Implementing a Joint Attention Intervention by Siblings: Effects on Children with Autism Spectrum Disorder

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Abstract
The Purpose of this study was to explore the effect of implementing a joint attention intervention by siblings on children with autism spectrum disorder. Participants were ten children between the ages of five and seven who attended a school for children with developmental disabilities (Tarbya Fekrya). A pre post design was used to examine the effect of implementing a joint attention intervention by siblings on children with autism spectrum disorder. Findings from this study indicated the effectiveness of implementing a joint attention intervention by siblings on children with autism spectrum disorder. On the basis of the findings, the study advocated for the effectiveness of implementing a joint attention intervention by siblings on children with autism spectrum disorder.

Keywords : *Joint attention, siblings, children with autism disorder*

Introduction

Joint attention (JA) is the ability to share experiences and interests about objects and events with others. Whereas neurotypical children develop a range of verbal and nonverbal social communicative skills within the first 2 years of life, children with autism spectrum disorders (ASDs) present with delayed and atypical social development (Paparella, Stickles , Freeman,& Kasari ,2011). Children with ASD use less communicative gestures, such as pointing and showing, to establish a shared focus of attention. They are also less likely to spend time in joint engagement (JE) when a child and a social partner are involved with the same object or event. This is concerning as children who engage in more JA and JE may facilitate increased social learning opportunities for themselves. Further, JA skills and longer time in JE are linked to language acquisition, which in turn facilitates social skill development. Initiating skills are strongly related to spoken language development, responding to JA (eg, following another person's gaze to join their focus) predicts preschool children's language outcome 8 years later, and a summary variable of all JA gesture use (both initiating and responding) also predicts better social outcomes(Paparella&, Freeman , 2015).

Whalen and Schreibman (2003) examined the effects of a naturalistic behaviour modification procedure on the acquisition of responding and initiating joint attention. The study had eleven participants, five with an Autism diagnosis and 6 typically developing children all between the ages of two and five. In the study, they used pivotal response training and discrete trial training. Pivotal response training (PRT) is derived from applied behaviour analysis and focuses on core deficits and excesses of Autism which are considered pivotal areas (Burris 2009). PRT emphasises the child's motivation by providing choices of reinforcement, reinforcing attempts at responding and interspersing maintenance tasks. The reinforcers which are used are initially directly related to the task so the child can establish a link between the target behaviour and the reinforcer which leads to generalisation. Discrete trial training (DTT) has also been used. It involves the process of breaking a skill down into discrete components and using repeated trials until the skill is mastered. A discrete trial is a three term contingency, the delivery of a discriminative stimulus followed by a prompt if necessary which is faded over time and finally, a response. If the response is correct, there is a consequence which is planned to function as a reinforcer. If the response is incorrect a variety of procedures such as error correction to elicit the correct response are used (Burris 2009).

The training in Whalen and Schriebman's (2003) study included the use of pivotal response training techniques, turn taking and the use of high preference natural consequences as reinforcement. There were two main phases, responding to joint attention training and initiating joint attention training. The training procedure successfully taught all participants

the skills to initiate and respond to joint attention and this successfully generalized for all participants except one whose initiation skills did not generalize. It was found at follow up testing that there was a marked decrement in the initiation of joint attention skills. Whalen and Schreibman (2003) suggest that the decrease in the initiation skills could be due to parents having not known how to maintain the skills. The study provides evidence that joint attention skills can be taught by behavioral interventions to children with impaired joint attention.

Siblings are the most familiar peers to a child with autism, so it follows that they should also have the potential to elicit increases in social behavior from children withautism. According to DiSalvo and Oswald, "peer-mediated strategies typically involve the use of socially competent peers to model and reinforce appropriate social behavior" (2002). Because autism may have a partially genetic etiology, concerns have arisen that typical children may display similar delays to their autistic siblings. However, the literature suggests that most typical siblings show age-appropriate cognitive skills, language, and social engagement (Yirmiya, Gamliel, Shaked, & Sigman, 2006; Pilowsky, Yirmiya, Shalev, & Varda, 2003; Yirmiya et al., 2006) and that siblings of children with autism are less likely to be impaired than siblings of children with other developmental disabilities (Yirmiya, Gross-Tsur, & Shalev, 2006). Thus, many siblings of children with autism are potentially fine peer models.

Children with autism appear to find interactions with their siblings reinforcing, and are more likely to respond to them than to other children. A study of 30 sibling pairsfound that while children with autism engaged in fewer interactions than matched subjects with Down syndrome, they reliably reciprocated initiations made by typical siblings (Knott, Lewis, & Williams, 1995). The authors of a 1999 study observed children with autism playing with their parents and typical siblings (El-Ghoroury & Romanczyk, 1999). Although parents made significantly more attempts to interact with the children with autism, the children initiated more interactions with siblings than with their parents. Children with autism also tend to generalize peer-trained social skills to their typically developing siblings (Taylor, Levin, & Jasper, 1999).

