Annotated Bibliography: Joint Attention Training

(as of 5-31-10)

Adamson, L.B., McArthur, D., Markov, Y., Dunbar, B., & Bakeman, R. (2001). Autism and joint attention: Young children's responses to maternal bids. *Applied Developmental Psychology*, *22*, 439-453.

DISCUSS: The purpose of the study was to acquire information about joint attention and what occurs when children do not accept an adult's attempt at joint attention. Engaging with peers or caregivers can be difficult for an infant learning about their environment, adding to the complexity of integrating events and interesting objects occurring in the environment. The participants were 18 boys and their mothers; 9 of the boys had a diagnosis of autism with an age range between 25 months and 44 months. The mothers expressed that some boys were using less than 10 words, while others were using 2 word phrases. The remaining 9 boys had typical development, and ranged in age from 18 months to 21 months. An average age of 20 months was chosen for children with typical development as it was expected that joint attention would be developed by this age. Average word count for children with typical development was 111. Three communication functions were targeted: shared commenting, social interacting and requesting. Each child was videotaped for 30 minutes interacting with the mother.

INTERPRET: The results found that mothers (regardless of whether or not their child had autism) issued roughly 82 joint attention bids. Mothers of children with typical development had bids that lasted longer; however, the results were not significant. The differences in the response of children to these bids showed that although both children with typical development and children with autism were almost equally as likely to decline a bid, the children with autism were much more likely to be unaware of the joint attention bid. Children with autism rejected or ignored 26% of the bids offered by the mother.

EVALUATE: It is important for caregivers to recognize that joint attention bids with children with autism may take longer, and there might be more rejection. In working with this population educators also need to be aware of this general lack of response to joint attention bids and to continue the attempts at engagement and connection

Charman, T. (2003). Why is joint attention a pivotal skill in autism? *The Royal Society 358*, 315-324.

DISCUSS: Joint attention is in fact a pivotal skill in children with autism—'the thing on which progress depends'. Autism is visibly present in infants before their first birthday, often seen as a lack of turning toward their name. Into the second year of life, autism is visible through what looks like ignoring people and preferring solitary time and play. Previous studies show an important link between joint attention skills and collateral changes. This study used a longitudinal design, consisting of 18 infants, all with autism or had been identified in a CHAT screening as prospectively. The *Griffiths Scale of Infant Development* was used at age 20 months for each of the participants. A similar assessment scale was used again when the participants were 48 months. By 48 months, half of the children were diagnosed with Autism and the other half were diagnosed with pervasive developmental disorder-unspecified. At 20 months of age, the child was given a spontaneous play task, where toys were available and the child's parents and experimenters offered limited responses. The children were each filmed for 5 minutes. Two joint attention tasks and an imitation task were also administered.

INTERPRET: Results indicated that there was a significant positive relationship between switching gazes and receptive language. Receptive language was also substantially correlated with imitation.

EVALUATE: An important finding from this study was that language ability is related and dependent on early social communication skills. At 20 months of age, only those abilities related to joint attention were linked to language abilities at 48 months.

Drew, A., Baird, G., Baron-Cohen, S., Cox, A., Slonims, V., Wheelwright, S., Swettenham, J., Berry, B., & Charman, T. (2002). A pilot randomized control trial of a parent training intervention for pre-school children with autism. *European Child & Adolescent Psychiatry 11*, 266-272.

DISCUSS: Children identified as having autism before their second birthday, were used in this study for the purpose of conducting a randomized control trial of a parent training intervention. The study was conducted to identify early intervention that is effective, and to demonstrate, using a randomized controlled trial that the effects of the treatment are a result of a specific intervention and not factors for which there are no controls. Of the 51 referred to the study, 24 parents agreed to participate. Participants were split into 2 groups: Parent Training Group (11 male, 1 female), or the Local Services Group (8 male, 4 female). These groups were matched for age and did not differ in language ability; of the 12 children in each group, 11 were non-verbal. The Parent Training program included joint attention activities, identified target behaviors, offered specific activities, encouraged integration into daily activities and routines; and, an SLP came to the home every 6 week for 3 hours. The Local Services group received a mix of services, ranging from speech and language to occupational therapy and physiotherapy.

INTERPRET: Results indicated that at follow up there was no difference in the words or gestures produced, however, the Parent Training group showed slightly higher language comprehension. Of the 12 children in each group, 3 children in the Parent Training group used spontaneous speech at follow up, compared to none in the Local Services Group. There were also five children in the Parent Training Group using more than 5 words, compared to 3 in the Local Services Group. The activity checklists showed that the parents in the Local Services group received more outside intervention; however there was no difference in the amount of 1-to-1 time parents spent in structured activities with their children.

EVALUATE: It is important to note that although some of the children in this study showed significantly more language acquisition, at follow up (average=34 months), the children in the Parent Training group were operating at a 16 month age equivalent for language.

Kasari, C., Freeman, S., & Paparella, T. (2006). Joint attention and symbolic play in young children with autism: A randomized controlled intervention study. *Journal of Child Psychology and Psychiatry, 47*(6), p. 611-620.

