ABA: From Discrete Trial to Pivotal Response Teaching

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Presentation Overview

Broad intervention considerations

Setting treatment goals

What is ABA?

Different types of ABA programs
  Structured programs
  Naturalistic programs

Issues for families when selecting intervention:

Resources
Broad Intervention Considerations
Many research questions still unanswered, but consensus on some issues

Begin as early as possible

Intensive in hours (20-45 hrs/week)

“Intensity is best thought of in the context of large numbers of functional, developmentally relevant, and high interest opportunities to respond actively” (National Research Council, 2001)

Program for generalization and maintenance
Broad Program Characteristics

- Individualized to the child’s needs
- Family involvement
- Instruction in structured AND natural environments
- Inclusive educational settings
- Use of specific curricular content
- Functional approach to problem behaviors
- Planned & supported transitions
- Highly trained staff
- Support for classroom staff
Characteristics of the Learning Environment

- High level of structure when necessary
- Adult attention—highly supportive teaching when necessary
- Appropriate adult : child ratio
- Consistent implementation of procedures
- Program for generalization
- Predictable routines—organized according to written/pictorial schedules
Where Does ABA Therapy Fit in Your Service Plan?

School:
- Embedded in classroom teaching strategies
- Service provided during (pull out or push in) or after school day (extended day)
- May not be provided by many schools

Home:
- In-home intervention program provided by private ABA agency
- In WA State there is minimal funding for these programs

Community:
- Center-based intervention program provided by private ABA agency or in rare cases, in outpatient clinic setting (e.g., Seattle Children’s)
- Funding for center-based programs is minimal unless they can be billed as mental health

Since WA State has limited funding for ABA programs other resources are often most helpful: e.g., books, parent training programs, online training programs, etc.
Setting Intervention Goals
Areas to Target in Intervention

Children with autism do not “recover”

Communication skills: nonverbal and verbal

Engagement & motivation

Social skills: e.g., eye contact, sharing, conversation, etc.

Play: e.g., symbolic, imaginative, cooperative, etc.

Cognitive/academic skills

Self-help (adaptive functioning)

Behavioral challenges: reductions in negative behaviors and behaviors that interfere with learning

Motor skills
Goals Across the Lifespan

Independence

Quality of life

Meaningful social relationships

Stable work experience

Financial
  • Managing—-independent or dependent
  • Stability and independence

Leisure opportunities
Setting Goals

Concrete and specific

Based on assessment

Measurable
  • Clear goals
  • Objectives / benchmarks
  • Data driven
Tracking Goals

- Requires clearly defined goals
- Convenient tracking system
- Data driven
- Ongoing regular (e.g., daily, weekly) data collection
- Ongoing communication
So What Is ABA?
What Does ABA Mean?

Applied: Addresses behaviors that are socially significant for an individual.

Behavior: Precise measurement of observable behaviors and environmental variables.

Analysis: Clear and convincing evidence, through systematic data collection, that the intervention is responsible for the change in behavior.

Relationships between behavior and environment govern behavioral changes in all of us every day—this is learning!

ABA systematically applies these principles to purposely change behavior.
Interventions that focus on understanding and altering environmental variables to change behavior using the A-B-C contingency

While naturally occurring contingencies result in learning all the time, we can also specifically control contingencies to purposely create learning—THIS IS ABA!

Increase desirable behaviors—i.e., teach skills

Decrease undesirable behaviors—i.e., reduce disruptive or maladaptive behaviors
Who Provides ABA?

**Applied Behavior Analyst:** A person trained in the theory and application of principles of learning.

People who use this label may have educational credentials ranging from none at all to a doctorate.

It is therefore important to ensure that an applied behavior analyst has the essential skills to work with your child.
How Do You Know if Your Behavior Analyst is Qualified?

Level of training: BA/BS, MA/MS, PhD

Type of degree: education, psychology, behavior analysis

Certification: Board Certified Behavior Analyst (BCBA)

Experience: time in the field, who they have worked with/for, how many children they have served

Supervision: if they have a lower level of training who will be supervising them?

