Autism Treatment: A Rich History and a Promising Future

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Special thanks to...

- Lauren Yates & Penn State National Autism Conference planning committee
- Jodi DiPiazza
- Students and staff at Alpine Learning Group
This morning...

- A little bit of history
- Impressions of what’s changed over the years
- Some areas of innovative practice
- Future directions
1948 Sidney Bijou who studied with B.F. Skinner became the Director of Child Development at the University of Washington

Incorporated Skinner’s natural science approach to child development

In 1961 Bijou and Bear published landmark text *Child Development: A systematic and Empirical Theory*


Historical Roots

- Wolf started Journal of Applied of Behavior Analysis in 1968
- Bear, Wolf, & Risley, 1968 set the first definition of ABA
- Many seminal researchers got there start with Bijou at the University of Washington – In particular Ivar Lovaas
Early Intensive Behavioral Intervention

- Lovaas (1987)
- Lovaas & Smith (1988)
- Sallows & Graupner (2005)
- Eikeseth, Smith, Jahr, & Stanislow, (2005)
  - Home-based
  - Intensive (30 h minimum) of one-to-one
  - Minimum of two years
1981

Teaching Developmental Disabilities to Children

by O. Ivar Lovaas

The ME Book

1994

Let Me Hear Your Voice

1996

A Family’s Triumph Over Autism

Behavioral Intervention for Young Children with Autism

ALPINE LEARNING GROUP

INNOVATION AND EXCELLENCE IN AUTISM EDUCATION™
PARENT ADVOCACY

LITIGATION

Autism Awareness

Areva Martin, Esq.
President and Founder of Special Needs Network

The Everyday Advocate
How to Stand Up for Your Autistic Child

Dr. Paul McGraw

"Parenting a child with special needs is challenging. Areva Martin and her team work on the PBS guide for parents for caring for their child. It's a successful publication and a masterpiece."

"An important resource for parents who care for their children with autism."

"The Everyday Advocate is a must-read for any parent whose child is on the spectrum."

Areva Martin, Esq.
Independent reviews by...

  - Thirty years of research demonstrating the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior (pg 164)
Independent reviews by...

- Practice Parameters for Autism by the American Academy of Child and Adolescent Psychiatry (1999)

It is clear that behavioral interventions can significantly facilitate acquisition of language, social, and other skills (pg 476). These methods build upon a large body of research on the application of learning principles to the education of children with autism and related conditions (pg 475).
Independent reviews by...


- National Research Council: Educating Children with Autism – 2001 Published – *Educating Children with Autism*
There is a growing body of evidence that intensive early intervention services for children in whom autism is diagnosed before age 5 years of age may lead to better overall outcomes (pg 8).

- The effectiveness of ABA–based in ASDs has been well documented through 5 decades of research...
New ABA Benefit for Federal Employees to be Introduced in 23 States
Impact of autism advocacy on legislation and research funding ...

- Combating Autism Act of 2000, 2006;
- Combating Autism Reauthorization Act of 2011

- Interagency Autism Coordinating Committee (IACC) established by Congress under the Children’s Health Act of 2000, renewed under the Combating Autism Reauthorization Act of 2011 to coordinate all activities concerning autism spectrum disorder within the U.S. Department of Health and Human Services and provide advice to the Secretary of HHS on issues related to autism.
What’s changed over the years?
What’s changed over the years?

Published reviews...

What’s changed over the years?

We looked at

- JABA articles from 1968–78 and 2002 – 2012
  - Changes in independent variables (how we teach)
  - Changes in dependent variables (what we teach)
What’s changed over the years?

Mostly my opinion...
Changes in who we teach

- Modified Checklist for Autism in Toddlers M–CHAT (a screening tool)
- Autism Diagnostic Observation Schedules (ADOS)
- Autism Diagnostic Interview–Revised (ADI–R)
Changes in who we teach

- By necessity older students (?)
- Broader diagnostic categories (?)
Changes in how we teach

- More attention to motivation
  - Incidental teaching
  - Preference assessments
  - Attention to motivating operations
Changes in how we teach

- Jodi – incidental teaching
Changes in how we teach

- Increased analyses
  - Behavior (e.g., Iwata et al. 1994)
  - Stereotypy (e.g., Rapp et al. 2013; Taylor, Hoch & Weisman, 2005)

- Language

- Teaching procedures (e.g., Ingvarsson & Hollobaugh (2011) *comparison of procedures to teach intraverbals)
Changes in how we teach

- **Errorless teaching**

- **Task interspersal**

- **“recently” More attention to generalization**
Changes in how we teach

- Stimulus control technology (e.g., photo schedules, textual prompts, audio-prompt)
The role of technology

- Communication devices
- Learning tools
- Leisure skills
- Enhancing data collection
- Staff / parent training tools
Changes in what we teach

- **Responses that lead to new information**
  - Marion, Martin, Yu, Buhler, Kerr & Claeys (2012) * mand “which?”;
  - Video – Jodi Where

[Video: jodiwherecut.mp4]
Changes in what we teach

- **Responses related to peer interaction**
Changes in what we teach

More complex social repertoires

- **Joint Attention** –

- White et al., 2011
More complex social repertoires

- **Social referencing** –

  Social referencing is an interaction in which children appear to observe the emotional reactions of others as a means of determining how to respond in ambiguous or novel situations (Feinman, 1992).

