principles to each school district and intermediate unit classroom within our project. Our data suggests that these efforts have been rewarded with success.

The PA Verbal Behavior (VB) Project remains committed to the families of the children we serve, and we seek your involvement, participation, and input.

It is my sincere honor to be part of this team collaboration and I want to thank all of the consultants, teachers, internal coaches, classroom staff, school districts, and intermediate units for their dedication and love of this field.

We look forward to taking this journey along with you, to enhance the lives of our students, your children. May we look at the world through the eyes of a child and see a future filled with much love, hope, and opportunity.

Best Wishes,
Debra Finarelli MS CCC-SLP
PA Verbal Behavior Project Coordinator

# The Role of Parents and Families in the Pennsylvania Verbal Behavior Project

The experience of a family that includes an individual (or individuals) living with autism should be appreciated and respected. To live with a child with autism means having to plan and adapt in ways that can be quite different from what other families face. Those who know people with autism understand the unique ways in which the behaviors associated with autism affect day-to-day life. Children with autism show the same need for social interaction and affection as any other person, but the way social interest and affection is demonstrated may not be as easily recognized by those who haven't lived with a child with autism. A "lack of interest in social interaction" is just, as most parents of children with autism will say, an "apparent" lack of interest. Children with autism need loving interactions like any other child. Likewise, parents of children with autism are keenly aware of how their children communicate: their child may not communicate as much and the style of communication may not be effective with the larger world of listeners, but the children do indeed communicate. Families of children with autism have the same basic needs as others families; however, the specifics are often very different.

The people who make up the PA Verbal Behavior (VB) Project realize that the families of children in the classrooms that we serve are a diverse group. Such diversity means that families and parents have a great deal to offer. The role of parents and guardians is highly respected by the PA Verbal Behavior Project. The Project staff is committed to helping families by helping schools address the specific educational needs of children. The development and implementation of effective programming requires a cooperative approach with families, educational providers, and the PA Verbal Behavior Project.

The PA Verbal Behavior Project is staffed by consultants who provide guidance on effective instruction for students with autism. We are proud that more than a third of our consultants are also parents of children with autism. These parent-consultants bring a perspective to the Verbal Behavior Project that ensures a family-centered approach.

Initial efforts to establish the PA Verbal Behavior Project were spearheaded by parents of children with autism. For its first three years, the Project was administered by a parents' association. Today the Project remains committed to family involvement and participation. Such participation can include:

- Providing families with the opportunity to discuss how the Verbal Behavior Project influences their child's educational program through discussion with teachers, local educational consultants, and Verbal Behavior Project consultants. The Verbal Behavior Project leadership is also available to answer parents' questions.

- Having opportunities to be active partners in identifying important skills to teach and decisions regarding how to teach those skills.

- Attending trainings, as they are scheduled, at a local level. Often Verbal Behavior Project consultants are available to provide informative sessions on the topics relevant to Applied Behavior Analysis (ABA) and Verbal Behavior.

The Verbal Behavior Project is able to identify a variety of resources for obtaining additional information on Autism, Applied Behavior Analysis, and Verbal Behavior.

Although the Pennsylvania Verbal Behavior Project is committed to helping families remain informed about educational programming resulting from consultation, it is important to remember that the PA Verbal Behavior Project serves a consultative role to local education providers (school districts and intermediate units). Educational services, including free and appropriate public education for children with disabilities, are the responsibility of local education agencies and not the PA Verbal Behavior Project. The Verbal Behavior Project can help, but Individualized Education Programs (IEPs) are to be delivered by your local school district or early intervention provider for children of preschool age.

*The purpose of the PA Verbal Behavior Project is to enhance learning and communication to improve the lives of children who live with autism and their families. The Project provides training, consultation, resources, and information.*

# PENNSYLVANIA VERBAL BEHAVIOR PROJECT SUMMARY SHEET

As part of an ongoing commitment to meeting the educational needs of students with Autism Spectrum Disorder (ASD), the Pennsylvania Department of Education (PDE) supports training, consultation and on-site guided practice. The PA Verbal Behavior Project is a PDE initiative that provides school districts, intermediate units, and families with evidence-based interventions for students with autism. This initiative is coordinated by Debra Finarelli, and administered by Tuscarora Intermediate Unit 11. Support to the training initiative and school sites will continue from the Pennsylvania Training and Technical Assistance Network (PaTTAN) Harrisburg office.

## Number of Participating Classroom Sites Across the Commonwealth by Year:

| School Year | 2003-2004 | 2004-2005 | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 |
|---|---|---|---|---|---|---|
| **Number of Classes** | 57 | 57 | 57 | 66 (57 returning, new, or extension; 9 model) | 90 (77 returning, new, or extension; 13 model) | 96 (78 returning, new, or extension; 14 model, 4 model independent) |

## Classroom Descriptions:

**New:** First year in the Project. These classrooms receive ongoing training, about 10 hours a month of on-site consultation provided by a Project consultant, as well as 4 hours a month of on-site consultation and oversight by a board certified behavior analyst.

**Extension:** First year in the Project, but have students that have transitioned from a previous participating site. These classrooms receive ongoing training, about 10 hours a month of on-site consultation provided by a Project consultant, as well as 4 hours a month of on-site consultation and oversight by a board certified behavior analyst.

**Return:** Classrooms that have been in the Project for two or more years. These classrooms receive ongoing training, 10 hours a month of on-site consultation provided by a Project consultant, as well as 4 hours a month of on-site consultation and oversight by a board certified behavior analyst.

**Model:** Classrooms that have achieved model status based on criteria such as level of implementation. These classrooms receive ongoing training and about 4 hours a month of on-site consultation and oversight by a board certified behavior analyst.

**Model-Independent:** Classrooms that have met criteria to continue implementation without Project consultation. These classrooms continue to receive training through the Project and are offered consultation on an as needed basis.

## The objectives of the Verbal Behavior Project are to:

- Establish classrooms that provide specified teaching procedures using Applied Behavior Analysis and the Analysis of Verbal Behavior to improve communication, social, self-care and other relevant skills for students with autism.

- Provide training, to include on-site guided practice, in Applied Behavior Analysis and the Analysis of Verbal Behavior to teachers, paraprofessionals, parents, administrators, speech language therapists, occupational therapists, behavior specialists, and all other staff participating in the Verbal Behavior Project. On-site guided practice refers to consultants working directly with staff in their classrooms, to model, guide, and provide feedback on specific procedures.