Remember...at this time, anyone can call themselves a behavior analyst, behavior therapist, etc. Know who you are hiring!
Characteristics of ABA Interventions

Use the A-B-C instructional cycle

Alter behavior using operant conditioning procedures
  - Environmental contingencies alter behavior
  - For example, reinforcement, punishment

Intervention strategies should be technological—meaning that they are clear enough to be duplicated by another individual

Specific and measurable goals—behavior change should be meaningful and should generalize

Systematic ongoing data collection
Mother is talking on the phone

Child screams

Mother gets off phone to reprimand child
The Importance of the ABCs

Contingencies

The relationship between a specific behavior, its antecedents and consequences

When A happens—B occurs—C follows
Increasing Appropriate Behaviors

Teaching a new behavior

- **Antecedent:** Creating an instruction/opportunity, situation, or indication that a behavior should take place
  - What is the child’s cue to engage in the behavior?

- **Behavior:** Teaching the right behavior
  - What response should take place given the antecedent?

- **Consequence:** Reinforcement
  - Anything that is provided or taken away that strengthens or maintains the behavior
Example: Teaching A New Behavior

**Antecedent:** Parent and child are in front of a closed door and parent prompts child to say “open”

**Behavior:** Child says “open”

**Consequence:** Parent opens the door

This positive reinforcer increases the likelihood that this child will say open the next time they are at the door. Learning has occurred!
Modifying Inappropriate Behaviors

Use the A-B-Cs to determine the function of behavior

Finding the purpose or the “why?” of a behavior will aid in reducing and replacing challenging behaviors

Every behavior serves a communicative function

- Sensory/Automatic (e.g., repetitive behaviors)
- Escape/Avoidance (e.g., refusal to do work)
- Attention (e.g., making silly faces)
- Tangible (e.g., crying for a toy)
Example: What is the Function?

Antecedent: Teacher has her back to the class

Behavior: Child screams

Consequence: Teacher turns around and tells child to be quiet
Modifying Inappropriate Behaviors

Reduce or replace inappropriate behavior

Unlike teaching a new behavior, the ABC contingency is already established.

- Intervening at A, B, and C
  - A: Antecedent-based strategies are used to decrease the likelihood of the behavior occurring—e.g., remind class to raise hands at the beginning of a lesson
  - B: Teaching strategies are used to teach replacement behaviors—e.g., teaching raising hands instead of screaming in class
  - C: Reactive strategies are used as a result of the behavior with the goal of eliminating or weakening the behavior (should match function)—e.g., ignore screaming and respond to raising hand

- Knowing the function of the behavior drives how one should intervene at each point
ABA is the science of how environmental variables can alter behavior

Environmental variables impact learning all the time—ABA seeks to identify these patterns and purposefully uses the same contingencies to alter behavior

ABA interventions define and track behaviors systematically and regularly
Making Sense of it All: Different Types of ABA-Based Interventions in Autism
Autism Interventions: Theoretical Orientations

**Developmental:**
- Developmental theory
- Rehabilitation by building relationship with child
- Child driven
- Occurs in natural settings
- For example, Floortime

**Structured Behavioral:**
- Principles of Applied Behavior Analysis (operant teaching procedures)
- Rehabilitation by teaching specific skills & reducing disruptive behaviors
- Adult/clinician driven
- Occurs in structured settings

**Naturalistic Behavioral:**
- Principles of Applied Behavior Analysis and child development
- Rehabilitation by teaching specific skills and reducing disruptive behaviors
- ABA teaching opportunities embedded in natural interactions/activities
- Child driven—often parent training models
- Occurs in natural settings
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<thead>
<tr>
<th>Structured (Discrete Trial)</th>
<th>Naturalistic</th>
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<tr>
<td>Controlled and paced by the instructor, who presents opportunities to respond that are separated by specific intertrial intervals.</td>
<td>Learner-initiated, usually by requests or gestures for preferred items.</td>
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<td>Traditional training usually occurs in sit-down sessions, where the setting has been arranged to minimize distractions.</td>
<td>Takes place in the context of other activities, where the environment includes items of interest among naturally occurring stimuli.</td>
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<tr>
<td>Teaching stimuli are typically teacher-selected items, and consequent stimuli (reinforcers) are often unrelated to teaching stimuli.</td>
<td>Stimuli used are learner-selected items, and contingent access to these items is used as reinforcement.</td>
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Broad Status of Literature*