Study: Teaching social referencing to children with autism

- Participants taught to:
  - Look
  - Discriminate
    - smile and head nod – Take the object
    - frown and head shake – Keep hands in lap
- Prompting and differential reinforcement
Social referencing

Baseline
Social referencing

Intervention
Some recent innovations in what we teach...

- **Problem Solving**
  - Sautter, LeBlanc, Jay, Goldsmith & Carr (2011); Kisamore, Carr & LeBlanc (2011)

- **Perspective Taking**
  - Gould, Tarbox, O’Hora, Noone, & Bergstrom (2010)

- **Responding to Sarcasm**
  - Persicky, Tarbox, Ranic & Clair (2013)

- **Observational Learning**
  - Taylor, DeQuinzio & Stine (2012)
For an overview of Observational Learning and Children with autism see:

How do we go from here to here?
How do we teach children with autism to attend to “social norms” and respond accordingly?
Difference between imitation and observational learning

- Imitation – behavior corresponds to that of the model
- BUT imitation does not mean that the person has learned something about consequences
Minimally observational learning requires:

- Observing behavior
- Listener behavior
- Imitation
- Understanding of contingencies
Observational Learning Research

- Charlop, Shreibman, Tryon (1983)*
  - Receptive labeling task
- Davies Lackey (2005)*
  - Reading dolch words
- Egel, Richman & Koegel (1981)*
  - Shape, color, preposition discrimination
- Goldstein & Mousetis (1989)
  - Language targets
- Griffen, Wolery, & Schuster (1992)
  - Preparing recipes
- Ogden (1995)
  - Reading sight words
- Pereira-Delgado and Greer (2009)*
  - Peer monitoring
- Rehfeldt, Latimore & Stromer (2003)*
  - Stimulus class formation
- Taylor & DeQuinzio (2012)*
  - Monitoring responses
  - Long response chains
- Werts, Caldwell, Wolery (1996)
  - Long response chains (e.g., using a calculator)

*participants with autism
This student acquired the words in baseline

Notice how well this child with autism attends to the model, the teacher and the stimuli
This student did not acquire the words

Notice this child does not attend to the model
Study 1…

- Determine if students with autism could learn to tact novel pictures by using a specific observational learning procedure
- Three participants – none were observed to acquire novel responses via observing peers but all had learned a range of generalized imitative responses (e.g., GMI, Imitation of objects, vocal imitation, etc.,)
Procedures

- Peer models response
- Student imitates response
- Peer models response – 1 distractor trial
- Peer models response – 2 distractor trials
- Peer models response – 3 distractor trials
- Peer models response – 4 distractor trials
- Peer models response – 5 distractor trials
- Student is prompted to attend to model
- Model’s accurate responding reinforced
- Student’s accurate responding reinforced
Here is an example of a typical training session
Let’s take a look at Liron now attending a first grade class...

Show from file Liron School
Teach observing / monitoring responses
  ◦ an imitative behavior
  ◦ a matching behavior

Looked at acquisition of site words

Multi element design
  ◦ Simple exposure
  ◦ Exposure plus monitoring responses
Procedure

- Student is exposed to one set of words with simple exposure – just hearing peer read words and being reinforced for reading words.
- With the second set – two monitoring responses were taught: Imitation:
  - Matching and imitation.
- Student tested on words following sessions – data reflect performance on tests of reading the word.
Exposure sessions
Monitoring sessions
Results
Percentage of Words Read Correctly During Test Sessions

Rebecca
Results
Percentage of Trials with Correct Monitoring Response

Rebecca
Results
Percentage of Words Read Correctly During Test Sessions

Sessions

Percentage of Words Read Correctly

0
20
40
60
80
100

two-week maintenance
two-month maintenance

Training Set

Exposure Set
Results

Percentage of Trials with Correct Monitoring Response

Jack
Results
Percentage of Words Read Correctly During Test Sessions
Eric

![Graph showing the percentage of words read correctly over sessions for Eric, with two sets: Training Set and Exposure Set. The graph demonstrates an improvement in reading accuracy over the sessions, with a three-week maintenance phase following session 22.](image-url)
Results
Percentage of Trials with Correct Monitoring Response
Eric

![Graph showing percentage of trials with correct monitoring response over sessions for Training Set and Exposure Set. The graph includes data points for sessions 1 to 22, with a clear trend indicating improvement in the percentage of correct responses over time. The graph also highlights a three-week maintenance period.]
If observational learning requires discrimination of contingencies...