- Coach the development and implementation of focused instructional goals based on individual student needs and aligned with Pennsylvania achievement standards.

- Train and guide staff on using effective instruction based on principles of ABA and Analysis of Verbal Behavior.

- Teach staff to utilize the Assessment of Basic Language and Learning Skills (ABLLS) and/or the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) as assessment tools and curriculum guides.

- Identify one internal coach from the local education agency (LEA) who will attend consultant trainings and participate in on-site guided practice with the Project consultants. The role of the internal coach will be to establish local capacity to extend applications of the ABA/VB consultation within the LEA and/or region.

- Evaluate the success of the Verbal Behavior Project through measures of instructor skill acquisition in ABA/VB and student outcomes as measured by the ABLLS/VB-MAPP.

- Evaluate professional and parent satisfaction with the project by conducting social validity assessments (satisfaction surveys).

For Further information concerning the Pennsylvania Verbal Behavior Project, please contact:

Ms. Debra Finarelli
PA Verbal Behavior Program Coordinator
570-762-8604
dlnamey@aol.com

# WHAT IS ABA?

ABA stands for Applied Behavior Analysis. It is the science of studying behavior and applying *data supported techniques* to increase or decrease *behaviors that are meaningful* to the student and the student's social environment.

## Basic Principles of ABA

### *These principles underlie all we do:*

- Analyzes socially significant behavior in need of improvement. This means that behavior analysts collect, examine, and interpret data as part of the teaching process.

- Behavior is defined in objective and measurable terms.

- Examines the functional relationship between behavior (what a person does) and its controlling variables (what happens in the environment).

- Analyzes behavior through a three-term contingency:

  ▶ What happens before the behavior?

  ▶ What does the behavior look like?

  ▶ What happens after the behavior?

# WHAT IS VERBAL BEHAVIOR?

- Verbal Behavior is behavior that is mediated by the behavior of another person. This means it is what we do in most of our interactions with other people. Verbal behavior is communication.

- Verbal Behavior focuses attention on the functional analysis of language; looking at the conditions under which a person will use language. In other words, looking at why things are said.

- Verbal Behavior can include speaking, using sign language, writing, gesturing, using picture exchange systems, and using various augmentative communication devices.

Verbal Behavior is best understood by learning the verbal operants. The verbal operants are a way of classifying what is said by why it is said.

**Mand** = request (you say it because you want it)

**Tact** = label (you say it because you see, hear, smell, taste, or feel something)

**Intraverbal** = conversation, answering a question, responding when someone else talks (you say it because someone else asked you a question, or made a comment)
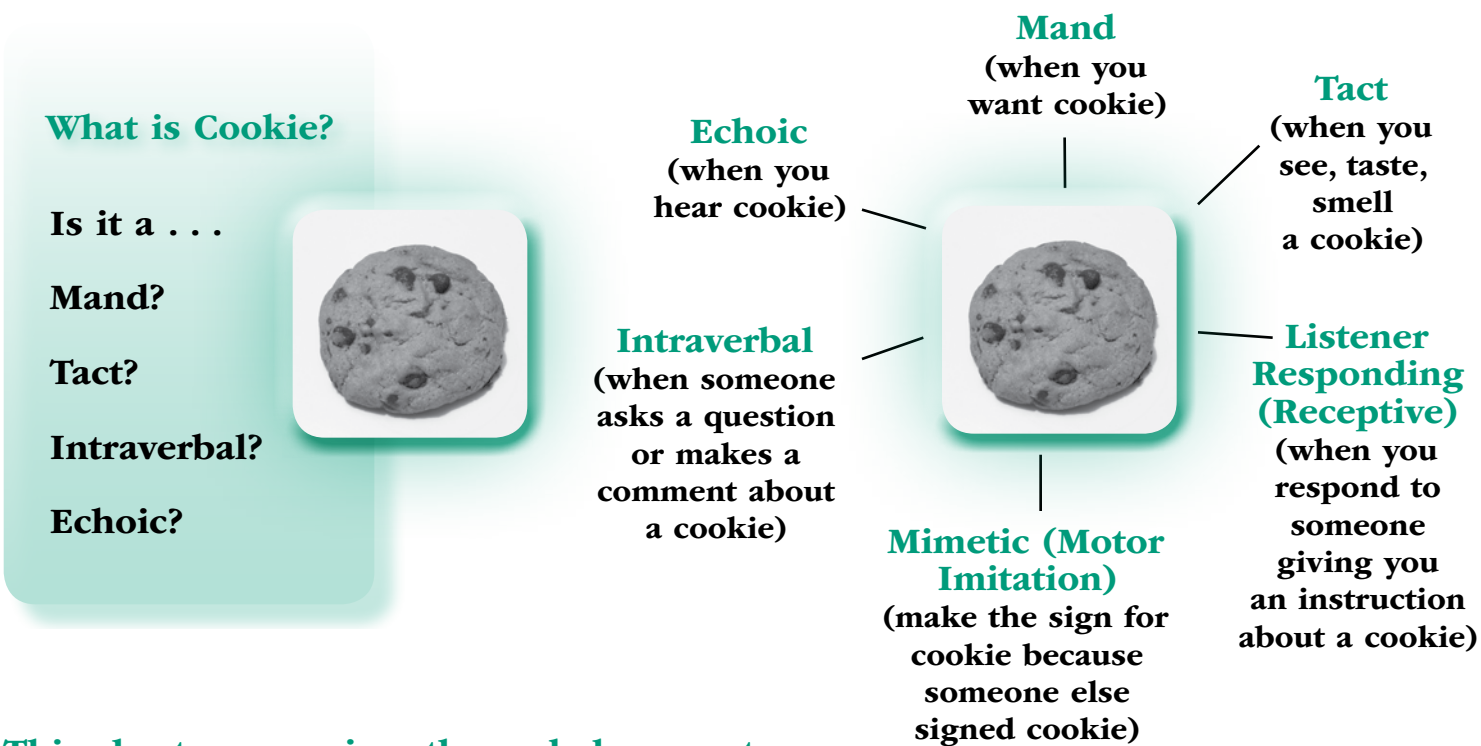
**Echoic** = repeating what someone else says (you say it because someone else said it)

**Imitation** = repeating someone else's motor movements (you move because someone else moved the same way)

**Listener Responding/Receptive** = following directions (you do what someone else asks you to do)

## This is what it means to teach all of the meanings of a word like "cookie":

In Verbal Behavior programs we focus on teaching all of the meanings of a word. One word, such as "cookie," may be used for a variety of purposes – to label, to request, to answer a question, to repeat what someone else has said, and so forth. The same word may have to be taught as a mand, a tact, an echoic, an intraverbal, or as a receptive response so that the student can use the word for a full range of purposes.

