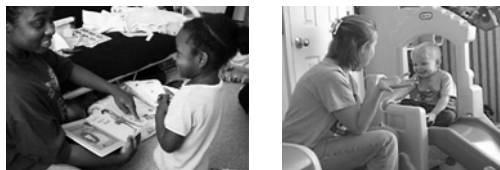


Developmental Approaches to Intervention for Young Children with Autism Spectrum Disorders:

What is the Research Base?



Amy M. Wetherby
Professor of Clinical Sciences and Communication Disorders
Florida State University

DSM IV Diagnostic Criteria for Autism Spectrum Disorder (ASD)

Impairment in Social Interaction

- ❖ *Impairment in the use of nonverbal behavior; Lack of spontaneous sharing; Lack of social/emotional reciprocity; Failure to develop peer relationships*

Impairment in Communication

- ❖ *Delay in or lack of development of spoken language & gestures; Impairment in the ability to initiate or maintain conversation; Repetitive and idiosyncratic use of language; Lack of pretend play*

Restricted Repertoire of Activity and Interests

- ❖ *Preoccupation with restricted patterns of interest; Inflexible adherence to routines; Repetitive movements; Preoccupation with parts of objects*

National Research Council (NRC, 2001)

Committee on Educational Interventions for Children with Autism
Birth to 8 Years

www.nap.edu



National Academy of Sciences

Committee on Educational Interventions for Children with Autism

- | | |
|-------------------------|----------------|
| ❖ Catherine Lord, Chair | ❖ Alan Leslie |
| ❖ Marie Bristol-Power | ❖ Gail McGee |
| ❖ Joanne Cafiero | ❖ Samuel Odom |
| ❖ Pauline Filipek | ❖ Sally Rogers |
| ❖ James Gallagher | ❖ Fred Volkmar |
| ❖ Sandra Harris | ❖ Amy Wetherby |

www.nap.edu

Committee's Process

- ❖ Conducted a systematic and rigorous assessment of research with an eye toward convergence of evidence from independent sources and different methodologies.
- ❖ Established guidelines for evaluating scientific evidence based on:
 - Internal Validity: Control for nonspecific factors such as maturation, expectancy, and experimenter artifacts
 - External Validity: Selection biases addressed in random assignment, sample size, and well-defined populations
 - Generalization: Documented in a natural setting outside of experimental intervention or with functional outcomes

What Do We Know About the Effectiveness of Intervention for Children with ASD?

(National Research Council, 2001: www.nap.edu)

- ❖ Studies have reported substantial changes in large numbers of children receiving a variety of intervention approaches, ranging from behavioral to developmental.
- ❖ The most common reported outcome measures are changes in IQ scores and post-intervention placement.
- ❖ Many single-subject design studies have demonstrated progress in individual responses to specific intervention techniques in a short time.
- ❖ Even in treatment studies with the strongest gains, children's outcomes are variable.

Characteristics of Effective Interventions: Recommendations

Six kinds of instruction should have priority:

- ❖ Functional, spontaneous communication
- ❖ Social instruction in various settings
- ❖ Teaching of play skills focusing on appropriate use of toys and play with peers.
- ❖ Instruction leading to generalization and maintenance of cognitive goals in natural contexts
- ❖ Positive approaches to address problem behaviors
- ❖ Functional academic skills when appropriate

What are the *Active Ingredients* of Effective Programs for Children with ASD?

(National Research Council, 2001: www.nap.edu)

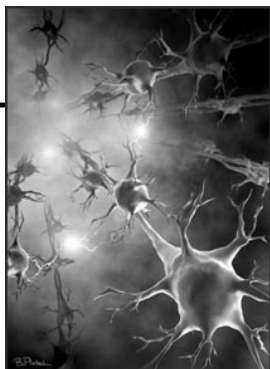
- ❖ Early is better
 - Intervention by 3 ½ years is more effective than after 5 years
- ❖ Goals need to be individualized and monitored regularly
 - Goals and supports need to target social communication, fixated interests, and behavior challenges
 - Progress should be documented within 3 months
- ❖ Intensity matters
 - Active engagement for 25 hour per week
 - Low student/teacher ratio (no more than 2:1)
- ❖ Family participation is essential
 - Families were a critical component in effective programs

Early is the better...

Early core deficits may lead to a cascading effect on neurodevelopment that arise from impoverished social interaction.

(Mundy & Burnette, 2005)

Underscores the importance of developmental interventions



Target core deficits in joint attention...

