

NATIONAL APPLIED BEHAVIOR ANALYSIS MODELS

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AUGUST 14, 2013

Superheroes social skills training, Rethink Autism internet interventions, parent training, EBP classroom training, functional behavior assessment: An autism spectrum disorder, evidence based (EBP) training track for school psychologists

US Office of Education Personnel Preparation Project: H325K120306

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CORE COMPONENTS OF ABA: DISCRETE TRIAL TRAINING

- Steps of a Discrete Trial –
 - **Instruction**
 - Short and to the point – omit any unneeded words
 - Use same wording/phrase consistently
 - **Response** – behavior cued by the instruction
 - Consistently defined among team members
 - No more than 3 seconds are allowed for response to be emitted
 - **Consequence** – reinforcing stimulus
 - Give immediately after correct response
 - Optimal duration is 3-5 seconds
 - Always provide social reinforcement – tickles, high fives, etc
 - Child is more likely to accept other reinforcers after initial reinforcer



CORE COMPONENTS OF ABA: IMPORTANT CONCEPTS

- **Task Analysis** - behaviors are broken down into smaller units and each unit is taught separately
 - Beginning units should be so simple that the child can be rewarded and can learn
 - **Shaping** – rewarding approximations of behavior
 - **Prompt** – any action that helps student perform a response so behavior can be reinforced/strengthened
 - Physical/manual, modeling, position prompting, and recency
 - Slowly fade prompt and shift rewards to unprompted behavior
 - Prompt Fading – graduated guidance, most-to-least, and least-to-most
 - **Rewards** – positives and escape from negatives
 - Schedules: immediate and partial
 - **Punishment** – aversives, time-out, and overcorrection
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TEACHING DEVELOPMENTALLY DISABLED CHILDREN: THE ME BOOK

O. IVAR LOVAAS (1981)

- Getting Ready to Learn
 - **Proper Sitting** - “Sit Down,” “Sit Up Straight,” and “Hands Quiet”
 - **Directing and Maintaining Attention** – “Look at Me”
 - Visual attention to face and to objects in environment
 - Best taught after proper sitting is achieved
 - **Eliminating Mildly Disruptive Behaviors**
 - Straight Extinction – ignore behavior
 - Time-Out – turn body away until child stops disruptive behavior
 - Corner Behavior – spread arms and legs against a corner
 - “No!”



THE ME BOOK

- **Imitation of Simple Actions – “Do This. . .”**
 - Children learn majority of social, recreational, and language skills through imitation
 - Imitation of gross motor actions, facial expressions, and gestures
 - Examples – raises arms, clapping hands, and shake head “no”
 - Goal – establish imitative set/tendency
- **Following Verbal Instructions**
 - Builds receptive language skills
 - Taught after imitation of simple actions
 - Gross motor skills, actions, manipulation of objects, and affectionate behavior
- **Matching Visual Stimuli – “Put Same with Same”**
 - Types – matching concrete forms, abstract forms, and concrete-to-abstract forms



THE ME BOOK

○ **Verbal Imitation – Sounds and Words**

- Teaching child how to talk is the most difficult skill to teach
 - Approximately ½ of therapy time is spent on language skills
- If child is >6 years old and uses C-V combinations, then will probably learn language quickly
- Phases –
 - Increasing vocalizations
 - Bringing vocalizations under temporal control
 - Imitation of sounds
 - Imitation of syllables and words
 - Imitation of volume, pitch, and speed of vocalizations

○ **Appropriate Play Skills**

- Use nonverbal imitation skills to learn play skills
 - Examples – playing with blocks, sports, drawing, dancing
- Independent Play – slow fading of therapist's presence



TEACHING INDIVIDUALS WITH DEVELOPMENTAL DELAYS: BASIC INTERVENTION TECHNIQUES

O. IVAR LOVAAS (2002)

- Behavior – not autism – is studied and addressed
 - Autism is a hypothetical construct, not “proven” to exist
- **Tenets of Behavioral Theory**
 - Behaviors can be accounted for by the laws of learning
 - Many separate behavioral deficits exist
 - Persons with autism can learn in a specialized environment
 - Problems are viewed as a mismatch rather than a disease
- **Core Behavioral Difficulties**
 - Tantrums/Self-Injury
 - Triggered out of frustration
 - Self-Stimulation
 - May provide “food” for the nervous system
 - May use behaviors as a reward
 - Motivational Problems
 - Goal – to increase effectiveness of intrinsic rewards
 - Attentional Problems
 - Experiment – clapping, starting pistol, and candy bar