No studies exist to date that support superiority of one program over another
  • Behavioral intervention research is most robust (Foxx, 2008)
  • Developmental programs have some empirical support

Most studies are program evaluation data
  • Pre and post-treatment outcome data
  • Use single case design methodology (especially behavioral models)
  • Small samples
  • Little/no comparison of models or comparison with controls

Cumulative body of research shows that early educational interventions allow children to acquire various skills

*National Research Council, 2001
Structured Behavioral Programs
Structured Behavioral Programs: AKA…

Applied Behavior Analysis (although this is an overgeneralization of this term!)

Discrete Trial Training

Lovaas Model

e.g., Lovaas, 1987; Handelman & Harris, 2000; Romanczyk et al., 1994
Structured Behavioral Programs

Rely on discrete trial teaching procedures

Some use of naturalistic behavioral procedures

Structured curriculums

May be center or home based

Intensive number of hours with 1-1 therapist
Discrete Trial Teaching

Breaking skills into smaller parts

Teaching one sub-skill at a time until mastery

Allowing repeated practice in a concentrated period of time—i.e., trials

Providing prompting and fading as necessary

Using reinforcement procedures
Discrete Trial Teaching

Advantages may include:
- Leads to fast acquisition
- Some individuals need high level of structure to learn
- Structured data collection procedures facilitate close monitoring of progress

Drawbacks may include:
- Lack of Generalization
- Lack of Maintenance
- Increased disruptive behavior
- Not always developmentally appropriate for very young children or older children who continue to require intensive intervention
Video Example of DTT

http://vids.myspace.com/index.cfm?fuseaction=vids.individual&videoid=28209441

http://www.youtube.com/watch?v=xql5nwziYv4
Research: Structured Behavioral Programs

Example measures:
- IQ, language, and adaptive functioning using standardized measures
- Educational placement as an outcome measure
- Observational data of target behaviors

A large body of single case design studies show improvements in specific target behaviors with discrete trial intervention

- Learning to learn skills (e.g., sitting in chair, first-then contingency, imitation)
- Preverbal communication goals (e.g., pointing, gestures, PECS, etc.)
- Language goals (e.g., expressive and receptive vocabulary, requesting, etc.)
- Play skills (e.g., symbolic play actions, building themes in play, independent play)
- Early cognitive skills (e.g., matching, sorting, puzzles, etc.)
Research: Structured Behavioral Programs

For example, Lovaas (1987): 38 children

- 5+ years follow up
- Replicated across sites with positive results
- Controversial due to subject selection issues and the claim that the children “recovered”

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<tr>
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<th>Intensive Behavioral Treatment</th>
<th>Treatment As Usual</th>
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<tbody>
<tr>
<td>IQ Average/Regular Education</td>
<td>47%</td>
<td>2%</td>
</tr>
<tr>
<td>IQ Mild MR/Special Education</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>IQ Severe MR/Restrictive Placement</td>
<td>10%</td>
<td>53%</td>
</tr>
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Naturalistic Behavioral Programs
Naturalistic Behavioral Programs: Examples

- Pivotal Response Training
- Incidental Teaching
- Early Start Denver Model (although emphasis on developmental)
- Many preschool programs (e.g., EEU)
Pivotal Response Training (PRT)

Provides intensity of intervention through parent training—parents are taught to provide active behavioral learning opportunities as often as possible

Based on principles of Applied Behavior Analysis (ABA)

- Contingent learning opportunities (A-B-C learning contingency)
- Goal directed
- Data driven

Developmental perspective: Intervention is...

- Play based
- Within daily routines in natural environment
- Child driven
Pivotal Response Training (PRT)

“Pivotal”: Results in improvements in untargeted areas

Primary pivotal area: MOTIVATION!