- Difficulty orienting and attending to a social partner
- Difficulty sharing and coordinating attention between people and objects
- Difficulty drawing another's attention to objects or events for the purpose of sharing experiences
- Difficulty with coordinated joint engagement and reading / sharing affect, emotional states, or perspectives



What are caregiver predictors of joint attention and later language outcomes for children with ASD?

- ❖ Children with ASD whose caregivers showed higher levels of synchronization during play at preschool age developed better joint attention skills 1 year later and better language outcomes 10 and 16 years later
- ❖ The strongest predictor of language gain was the proportion of caregiver utterances that follow the child's attentional focus and allow the child to continue the ongoing toy engagement



(Siller & Sigman, 2002)

Meaningful communication outcome measures ...

- ❖ Gains in initiation of spontaneous communication in functional activities
- ❖ Generalization of gains across activities, interactants (adults and peers), and environments



National Research Council, 2001

Empirically Supported Strategies for Initiation and Generalization

- ❖ Environmental Arrangement—modify the environment to prompt or cue a child to initiate social interaction
- ❖ Natural Reinforcers—provide access to objects or events that the child desires or removing undesired objects or events
- ❖ Time Delay—provide a stimulus and wait briefly before giving a verbal prompt for a child to respond
- ❖ Contingent Imitation—imitate a child’s actions immediately following the child’s actions

(Hwang & Hughes, 2000; Koegel, 1995; McGee, 1999)

Intensity matters...

...so we need to ensure 25 hours per week in which the child is engaged **actively** and **productively** in meaningful activities



Children with ASD do not participate actively and productively without support and structure.



Research tells us that...

...a variety of intervention strategies work well with some children.



Media and marketing put a different spin on this

Continuum from Behavioral to Developmental

	↗	Developmental/ Social-Pragmatic
↗	Contemporary Behavioral/ Naturalistic	↗
Traditional Behavioral/ Discrete Trial	↗	

Evidence-Based Interventions Evaluating the Level of Evidence

- I. True experimental group treatment designs with randomized clinical trials to document group treatment effects under controlled conditions,
- II. Quasi-experimental group treatment designs to demonstrate the feasibility of implementing the model and document group treatment effects,
- III. Single-case experimental treatment designs to examine specific intervention strategies that are incorporated in a treatment, and
- IV. Case-control cross-sectional or longitudinal descriptive group research designs that document core deficits of ASD or significant predictors of outcome for individuals with ASD
- V. Anecdotal reports of change in response to treatment.

Guiding Principles of Developmental Approaches to Intervention for Young Children with ASD

- ❖ Developmental framework for targeting social communication goals and strategies
- ❖ Focus on the core deficits associated with autism
- ❖ Family-guided approach to meet the family's needs, concerns, and priorities
- ❖ Providing intervention in natural environments
- ❖ Naturalistic teaching strategies

What is the Evidence Base for Developmental Interventions for Young Children with ASD?

I. True experimental group designs

	N	Age	1.	2.	3.	4.	5.
Aldred, Green, & Adams (2004)	14	48	✓	✓	✓	✓	✓
Drew et al. (2002)	12	23	✓	✓	✓	✓	✓
Kasari, Freeman & Paparella (2006)	41	43	✓	✓			✓
McConachie et al. (2005)	26	38		✓	✓	✓	✓
Yoder & Stone (2006)	36	31	✓	✓			✓

1. Developmental Frame; 2. Core Deficits; 3. Family Guided; 4. Natural Environment; 5. Natural Teaching Strategies

What is the Evidence Base for Developmental Interventions for Young Children with ASD?

II. Quasi-experimental group designs

	N	Age	1.	2.	3.	4.	5.
Boutware et al. (2006)	8	25	✓	✓	✓	✓	✓
Mahoney & Perales (2005)	20	32	✓	✓	✓		✓
McGee, morrier & Daly (1999)	28	29	✓	✓	✓	✓	✓
Rogers & DiLalla (1991)	49	46	✓	✓			✓
Wetherby & Woods (2006)	17	18	✓	✓	✓	✓	✓

1. Developmental Frame; 2. Core Deficits; 3. Family Guided; 4. Natural Environment; 5. Natural Teaching Strategies

What is the Evidence Base for Developmental Interventions for Young Children with ASD?