TEACHING INDIVIDUALS WITH DEVELOPMENTAL DELAYS

- **Establishing Cooperation and Tantrum Reduction**
 - “Sit,” “Hands Quiet,” and “Sit Nice”
 - If noncompliant, teach preferred tasks – complete a puzzle and drop a block
- **Matching** – class, category, and sorting
- **Imitation** – “Do This. . .”
 - Generalized Imitation – when child learns to imitate novel behaviors without being taught (one-trial learning)
- **Receptive Language** – “Drop Block” and “Car”
- **Receptive Identification** – objects and behaviors
- **Verbal Imitation**
- **Expressive Labeling** – objects and behaviors



TEACHING INDIVIDUALS WITH DEVELOPMENTAL DELAYS

○ **Types of Language Learners**

- Auditory Learners – the aforementioned procedures are effective in teaching the child language
- Visual Learners – characterized by expressive language deficits, require a visual system for communicating

○ **Picture Exchange Communication System (PECS)**

- Phase 1 – Beginning Training
 - Teach child to approach adult to communicate
 - Arrangement: enticer, child, helper
 - Do NOT prompt communication – wait for child to reach
- Phase 2 – Increasing Spontaneity
 - Increase: rewards, distance to teacher, distance to picture, and adults
- Phase 3 – Discrimination Training
 - Present two items with pictures (preferred and neutral) and give item selected



BEHAVIORAL INTERVENTION FOR YOUNG CHILDREN WITH AUTISM

CATHERINE MAURICE, EDITOR

- About Catherine Maurice –
 - Mother of 2 children diagnosed with an ASD in the 1990s
 - Compiled a parent manual for the treatment of ASDs
- **Applied Behavioral Analysis** – has been proved, through extensive research, to be the most effective intervention for treatment of ASDs
 - ABA is NOT a cure, but can result in typical school placements for “many” and “completely normal functioning for some”
- **Characteristics of ABA** –
 - Treatment begins at 2-3 years of age for at least 30 hrs/wk for a minimum of 2 years
 - Improves – intellectual functioning, language, social skills, play, self-help, and problematic behavior



BEHAVIORAL INTERVENTION FOR YOUNG CHILDREN WITH AUTISM

- **Skills Assessment** – used to determine proficiency of skill set without assistance
 - Skills should be reliable, complete, and generalized
- **Behavioral Objective** – states the condition for the behavior, the expected behavior, and the criteria for attainment
- **Curriculum Guides**
 - Beginning and Intermediate – attending, imitation, receptive/expressive language, pre-academic, and self-help skills
 - Advanced – addition of abstract language, academic skills, social skills, and school readiness



BEHAVIORAL INTERVENTION FOR YOUNG CHILDREN WITH AUTISM


○ **Types of Instruction**

- Direct Teaching – tight control over instructional activities
 - Typical ABA teaching method – sit face-to-face with rapid presentation of trials
- Activity-Based Instruction – learning trials embedded in an activity
- Incidental Learning – child directed, natural activities
 - Occurs naturally with natural consequences



BEHAVIORAL INTERVENTION FOR YOUNG CHILDREN WITH AUTISM

○ Strategies for Promoting Language

- Minimize direct questions
 - Commenting – provide internal dialogue
 - Wait and signal – clear, visible anticipation while looking at the child
 - Communicative situations – create situations where child must use language to have needs met
 - Modeling – provision of appropriate language
 - Reduction – shorten sentences and match language ability of the child
 - Expansion – increase linguistic complexity by one word
 - Exaggerated intonation, volume, and rate of speech
 - Reinforcement
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A WORK IN PROGRESS: BEHAVIOR MANAGEMENT STRATEGIES AND A CURRICULUM FOR INTENSIVE BEHAVIORAL TREATMENT OF AUTISM

RON LEAF AND JOHN MCEACHIN, EDITORS


○ **Characteristics of Intensive Behavioral Intervention**

- Appropriate for children up to 3 years old
- Average of 40 hrs/wk for a minimum of 2 years

○ **Stages of Therapy**

- Beginning – building a social relationship, establishing reinforcers, and “learning to learn”
- Middle – learning specific communication, play, self-help, and social skills
- Advanced – generalization of skills

○ **Reinforcement**

- Goal – provide reinforcers at natural frequencies
 - The baseline rate of the disruptive behavior sets reinforcement schedule
 - Social reinforcers should be paired with primary reinforcers
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A WORK IN PROGRESS