- How do we teach this?
- How do you teach children with autism to understand differential feedback to the model?
  - Imitate behavior that leads to a functional outcome
  - Identify / tact reinforcement contingencies
  - Identify / tact corrective contingencies
  - Improve listener behavior to discriminate these contingencies

- Pereira-Delgado and Greer (2009)
  - first to document acquisition of discrimination of contingencies
Identifying reinforcement contingencies
Discrimination of reinforced from nonreinforced responses

- Two Sets of unknown labels
- Child exposed to two conditions
  - Exposure of instruction between teacher and adult
  - Exposure of instruction with opportunity to imitate the adult and prompts for saying, “I don’t know” when the adult is incorrect
- Teacher presents trial to adult and delivers one of two consequences
  - Praise “Good that’s right”
  - Punishment “No that’s wrong”
- Child is then given an opportunity to label the photo
- Assess if child says label that is correct, and “I don’t know” when teacher said adult was wrong in session
- Tested acquisition of the labels in test session ten min later
Discrimination Training: Adult Models Correct Response (Reinforced Category)

Instructor asks Adult Model to label a picture ("What's this?")

Adult models **CORRECT** response

Instructor provides praise and reinforcer item to adult model

Instructor asks Participant "what's this?"

Participant says incorrect label

Instructor states rule "say what she says when she gets it right" let's try again

Participant says correct label

Instructor provides praise and a reinforcer item

Instructor moves on to next label
Discrimination Training: Adult Models Incorrect Response (Non-Reinforced Category)

Instructor asks Adult Model to label a picture ("What's this?")

Adult models INCORRECT response

Instructor provides feedback indicating model is incorrect and reinforcer item is removed from the table

Instructor asks Participant "what's this?"

Participant imitates the model—or doesn't say "I don't know"

Instructor states rule "say I don't know when she gets it wrong" let's try again

Participant says "I don't know"

Instructor provides praise and a reinforcer item

Instructor moves on to next label
Percentage Correct During Test Sessions—Study 3

[Graph showing percentage correct responses for Baseline, Discrimination Training, and Probe for Rose, Leah, Mary, and Mark across sessions.]
Discrimination Training
The Future?

The Best Way to Predict The Future is to Create it
Here are some prompts...

- Increase application of our work to toddlers
  - Both in WHAT we teach and HOW we teach
- Increase application of our work to adults with autism
- Improve the social validity of our interventions
- Publish in non-behavioral journals
- Consider Smith’s (2012) four stage framework for autism research
  - Initial efficacy studies on intervention procedures with single-case designs
  - Package procedures into an intervention manual
  - Conduct Randomized Control Trials (RCT) to test efficacy of the intervention in University settings
  - RCT’s to evaluate intervention deployed in community settings
Here are some prompts...

- Teach skills that lead to independence
- Teach skills that lead to learning without explicit instruction
- Teach skills that are beyond simple discriminations – that address skills historically thought to be cognitive or developmental in nature
- Train / teach parents
- Make our curricula “visionary” – skills that will be essential and necessary for adulthood
- Carefully consider and assess ABA–based strategies that come in “vogue” and are not yet grounded in research
- Discriminate professional preference over data–based decisions
Don’t forget the fundamentals
Key components of ABA

- **Applied**: Applied interventions deal with problems of demonstrated social importance.
- **Behavioral**: Applied interventions deal with measurable behavior (or reports if they can be validated).
- **Analytic**: Applied interventions require an objective demonstration that the procedures caused the effect.
- **Technological**: Applied interventions are described well enough that they can be implemented by anyone with training and resources.
- **Conceptual Systems**: Applied interventions arise from a specific and identifiable theoretical base rather than being a set of packages or tricks.
- **Effective**: Applied interventions produce strong, socially important effects.
- **Generality**: Applied interventions are designed from the outset to operate in new environments and continue after the formal treatments have ended.

Baer, Wolf, and Risley (1968)
“Discrete trial” is not a dirty word
There is nothing wrong with extrinsic rewards
Practice can indeed make perfect
Autism is a complex, heterogeneous disability – therefore the entire arsenal of ABA-based strategies should be considered
Diagnosed with autism at age 2
Started our outreach program at age 2.9
Started our school program at age 3
Mastered well over 300 skill acquisition programs

- Examples: follows one-step instructions, uses yes and no, establishes eye contact, asks “what’s that?”, responds to bids for joint attention, answers questions about past events, answers “why?” questions, dries hair using a blow dryer, writes in a journal, cooperates when others sing, uses a cell phone, joins a conversation, functions independently in inclusion...
A little bit about our next performer: Jodi DiPiazza

- Over the years behavior intervention programs to address
  - Eye gazing
  - Eye crossing
  - Facial movements
  - Spit collection
  - Tantrums
  - Stereotypic vocalizations
  - Aggression
  - Property destruction
  - Self-injury
  - Elopement
  - Noncompliance
A little bit about our next performer: Jodi DiPiazza

- Started part time supported inclusion with Alpine staff in a typical preschool at age 4.5
- Inclusion terminated half through 1st grade due to behavior and school districts lack of services
- Returned to Alpine for two more years
- Re-started supported inclusion for 4th grade
- Entering fifth grade with support from Alpine staff in the fall, 2013.