For example, increased motivation results in improved:
  • Affect (Dunlap, 1984)
  • Joint attention (Bruinsma, 2004)

Focus on motivation is critical because:
  • Cannot rely on social motivation that typically developing children have
  • Motivation is a core deficit in ASD
Goal: Creating **Opportunities** for Learning

**Opportunity:** Any question/offer/instruction or circumstance that the parent creates or provides to the child where the child is expected to respond

**Goal:** To teach parents to provide as many behaviorally-based learning opportunities as possible during the child’s natural interactions, activities, and routines

Can also enhance learning opportunities through environmental arrangements (Incidental Teaching strategy)
Naturalistic Behavioral Programs

Advantages may include:
- Facilitates maintenance and generalization of skills
- Parent/caregiver involvement
- Allows child to remain in natural environment
- Easier to adapt to developmentally appropriate activities, settings, etc.

Drawbacks may include:
- Some children do not learn as well with less structure
- Data collection can be more difficult in natural settings
Research: Naturalistic Behavioral Programs

Example measures:

- IQ, language, and adaptive functioning using standardized measures
- Educational placement as an outcome measure
- Observational data of target behaviors
- Improvements on rating scales
A large body of single case design studies show improvements in specific target behaviors with PRT intervention

Acquiring language (Koegel, O’Dell & Dunlap, 1988)

Improvements in language. For example:
- Spontaneous language (Koegel, Carter & Koegel, 2003)
- Vocabulary (Koegel, et al., 1998)
- Intelligibility/articulation (Koegel, et al., 1998)
- Functions of language: (Koegel, et al., 1998)
- Conversation skills (Boettcher, 2004)
Research: Pivotal Response Training

**Improvements in social and play skills:**
- Social communication skills (Frea, 1995)
- Interactive play (Baker, 2000)
- Symbolic play/social interactions (Schreibman, Stahmer & Pierce, 1996)

**Improvements in parent variables:**
- Parent empowerment (Brookman-Frazee, 2004)
- Improved family interactions (Koegel, Bimbel & Schreibman, 1996)
- Parents as trainers (Symon, 2005)
- Reduction in parenting stress (Moes, 1995)
- Parent affect (Schreibman, Kaneko, & Koegel, 1991)
For example, Koegel et al. (1999): 10 children

8-12 year follow-up

Positive outcomes demonstrated by improvements in:

- Pragmatics ratings
- Number of initiation behaviors
- Less restrictive educational settings
- Decrease in need for services
- Vineland scores within average range (demonstrates catching up to peers)
Video Example: PRT Overview
Video Example: Teaching Single Words
Video Example: Teaching Names of People
Comparing Teaching Examples

<table>
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<tbody>
<tr>
<td><strong>Teaching Names:</strong></td>
<td></td>
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<tr>
<td>Using flashcards with photos of familiar people—reinforce correct name with edible</td>
<td>Play with familiar people—reinforce correct name with tickles, etc. from that person</td>
</tr>
<tr>
<td><strong>Teaching Colors:</strong></td>
<td></td>
</tr>
<tr>
<td>Using shapes that are different colors—reinforce correct color with access to preferred toy</td>
<td>Using puzzle with different color pieces—reinforce correct color by placing piece in puzzle</td>
</tr>
<tr>
<td><strong>Teaching Imitation:</strong></td>
<td></td>
</tr>
<tr>
<td>Prompt imitation of actions (e.g., clap hands)—reinforce correct response with edible</td>
<td>Prompt imitation of actions using preferred toy (e.g., drive car)—reinforce correct response with toy</td>
</tr>
</tbody>
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Other Recent ABA Research

Type of approach: e.g., Howard et al., 2005
- Intensive behavioral analytic intervention
- Eclectic approach (e.g., preschool + ABA), intensive or nonintensive

Dose related effects: e.g., Osborne & Corness, 2007
- High-intensity: M = 30 hours per week
- Low-intensity: M = 12 hours per week

Parent education and/or intensive 1-1 behavioral models: e.g., Smith, 2000; Sallows & Graupner, 2005
- Parent training as primary intervention model
- Parent training as supplement to 1-1 intervention

Research still inconclusive
- Type of approach
- Amount of hours
- Strategies for measuring intensity of naturalistic approaches
- Individual indicators of treatment response
- Role of parent training
Issues for Families When Selecting Interventions
Issues for Families: Selecting Interventions

Understanding interventions portrayed in the media

Understanding research-based interventions

Differing opinions of professionals

How much is enough?

