

BAR-ILAN UNIVERSITY

The Contribution of Joint Attention Abilities to the
Development of Conversation Skills of Minimally
Verbal Children with Autism (MVCwA).

Avner Fraidlin

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Abstract

Background

Research on children diagnosed with Autism Spectrum Disorder (ASD) differentiates between children who develop speech and children who remain nonverbal or are minimally verbal (Minimally Verbal Children with ASD – MVCwA). Researchers estimate the percentage of MVCwA, who acquire less than 30 functional spoken words (Goods, Ishijima, Chang, & Kasari, 2012) is 25-30% of all children diagnosed with ASD (Rose, Trembath, Keen & Paynter, 2016). According to research, these children have a unique developmental and behavioral profile; they demonstrate low cognitive abilities and show low motivation to communicate (Lord, 2010), they score low in the Vineland Adaptive Behavior Scale – VABS (Perry, Flanagan, Dunn-Geier & Freeman, 2009; Lord, 2010), they struggle taking part in social play (Bopp and Miranda, 2010), they might be diagnosed with a comorbid diagnosis of Apraxia (Shriberg, 2010; Tager-Flusburg et al, 2005), they present high variability in their receptive language and their nonverbal cognitive skills (DiStefano, Shih, Kaiser, Landa, & Kasari, 2016), and their Joint Attention abilities are impaired (McDuffie, Yoder & Stone, 2005).

Joint Attention is the human ability to coordinate social attention; it refers to the individual's ability to share and merge his attention with another person's attention with respect to a third object or event in a manner that will allow adopting a shared point of reference (Mundy & Newell, 2007). Many of the human learning processes depend on the ability to pay attention to a shared point of reference. The development of these abilities, first in respect to objects and later on in respect to events and ideas is repeatedly demonstrated to relate to the development of language, cognition and the ability to interact with others and is related to the child's sense of belonging whether he

is diagnosed with ASD or typically developed (Mundy, 2016; Delgado, Pomares, Van Hecke, & Parlade, 2007).

Studies on children diagnosed with ASD have found deficits in joint attention skills and consider them to be one of the early markers of ASD (Naber et al., 2008; Morgan et al, 2003; Charman, 2003; Charman et al, 1997). Compared to other children, typically developed or diagnosed with other diagnosis, children with ASD lack the ability to shift their gaze from an object to a person or to use direction of gaze and gestures to direct the attention of others (Charman et al., 1997; Charman, 2003; Meind & Cannella- Malone, 2011) and they are less responsive to joint attention initiated by others (Loveland & Landry, 1986). Deficits in joint attention skills are a significant precursor to the child's capacity to social engagement with his peers and to prosocial behavior during elementary and secondary school years (Chang, Shih, & Kasari, 2016).

Intervention studies on MVCwA are sparse and only few interventions have successfully improved speech of MVCwA (Tager-Flusberg & Kasari, 2013; Wan et al., 2011). Despite the fact that MVCwA are at risk for low quality of life compared to children with ASD who are verbal, the research on this group of children is preliminary and more often than not these children are excluded from research aiming to develop and evaluate interventions (DiStefano et al., 2016; Almirall et al., 2016; Tager-Flusberg & Kasari, 2013).

In the current research we implemented an intervention aiming to promote the conversational skills of MVCwA. The intervention's main goal was to promote MVCwA's ability to develop and maintain social conversation interaction with their peers. In order to achieve this goal we sequentially taught individual sub goals: learning how to initiate a conversation, asking questions and making social statements,

answering questions and identifying when a conversation has ended, reaching for attention from peer in a socially acceptable manner and more.

The research goals were to examine: (1) the efficacy of intervention aiming to promote conversational skills of MVCwA, (2) the contribution of joint attention abilities to the progress made by children in the intervention group and (3) the correlation between verbal and nonverbal IQ and the progress made by children in intervention group. We hypothesized that: (1) children in the intervention group will show greater progress compared to children in the controlled delayed treatment group, (2) children with higher joint attention skills will show greater improvements in their conversational abilities compared to children with low joint attention skills and (3) a positive correlation will be found between verbal and nonverbal IQ and the progress made by children in the intervention group.

Method

Thirty six children participated in this study which was part of a more comprehensive study. Participants were randomly assigned to intervention and waitlist delayed treatment groups, the waitlist group received the intervention at the end of the study. Intervention was implemented in dyads of two MVASD who were matched on age and on their communication channel used (using spoken language, sign language or PECS). Inclusion criteria in this research were: (1) age range between 8-16, (2) a diagnosis of ASD based on the SCQ-Social Communication Questionnaire (Rutter, Bailey, & Lord, 2003), (3) using no more than 30 functional words spontaneously (Goods, Ishijima, Chang, & Kasari, 2012), (4) verbal IQ equals to or higher than 35 according to the Peabody Picture Vocabulary Test III (Dunn & Dunn, 1997) and (5) IQ corresponded with the high end of moderate intellectual disabilities based on the Raven Colored Progressive Matrices test (Raven, 1976).