III. Single-subject experimental designs

	N	Age	1.	2.	3.	4.	5.
Hancock & Kaiser (2002)	4	35-54	✓	✓			✓
Hwang & Hughes (2000)	3	32-43	✓	✓			✓
Ingersoll et al. (2005)	3	32-46	✓	✓			✓
Kaiser et al. (2006)	6	35-54	✓	✓	✓		✓
Kashinath et al. (2006)	5	33-65	✓	✓	✓	✓	✓

1. Developmental Frame; 2. Core Deficits; 3. Family Guided; 4. Natural Environment; 5. Natural Teaching Strategies

Early Social Interaction

Early Social Interaction Project

Model Demonstration & Research Project
funded by the U.S. DOE

Amy Wetherby & Juliann Woods
Project Co-Directors

esi.fsu.edu



Early Social Interaction

Theoretical Principles

1. A family-centered approach to meet the family's needs, concerns, and priorities throughout the assessment and intervention process
2. Embedded intervention in natural environments for the child and family to enhance generalization
3. Parent-implemented routine-based intervention



Early Social Interaction

Theoretical Principles

4. Intensity of programming for at least 25 hours of active engagement per week
5. Systematic instruction and evaluation using individualized and evidence-based strategies
6. Focus on the core deficits associated with autism—social communication, family and peer interaction, and play skills using the SCERTS curriculum



SCERTS Intervention Model

Barry Prizant, Amy Wetherby, Emily Rubin, & Amy Laurent

- S- SOCIAL
- C- COMMUNICATION
- E- EMOTIONAL
- R- REGULATION
- T- TRANSACTIONAL
- S- SUPPORT

www.scerts.com

Brookes Publishing

© 2006

Early Social Interaction

Quasi-experimental Group Design Research Questions

Are there differences in social communication measures from pre- to post-intervention in a group of toddlers who entered ESI in the 2nd year of life and participated in ESI for a year?

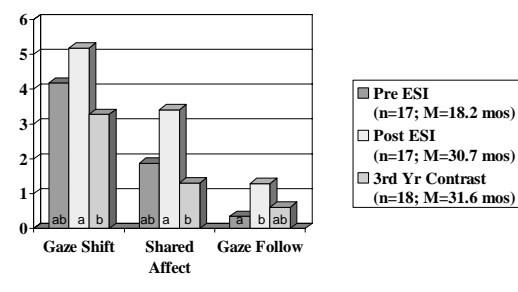
Are there differences in measures of social communication between children with ASD who participated in ESI in the 2nd year of life and a contrast group of children who entered the early intervention system in the 3rd year of life?



Wetherby & Woods, 2006

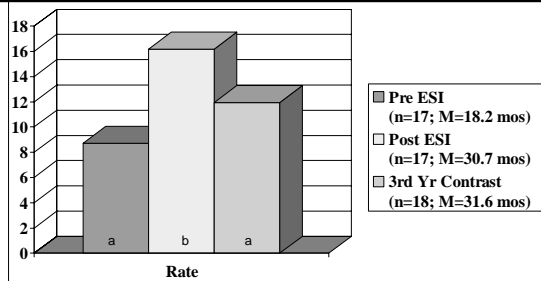
CSBS Behavior Sample Social Signals

Wetherby & Woods, 2006



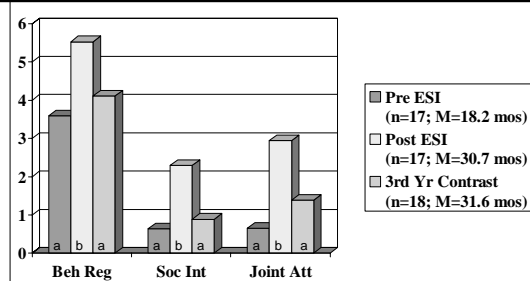
CSBS Behavior Sample Rate of Communicating