What is recommended versus what you can obtain
Evaluating Treatment Claims

Interventions that are supported by theoretical justification and studies that are conducted using scientific rigor (Metz et al., 2005)

- **Outcome:** What outcomes are demonstrated or claimed?
- **Evidence:** What is the evidence for those outcomes?
- **Theory:** What theory supports the use of the intervention?

Interventions with strong support for children with ASD

- Interventions based on the principles of Applied Behavior Analysis (ABA)
- Pharmacological Interventions (Lilienfield, 2005)
Outcome: Gains in everyday skills (adaptive behaviors) related to all areas of development and decreases in maladaptive behaviors

Evidence: Over 30 years, several thousand published and peer-reviewed journal articles

Current controversy about evidence comes from the type of study designs that have been used

Theory: Based on the principles of learning theory and the science of human behavior
Guidelines for Evaluating Treatment Options

National Institutes of Mental Health Guidelines (NIMH)

Autism Society of America Guidelines (ASA)

Work with trusted providers to make decisions that are best for your child (e.g., doctors, psychologists, teachers, therapists, etc.)
Resources
Teaching PRT in individual and group therapy format

- Both 12-week parent training programs

Individual format
- 12 weekly, 50-minute sessions with parent and child present
- Provide in vivo feedback to parents while they work with the child
- Appropriate for children of all ages
- Focus is on teaching a range of skills (e.g., communication, social, cognitive, play, etc.)

Group format
- 12 Weekly sessions: 8 group sessions (90 minutes) with parent(s) only and 4 individual sessions (50 minutes) with parent and child
- Feedback via home video review during group sessions and in vivo during individual sessions
- Appropriate for children 18 months to 6 years of age
- Focus is on targeting language and communication skills

Referral from PCP, Seattle Children’s provider or other medical provider needed
Pivotal Response Treatment
For Autism Spectrum Disorders

What Is Pivotal Response Treatment?
Many parents of children with Autism Spectrum Disorders (ASD) feel they do not have the tools to promote their child’s development outside of therapy. Pivotal Response Treatment (PRT) has proven to be successful in helping parents develop skills in their children with ASD. It uses Applied Behavior Analysis (ABA) methods in the child’s natural environment. It can be used to teach language, social, play, cognitive, and other skills. Parents are taught to use PRT during family routines such as play, meals and bath time.

How does the program work?
There are two PRT programs, group and individual.

Group PRT Program
What: 12-week group for parents of children with ASD including 8 group sessions for parents only and 4 individual sessions for the parent and child.
Who: For parents with children ages 1 to 6.
Treatment focus: Teaching parents to work on communication goals with their child.

Individual PRT Program
What: 12-week program for parents and their children with ASD, including 12 weekly individual sessions for the parent and child.
Who: For parents and children of all ages.
Treatment focus: Teaching parents to work on any skills with their child such as communication, social, play and cognitive skills.

How do I register for the PRT program?
You do not need to decide which PRT program is right for you. During an intake visit, you will meet with a psychologist who will make a treatment plan that meets your child’s needs.

To Learn More
• Autism Center
  206-987-8080
• Ask your child’s healthcare provider
• www.seattlechildrens.org

Free Interpreter Services
• In the hospital, ask your child’s nurse.
• From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.
• For Deaf and hard of hearing callers 206-987-2280 (TTY).
Helpful Books


**Overcoming Autism: Finding the answers, strategies, and hope that can transform a child’s life.** (2004). Lynn Kern Koegel and Claire Lazebnik

**A Work in Progress.** (1999). Ron Leaf and John McEachin


**Topics in Autism Series:** includes many different books on behavioral interventions
Helpful Websites

www.education.ucsb.edu/autism

www.koegelprt.com

www.ocali.org

www.featwa.org

www.depts.washington.edu.uwautism

http://depts.washington.edu/dbpeds
THANK YOU!

Website: www.seattlechildrens.org/clinics-programs/autism-center/

Blog: www.theautismblog.seattlechildrens.org