○ **Disruptive Behavior**

- Difficult to change, expect extinction bursts
- The primary barrier to the classroom is disruptive behavior, not lack of cognitive and language skills
- **Positive Learning Situations** – situations where child is likely to be calm and cooperative
 - Increases reinforcement
 - Constantly identifies appropriate behaviors
 - Allows for a positive relationship
 - Makes learning situation enjoyable for the child
- **Behavior Management Techniques**
 - Provide the least amount of attention for disruptive behavior
 - Praise, label, and reinforce de-escalation
 - Utilize behavioral momentum to create a pattern of success
 - Antecedents are the most important aspect of the disruptive behavior



A WORK IN PROGRESS

○ Escalation Cycle

- Proactive Measures
- Beginning Stage – slight agitation/disruption
 - If agitated, continue with activity but increase strength of reinforcement
 - If agitation increases, ignore behavior and give reinforcement as appropriate
- Second Stage – moderate agitation/disruption
 - Use stimulus change procedures – identify and alter antecedent
 - Reinforce as appropriate and give soothing reinforcers as time passes
- Third Stage – extreme agitation/disruption
 - Give specific instructions and avoid using “not”
 - Reinforce as child gains control
- Final Stage
 - If child is a danger to self/others, use hands-on procedure



A WORK IN PROGRESS

○ Sleep Problems

- Steps –
 - Establish a nighttime routine
 - Select a proper bedtime
 - Develop a “sleep object”
 - Keep child in own bed

○ Toilet Training

- Schedule Training – teach child to void when placed on a toilet and to withhold voiding at other times
 - Place child on toilet every 90 mins for a total of 15 mins
 - If child is consistently successful, lengthen schedule by 15-30 mins
 - If child does not void, shorten schedule to every 60 mins
- Shaping Independent Toileting
 - Place unclothed child on a chair next to the toilet every 90 mins for a total of 15 mins
 - If successful, add an article of clothing and slowly move chair farther from toilet



RESEARCH-BASED EVIDENCE: THE LOVAAS STUDIES

- Lovaas (1987) –
 - **Conditions:**
 - Experimental Group – intensive one-to-one treatment for an average of 40 hrs/wk for 2+ years ($n = 19$)
 - Control Group 1 – one-to-one treatment for at most 10 hrs/wk for 2+ years plus any community services ($n = 19$)
 - Control Group 2 – pre- and post-treatment data ($n = 21$)
 - **Results:**
 - Experimental Group –
 - 47% passed 1st grade in a normal class with average or better IQ
 - 42% passed 1st grade in an aphasia class and within “mildly retarded range”
 - 10% placed in “autistic/retarded” class and within “profoundly retarded” range
 - Control Groups 1 & 2 –
 - 2% achieved normal functioning
 - 45% placed in aphasia classes
 - 53% placed in “autistic/retarded” classes



RESEARCH-BASED EVIDENCE: THE LOVAAS STUDIES

- McEachin, Smith, & Lovaas (1993) – examined long-term outcomes of children in Lovaas (1987)
 - **Experimental vs. Control Group** –
 - Experimental children in regular classes remained the same (47%)
 - Experimental group had significantly higher IQ scores
 - Experimental group showed more adaptive behavior
 - **“Best-Outcome” Group vs. Typical Peers** –
 - Maintained level of intellectual functioning (99-136)
 - Did not display clinically significant levels of maladaptive behavior
 - Scored in normal range on personality inventory
 - One participant appeared to no longer be “normal-functioning”




RESEARCH-BASED EVIDENCE: CRITIQUES OF LOVAAS

- Schopler, Short, & Mesibov (1989) and Lovaas, Smith, & McEachin (1989) –
 - **Inappropriate Outcome Measures**
 - Absence of specific social, behavioral, and communication measures
 - REPLY: “Focused on more global measures of treatment outcome”
 - Use of mainstream classroom placements as evidence
 - REPLY: After pre-school, placement made without assistance
 - Improvement of IQ reflects improvement in compliance
 - REPLY: Severe intellectual deficits exist regardless of compliance
 - **Subject Selection Bias**
 - PMA of 11 months or greater (IQ = 37+) OR chronological age younger than 40-46 months excluded too many low functioning children
 - REPLY: Low scores on PMA were excluded because difficult to distinguish autism from “other profoundly retarded children”
 - Reported average IQ for treatment group (IQ = 63)
 - REPLY: An IQ = 63 is representative of a random sample of autistic children



