Past, Present and Future: Early Intervention in Autism

Sally J. Rogers, Ph.D.
M.I.N.D. Institute, Univ. California at Davis
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The Past - Model Development

Three Main Models

- Didactic application of Applied Behavior Analysis – discrete trial teaching
- Naturalistic application of Applied Behavior Analysis
- Developmental approaches - derived from theories and research in infant and early childhood development – includes relationship based approaches
Traditional, or Didactic Behavioral Approaches (DTT)

- **ABA ⇨ DTT**
- **DTT** = one way of applying ABA principles to teach new skills
- **DTT** = Adult directed teaching (Lovaas and Smith; Princeton; Rutgers; derived from Wolf and Risley’s first treatment report – 1964)
  - Adult chooses materials
  - Adult selects the teaching lesson
  - Adult pre-determines the correct response
  - Positive reinforcement chosen for strength
  - Massed trials
  - Focus is on child responses

Outcomes from Lovaas’s Treatment

- **Treated group/ comparisons**
  - reg ed = 9 (47%)
  - mild dis.= 8 (42%)
  - severe = 2 (10%)

- Best outcome 9/19 (49%)
- Tx grp mean IQ 85
- Effects continued into adolescence
- Have the results been replicated?

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- Significant IQ gain
- No other sig differences
- No “recovery”
- 2/15 best outcomes
- 60% in special ed rooms
- Tx effects appear to be driven by PDDNOS group

Other Replications

Other Efficacy Studies
- Delivered 25-30 hours per wk over several years with high levels of expertise and supervision
- Demonstrated significant and large IQ gains
- Demonstrated significant language gains compared to controls
- No other RCTs

Community Effectiveness Studies
- When delivered at high intensity with expertise and strong supervision, some produce results similar to efficacy studies
- When delivered in homes by visiting consultants or self trained teams, little changes in scores
- Though progress occurs
- Progress versus acceleration
Should DTT Teaching Be Used Exclusively?

Current Lovaas replication project:
- 10 min of generalization each hour
- 3-5 peer play hrs weekly after 1st year
- 6-9 hrs inclusion in typical preschool with aides

Naturalistic Applications of Behavioral Teaching

- Incidental teaching
  - first used with impoverished preschoolers in the 1970’s (Hart and Risley, 1975)
  - used with children with autism to teach receptive language (McGee et al, 1983)
- Pivotal Response Training (Laura Schreibman, Robert and Lynn Koegel)
  - Initial papers in 1980’s involving language instruction intrinsic reinforcement, reinforcing attempts, parent training; each aspect empirically supported
Should This Approach Be Used Exclusively?

- No, not a comprehensive approach to treatment
- Specific to behaviors for which there are natural reinforcers: communication, play, imitation
- If no natural reinforcers exist, then must use extrinsic reinforcers

TEACCH

- Treatment & Education of Autistic & Communication-handicapped Children
- Developed at the University of North Carolina in early 1960’s by Eric Schopler
- Goal is independence and functional living skills
  - Capitalize on good visual-spatial skills & interest in visual detail
  - Reduce reliance on other people, prompts
  - Help individual predict and control own environment and behavior
  - “Normal” not necessarily the goal
    - Accepts “culture of autism” as different but not inferior
    - Increase self-acceptance and sense of self-efficacy
Evidence of TEACCH Effectiveness

- Controlled group study provided at home by parents 1 hr/week – significant developmental differences in 4 months on PEP-R (Ozonoff & Cathcart, 1998)
- Controlled group study of 8 children in a residential TEACCH-based program vs. 8 children in Italian public school classrooms – 1 year of treatment resulted in significant differences in cognitive skills (Panerai, Ferrante & Zingale, 2002)
- ABAB single subject design study found large increase in on-task behavior and reduction in teacher prompting when using schedules and work systems (Hume & Odom, 2007)

Should This Approach be Used Exclusively?

- Issues involve developmental appropriateness:
  - Language development
  - Play development
  - Social development
- Philosophical issues: To what extent do we accommodate early autism? To what extent do we try to change the developmental trajectory?
Development of New Models; Testing of Existing Models

- Mahoney – Responsive teaching
- Rogers and Dawson – Early Start Denver Model
- Webb and Dawson – prevention of ASD in infant sibs
- Landa - “feature match” design: instructional features selected for individual patterns of strength-need
- Autism Speaks Toddler Treatment Network

Developmental Approaches

- Autism as a developmental disorder
- Build skills teaching sequences of normal development
- Focus on internal motivation for learning & positive affect
- Relationships as a core component
- More focused on content, less focused on precision of teaching process, than ABA based interventions
Commonalities Across the Interactive Developmental Approaches

Floortime, Denver Model, SCERTS, RDI, TEACCH, Hanen,

- Focus on social interaction and engagement
- Focus on play, especially symbolic play
- Focus on communication and language development, shared attention
- Models come from empirical literature involving typical early social and language development
- Goal is normalizing skills to the extent possible

Do Developmental Approaches Help?

