



### Evidence Based Practice in Early Intervention: The Importance of Joint Attention

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University of California, Los Angeles

Help Group Summit  
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### Key Points

- Joint attention is an area of developmental concern for young children with autism
- Targeted interventions can improve this "core feature"
- Recent UCLA studies demonstrate long term change, and improvement in language
- Child age, developmental level and context dictate focus of treatment

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### Importance of Language

- Defining feature of disorder is impaired/delayed language
  - Initially brings family to doctor
  - Approximately 1/4 to 1/2 will not develop functional language by 10-13 years (Lord & Schopler, 1989; Sigman & Ruskin, 1999)
  - Belief that language by 5-6 years predicts best outcome (Lord, 2000)

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## Early Interventions

- Early interventions focused on developing language
- But how interventions focus on language development varies widely.....
- Our focus has been on early developing prelinguistic and nonverbal skills

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## Focus on Joint Attention

- Involves shared positive affect and sharing interest (pointing, showing)
- Joint attention deficits:
  - specific,
  - universal, and
  - predictive of later language skills

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## What does joint attention look like?

Early Social Communication Scales  
Children matched on mental age (24 mo)

QuickTime™ and a  
YUV420 codec decompressor  
are needed to see this picture.

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## What does joint attention look like?

Joint engagement while interacting with others

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## Studies on “Joint Attention”

Direct Teaching; Multiple Baseline Designs

Study	N & Ages	Focus	Methodology	Findings
Jones, Carr, & Feeley (2006)	5 children, aged 2-3 yrs. Teachers, Parents	3 studies-- IJA and RJA--point only, "Look"	Multiple-baseline DTT, PRT	Respond mastery 19-78 sessions; Initiate mastery 26-157 sessions
Martins & Harris (2006)	3 children, aged 3 and 4, Therapists	RJA-- gaze following only in phases (point to head turn)	Multiple-baseline with reversal	Improved in responding, no change in initiating
Rocha, Schreibman, & Stahmer, 2007	3 children, aged 2-3 yrs. Parents	RJA--5 phases, respond to show, point, gaze	Multiple baseline; 3 20- min sessions per day, 3 days/wk for 6 wks	Avg 51 sessions, all children and parents improved; 2 of 3 maintained
Schertz & Odom (2007)	3 children, under 36 months, parents	4 phases: 2 focused on RJA and IJA each	Multiple baseline, behavioral and developmental approach	2 of 3 children made progress in JA
Whalen & Schreibman (2003)	5 children, aged 2-4, Therapists	RJA-- show, follow gaze/point; IJA--point ,coordinated gaze	Multiple-baseline, DTT, PRT	All 5 improved in responding; 4 of 5 improved in initiating; weaker generalization and maintenance

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## UCLA Study: Joint Attention and Symbolic Play

- Goal to teach joint attention to children
  - Theoretically if joint attention improves, language should also improve
  - Added comparison intervention on symbolic play
    - Little evidence that improving symbolic play would improve language
- Young children with autism
  - 3 and 4 year olds who would have limited joint attention and symbolic play skills (average age = 3 1/2 years)
  - Began data collection in 1998; funded through CPEA; finished follow up data (4 years post tx) in 2007

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## Uniqueness of UCLA study

- Randomized controlled clinical trial
  - 3 conditions--joint attention, symbolic play and control
- All children with autism attended same ABA-based preschool program
  - Important to control for intensity and type of other interventions (dose)
  - "Control" intervention considered "optimal"--6 hours per day, 5 days per week
- All children had confirmed diagnoses (ADI-R and ADOS) of autism

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## Uniqueness of UCLA study: Multiple Assessments and Follow up

- Children assessed by *independent examiners*
  - Joint attention--ESCS
  - Symbolic play--Structured Play Assessment
  - Developmental level--Mullens
  - Language level--Reynell Developmental Language Scales
  - Mother-child interaction--15 minutes with standard toys
- Assessments carried out prior to treatment, at end of treatment, 6 and 12 months post treatment
- 4 year follow up--children on average 8.5 years old
  - Differential Abilities Scale
  - PPVT
  - Expressive One-Word Test
  - ToM, Imitation, Friendship measures, MCX