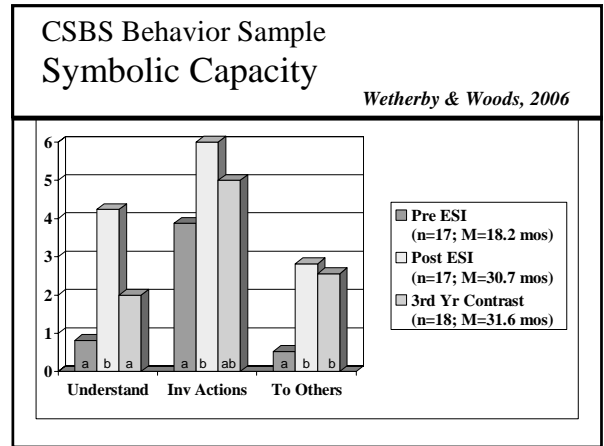
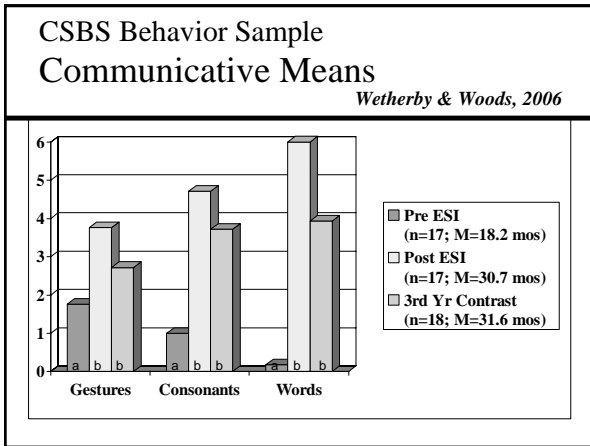
Wetherby & Woods, 2006



CSBS Behavior Sample Communicative Functions

Wetherby & Woods, 2006





Early Social Interaction

Early Social Interaction Project

Collaborative Experimental Treatment Study
funded by Autism Speaks and NIMH

Florida State University
PI- Amy Wetherby

University of Michigan
PI- Catherine Lord

esi.fsu.edu

Early Social Interaction

True Experimental Group Design

Randomized control trial with 96 parent-child dyads over 6 years beginning when child with ASD is 18 months

Crossover design comparing two parent-implemented 9-month interventions, 3 individual sessions per week (high intensity) and 1 group session per week (low intensity)

Child outcome measures include social communication and autism symptoms measured bimonthly and developmental level and adaptive behavior measured at pretest, crossover, and posttest

Measures of active engagement from monthly fidelity videotapes to measure the parent-child dyad

Early Social Interaction

Research Aims

- Aim 1. Intensity of Treatment:** To compare the effectiveness of high and low intensity condition beginning at 18 months of age on outcome measures from 18 to 27 months.
- Aim 2. Timing of Treatment:** To compare the effectiveness of the high intensity condition beginning at 18 months of age with that beginning at 27 months of age on outcome measures.
- Aim 3. Mediator of Treatment:** To determine whether parent synchronization is a mediator of response to intervention.
- Aim 4. Moderator of Treatment:** To identify individual child and family characteristics which predict response to intervention.

Early Social Interaction

ESI Adult Instructional Strategies

- Direct Teaching
- Guided Practice with Feedback
- Caregiver Practice with Feedback
- Video Feedback
- Modeling/Demonstrating
- Problem Solving
- Observing
- Conversations and Information Sharing

Intensity matters...

...so how do we ensure 25 hours per week in which the child is engaged **actively** and **productively** in meaningful activities?



(National Research Council, 2001)

Early Social Interaction

ESI Activity Categories

Play with Toys Blocks, Puzzles, Sand box, Playdough, Cars and Trucks, Ball Games, Baby Dolls	Play with People Social Games like Peek-a-boo, Rough and Tumble, Songs & Rhymes
Meals and Snacks Preparation, Eating, Cleanup	Caregiving Dressing, Diaper Change, Bath, Washing Hands, Brushing Teeth
Book Sharing	Family Chores Mailbox, Laundry, Care for Pets, Plants



38

Increase Active Engagement with Activity Structure and Supports

- ❖ Clear beginning, middle, and end
- ❖ Joint focus of attention and joint interaction
- ❖ Clear roles for child and partner with balance of turns
- ❖ Predictability within and across activities
- ❖ Repeated and varied opportunities for language learning

Possible Mediating Variable: Active engagement

- ❖ A child is focused but can shift attention and problem solve, can communicate effectively, and benefit from learning opportunities in his/her environment.
- ❖ Coincides with demands of the social and physical environment.



(Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006)

Active engagement

- Is the child well regulated?
- Is the child actively participating in a productive activity?
- Is the child oriented to social stimuli and initiating social communication?
- Does the partner provide a balance of support and demand within the activity?



Future Directions

Building the Evidence Base for Developmental Interventions

- ❖ Randomized Group Experimental Designs
 - Multisite
 - Control for maturation and expectation
- ❖ Careful Description of Participants
- ❖ Meaningful Outcome Measures
- ❖ Operationalize Intensity
 - Dosage of treatment
 - Density of trials or learning opportunities
 - Spontaneity of behavior and active engagement
- ❖ Who are Treatment Responders and Nonresponders?
 - Which treatment strategies work best for which children?
 - Tease out Mediators and Moderators