Randomized Controlled Trials

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Intervention Details</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jocelyn et al, 1998; 35 AD/PDD</td>
<td>35 children</td>
<td>12 wk study. Training &amp; consult to day care centers and parents; spec worker assigned; focus on language dev and behavior</td>
<td>Group diff in language; trend towards improved soc/emot after 12 wks</td>
</tr>
<tr>
<td>Drew et al, 2002; 24 AD</td>
<td>24 AD children, mean age 23 months</td>
<td>Home based. Parent training 3 hr every 6 wks; int 1 hr daily; behavior, jt attin, shared routines</td>
<td>few diff; some trends after 12 months</td>
</tr>
<tr>
<td>Aldred et al, 2004; 28 AD</td>
<td>28 AD children, mean age 48 mon</td>
<td>Home based, parent training pragmatic language intervention delivered 30 min per day. Parents recd group training a 1 visit/mon</td>
<td>Dec autism severity scores, inc exp language, child comm, parent responsivity</td>
</tr>
</tbody>
</table>

YES
Strengths and Weaknesses of a Developmental Approach

### Strengths
- Familiar to a wide range of interventionists
- Approach is used in typical preschools – makes for easier inclusion
- DAP
- Developmental fittedness improves learning rate (Lifter, 1991)
- Based on current research in child development
- Fits many different settings
- Addresses all domains

### Weaknesses
- Empirical studies of poorer quality than others
- Less articulated teaching procedures
- Not as data driven as others
- Needs adaptation for children with autism: repetition, structure, attention, weaknesses in observational learning

Targeting ASD Specific Deficits

- **Joint attention** - short term increases in joint attention, and imitation, play, social initiations, and language usage (Whalen et al, 2006) Longer term changes in joint attention, language, symbolic play (Kasari et al, 2008)

- **Symbolic play** – short term increased play and language and social initiations (Thorpe et al, 1995), longer term changes in joint attention, language, and symbolic play (Kasari, 2008)

- **Imitation** – short term increases in generalized imitation, and joint attention, language, symbolic play (Ingersoll and Scerbman, 2006)
The Early Start Denver Model

an intervention approach for 12-36 month olds with ASD

S. Rogers and G. Dawson

ABA Principles
- Attention
- ABC Format
- Efficacious application of behavioral teaching techniques
- Number of repetitions
- Management of unwanted behavior

PRT Principles
- Takes turns
- Gives choices
- Maintenance interspersed with acquisition
- Reinforces child attempts
- Activities are intrinsically reinforcing for child

Denver Model Principles
- Number of repetitions
- Management of unwanted behavior
- Quality of relationship/affect
- Optimize arousal
- Communication in all activities
- Teach multiple objectives in each activity
- Varied communicative functions
- Emphasize nonverbal communication
- Follows child’s lead
- Takes turns
- Gives choices
Joint activity routines

**Object focused routines**
- Cognitive, imitation, self care, motor objectives
- Communication opportunities
- Dyadic engagement
- Social orienting

**Sensory social routines**
- Focus is social exchange
- Positive affect
- Reciprocal interactions
- Social, communication, imitation objectives
- Modulates child arousal, attention

Testing an Eclectic Approach: Eikesheth’s 2002 Study

- 25 children dx with Autistic Disorder
- Ages 4-7, IQ’s 50 and higher
- ½ received Lovaas’s treatment; ½ eclectic
- Treatment delivered in public schools
- Hours (28) and ratio (1:1) equal across the treatments
- Uniform assessment after 1 year of treatment
- Replicated by Howard et al, 2005; Cohen et al, 2006;
- Why? Curriculum, parent training, supervision and oversight?

Change in standard test scores after 1 year of treatment

** IQ     Exp Lang     Rec Lang     Adap Beh**

Lovaas  Eclectic

**p<.01 one tail
*p<.05 one tail
Fitting Treatments to Individual Profiles

Indiv responses to same tx differ greatly
Assumption of biologically different subgroups
Future will involve choosing tx based on individual profiles

Predicting Outcomes
Sallows and Graupner 2005

Predicts better good outcome
- Pretreatment IQ
- Pretreatment imitation
- Pretreatment language skills
- Pretreatment ADI soc and Comm scores
- Significant amount of weekly peer play
- Pretx variables predicted over 70% of IQ and language variance 4 years later

Did not predict outcomes
- Regression
- Hours of ABA treatment
- Biomedical treatments
- Supplemental treatments

See also Ben-Itzchak et al, 2006 for similar findings
Note: none of these children have biological diagnoses
Resolving Treatment Controversies

- Which model to use
- Language approach: operant or developmental
- PECS versus speech for nonverbal children
- Hours per week
- Mixing therapy approaches (DTT + Floortime)
- How to address sensory and repetitive behaviors
- Efficacy of OT and PT
- Inclusion versus center-based group programs
- Home versus center-based individual programs
- Specialists versus generalists

To Conclude

- Are we too optimistic?
- Are we burdening parents and families?
- Are we developing too many models?
- What about culturally appropriate practices?
- Early intervention depends upon early identification