Researchers have capitalized on the benefits of sibling interactions to teach children with autism a variety of social skills, including play, engagement, social initiation, social response, and joint attention (Jones & Schwartz, 2004; Reagon, Higbee, & Endicott, 2006; Tsao & Odom, 2006). These studies evidence not only the ability of children with autism to learn from their siblings, but the ability of the typical siblings to reliably implement social skills intervention techniques.

The purpose of the present study was to examine the effect of implementing a joint attention intervention by siblings on children with autism spectrum disorder. The primary research question was, what effects will implementing a joint attention intervention by siblings have on children with autism disorder?.

Methods

Participants

Participants were ten children between the ages of five and seven who attended a school for children with developmental disabilities (Tarbya Fekrya).All children attended the same classroom within the school. Parental informed consent forms were sent home by the school director and school psychologist to parents of potential participants telling them about the study and requesting them to give permission for their children to participate. Through a previous comprehensive psychological evaluation each targeted child had received a primary diagnosis of Autistic Disorder. All children were also capable of communication using speech

assessed through a combination of teacher report and observation. They were so-called high functioning.

Criteria for participation in the present study included: (1) A diagnosis of ASD from child psychologist based on The Scale for Screening Autism Disorder (Mohammed, 2003); (2) Deficits in Joint attention, as the aim of this study was to improve these deficits through the training program. Deficits in Joint attention were defined as an inability to intentionally communicate to direct another's attention to an object or event through gaze shifts, gestures or verbal communication.

Instruments

Teacher's rating of child's Joint Attention Scale (Mourad Ali, 2015). The test was developed to assess joint attention in children with autism disorder. The scale is a 3 point rating scale – Always (2), Sometimes (1) and Never (0). There are four domains in the *Teacher's rating of child's Joint Attention* Scale - they are Eye Contact(5 Items) , Gesturing (5 Items) , Follow the instructions (5 Items) , Initiating caressing/singing (5 items). Reliability and Validity of the scale was established and the final checklist consisted of 20 items.

Procedures

Screening: Participants were ten children between the ages of five and seven who attended a school for children with developmental disabilities (Tarbya Fekrya). Each child also had the following characteristics: : (1) A diagnosis of ASD from child psychologist based on The Scale for Screening Autism Disorder(Mohammed, 2003); (2) Deficits in Joint attention, as the aim of this study was to improve these deficits through the training program. (3) ability to read and comprehend words, and (4) ability to follow directions.

Pre-intervention testing: Teachers were asked to rate child's Joint attention on Teacher's rating of child's Joint Attention.

General Instructional Procedures: The program used in the current research in order to improve Joint attention in children with autism disorder depends on training in: visual communication, self-awareness, visual discrimination, assertiveness, discrimination forms, distinguish colors, and means of transportation. Children were seated at a table facing the experimenter on the other side of the table in a room with pictures on the wall and toys on a bookshelf behind the experimenter. Each toy was presented one at a time to the child to determine if and how the child requested items and to assess joint attention and turn taking.

Results

Joint Attention intervention and development of joint attention

The first objective of the study was to determine the effect of implementing a joint attention intervention by siblings on children with autism spectrum disorder, and if this would be more effective for the treatment group compared to the control group .For this purpose, the post intervention scores of both treatment and control groups were analyzed. Table 1 shows Z Value results for the differences in post- test mean rank scores between experimental and control groups in Social Skills Rating Scale. The table shows that (Z) values were (-2.235) for Eye Contact, (-2.531)for Gesturing, (-2.411) for Follow the instructions,(-2.601) for Initiating caressing/singing and (-2.68833) for the composite score. These values are significant at the level (0.01) in the favor of experimental group.

Table 1. *Z Values results for the differences in post- test mean rank scores between experimental and control groups in Teacher's rating of child's Joint Attention Scale*

Variables	Groups	N	Mean Ranks	Sum Ranks	Mann-Whitney	Z Value	Sig.
Eye Contact	Ex	5	8	40	Zero	-2.235	0.01
	Cont.	5	3	15			
Gesturing	Ex	5	8	40	Zero	-2.531	0.01
	Cont.	5	3	15			
Follow the instructions	Ex	5	8	40	Zero	-2.411	0.01
	Cont.	5	3	15			
Initiating caressing/singing	Ex	5	8	40	Zero	-2.601	0.01
	Cont.	5	3	15			
Composite	Ex	5	8	40	Zero	-2.633	0.01
	Cont.	5	3	15			

The second objective of the study was to determine the effect of joint attention intervention on improving joint attention in children with autism disorder. The children's performance on joint attention was measured pre and post intervention. Table 2. shows Z Value results for the differences in pre and post test mean rank scores for the experimental group in *Teacher's rating of child's Joint Attention Scale*. The table shows that (Z) values were(-2.312)for Eye Contact ,(-2.323)for Gesturing, (-2.432)for Follow the instructions, (-2.504)for Initiating caressing/singing and (-2.555)for the composite score. These values are significant at the level (0.01) .This indicates that use of Joint Attention intervention had a positive effect on improving Joint Attention in children with autism disorder.

