Joint Attention Intervention for Young Children with Autism

Emily A. Jones,
PhD, BCBA-D

Overview

- Joint attention
  - What is joint attention?
  - Why is joint attention important?
  - Impairments in joint attention in autism
- Joint attention intervention research
- Intervention
- Considerations in developing intervention:
  - Joint attention materials and contexts
  - RJA and IJA and choosing cues
  - Forms of joint attention

What is joint attention?

- an early social-communicative behavior in which two people share attentional focus on an object or event, for the sole purpose of sharing that interesting object with each other

Bakeman, R., & Adamson, L. (1984). Coordinating attention to people and objects in mother-infant and peer-infant interaction. *Child Development, 55,* 1278-1289.

What is joint attention?

- Sigman and Kasari (1995): narrower and broader definitions:
- "Looking where someone else is looking" (Butterworth, 1991, p. 223)
- "Responsive and initiating behaviors as well as the checking of another person's face that occurs while the infant is playing with something, when the infant has pointing to something, or in an ambiguous situation" (Sigman & Kasari, 1995, p. 189)

Joint attention in typically developing children

- State of coordinated attention
- Set of skills
  - Responding to others' joint attention directives
  - Initiating joint attention
- Function?

Why is joint attention important?

- Language development (Bono, Daley, & Sigman, 2004; Loveland & Landry, 1986; Mundy & Gomes, 1998; Smith, Mirenda, & Zaidman-Zait, 2007; Toth, Munson, Meltzoff, & Dawson 2006)
- Social-cognitive development (Sheinkopf, Mundy, Claussen, & Willoughby, 2004; Travis, Sigman, & Ruskin, 2001; Vaughan et al. 2003)

Impairments in joint attention in children with autism

- Deficits in both responding to others' joint attention directives and initiating joint attention
- Persisting deficits in initiating joint attention
- Evident very early and persists

Why is joint attention important in intervention for children with autism?

- Reflects core social-communicative impairments (Mundy & Crowson, 1997)
- Related to social, communication development
- Pivotal skill (Mundy & Crowson, 1997; Jones & Carr, 2004)

Outcomes of JA Intervention

- Collateral changes
  - Ratings of happiness, interest
  - Language acquisition
  - Positive affect

  (Jones et al., 2006; Naoi et al., 2008; Whalen et al., 2006)
- Existing joint attention abilities positively influences intervention outcomes in children with autism (e.g., Kasari, Paparella, Freeman, & Jahromi, 2008; Yoder & Stone, 2006).
- Compared to interventions that do not focus on joint attention, specifically teaching joint attention is related to greater improvements in language (Kasari et al., 2008).

JA Intervention

- Repeated opportunities
- Structured and more natural practice
- Specific prompting and fading procedures
- Use of social consequences
- Additional reinforcers?
- Pivotal response training (Jones et al., 2006; Whalen & Schreibman, 2003) and milieu teaching procedures (Kasari et al., 2006)

Intervention

- Seat yourself across from the child (rather than next to or behind the child) and close to the child's eye level
- Engage child in activity or with object
- Present joint attention cue
- Prompt a response as necessary
- Present consequences: Social: comment, smile, look, engage with object/activity

Teach responding to others' joint attention directives

- S^D = Adult points, looks at, and vocalizes about (e.g.., "Look at that!") interesting object or event
  * make sure to vary what you say across opportunities
- Child's response
- Consequence = comment, social reinforcers, and continued attention on the interesting object or event
  * make sure to vary what you say across opportunities

Teach initiating joint attention

- S^D = presence of an interesting object or event and person to share it with
- Child's response
- Consequence = comment, social reinforcers, and continued attention on the interesting object or event

Considerations in developing intervention

Materials

- Preference (interest)
- Salience: toys that can be activated (i.e., make noise, light up, move)
- Novelty:
  - multiple exemplars (Jones et al., 2006)
  - Without prior exposure or unusual features (Taylor & Hoch, 2008)

Toys/items:
- A toy that makes noise
- A remote control car that moves in front of the child
- Familiar items but different presentation (e.., "toy horse wearing a clown wig" Taylor & Hoch, 2008, p. 379)
- Item appears from behind a screen (Naoi et al., 2008)
- Opening a box with a preferred item inside

Routines:
- Arriving at a particular animal display at the zoo
- Turn taking

Circumscribed interests

- Circumscribed interests (**CI**): specific topics or themes of abnormal intensity
- Interventions which included CI demonstrated a positive effect on a variety of responses of children with autism, including collateral increases in joint attention (Baker, 2000; Vismara & Lyons, 2007)
- CI-related materials may be particularly powerful reinforcers for joint attention intervention

Kryzak, L., Bauer, S., Jones, E. A., & Sturmey, P. *Using Circumscribed Interest Embedded Activities and Prompting to Establish Joint Attention in Children with Autism Spectrum Disorders.* Manuscript submitted for publication.