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## Intervention Content and Approach

- Interventions for 30 minutes daily for 5-6 weeks
  - 5 minutes of priming skill--ABA discrete trial approach
  - 20-25 minutes of combined developmental and behavioral play on floor targeting specific skill
    - Child driven, following child's interests
    - Imitation of child and development of routines
      - Focus on joint engagement state to develop joint attention skills
    - Criteria and mastery of skill before moving to next skill
- Fidelity checks across interventionists
- *Generalization checks to parent*

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## Joint Attention Measures

- Joint attention coded as:
  - ESCS:
    - Summary score of *responds to JA acts*
    - Summary and individual scores of *initiates JA--pointing, showing, coordinated joint looks*
  - Mother-child interaction:
    - Duration of *child-initiated joint engagement states*



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## Play Measures

- Symbolic play skills determined in terms of symbolic play types (not frequency) and play level.
  - Symbolic play types:
    - The number of different novel, child initiated symbolic play acts
    - Focus is on *spontaneous initiations* of child-directed play
  - Play level:
    - The highest, most frequent, and flexible level child plays (with mastery)



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What does the intervention look like?  
Play intervention with boy at mean of group

QuickTime™ and a YUV420 codec decompressor are needed to see this picture.

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What does the intervention look like?  
Joint attention intervention with boy at just below mean of group

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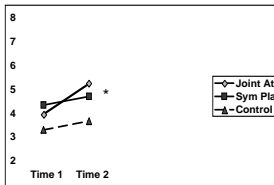
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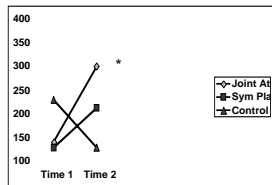
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Effects of the Interventions on Joint Attention Skills and Engagement



Initiates Joint Attention Skills: Composite ESCS & MCX



Duration of child initiated joint attention: Mother-child interaction

Kasari, Freeman & Paparella, 2006

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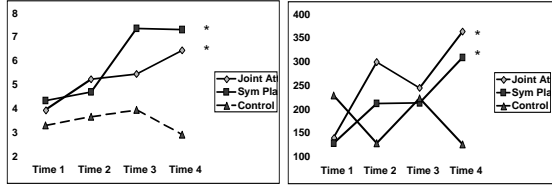
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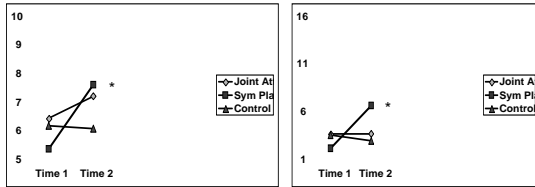
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### Effects of the Interventions on Symbolic Play Level and Skills



Play level averaged across independent assessments

Frequency of symbolic play types: Mother-child interaction

Kasari, Freeman, & Paparella, 2006

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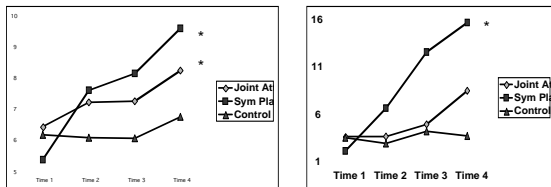
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Kasari, Paparella, Freeman & Jahromi, 2008

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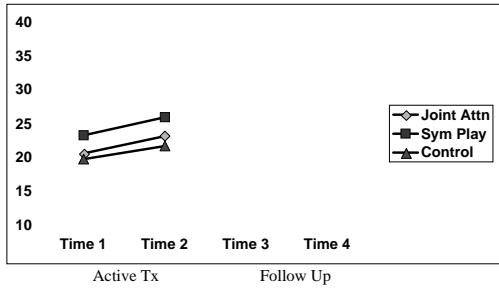
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### Effects of the Interventions on Language Skill