The main goal of the intervention was to develop MVCwA's social conversation skills with peers. The intervention was implemented for four months, four times a week, and each lesson lasted an hour. Intervention took place in the children's schools and was executed by their teachers who were supervised by the research team, every two-weeks.

Tools

Intervention was measured using conversation observation: each participant was observed at the beginning and at the end of the study during a six minutes conversation with a peer. The observation was coded using social conversation interaction coding scale (Capps, Kehres, & Sigman, 1998) that was adapted to the participant's characteristics. A seconded observation was conducted at the beginning of the study to evaluate participant's joint attention abilities. This observation was based on the Autism Diagnostic Observation Schedule - ADOS (Lord et al., 2000).

Results

In line with the first hypothesis participants from the intervention group showed a significant progress compared to participants from the waitlist group. Findings indicated an increase in number of relevant behaviors used during conversation with an adult and with a peer and an increase in number of words used during conversation with peers. In addition, an increase in the number of initiations towards peers was evident while a decrease in the number of self-stimulatory behaviors was shown. Also, an improvement in the ability to hold and maintain conversation was evident among participants from the intervention group. No improvement was found in other social behaviors such as eye contact, social smile or communicative gestures.

Findings for the second hypothesis indicate that improvement was found among participants from the intervention group, with both high levels of joint attention abilities

(HJAA), and low levels of joint attention abilities (LJAA), In regards to initiating joint attention ability, more substantial findings were found among participants with LJAA; an improvement was found in the number of relevant behaviors used towards adult and peers during conversation, as well as an improvement in the number of communicative initiations towards peers and an improvement in social smile toward peers. In addition, an improvement was evident in their ability to hold and maintain conversation while a decrease in the number of self-stimulatory behaviors was observed. Among participants with HJAA improvement was found in social smile towards peers and in the ability to hold and maintain a conversation.

In regards to responding to joint attention ability, among participants from the intervention group, improvement was observed among participants with both HJAA and LJAA. An increase among participants with HJAA was shown in the number of relevant behaviors used during conversation with an adult and in social smile towards an adult. In addition, an increase was observed in the number of words used during conversation with an adult and the number of communicative initiations towards peers. Among participants with LJAA from the intervention group, an increase was found in the number of relevant behaviors used during conversation both with adult in addition to an increase in the ability to hold and maintain conversation and a decrease in the number of self-stimulatory behaviors exhibited during conversation.

The third hypothesis was only partially confirmed, a single finding supported the hypothesis; a positive correlation was found between verbal IQ and social smile towards adult and peers among participants from the intervention group.

The current research is a pioneering research aiming to evaluate the effect of an intervention on MVCwA targeting their ability to engage in a social conversation with their peers. Despite the significant difficulties this group of children exhibit, only few

studies aimed at promoting these children's social conversation abilities and non of them aimed at increasing social conversation with peers. The efficacy of the intervention found in current study demonstrates that low functioning children with ASD can benefit from intervention adjusted to their profile and needs.

The hypothesis regarding the promotion of conversational abilities of MVCwA were partially confirmed; findings show improvement in social behaviors such a the use of more relevant social behavior during conversation, number of communicative initiations, number of words used as well as an increase in the general ability to hold and maintain conversation and a decrease in the self-stimulatory behaviors. Joint attention abilities were found to be correlated with improvement in social conversational skill; participants with HJAA demonstrated improvement in measures such as communicative initiations, social smile and number of relevant behaviors and number of words used during conversation as well as improvement in the general ability to maintain a conversation, improvement was evident among participants with LJAA as well. Findings in this research were not in line with the hypothesis regarding correlation between IQ and improvement in conversational skills.

The partial confirmation of the research hypothesis demonstrates the complexity of MVCwA, and the need to develop screening tools which will be sensitive to the complexity and highly heterogenic profile of MVCwA. We attribute the partial confirmation of the research hypothesis to specific characteristics of the intervention program (e.g. intensity and duration of the intervention and the lack of generality) and to the complexity of this group of children. Despite these limitations and in light with intervention's effectiveness, it is of utmost significance to conduct similar research in order to promote MVCwA's ability to engage in a social conversational communication and by doing so improving the quality of their and their familie's lives.