RESEARCH-BASED EVIDENCE: CRITIQUES OF LOVAAS


- Gresham & MacMillan (1997) and Smith & Lovaas (1997):
 - **Threats to Internal Validity**
 - Instrumentation – IQ scores on pre- and post-test measures; scores obtained under different experimental conditions
 - REPLY: No one test exists that covers all developmental levels; scores obtained are a conservative estimate of improvement
 - Selection – lack of random selection
 - REPLY: The assignment procedure as random as ethically possible
 - **Threats to External Validity** – “representativeness” of the participants
 - REPLY: Lovaas sample is representative as compared to other samples
 - **Threat to Construct Validity** – improvements may be due to intensive attention and contact rather than intensity of intervention
 - REPLY: Evidence suggests no benefit is derived from increased attention alone
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RESEARCH BASED EVIDENCE: META-ANALYSES

- Reichow and Wolery (2008)
 - **Outcome Measures** – psychopathology (100%), IQ (92%), adaptive behavior (69%), academic placement (69%), diagnostic reclassification (62%), and language (46%)
 - **Intervention Density/Duration** – 18.7 to 40 hrs/wk for 12-48 months
 - **Diagnostic Reclassification** – 18%
 - **Range of Effect Sizes (g_c)** –
 - IQ = -0.19 to 1.58
 - Adaptive Behavior = -0.25 to 0.86
 - Expressive Language = 0.23 to 1.72
 - Receptive Language = 0.45 to 1.79
 - **Mean Effect Size** = 0.69 ($p < 0.001$)*
 - **Moderator Analyses**
 - Supervisor Training Model – $B = 0.62$, $p = 0.01$ *
 - Intervention Duration – $B = 0.48$, $p = 0.097$
 - Total Hours of Therapy – $B = 0.40$, $p = 0.186$



RESEARCH BASED EVIDENCE: META-ANALYSES

- Virués-Ortega (2010) –
 - **IQ** – $ES = 1.19, p < 0.001$
 - ES tended to be stronger for clinic-based programs compared to parent-managed programs ($ES = 1.23$ and 1.02 , respectively)
 - No clear effects for treatment intensity or duration
 - **Language Skills** – $ES = 1.07, p = 0.004$
 - Receptive – $ES = 1.48, p < 0.001$
 - Expressive – $ES = 1.47, p < 0.001$
 - Dose-response trends for duration of intervention
 - **Adaptive Behavior Composite** – $ES = 1.09, p < 0.001$
 - Composite tended to be stronger for clinic-based programs compared to parent-managed programs ($ES = 1.17$ and 0.97 , respectively)
 - Communication subscale tended to be higher for the UCLA model compared to “general” ABA ($ES = 1.73$ and 1.17 , respectively)
 - Effects increased with intervention intensity but not with duration of intervention
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RESEARCH-BASED EVIDENCE: FINDINGS RELATED TO FAMILY EXPERIENCES

- Grindle, Kovshoff, et al. (2009) –
 - **Positive Aspects of EIBI –**
 - Progress in language, communication, and social skills development
 - Additional support in the home
 - Improvements in parent-child and sibling-child relationships
 - Delight when goals were met (66% of mothers and 72% of fathers)
 - **Negative Aspects of EIBI –**
 - Difficulty with finding new therapists and privacy within home
 - Lack of attention to siblings
 - Deterioration in relationship between parents
 - Disappointment at lack of progress (34% of mothers and 29% of fathers)




EARLY START DENVER MODEL FOR YOUNG CHILDREN WITH AUTISM

SALLY J. ROGERS AND GERALDINE DAWSON

○ **Characteristics of Early Start Denver Model (ESDM)**

- ESDM is designed to be used for toddlers 12 months to 60 months of age.
- Treatment delivery is intensive, in-home, 20-hr per week, and one-to-one delivery model.