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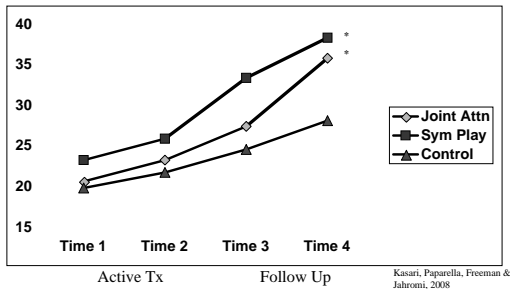
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### Effects of the Interventions on Language Skill



Kasari, Paparella, Freeman & Jahromi, 2008

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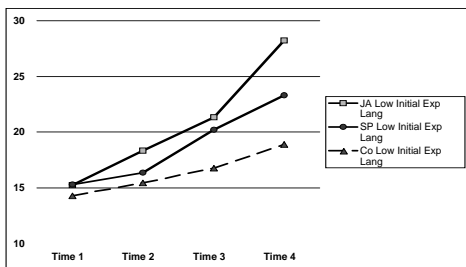
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### Do some children benefit more from one intervention versus another?

Expressive Language Outcome for children with initially LOW Level of Expressive Language



Kasari, Paparella, Freeman & Jahromi, 2008

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## What are the long-term implications of joint attention?

### Predictors of Outcome

- Outcomes at 8.5 years for entire sample
  - Receptive Language (PPVT)
  - Expressive Language (EOW)
  - Verbal IQ
  - ADOS (communication and social interaction)
  - (ToM, MCX, Imitation)
- Only Predictors for each model (same each time)
  - Expressive Language
  - Play level
  - Joint attention initiations

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## Long term outcome--treatment effects

- Outcomes at 8.5 years
  - Receptive Language (PPVT)
  - Expressive Language (EOW)
  - Verbal IQ
  - ADOS (communication and social interaction)
- Predictors for each model
  - Expressive Language held constant
  - Play level residual (not significant)
  - Joint attention initiations residual \*\*

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## Summary of 4 year follow up

- Play level and joint attention initiations both predict to cognitive and language scores at the 4 year follow up for all children
- Only *joint attention improvement* predicts to cognitive and language outcomes at 4 year follow up
- Joint attention improvement also predicts ADOS improvement

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# Study Design

## UCLA Toddler Study

- Bringing in parents.....
- Using hands on coaching to improve engagement

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# Treatment

- 10 modules
  - Generally one topic per week
  - Individualized to dyad
  - Each session involved parent coaching, practiced interactions, and videotaping of free play session
  - Therapist scored involvement -buy-in rating (alliance)

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**Allowing the Child to Initiate Communication**

- Set up opportunities to "test" the child. When these opportunities arise, do not withdraw or avoid your child or avoid withdrawal or avoid your child or avoid withdrawal or avoid your child.
- Wait for your child to initiate contact. When your child wants to get the toy, toy, or make a noise, you let the child to what he or she wants to do.
- When you see an opportunity for your child to initiate contact, you let the child to what he or she wants to do.
- Use "Who's in your car?" The you are modeling your behavior with the you.
- Point to the toy your child is playing with. Point to the toy your child is playing with.
- Hold up a toy similar to the one your child is playing with.
- Engage in shared play.
- When you point to a toy or pick up your child's toy, you are modeling your behavior with the you.
- When you see an opportunity for your child to initiate contact, you let the child to what he or she wants to do.
- Use "Who's in your car?" The you are modeling your behavior with the you.