**What is Cookie?**

Is it a . . .

Mand?

Tact?

Intraverbal?

Echoic?

**Mand**
(when you want cookie)

**Tact**
(when you see, taste, smell a cookie)

**Echoic**
(when you hear cookie)

**Intraverbal**
(when someone asks a question or makes a comment about a cookie)

**Listener Responding (Receptive)**
(when you respond to someone giving you an instruction about a cookie)

**Mimetic (Motor Imitation)**
(make the sign for cookie because someone else signed cookie)

## This chart summarizes the verbal operants:

| Verbal Operant | Antecedent | Behavior | Consequence |
|---|---|---|---|
| Mand | Motivative Operation (MO, want or desire for cookie) | Verbal behavior (says "cookie," signs cookie, or exchanges a picture of cookie) | Direct reinforcement (gets a cookie) |
| Tact | Sensory stimuli (sees a cookie, smells cookies, tastes a cookie, hears someone eating a cookie, touches a cookie) | Verbal behavior (says "cookie," signs cookie, or exchanges a picture of cookie) | Nonspecific reinforcement (example: praise; "you're right!" "great job!" high five, pat on back, etc.) |
| Intraverbal | Verbal stimulus (example: "What do you like to eat?") | Verbal behavior (says "cookie," signs cookie, or exchanges a picture of cookie) | Nonspecific reinforcement (example: praise; "you're right!" "great job!" high five, pat on back, etc.) |
| Echoic | Verbal stimulus (someone says "cookie") | Verbal behavior (says "cookie") | Nonspecific reinforcement (example: praise; "you're right!" "great job!" high five, pat on back, etc.) |

# How Do We Implement Verbal Behavior in the Classroom?

- First we teach the child to cooperate and want to be with us. We do this through pairing ourselves with reinforcement. Pairing is the process by which we correlate the teaching environment and staff with the child's reinforcers (their favorite items or activities) in order to eventually get them to want to approach us.

- Then we teach the child:

  ▶ How to ask for what they want (MAND)

  ▶ How to say what things are (TACT)

  ▶ How to answer questions (INTRAVERBAL)

  ▶ How to follow instructions (RECEPTIVE)

  ▶ How to imitate others:
    What others say (ECHOIC)
    What others do or how others move (MOTOR IMITATION)

  ▶ Other skills relevant to communication and social development

Note:  The specific skills taught depend on individual student needs.

- Before we start teaching children, we need to assess their skills. This is done by using one or more of the following:

  ▶ Basic Language Assessment Form (BLAF)

  ▶ Assessment of Basic Language and Learning Skills (ABLLS)

  ▶ Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP)

- In addition to assessment, the Verbal Behavior consultants train the teachers and classroom staff in program development and on-site guided practice. This may include modeling for the staff how to implement certain programs or handle behavior problems, data based decision making, behavior management, and research supported teaching techniques.

# WHAT IS THE BLAF?

The BLAF stands for Behavior Language Assessment Form. It is a quick assessment that can be done before the staff completes the more thorough ABLLS or VB-MAPP assessments.

## Basic Principles of the BLAF

- It has 12 sections that cover early language and related areas (pp. 15-46, *Teaching Language to Children* Manual).

- It helps to determine where to start a language intervention program.

- It is a quick assessment that can help guide initial programming and give an overall view of the student's skills.

- A typical 3-4 year old child would have the BLAF skills completed.

## Why use the BLAF?

- It is useful with children with limited verbal behavior.

- It is a brief assessment, much less time consuming than administering the complete ABLLS.

- It helps identify which operants to teach first, and perhaps, which response form to use (vocal, signs, picture selection).

- It is a good place to start planning.

- It is a simplified version of the ABLLS.

- It is a screening tool.

- It has a brief administration time.

- Teaching staff can begin to develop teaching programs based on the BLAF while completing the ABLLS. Please see APPENDIX 1 & 2.

# WHAT IS THE ABLLS?

The ABLLS stands for *Assessment of Basic Language and Learning Skills*, written by James Partington, Ph.D and Mark Sundberg, Ph.D.

The ABLLS is divided into sections that include:

## Basic Language and Pre-language Learner Skills Assessment

A. Cooperation and Reinforcer Effectiveness
B. Visual Performance
C. Receptive Language
D. Imitation
E. Vocal Imitation
F. Requests
G. Labeling
H. Intraverbals
I. Spontaneous Vocalizations
J. Syntax and Grammar
K. Play and Leisure
L. Social Interaction

M. Group Instruction
N. Follow Classroom Routines
P. Generalized Responding

## Academic Skills Assessment

Q. Reading Skills
R. Math Skills
S. Writing Skills
T. Spelling

## Self-Help Skills Assessment

U. Dressing Skills
V. Eating Skills
W. Grooming
X. Toileting Skills

## Motor Skills Assessment

Y. Gross Motor Skills
Z. Fine Motor Skills

# WHAT IS THE VB-MAPP?

The VB-MAPP stands for *Verbal Behavior Milestones Assessment and Placement Program* written by Mark Sundberg, Ph.D. It is a more current assessment based on Skinner's analysis of Verbal Behavior. The VB-MAPP contains 170 milestones balanced across three developmental levels and 16 different verbal operants and related skills. In addition, the program includes an assessment and analysis of 22 language and learning barriers that can impede language acquisition. Collectively, the assessment data can lead to a more efficient language intervention program.

## What are the levels of the VB-MAPP and what skills are assessed?

**Level 1**
Mand
Tact
Listener Responding (LR)
Visual Performance/Matching
Imitation
Echoic
Play
Social
Vocalizations

**Level 2**
Mand
Tact
Listener Responding (LR)
Visual Performance/Matching
Imitation
Echoic
Play
Social
LR by feature/function/class
Intraverbals

Group/Choral Responding
Linguistics

**Level 3**
Mand
Tact
Listener Responding (LR)
Visual Performance/Matching
Math
Reading
Writing
Social/Play
LR by feature/function/class
Intraverbals
Group Instruction
Linguistics

## What are the language barriers that are assessed?

The barriers assessment is part of the VB-MAPP and allows the instructor to conduct a detailed analysis of the following factors that can impede the learner's language acquisition and overall progress.