Responding to others' joint attention directives and/or Initiating joint attention

- RJA first
- RJA and IJA simultaneous

Cue?

Responding to others' joint attention directives	Initiating joint attention
E.g., Book reading: • Look and point at, while commenting on, any picture on a page • look at and comment while pressing a sound button on the book • look at and comment while opening a flap	E.g., Book reading: • New page of pictures • Sound when a button is pressed • After partner is done reading the text on the page

Other JA Cues

- Adult turn's head toward, looks at, and points to object and vocalizes (point touches object; point does not touch object)
- Adult turn's head toward and looks at object, and vocalizes
- Adult turn's head and looks at object
- Adult looks at object
- Object

Krstovska-Geurrero & Jones, in progress; Martins & Harris, 2006

Other JA Cues

- Time based for IJA (Whalen & Schreibman, 2003)
- Only very odd or unusual stimuli (Taylor & Hoch, 2008)
- Objects that make noise, light up, move, etc. (Jones et al., 2006)
- Turn taking (Isaksen & Holth, 2009; Jones, 2009)

Form of joint attention

- Gaze alternating *
- Gesture (pointing, showing)
- Vocalizations (single words such as “Wow” to elaborate comments “Ooh, that’s a cool duck!”)
- Affect
- Coordinating forms

Positive affect and joint attention

- Collateral changes

- Jones et al. (2006), Naoi et al. (2008), Whalen et al. (2006)

Gaze alternating coordinated with smiling

1. teach smiling in response to verbal instruction smile

*rationale: child smiles and looks at object first, so need a prompt that you can use when child is not looking at you

2. teach looking at the object and smiling
3. teach gaze alternating and smiling

Identify prompts

- For gaze alternating
  - "Name"
  - Primary reinforcer
  - Pointing finger
  - Touch chin
  - Expectant look
  - Fading: Time delay and most to least prompt hierarchy
  - Example:

Full prompt	Child's name	Primary reinforcer
Partial prompt	Initial sound of name	Pointing finger

Identify prompts (continued)

- For gesture
  - Model
  - Hand over hand
  - Teach pointing in imitation first
- For verbalization
  - Model
  - Visual prompt
- For affect
- Fade: most to least, time delay

Determining most effective prompt

- For gaze alternating:
  - Engage child with toy or activity and present a potential prompt (e.g., call child's name)
  - Present 5 opportunities
  - Examine if child looks up at you from toy/activity
  - Choose the least intrusive and most successful (e.g., 80% responding) prompt
- Repeat to examine prompts for gesture and verbalization

Performance Criteria

- Percentage of RJA (80%)
- Frequency IJA within natural opportunities and routines
- Compare to typical peers with similar partners
- In Jones (2009) and Jones et al. (in prep)
  - Typical preschoolers (3-4 years)
  - Engage in 3 routines with their mothers for 5 minutes
  - Average 5 RJA
  - Average 3 IJA

Consequences

- Social: comment, smile, look, engage with
- Increasing the value of social consequences:
  - Initial step of joint attention intervention:
    - Pairing social and nonsocial reinforcers
    - Rapport building (Jones et al., 2006)
    - Establish social consequences of JA as conditioned reinforcers (Isaksen & Holth, 2009)
  - Idiosyncratic social reinforcers and interactive play (Jones et al., 2006)
  - Use access to object of JA as reinforcer; lose access to toy if incorrect response (Whalen & Schreibman, 2003)
  - Add other reinforcers (Taylor & Hoch, 2008) and fade

Expanding JA repertoire

- Additional partners (parents, peers, siblings)
- Distance and positioning of partners and objects
- Number of objects and other distractors
- Other forms and combinations of forms
- Move from structured instruction with toys to routines and more naturally occurring opportunities
- Different sequences of skills and sub skills across functions of communication

I would like to thank …

- The Organization for Autism Research for funding several of these studies
- The Young Autism Program (a division of Developmental Disabilities Institute)
- The children, their parents, and teachers who devoted their time and energy to this research
- Marisa Pose, Lauren Kryzak, MA, BCBA, Sara Bauer, and Ivana Krstovska-Guerrero, MA, BCBA

Select References

Adamson, L. B., & Bakeman, R. (1985). Affect and attention: Infants observed with mothers and peers. *Child Development*, *56*, 582–593.