**Facilitating & Maintaining States**

- Follow your child's lead.
- Attend to your child's focus of attention.
- Observe interest in what your child is interested in.
- If your child is interested in a block, then focus your attention on that block and/or make an action with it.
- If your child is interested in a block, then you attach to the block.
- Describe your child's actions. They may spark your child's interest.
- If your child makes the doll jump, then make your doll jump.
- If your child starts making the blocks, then start making your own "making blocks" blocks. When you see an interest in a block, then you attach to the block.
- Engage on the child's actions.
- Respond to the child's actions with the you by making your own blocks or actions. If the child is interested in a block, then you attach to the block.
- When you see an opportunity for your child to initiate contact, you let the child to what he or she wants to do.
- Use "Who's in your car?" The you are modeling your behavior with the you.
- Occasionally initiate on an established routine in a playful manner.
- Engage on your child's consistently playing with the you. This can bring new interest to the toy and additional attention to you.
- If the child has an interest in a toy, then you attach to the toy.
- Describe the child's actions on the table or on the middle of the table.
- Provide language contingent on the child's focus.
- "Look, you're a block!" "The doll is jumping!" "There's a block!" "There's a block!" "There's a block!"

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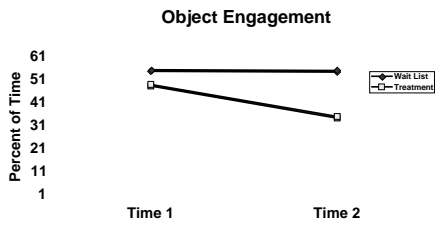
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### Change in Object Engagement State




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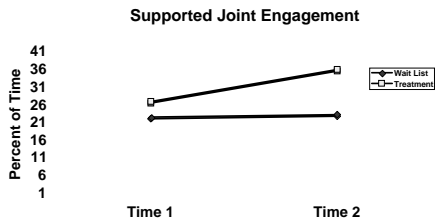
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### Change in Supported Joint Engagement




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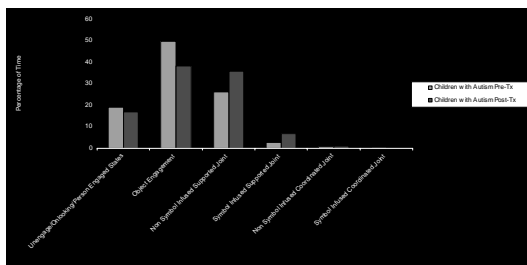
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### Comparison of the Percentage of Time in Engagement States




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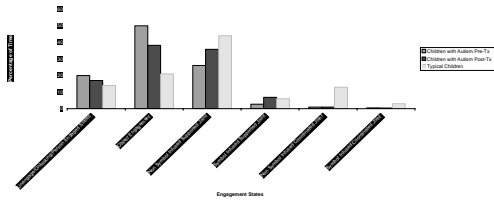
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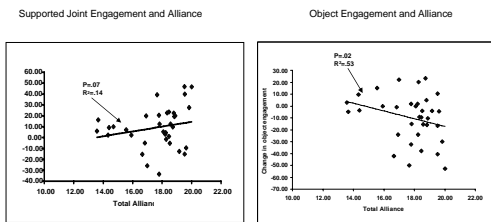
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### Relationship between Alliance and the Change Across Intervention in Supported and Object Engagement




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### Phased development of intervention

- Baseline
  - Child object focused
- Phase 1
  - Environmental changes; routine building
- Phase 2
  - Routine building, waiting, following, symbols
- Exit




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## Summary of Early Intervention Work

- Can teach joint attention and play skills to children, and to mothers who can teach their children
- These skills affect language outcomes
- Early intervention programs need to include these areas of development (few do)
- Researchers need to address the translation from research to practice

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## Collaborators

- Graduate Students
  - Stephanny Freeman
  - Tanya Paparella
  - Erin Rotheram-Fuller
  - Lavada Minor
  - Brandt Chamberlain
  - Julia Vallone
  - Valeria Chow
  - Steve Johnson
  - Connie Wong
  - Wendy Bertolotti
  - Susan Kwon
  - Lisa Lee
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  - Jill Locke
  - Kelly Stickle
  - Hyunuk Kim
  - Linh Hyunh
  - Tracy Guiou
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  - BJ Freeman, PhD
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