Instruction Control
Behavior Problems
Defective Mands
Defective Tacts
Defective Imitation
Defective Echoic
Defective Matching
Defective Listener
Defective Intraverbal
Prompt Dependency
Generalization
Scrolling

Defective Scanning
Defective Conditional
   Discrimination
Weak Motivation (MO)
Response Requirement
   Weakens (MO)
Self-Stim Behavior
Defective Articulation
Obsessive Compulsive
   Behavior
Reinforcer Dependency
Attending

# IMPORTANT TERMS TO KNOW

Reinforcement is a change in the environment following a behavior that increases the future probability of that behavior under similar circumstances.

Reinforcement ALWAYS INCREASES the probability of behavior (it doesn't matter if the reinforcement is positive or negative).

**Positive Reinforcement** - something is added or gained that increases the probability of the behavior occurring again.

**Negative Reinforcement** - something is removed or taken away that increases the probability of the behavior occurring again.

Remember that reinforcement can consist of almost any event; do not think of reinforcement as being just something that is given to the child. Any event that follows a behavior and makes that behavior more likely to occur in the future is reinforcement.

## What does it mean to pair with reinforcers?

We offer free reinforcers to the child before working on any instructional demands. Candy, tickles, hugs, and spins may be examples of free reinforcers. "Free" simply means that you deliver the reinforcer without demanding anything of the child other than to not engage in problem behavior.

When pairing is done properly, kids want to be around us! They don't mind working with us when the time comes, because a history of positive reinforcement has been established. The adults are seen as "givers," a source of good things.

The result of pairing should be approach behavior!

## What is approach behavior?

Approach behavior refers to any behavior (movement and/or vocalization) of the child that indicates they want to be with you.

"We want the children to run toward us."

-Jim Partington

"Our goal is to be a human chocolate chip cookie!"

-Siri Ming

If we're having fun, the students will be having fun and will want to be with us. It is easier to teach someone who wants to be with us rather than someone who wants to run away from us.

Though no demands are placed at first, reinforcers are contingent (dependent) on approach behavior . . . the student has to look at us, or walk by us, or allow us to walk by him/her to get the reinforcer. We do not chase . . . that would reinforce "walking away" behaviors!

When we start assessing and working with the students we need to assess their preferences. Things the student prefers may serve as reinforcers. You will be asked to fill out a Reinforcer Assessment in the beginning of the year. There are many different reinforcer assessments available. For an example of a reinforcer assessment please see APPENDIX 5.

# BEHAVIOR REDUCTION

## What are the steps we follow when there is a student exhibiting problem behavior in the classroom?

- Clearly define the behavior.

- Try to PREVENT the behavior from occurring. Prevention starts with effective instruction and careful use of motivation strategies. Busy kids who are having fun and learning generally do not present behavior problems.

- Collect and graph baseline data and then continue to collect ongoing frequency data (how often the behavior occurs) and/ or duration data (how long each instance of behavior lasts). This allows us to follow the behavior and analyze whether the behavior is improving, worsening, or remaining the same.

## If the problem behavior continues we need to look at why the behavior is occurring (the functions of behavior).

In order to do this we conduct a functional assessment. A functional assessment is the process we use to collect the information necessary to find out why the behavior is occurring.

The main outcomes of a functional assessment are:

- A clear description of the problem behavior.

- Identification of the events that predict when the problem behavior will and will not occur.

- Identification of the consequences that maintain the behavior (reinforcer for the problem behavior).

- Development of a summary statement or hypothesis that describes the behavior, the specific situations in which it occurs, and the reinforcer that maintains the behavior.

There are three ways to conduct functional assessments. In most cases, a combination of two or more of these is used in order to ensure accurate and reliable data is obtained.

The three methods of obtaining the data to determine why the behavior is occurring are:

- Anecdotal (indirect) methods: Interviewing the person and those who have direct contact and knowledge about the person. These can be helpful to identify and narrow those events that may be affecting the behavior of concern.

- Descriptive (naturalistic) analysis: Directly observing the behavior in the typical setting in which the behavior occurs. In most cases, the data collected includes when the problem behavior occurs (each instance is recorded), what happens immediately before the behavior occurs (antecedent), and what happens immediately after the behavior occurs (consequence).

- Functional (experimental) analysis: Systematically manipulating conditions in the environment such as what happens before or after the problem behavior in order to determine under which conditions the problem behavior is most likely to occur. It is the most precise, controlled way to conduct a functional assessment and will provide the most reliable results.

The functional assessment will allow us to formulate a hypothesis for **why** the behavior is occurring (what type of reinforcement the child is getting from the behavior). We can then determine an appropriate intervention based on **why** the behavior is occurring. If behavior plans are developed without conducting a functional assessment they can actually make problem behavior worse.

## What are the components of a behavior plan?

All behavior plans for decreasing problem behavior should include:

1. Antecedent manipulation: This involves changing things in the environment to decrease the child's motivation to engage in the problem behavior. In other words to prevent the behavior from occurring.

2. Teaching a replacement behavior: This involves systematically reinforcing an appropriate behavior that does the same thing as the inappropriate behavior. For example, teaching the child to ask for what they want appropriately rather than crying to get what they want.

3. Extinction: Not providing the reinforcement that has been maintaining the behavior. In other words, making sure that the problem behavior does not result in things getting better for the child. It is important to mention that because children may have a strong history of "getting what they want" when they engage in the problem behavior, when we use extinction (no longer letting them get what they want

through a problem behavior), we may have a **temporary** increase in the frequency, intensity, and/or variety of the problem behavior (behavior may get worse) before the behavior starts to decrease. This is called an "extinction burst." It is critical that parents understand that in most cases, a temporary increase in the problem behavior is necessary before we can see a decrease in the problem behavior. For example, if you are talking to a friend and say "what time is it" and your friend doesn't answer (putting you on extinction) what do you normally do?  You ask again, then maybe say it louder!  This is an extinction burst. If your friend continued to ignore you, you would eventually stop asking.

4. Data: Like all well-designed and implemented behavior programs, we need to include data collection that will allow continuous assessment of the problem behavior (frequency and/or duration).