Bakeman, R., & Adamson, L.B. (1984). Coordinating attention to people and objects in mother-infant and peer-infant interaction. *Child Development, 55,* 1278-1289.

Baker, M.J. (2000). Incorporating the thematic ritualistic behaviors of children with autism into games: Increasing social play interactions with siblings. *Journal of Positive Behavior Interventions, 2,* 66-84.

Baker, M.J., Koegel, R.L., & Koegel, L.K. (1998). Increasing the social behavior of young children with autism using their obsessive behaviors. *Journal of the Association for Persons with Severe Handicaps, 23,*300-308.

Bono, M. A., Daley, T., & Sigman, M. (2004). Relations among joint attention, amount of intervention, and language gain in autism. *Journal of Autism and Developmental Disabilities, 34,* 495-505.

Boyd, B.A., Conroy, M.A., Mancil, G.R., Nakao, T., & Alter, P.J. (2007). Effects of circumscribed interests on the social behaviors of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 37,* 1550-1561.

Charlop, M.H., Kurtz, P.F, & Casey, F.G. (1990). Using aberrant behaviors as reinforcers for autistic children. *Journal of Applied Behavior Analysis, 23*, 163-181.

DeQuinzio, Townsend, Sturmey, & Poulson, (2007) Generalized imitation of facial models by children with autism. *Journal of Applied Behavior Analysis*. *40*, 755–759.

Dube, W. V., MacDonald, R. P. F., Mansfield, R. C., Holcomb, W. L., & Ahearn, W. H. (2004) Toward a behavioral analysis of joint attention. *The Behavior Analyst, 27,* 197-207.

Gena, A., Couloura, S., & Kymissis, E. (2005). Modifying the affective behavior of preschoolers with autism using in-vivo or video modeling and reinforcement procedures. *Journal of Autism and Developmental Disorders, 35*(5), 545-556.

Gena A, Krantz P.A, McClannahan L.E, & Poulson C.L. (1996). Training and generalization of affective behavior displayed by youth with autism. *Journal of Applied Behavior Analysis*. *29*, 291–304.

Holth, P. (2006). An operant analysis of joint attention skills. *European Journal of Behavior Analysis, 7,* 77-91.

Hwang, B., & Hughes, C. (2000). Increasing early social-communicative skills of preverbal preschool children with autism through social interactive training. *Journal of the Association for Persons with Severe Handicaps, 25,* 18-28.

Isaksen, J., & Holth, P. (2009). An operant approach to teaching joint attention skills to children with autism. *Behavioral Interventions, 24,* 215-236.

Jones, E. A. (2009). Establishing response and stimulus classes for initiating joint attention in children with autism. *Research in Autism Spectrum Disorders, 3,* 375-389.

Jones, E.A., & Carr, E.G. (2004). Joint attention in children with autism: Theory and intervention. *Focus on Autism and Other Developmental Disabilities, 19,* 13-26.

Jones, E. A., Carr, E. G., & Feeley, K. M. (2006). Multiple effects of joint attention intervention for children with autism. *Behavior Modification, 30,* 782-834.

Jones, E. A., & Feeley, K. M. (2007). Parent implemented joint attention intervention for preschoolers with autism. *Journal of Speech and Language Pathology and Applied Behavior Analysis, 2,* 253-268.

Joseph, R. M., & Tager-Flusberg, H. (1997). An investigation of attention and affect in children with Autism and Down Syndrome. *Journal of Autism and Developmental Disorders, 27*, 385-396.

Kasari, C., Freeman, S. F. N., & Paparella, T. (2001). Early intervention in autism: Joint attention and symbolic play. In L. M. Glidden (Ed.), *International Review of Research in Mental Retardation: Vol. 23. Autism* (pp. 207-237). San Diego, CA: Academic Press.

Kasari, C., Freeman, S. F. N., & Paparella, T. (2006). Joint attention and symbolic play in young children with autism: A randomized controlled intervention study. *Journal of Clinical Psychology and Psychiatry, 47,* 611-620.

Kasari, C., Gulsrud, A. C., Wong, C., Kwon, S., & Locke, J. (2010). Randomized controlled caregiver mediated joint engagement intervention for toddlers with autism. *Journal of Autism and Developmental Disabilities, 40,* 1045-1056.