Table 2. *Z Values results for the comparison of mean rank scores of experimental group at pre- and post-intervention in Teacher's rating of child's Joint Attention Scale*

Variables	Negative Ranks		Positive Ranks		Z Value	Sig.
	Mean	Sum	Mean	Sum		
Eye Contact	3	15	Zero	Zero	-2.312	0.01
Gesturing	3	15	Zero	Zero	-2.323	0.01
Follow the instructions	3	15	Zero	Zero	-2.432	0.01
Initiating caressing/singing	3	15	Zero	Zero	-2.504	0.01
Composite	3	15	Zero	Zero	-2.555	0.01

Discussion

The present study evaluated the effects implementing a joint attention intervention by siblings on children with autism spectrum disorder , and if this would be more effective for the treatment group compared to the control group. The results from this study indicated that as siblings are the most familiar peers to a child with ASD, they have the potential to evoke increases in social behavior from children with ASD. Training siblings as teachers may benefit the typical siblings as well as the children with ASD.

The results of this study suggest that a short-term behavioral intervention for teaching JA skills evoked meaningful change in the responding skills of children with ASD.

Additionally, results from this study supports other research studies which indicated that children with ASD are more likely to respond to their siblings than to other children and may find these interactions more reinforcing than interactions with parents or peers (Knott, Lewis, & Williams, 1995; El-Ghoroury & Romanczyk, 1999).

Limitations and Further Study

One limitation of the current study stems from the fact that the scope of the study is limited to the data collected from children with ASD. Hence, further research with larger and more demographically diverse populations with random selection would strengthen the findings of the study.

Secondly, it may be that the length of the intervention was not sufficient to see change large enough to be measured. Sheridan et al. (1996) suggested that the training used in that study (10 weeks long) possibly was too short to produce long-range effects. The present study also used brief training (6 weeks), as is often the case with interventions in the school setting.

References

Burris, H. (2009). *An Assessment of a Naturalistic In-home Training Protocol to Establish Joint Attention Responding with Children Diagnosed with Autism Spectrum Disorder* (Unpublished master's thesis). University of South Florida, South Florida.

DiSalvo, C. A., & Oswald, D. P. (2002). Peer-mediated interventions to increase the

social interaction of children with autism: Consideration of peer expectancies. *Focus on Autism and Other Developmental Disabilities, 17*(4), 198-207.

El-Ghoroury, N. H., & Romanczyk, R. G. (1999). Play interactions of family members towards children with autism. *Journal of Autism and Developmental Disorders, 29*(3), 249-258.

Knott, F., Lewis, C., & Williams, T. (1995). Sibling interaction of children with learning disabilities: A comparison of autism and Down's syndrome. *Journal of Child Psychology and Psychiatry, 36*(6), 965-976.

Jones, C. D., & Schwartz, I. S. (2004). Siblings, peers, and adults: Differential effects of models for children with autism. *Topics in Early Childhood Special Education, 24*(4), 187-198.

Paparella T, Stickles K, Freeman S, Kasari C. (2011)The emergence of joint attention and requesting skills in young children with autism. *Journal of Communication Disord*ers , 44:569–583.

Paparella T and Freeman SF(2015). Methods to improve joint attention in young children with autism: a review. *DovePress*, 65-78.

Pilowski, T., Tirmiya, N., Shalev, R. S., & Gross-Tsur, V. (2003). Language abilities of siblings of children with autism. *Journal of Child Psychology and Psychiatry, 44*(6), 914-925.

Reagon, K. A., Higbee, T. S., & Endicott, K. (2006). Teaching pretend play skills to a

student with autism using video modeling with a sibling as model and play partner. *Education and Treatment of Children, 29*(3), 517-528.

Taylor, B. A., Levin, L., & Jasper, S. (1999). Increasing play-related statements in children with autism toward their siblings: Effects of video modeling. *Journal of Developmental and Physical Disabilities, 11*(3), 253-264.

Tsao, L., & Odom, S. L. (2006). Sibling-mediated social interaction intervention for

young children with autism. *Topics in Early Childhood Special Education, 26*(2), 106-123.

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

Yirmiya, N., Gamliel, I., Pilowsky, T., Feldman, R., Baron-Cohen, S., & Sigman, M.

(2006). The development of siblings of children with autism at 4 and 14 months: Social engagement, communication, and cognition. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *47*(5), 511-523.

Yirmiya, N., Gamliel, I., Shaked, M., & Sigman, M. (2006). Cognitive and verbal abilities of 24- to 36-month old siblings of children with autism. *Journal of Autism and Developmental Disorders*, *1*(2).