Keep in mind that interventions to help reduce problem behavior are developed based on the child's individual needs. As a parent or guardian, you may be asked by your child's school team to be a part of this process.

Some behavior reduction procedures need to be written into the Individualized Education Program (IEP). Your child's teacher will keep you up to date on the behavior reduction plan and your child's data. It is the school's responsibility to develop behavior plans. The VB consultants can assist staff during the process and provide information on how to best select positive and effective ways of managing problem behavior.

# Resources

## Websites

www.autism-society.org

www.autismlink.com

www.Autismsafe.org

www.autismshop.com

www.christinaburkaba.com/AVB.htm

www.difflearn.com – Online catalog specializing in learning materials and playthings for children with developmental delays and challenges.

www.drcarbone.net

www.mariposaschool.org

www.marksundberg.com

www.pattan.net

www.poac.net

www.thinkingpublications.com

www.tiu11.org

www.VBapproach.com

www.VBNtraining.com

www.VBteachingtools.com

## Other

*The Assessment of Basic Language and Learning Skills (ABLLS): An Assessment, Curriculum Guide, and Tracking System for Children with Autism or Other Developmental Disabilities.* Sundberg, M.L., & Partington, J.W. (1998). Danville, CA, Behavior Analysts, Inc.

*The Journal of Applied Behavior Analysis,* http://seab.envmed.rochester.edu/jaba/

*Journal of Applied Verbal Behavior.* Partington, J.W. & Bailey, J.S. (1993), 11, 9-18.

*Teaching Language to Children with Autism or Other Developmental Disabilities.* Sundberg, M.L., & Partington, J.W. (1998). Danville, CA: Behavior Analysts, Inc.

*The Verbal Behavior Approach: How to Teach Children with Autism and Related Disorders.* Barbera, M.L. & Rasmussen, T. (2007). London: Jessica Kingsley Publishers.

*Verbal Behavior.* Skinner, B.F. (1957). New York: Appleton-Century-Crofts.

*Verbal Behavior Analysis.* Greer, D. & Ross, D. (2007). Boston, MA: Pierson Publishing.

## The Behavioral Language Assessment Form (BLAF)

| Score | Cooperation | Request (Mand) | Motor Imitation | Vocal Play | Vocal Imitation (Echoic) | Match to Sample | Receptive | Labeling (Tact) | Receptive by FFC | Conversation (Intraverbal) | Letters & Numbers | Social Interaction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |

For the following questions, indicate the level of performance that best describes the learner's typical level of performance.

1. COOPERATION WITH ADULTS _____ (enter score)

How easy is it to work with the child?

1. Always uncooperative, avoids work, engages in negative behavior
2. Will do only one brief and easy response for a powerful behavior
3. Will give 5 responses without disruptive behavior
4. Will work for 5 minutes without disruptive behavior
5. Works well for 10 minutes at a table without disruptive behavior

2. REQUESTS (Mands) _____

How does the learner make his needs and wants known?

1. Cannot ask for reinforcers; or engages in negative behavior
2. Pulls people, points, or stands by reinforcing items

3. Uses 1-5 words, signs, or pictures to ask for reinforcers
4. Uses 5-10 words, signs or pictures to ask for reinforcers
5. Frequently requests using 10 or more words, signs, or pictures

3. MOTOR IMITATION _____

Does the learner copy actions?

1. Cannot imitate anybody's motor movements
2. Imitates a few gross motor movements modeled by others
3. Imitates several gross motor movements on request
4. Imitates several fine and gross motor movements on request
5. Easily imitates any fine or gross movements, often spontaneously

4. VOCAL PLAY _____

Does the learner spontaneously say sounds and words?

1. Does not make any sounds (mute)
2. Makes a few speech sounds at a low rate

3. Vocalizes many speech sounds with varied intonations
4. Vocalizes frequently with varied intonation and says a few words
5. Vocalizes frequently and says many clearly understandable words

## 5. VOCAL IMITATION (Echoic) _____

Will the learner repeat sounds or words?

1. Does not make any sounds (mute)
2. Makes a few speech sounds at a low rate
3. Vocalizes many speech sounds with varied intonations
4. Vocalizes frequently with varied intonation and says a few words
5. Vocalizes frequently and says many clearly understandable words

## 6. MATCHING-TO-SAMPLE _____

Will the learner match objects, pictures, and designs to presented samples?

1. Cannot match any objects or pictures to a sample
2. Can match 1 or 2 objects or pictures to a sample
3. Can match 5-10 objects or pictures to a sample
4. Can match 5-10 colors, shapes, or designs to a sample
5. Can match most items and matc

## 7. RECEPTIVE _____

Does the learner understand any words or follow directions?

1. Cannot understand any words
2. Will follow a few instructions related to daily routines
3. Will follow a few instructions to do actions or touch items

4. Can follow many instructions and point to at least 25 items
5. Can point to at least 100 items, actions, persons, adjectives

## 8. LABELING (Tacts) _____

Does the learner label or verbally identify any items or actions?

1. Cannot identify any items or actions
2. Identifies only 1 to 5 items or actions
3. Identifies 6 to 15 items or actions
4. Identifies 16 – 50 items or actions
5. Identifies over 100 items or actions and emits short sentences

## 9. RECEPTIVE BY FUNCTION, FEATURE, AND CLASS _____

Does the learner identify items when given information about those items?

1. Cannot identify items based on information about them
2. Will identify a few items given synonyms or common functions
3. Will identify 10 items given 1 of 3 functions or features
4. Will identify 25 items given 4 functions, features, or classes
5. Will identify 100 items given 5 functions, features, or classes

## 10. CONVERSATIONAL SKILLS (Intraverbals) _____

Can the learner fill-in missing words or answer questions?

1. Cannot fill-in missing words or parts of songs
2. Can fill-in a few missing words or provide animal sounds
3. Can fill-in 10 non-reinforcing phrases or answer at least 10 simple questions

4. Can fill-in 20 phrases or can answer 20 questions with variation
5. Can answer at least 30 questions with variation

11. LETTERS AND NUMBERS _____

Does the learner know any letters, numbers, or written words?