DISCUSS: The purpose of this study was to examine the effectiveness of joint attention and symbolic play interventions. The study design was a randomized control, where one group received joint attention intervention and one group received symbolic play intervention. There was also a control group. Pre and post-tests were conducted 58 children participated, 20 children in the joint attention group, 21 in the play group and 17 in the control group. The participants in these groups were similar in: chronological age, mental age, developmental quotient, expressive and receptive language age, gender, ethnicity and mother's education. Participants were recruited from an early intervention program (EIP), and each received a 6-hour school day. ECSC (Early Social-Communication Scales), Structured Play Assessment, and Caregiver-child interactions were conducted at the beginning and the end of the intervention, which lasted a total of 5-6 weeks. Each child received 30 minutes a day of intervention. Each child received around 5 minutes of "priming" and direct instruction, with the remaining 30 minutes being dedicated to floor time.

INTERPRET: The joint attention group and play group showed improvement in initiation of shows compared to the control group, however, the joint attention group showed more improvement in responding over time to joint attention, and made more gains in "gives". All three groups showed increases in symbolic and functional play; however the playgroup showed significant improvement. The playgroup also showed considerably more types of symbolic play compared to the other two groups, in mother-child interactions.

EVALUATE: This study found that children with autism can be taught joint attention and symbolic play skills. The children in the joint attention group showed greater improvement in responding to and eliciting joint attention and the play group showed greater diversity in play. Notably, improvement was noted in a short period of time, suggesting that the children were able to generalize the skills they learned during the intervention to other settings and with other people. This is a powerful finding related to key interventions addressing the core deficits in autism.

Klein, J.L., MacDonald, R.P.F., Vaillancourt, G., Ahearn, W.H., & Dube, W.V. (2009) Teaching discrimination of adult gaze direction to children with autism. *Research in Autism Spectrum Disorders, 3*, p. 42-49.

DISCUSS: The purpose of this study was to determine if children with autism could locate an object using gazes from adults in the environment. Recent findings had identified how children with autism often have difficulties turning towards sounds and stimuli presented in the environment. Similarly, previous studies found that although children would establish eye contact with a mechanical toy, they were unable to establish eye gaze between the toy and an adult in the room. Further, past findings indicate that objects interesting to a specific child have more potential for eye gaze. Three boys participated in this study, who were currently enrolled in an Early Intervention Program for children specifically diagnosed with Autism. The boys were 4, 6 ¼ and 4 ¾ and were all chosen because their directional gaze was not controlled by the adults' gaze. Three days a week each child participated in a 3-7 minute long session. The children were presented with meaningless tasks (jump, clap, etc.) throughout the session and were rewarded when they responded correctly with a edible treat (pre-determined to be one they picked). After the experimenter gained eye contact with the child the experimenter then turned eye gaze to a mechanical toy. A correct response for the child was if they turned eye gaze to the toy within 5 seconds after the adult.

INTERPRET: The results showed that the increased exposure to delayed cue training, with the use of mechanical toys, increased the child's gaze shifting.

EVALUATE: A primary limitation of the study was the small number of participants.

Murray, D.S., Creaghead, N.A., Manning-Courtney, P., Shear, P.K., Bean, J., & Prendeville, J. (2008). The relationship between joint attention and language in children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 23*(1), p. 5-14.

DISCUSS: The study investigated joint attention (response to and initiation of) and its relationship to verbal expression. Participants included 16 males and 4 females, for a total of 20 participants, all having been diagnosed with autism. Children ranged in age from just under 3 ½ to 5 years, 11 months. All families had previously volunteered for a different study. All children were administered the *Mullen Scales of Early Learning*. This test was used to determine a score for receptive language for each child. Children were also video-taped during a 15 minute play interaction with a caregiver. Systematic Analysis of Language Transcriptions was used to analyze the average length of spontaneous expressive utterances (Mean Length of Utterance (MLU)) and the diversity of vocabulary (Type Token Ratio (TTR)). The play interaction was used to determine the children's response to, and initiation of joint attention. The examiner called the child's name to establish eye contact and then looked at an object to the right of the child. The child was given time to look toward the object, at which point the child was given a verbal prompt of "look". If the child didn't respond to either prompt, the experimenter pointed while saying "look". To determine the child's ability to initiate joint

attention the experimenter used bubbles.

INTERPRET: Response to joint attention was associated with significantly longer spontaneous expressive utterances; however, response to joint attention was not significantly related to the diversity of vocabulary displayed. Initiation of joint attention was not related to either MLU or TTR.

EVALUATE: The results should be interpreted with caution as the sample size was relatively small and language was based on only a 10 minute interaction segment.

Naoi, N., Tsuchiya, R., Yamamoto, J., & Nakamura, K. (2007). Functional training for initiating joint attention in children with autism. *Research in Developmental Disabilities, 29*, p.595-609.