○ **Theoretical Foundations**

- The Original Denver Model – ASDs are viewed as a failure of social-communication development
 - Imitation Impairments – the ability to imitate serves as first communication tool between infant and caregiver
 - Social Motivation Hypothesis – children with ASDs do not find social interactions intrinsically rewarding
- The ESDM seeks to reduce severity of ASD symptoms and increase developmental growth through dyadic exchanges in a natural, interactive play format.
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EARLY START DENVER MODEL

- **ESDM Curriculum Checklist** – assesses developmental sequences of skills specific to ASDs
 - Scoring – Pass; Pass/Fail; Fail
- **Learning Objectives** – mastered within 3 months
 - Identifies the antecedent, the behavior, mastery criterion, and generalization criterion
 - Types – developmental sequences, behavior chains and behavior “bundles;” increasing behavioral frequencies and adding context; and linking existing behaviors to new antecedents
- **Time Interval Recording System** – behaviors are recorded ~15 minutes
 - A learning opportunity occurs ~10 seconds



EARLY START DENVER MODEL

○ **Teaching Procedures**

- Strategies from ABA – A-B-C sequence, prompting, reinforcement, fading, shaping, and chaining of behaviors
- Pivotal Response Training (PRT) – based on principles of ABA; trials presented in a natural, interactive framework
- The Denver Model – turn taking, dyadic engagement, elaboration of activities

○ **Play** – foundation of intervention


○ **Joint Activity Routine** – an elaborated play theme that allows for multiple teaching opportunities

- Unifying theme, joint focus and attention, logical sequence of events, turn taking, planned variation


○ **Teaching methods target:** receptive/expressive communication, social skills, play skills, cognitive skills, fine/gross motor skills, and adaptive skills.




EARLY START DENVER MODEL: RESEARCH-BASED EVIDENCE

- Dawson, Rogers, Munson, et al. (2010)
 - **Conditions** –
 - ESDM Group – combined 25 hrs/wk intervention for 2 years ($n = 24$)
 - Assess-and-Monitor Group – intervention from the community ($n = 21$)
 - **ESDM Group Results** –
 - Cognitive Ability – 17.6 point increase
 - Adaptive Behavior – steady rate of development
 - Diagnostic Status
 - 29% from AD to PDD-NOS
 - 8% from PDD-NOS to AD
 - Communication Skills
 - Receptive – 18.9 point increase
 - Expressive – 12.1 point increase
 - Dawson, Jones, Merkle, et al. (2012)
 - “The ESDM intervention is associated with normalized brain activity related to social attention and engagement”
 - “. . . These normalized brain activity patterns are correlated with improvements in social behavior”
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EARLY START DENVER MODEL: RESEARCH-BASED EVIDENCE

- Vismara, Colombi, & Rogers (2009)
 - **Method** –
 - 8 families of toddlers (ages 10-36 months) diagnosed with ASD
 - Parent training sessions 1 hour per week for 12 weeks and 4 follow-up sessions for 1 hr each
 - **Results** –
 - Significant increase in parent skills – mastery by 5th-6th week
 - Children made consistent and sustained gains in target skills – spontaneous functional verbal utterances and imitative behavior
 - Vivanti, Dissanayake, Zierhut, and Rogers (2013) –
 - **Early Social Learning Skills** –
 - Functional Use of Objects – 70% of variance in Visual Reception gains
 - Social Attention – not related to treatment response
 - Goal Understanding – 30% of variance in Receptive Language gains
 - Imitation – 50% of variance in Fine Motor gains
 - Symptom severity accounted for ~40% of variance in Expressive Language gains
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NATIONAL STANDARDS REPORT

- Established Treatments –
 - **Antecedent Package** – includes behavioral momentum; cueing and prompting/prompt fading procedures; errorless learning; and incorporation of interests into tasks
 - **Behavioral Package** – includes behavioral toilet training; chaining; differential reinforcement strategies; discrete trial training; reinforcement; shaping; successive approximation; task analysis; and token economies
 - **Comprehensive Behavioral Treatment for Young Children** – involves combination of ABA procedures with young children delivered in a variety of settings
 - **Modeling Package** – demonstration of the target behavior resulting in an imitation of the behavior
 - **Joint Attention Intervention** – involves teaching a child to respond to the nonverbal social bids of others or to initiate joint attention interactions
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NATIONAL STANDARDS REPORT

- Established Treatments, continued –
 - **Naturalistic Teaching Strategies** – provision of a stimulating environment; modeling; providing choices; and direct/natural reinforcers
 - **Pivotal Response Training** – targets motivation to engage in social communication, self-initiation, self-management, and responsiveness to multiple cues
 - Emerging Treatments –
 - **Developmental Relationship-Based Treatment** – emphasizes the importance of building social relationships
 - Conclusions –
 - Of the Established Treatments, two-thirds were developed from behavioral literature
 - Behavioral treatments have “strongest research support at this time”
 - Most common skills increased: interpersonal, communication, and play
 - Most common behaviors decreased: problem behaviors and SER
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