1. Cannot identify any letters, numbers, or written words
2. Can identify at least 3 letters or numbers
3. Can identify at least 15 letters or number
4. Can read at least 5 words and identify 5 numbers
5. Can read at least 25 words and identify 10 numbers

12. Does the learner initiate and sustain interactions with others?

1. Does not initiate interactions with others
2. Physically approaches others to initiate an interaction
3. Readily asks adults for reinforcers
4. Verbally interacts with peers and prompts
5. Regularly initiates and sustains verbal interactions with peers.

**Assessment of Basic Language and Learning Skills**
**Skills Tracking System**

Student:

| Assessor | Date | Color Code |
|----------|------|------------|

ABLLS REGISTRATION #

| A | Cooperation & Reinforcer Effectiveness | B | Visual Performance | C | Receptive Language | D | Imitation | E | Vocal Imitation | F | Requests | G | Labeling | H | Intraverbles | I | Spontaneous Vocalizations |
|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|

# APPENDIX 3

## VB-MAPP Milestones Master Scoring Form

| Key: | Score | Date | Color | Tester |
|------|-------|------|-------|--------|
| 1ST TEST: | | | | |
| 2ND TEST: | | | | |
| 3RD TEST: | | | | |
| 4TH TEST: | | | | |

Child's name:

Date of birth:

Age at testing: 1    2    3    4

### LEVEL 3

| Mand | Tact | Listener | VP/MTS | Play | Social | Reading | Writing | LRFFC | IV | Group | Linguistics | Math |
|------|------|----------|--------|------|--------|---------|---------|-------|----|----|-----|------|

15
14
13
12
11

### LEVEL 2

| Mand | Tact | Listener | VP/MTS | Play | Social | Imitation | Echoic | LRFFC | IV | Group | Linguistics |
|------|------|----------|--------|------|--------|-----------|--------|-------|----|----|-----|

10
9
8
7
6

### LEVEL 1

| Mand | Tact | Listener | VP/MTS | Play | Social | Imitation | Echoic | Vocal |
|------|------|----------|--------|------|--------|-----------|--------|-------|

5
4
3
2
1

# APPENDIX 4

## VB-MAPP Barriers Scoring Form

| Key: | Score | Date | Color | Tester |
|------|-------|------|-------|--------|
| 1st test: | | | | |
| 2nd test: | | | | |
| 3rd test: | | | | |
| 4th test: | | | | |

Child's name:

Date of birth:

Age at testing: 1  2  3  4

Behavior Problems | Instructional Control | Defective Mand | Defective Tact | Defective Echoic | Defective Imitation

Defective VP-MTS | Defective Listener | Defective Intraverbal | Defective Social Skills | Prompt Dependent | Scrolling

Defective Scanning | Defective Conditional Discrimination | Failure to Generalize | Weak Motivators | Response Requirement Weakens MO | Reinforcer Dependent

Self-Stimulation | Defective Articulation | Obsessive-Compulsive Behavior | Hyperactive Behavior | Failure to Make Eye Contact | Sensory Defensiveness

VB-MAPP    Barriers Scoring Form

# APPENDIX 5

## REINFORCEMENT ASSESSMENT FORM

Child's Name: _____ Date:_____
Completed by: _____

Prior to beginning intensive teaching it is important to identify ALL of your child's motivators or reinforcers. Many children have very specific reinforcers and some like to use them only in a particular way. Please provide as much detail as possible about your child's reinforcers. This information will help expedite the transition to intensive teaching.

Using a scale of 1-5 (1 being the most favorable) please indicate your child's preferences below:

### 1. WHAT ARE YOUR CHILD'S FAVORITE INDOOR ACTIVITIES?
Puzzles _____          Games _____              Books _____
Sensory toys _____     Musical instruments _____  Computer games _____
Action figures _____   Painting _____           Bowling _____
Play dough _____       Other: _____
Notes:

### 2. WHAT ARE YOUR CHILD'S OUTDOOR PLAYTIME ACTIVITIES?
Bicycle _____          Swing set _____          Trampoline _____
Theme parks _____      Swimming _____           Slide _____
Roller-skating _____

### 3. WHAT ARE YOUR CHILD'S FAVORITE VIDEO PREFERENCES?
Disney movies _____    Animated movies _____    Cartoons _____
Real-life animal videos_____
List some of your child's favorite videos:

### 4. WHAT ARE YOUR CHILD'S FAVORITE SNACKS?
Candy _____            Fruit _____              Cookies _____
Crackers _____         Chips _____              Pretzels _____
Ice cream _____        Other: _____
List your child's favorite brand names:

## 5. WHAT ARE YOUR CHILD'S FAVORITE BEVERAGES?

Soda ____          Juice ____          Water ____

Milk ____

List your child's favorite flavors and brand names:


## 6. WHAT ARE YOUR CHILD'S FAVORITE BOOKS?

Pop-up books ____        Picture books ____        Books with sound cards ____

Sensory books ____        Puzzle book ____        Coloring books ____

Sticker books ____

Notes:


## 7. WHAT ARE YOUR CHILD'S PREFERENCES FOR PETS?

Cats ___          Dogs ____          Hamsters ____

Fish ____          Gerbils ____          Other ____

Notes:


## 8. WHAT IS YOUR CHILD'S SPECIAL STRENGTH?

Art ____          Math ____          Music ____

Spatial ____          Reading ____          Computer ____

Other ____

Notes:


## 9. WHAT ACTIVITY DOES YOUR CHILD PREFER WHEN USING THE COMPUTER?

CD Rom games ____        Internet Sites ____

List your child's CD Rom games:


List your child's favorite internet sites:


## 10. WHAT ARE YOUR CHILD'S FAVORITE SONGS?

Song 1. _____

Song 2. _____

Song 3. _____

Song 4. _____

Song 5. _____

# APPENDIX 6

## GLOSSARY OF TERMS

**ABA –** An acronym that is used to refer to the field of APPLIED BEHAVIOR ANALYSIS, the application of the science of learning to socially significant human behavior.

**A-B-C –** A description of a RESPONSE in terms of the Antecedent (A), Behavior (B), and Consequence (C).

> **Antecedent ~** The stimulus that *immediately* comes before the behavior
> **Behavior ~** A description of the response in terms of its **topography** (what the behavior looks like)
> **Consequence ~** The immediate outcome of the behavior

**ABLLS –** Acronym for the Assessment of Basic Language and Learning Skills, a language assessment tool in common usage within Applied Behavior Analytic programs. Created by Dr. James W. Partington and Dr. Mark L. Sundberg.