DISCUSS: The purpose of this study was to examine controlling variables and the underlying initiation of joint attention deficits in children with autism. The researchers were interested in determining if adults play a motivating role in children's ability to attend to stimuli. A multiple-baseline design was used with three Japanese participants. Two of the participants were boys and one was a girl. All three students met current DSM-IV criteria for autism and had been diagnosed independent of the study. Two of the participants were seven years old; there other was just under 5. All participants had little spontaneous speech, unclear speech or intelligible speech. During baseline the experimenters determined each child's ability to initiate joint attention. The child was given the opportunity to engage in a preferred activity alone. A stimulus was presented on one side of a screen hiding it from view and the child was given 10 seconds to respond. Intervention took place in the same fashion that baseline took place. Child preferred materials were used and the child was again given 10 seconds to respond, getting an immediate response from the experimenter when they initiated a gaze shift or pointed. A 2-month follow up also occurred.

INTERPRET: The results found that none of the three participants were able to initiate joint attention during baseline within 10 seconds, however, with the onset of training (intervention) all participants showed increases in their initiations of joint attention.

EVALUATE: Direct training was not required to elicit pointing from all three children. One issue that should be considered is that some of the preferred activities used may not have been sufficiently motivating for the children to imitate joint attention. The study did find that, however, that children with autism were more likely to elicit joint attention behaviors to obtain preferred vs. non-preferred items. This study requires replication as the study sample size was small.

Smith, V., Mirenda, P., & Zaidman-Zait, A. (2007). Predictors of expressive vocabulary growth in children with autism. *Journal of Speech, Language and Hearing Research, 50*, 149-160.

DISCUSS: This study examined what leads to the prediction of expressive language and the variability within these predictions. Joint attention skills have shown to be related to language development. More advanced early language skills are often associated with more initiations of joint attention bids. Participants included 28 males and 7 females, for a total of 35 participants, ranging in age from 27 to 67 months. Participants had a baseline vocabulary of 60 words or less and had a diagnosis of Autism. Sixty-five percent of the participants were Caucasian, 25% were Asian and 10% were identified as "other". English was spoken in all of the homes, with 3 of the 35 participants having a first language other than English. The intervention procedure took place over 2 years, with the 1st three sessions every 6 months, & the 4th session taking place 12 months after the 3rd. Primary caregivers completed questionnaires including questions regarding joint attention. Cluster analysis was used to organize the data collected, ranging from slow to little improvement all the way to steady improvement.

INTERPRET: The two groups with the most rapid increase in language development over the course of two years had participants who were using some words at baseline. Similarly, chronological age was not correlated with language growth rate. Joint attention gestures were significantly related to the number of words produced over the span of two years.

EVALUATE: The results are consistent with previous studies identifying language development as a complex process, affected by many variables.

Whalen, C., & Schreibman, L. (2003). Joint attention training for children with autism using behavior medication procedures. *Journal of Child Psychology and Psychiatry, 44* (3), p. 456-468.

DISCUSS: This study assessed the social validity and generalization effects of teaching joint attention behaviors. The study design used was a single subject, multiple baseline design. The design had a 2-10 week baseline requirement, allowing the researchers to control for maturation. Participants consisted of 11 children; 6 with typical development and 5 with autism (around 4 years of age). Prior to treatment all children were administered standardized intelligence and language assessments. They also participated in an unstructured joint attention assessment where the experimenter observed the child for 30 minutes to measure unprompted joint attention. A structured laboratory observation (SLO) also took place, which was designed to determine generalization as this took place in a new setting, once with an experimenter and once with a caregiver. A structured joint attention assessment also took place where social behaviors were assessed. All assessments were repeated following intervention and again at a 3 month follow-up.

INTERPRET: Teaching children to respond to joint attention was effective for all participants and four out of the five participants learned to initiate joint attention. Results indicated that the children generalized their initiation to other settings, including with their parent.

EVALUATE: The results are important in defining how joint attention can be taught to children with ASD. The number of participants, however, is a limitation to the study.

Whalen, C., Schriebman, 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 Developmental Disorders 36*, p. 655-664.

DISCUSS: The purpose of this study was to determine if there are collateral changes in social communication skills when teaching joint attention skills. The specific collateral changes examined were: social initiations, positive affect, play, imitation, and language. A single subject, multiple baseline study was implemented. Baselines ranged from 2 weeks to 10 weeks, with the intervention taking approximately 10 weeks. Data was taken four times: baseline, treatment, post-treatment and 3-month follow up. There were 10 preschool aged children who participated in this study, four of them had autism and were participating in an EIP (Early Intervention Program). The CARS (Childhood Autism Rating Scale) was used to determine a diagnosis of autism. Of the four participants with autism, 3 were male and 1 female.

INTERPRET: At pre-treatment, none of the children with autism showed occurrences of social initiations. At post-treatment, all of the children exhibited social initiations, with two of the participants showing initiations at a level similar to that of children with typical development. Empathic responses also showed improvement for three of the four children. All four participants increased their imitation to 20%, from 0%-3% pre-treatment rates. All four participants also showed increases in spontaneous speech at post-treatment.

EVALUATE: Since this study used long baselines, it is more likely that the collateral changes were a result of intervention. This study provides additional support for joint attention training for children with autism

beyond achieving joint attention as language changes were also noted. The small sample size is a limitation as the participants might not be representative of the population; therefore, further research is needed in this area.