Kasari, C., Paparella, T., Freeman, S., & Jahromi, L. B. (2008). Language outcome in autism: Randomized comparison of joint attention and play interventions. *Journal of Consulting and Clinical Psychology, 76,* 125-137.

Kasari, C., Sigman, M., Mundy, P., & Yirmiya, N. (1990). **Affective sharing in the context of joint attention interactions of normal, autistic, and mentally retarded children.** ***Journal of Autism and Developmental Disorders,*** *20,* 87-100.

Koegel, L. K., Koegel, R. L., Harrower, J. K., & Carter, C. M. (1999). Pivotal response intervention I: Overview of approach. *Journal of the Association for Persons with Severe Handicaps, 24,* 174-185.

Koegel, R. L., Werner, G. A., Vismara, L. A., & Koegel, L. K. (2005). The effectiveness of contextually supported play date interactions between children with autism and typically developing peers. *Research and Practice for Persons with Severe Disabilities, 30,* 93-102.

Kryzak, L. A., Bauer, S., Jones, E. A., & Sturmey, P. (2010). The effect of prompts and embedded circumscribed interests to establish responding to others' joint attention directives in children with autism. Manuscript submitted for publication.

MacDonald, R., Anderson, J., Dube, W. V., Geckeler, A., Green, G., Holcomb, W., Mansfield, R., & Sanchez, J. (2006). Behavioral assessment of joint attention: A methodological report. *Research in Developmental Disabilities, 27,* 138-150.

Martins, M. P., & Harris, S. L. (2006). Teaching children with autism to respond to joint attention initiations. *Child & Family Behavior Therapy, 28*, 51-68.

Mundy, P. (1995). Joint attention and social-emotional approach in children with autism. *Development and Psychopathology, 7,* 63-82.

Mundy, P., & Crowson, M. (1997). Joint attention and early social communication: Implications for research on intervention with autism. *Journal of Autism and Developmental Disorders, 27*(6), 653-676.

Mundy, P., Delgado, C., Block, J., Venezia, M., Hogan, A., & Seibert, J. (2003). *A manual for the abridged Early Social Communication Scales (ESCS)* Coral Gables, FL: University of Miami, Department of Psychology.

Naoi, N., Tsuchiya, R., Yamamoto, J., & Nakamura, K. (2008). Functional training for initiating joint attention in children with autism. *Research in Developmental Disabilities, 29*, 595-609.

Parlade, M. V., Messinger, D. S., Delgado, C. E. F., Kaiser, M. Y., Van Hecke, A. V., & Mundy, P. C. (2008). Anticipatory smiling: Linking early affective communication and social outcome. *Infant Behavior and Development*, *32*, 33-43.

Pierce, K., & Schreibman, L. (1995). Increasing complex social behaviors in children with autism: Effects of peer-implemented pivotal response training. *Journal of Applied Behavior Analysis, 28,* 285-295.

Rocha, M. L., Schreibman, L., & Stahmer, A. C. (2007). Effectiveness of training parents to teach joint attention in children with autism. *Journal of Early Intervention, 29,* 154-172.

Taylor, B. A., & Hoch, H. (2008). Teaching children with autism to respond to and initiate bids for joint attention. *Journal of Applied Behavior Analysis, 41,* 377-391.

Vaughan, A., Mundy, P., Block, J., Burnette, C., Delgado, C., Gomez, Y., et al. (2003). Child, caregiver, and temperament contributions to infant joint attention. *Infancy, 4,* 603-616.

Warren, S. F., Yoder, P. J., Gazdag, G., Kim, K., & Jones, H. (1993). Facilitating prelinguistic communication skills in young children with developmental delay. *Journal of Speech and Hearing Research, 36,* 83-97.

Whalen, C., & Schreibman, L. (2003). Joint attention training for children with autism using behavior modification procedures. *Journal of Child Psychology and Psychiatry, 44,* 456-468.

Whalen, C., Schreibman, L., & Ingersoll, B. (2006). The collateral effects of joint attention training on social initiations, positive affect, imitation, and spontaneous speech for young children with autism. *Journal of Autism and Developmental Disorders, 36*, 655-664.

Vismara, L.A., & Lyons, G.L. (2007). Using perseverative interests to elicit joint attention behaviors in young children with autism: Theoretical and clinical implications for understanding motivation. *Journal of Positive Behavior Interventions, 9,* 214-228.

Yoder, P., & Stone, W. L. (2006). Randomized comparison of two communication interventions for preschoolers with autism spectrum disorders. *Journal of Consulting and Clinical Psychology, 74,* 426-435.