**Acquisition –** The time during which an individual is learning a new behavior. Data collected on the rate (speed) and accuracy of the skill being acquired informs the interventionist working with an individual as to whether the teaching procedures being used need to be adjusted.

**Activities of Daily Living (ADL) –** Includes many different behaviors involved in taking care of one's self (e.g. toilet usage, washing, dressing, eating). These behaviors are also referred to as self-help skills.

**Activity Schedule –** Individuals are taught to follow a series of written or pictorial cues, engaging in the **behavior chain** represented.

**Backward chaining –** A specific method of instruction where one attempts to teach a task by teaching the last step first and working through a **task analysis** in reverse. For example, putting together a new puzzle. The instructor would prompt the student to put in all of the pieces in the puzzles. They would fade the prompt on the last piece while continuing to prompt the student through the rest of the puzzle. Once the student puts the last piece in independently (no prompts), the instructor can begin to fade prompts on second to last piece.

**Baseline –** The period of observation during which we gather **data** relevant to the behavior of interest before we initiate an intervention.

**Behavior –** This term refers to some action made by an individual. Behavior is the movement of a person in the environment. See the **dead man's (or person's) test**.

**Behavior chain –** Multiple steps linked together to make up a given behavior or activity. Completion of one step leads to the next step until the entire task is completed.

**Behavior Treatment Plan –** A written description outlining how relevant individuals should respond in order to decrease inappropriate behavior and increase appropriate behavior.

**Behaviorism –** The philosophy of the science of **behavior.** It takes several forms, but always emphasizes that behavior is the proper subject matter of psychology and should be studied using an objective scientific, experimental methodology.

**Board Certified Behavior Analyst –** This is a person who has satisfied all the requirements to acquire the "B.C.B.A." and can, therefore, call himself/herself a Board Certified Behavior Analyst. Requirements include completing a prerequisite number of hours of university-level course work in the science of behavior, completing a period of internship under the supervision of a Board Certified Behavior Analyst, and passing the required written examination. To maintain certification once it is achieved, there are various continuing education requirements. There are currently two levels of certification: the Board Certified Behavior Analyst (B.C.B.A.) and the Board Certified Associate Behavior Analyst (B.C.A.B.A.). The exact requirements and most current information regarding how to become or locate a Board Certified Behavior Analyst are available through the Behavior Analyst Certification Board web site, at www.BACB.com.

**Case Study –** A description of the background of a particular individual, an educational program, or a behavior program usually used to assist in treatment decisions.

**Conditioned Reinforcer –** A reinforcer that was previously neutral, but has become a reinforcer. Money becomes a conditioned reinforcer by being paired with the items it purchases. Interventionists may become conditioned reinforcers for their student's behavior, through being paired with other reinforcers (e.g. praise, tokens, favored activities).

**Consequence –** The specific immediate result of a given behavior. The consequence may or may not alter how often the behavior occurs in the future.

**Data –** Quantitative information gathered to guide the decision-making progress.

**Data-Based Decision Making ~** A set of rules based on relevant data that allows teachers to make decisions about when to change programs or methods.

**Dead Man's (Person's) Test –** A guiding principle in the definition of behavior. It basically states that anything a dead person can do is not behavior.

**Deprivation –** To increase the potency of a reinforcer by not delivering it to the individual for a time. For example: to make access to a favorite video game particularly reinforcing, one might limit access to the game. When a particular goal is met (cleaning up their room), they can have access to their reinforcer. If an individual has restricted access to a particular reinforcer, it is unlikely to be particularly potent when offered as a reinforcer. Contrast with **satiation.**

**Direct Instruction –** A form of teaching that is heavily based upon behavioral principles. Students are taught in groups that are made up of students at roughly the same academic level, there is a 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 uses the three-term contingency (A-B-C) relationship to teaching various skills. Each "trial" is a separate attempt to teach a new behavior or reinforce a previously learned behavior.

**Echoic –** The repeating of previously heard utterances. (One of Skinner's Verbal Operants)

**Edible Reinforcers –** Food items that may be used as reinforcers for some persons. One common myth surrounding ABA is that edibles are the predominant reinforcers used in all treatment procedures with children. In actuality, when edibles are used, they are always paired with other more natural reinforcers such as verbal praise, attention, and tokens, and are faded as the student acquires other reinforcers.

**Errorless Learning –** In errorless learning, **prompting** and prompt fading are utilized to reduce and or eliminate the likelihood of learner errors. If possible, the student is prevented from making the incorrect response in the first place through careful prompting. This increases the probability that the student will have more opportunities to make a correct response and receive reinforcement.

**Error Correction –** Set procedures that are used in the event that the learner responds incorrectly, or is nonresponsive. In one error correction procedure, the **discriminative stimulus** (SD) is repeated, followed by a zero second **prompt** for the child to respond correctly, and is followed by a **transfer trial.**

**Extinction –** To cease reinforcing a previously reinforced behavior to decrease the behavior's frequency.

**Extinction Burst –** Refers to the tendency for behavior "to get worse before it gets better." When a previously reinforced behavior is no longer reinforced, the behavior will *temporarily* increase in frequency, magnitude, and variability.

**Fading –** This term refers to gradually removing any extra prompts one has introduced into a teaching situation.

**Fluency –** A measure of the ability of an individual to complete a given number of **responses** accurately within a given period of time. High rates of fluency are associated with effortless and proficient performance.

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

**Forward Chaining –** A type of chaining procedure in which the first step in a **task analysis** is taught first, then the second step, then the third step, through to the final step. In other words, each step is taught one at a time, from first to last until the full behavior chain is emitted.

**Functional Analysis –** A process in which the events in the environment that are maintaining a particular response are identified. Functional analysis helps to answer questions such as "why does that behavior occur?" or "under what conditions is that behavior 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 and/or treatment decisions.

**Imitation –** To duplicate someone else's behavior. Most often discussed in ABA programming in terms of motor (nonverbal) imitation of actions, or verbal (vocal) imitation of speech sounds.

**Incidental Teaching –** Incidental teaching refers to teaching that "takes advantage" of naturally occurring opportunities to teach, often with student-initiated activities.

**Inclusion –** Inclusion refers to the general philosophy of education which states that, to the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, are educated with typically developing peers; unless the nature or severity of the disability is such that education in regular classes with the use of supplementary aids and services, cannot be achieved satisfactorily.

**Intraverbal –** A verbal response that is controlled by the verbal responses of others. Common names for intraverbal responses may include answering questions, word-associations, fill-ins, conversational responses, etc. **(One of Skinner's Verbal Operants)**

**Listener –** A person who responds to verbal behavior.

**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."

**Mand –** Verbal behavior (could be talking, signing, gesturing, etc.) that occurs when there is **motivation** for something and the reinforcer for the verbal behavior is the specific reinforcer. For example, asking for "water" (verbal behavior) when one is thirsty (motivation for water) and receiving water (reinforcer/consequence). Common terms for mands might include ask, demand, request, command, question, etc. **(One of Skinner's Verbal Operants)**

**Matching to Sample –** In the presence of one stimulus, the student selects another stimulus that shares some or all characteristics. Matching can occur based on a variety of similar characteristics (matching things that look alike, that are associated by their function, that are associated by belonging to the same category, etc.).

**Most-to-least prompting –** This term refers to a **prompting** and **prompt fading** strategy where one begins prompting at a level guaranteed to get the response to occur. You would then fade the intensity of the prompt over time to avoid prompt dependency.

**Motivational Operation –** Sometimes abbreviated as MO, this term refers to a change in the environment that affects the value of other stimuli to serve as reinforcers and antecedent stimuli. In other words, something in the environment temporarily alters the value of something else, and therefore will result in the individual engaging in behaviors to get what is valuable at that particular time. For example, not drinking water for a long period of time (being thirsty) is a motivative operation because it temporarily increases the value of water and therefore will make the person engage in behaviors to get water such as opening the refrigerator, asking for water, walking to a water fountain, etc.

**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 –** 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. In such a case, the teacher has accidentally **negatively reinforced** the tantrum and unwittingly made it *more likely to happen* in the future.

**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 stimulas is only a positive reinforcer if, when presented, 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. The data in precision teaching programs are recorded and displayed on the standard celeration chart developed by Ogden Lindsley. The outcome of precision teaching is fluency.

**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 (cold) –** Data that is collected for a student's first unprompted response. It is a brief assessment of learning for a specific teaching target.

**Prompt –** Makes the desired behavior more likely. Think of prompts as hints. Whenever you use a prompt, you should be thinking about how to fade it out. This will allow the student to respond to cues in the environment on their own. In instruction, the prompt occurs as part of the antecedent condition (before the behavior occurs).

**Rate –** A measure of frequency across a specific period of time. For example, a child emits seven initiations per hour.

**Redirection –** One individual attempts to interrupt a student engaging in a behavior (often an inappropriate behavior) and attempts to engage him/her in an alternate (generally more appropriate) behavior.

**Reinforcer –** 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 it has on future behavior.

**Reinforcer Assessment –** This is a procedure to identify the stimuli and activities that a student finds reinforcing. 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.

**RFFC –** Receptive categorization according to the Function, Feature, or Class of an object. Examples:

> **Function:** "What do you eat with?" Child hands you a spoon.
> **Feature:** "Which one bounces?" Child touches the picture of a ball.
> **Class:** "Which one is a toy?" Child gives you the yoyo on the table.

**S$^D$ –** This is the symbolic notation for Discriminative Stimulus. This is a stimulus that signals that a given behavior will be reinforced.

**Sr$^+$ –** The symbolic notation for positive reinforcement.

**Satiation –** A reinforcer loses its effectiveness because it has been ingested in quantities that do not allow more absorption. In common terms satiation is synonymous with "being full." Although the term is sometimes used to describe the weakening effect of time spent interacting with a conditioned reinforcer (for example, a child "getting

tired of playing with a toy"). This later effect is best described as habituation.

**Schedule of Reinforcement –** The ratio of responses to reinforcers. Schedules of reinforcement determine how often particular responses will result in reinforcement.

**Secondary Reinforcer –** A consequence that was previously neutral, but has become a reinforcer through pairing with a previously established reinforcer.

**Shaping –** Process used to create new behavior by differentially reinforcing successive approximations to a desired behavior (the target response).

**Social reinforcers –** Reinforcers that consist of interactions with other individuals (high five, thumbs up, wink).

**Tact –** Verbal behavior where a non-verbal stimulus evokes a verbal response. In other words one sees, hears, smells, tastes, or feels something that evokes a verbal response. Common terms for a tact are labeling or naming. (**One of Skinner's Verbal Operants**)

**Target Behavior –** A response that is selected to be changed in some manner as part of a teaching program. It is the behavior we expect to be demonstrated as a result of our teaching. The target can be chosen to be increased or decreased.

**Task Analysis –** Used most often in discussions of **chaining,** this is a written list of all steps that must be accomplished to perform a particular behavior. Depending on the individual, one skill could take 10 steps or 100 steps.

**Time Out From Positive Reinforcement –** Often called "time out" for short, this term refers to a collection of very often misused techniques. 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 (e.g., the common "time out chair"), time out need not take this form, and there are good 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 T.V. set is turned off for 10 seconds following inappropriate hand flapping while watching).

**Topography –** What a behavior looks like. A description of the form of the behavior.

**Transfer Trial –** An unprompted trial that follows a prompted trial. To get a transfer trial, prompts are faded to lead to an independent response.

**Variable Ratio Schedule of Reinforcment –** An intermittent schedule of reinforcement where reinforcement becomes available after an average number of responses. In other words the number of responses required prior to reinforcement varies but, on average, occurs at a similar frequency (for example, VR 10 requires an average of 10 responses for reinforcement). This is among the most powerful schedules of reinforcement for encouraging rapid responding and providing resistance to extinction.

**Verbal Behavior (1) –** A book written by B.F. Skinner that describes a behavioral approach to language. It emphasizes the idea that communication is a behavior that follows the same laws and principles as other forms of behavior.

**Verbal Behavior (2) –** Behavior that is effective only through the mediation of another person (listener) who has been specifically trained to reinforce the behavior. It encompasses terms such as language, speech, talking, comprehension, memory, etc. It can involve speaking but also includes sign language, writing, picture communication systems, Braille, and so forth.

**Visual Prompt –** A cue that is meant to be seen and that has behavior-altering effects. This may take the form, for example, of a culturally accepted symbol such as a "stop sign," or may take the form of something designed for an individual teaching program. For example, holding up a picture of a cat when asked: "What says meow?"

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

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