

**BAR-ILAN UNIVERSITY**

**Emotional Expressiveness in Minimally Verbal  
Children with Autism Spectrum Disorder during  
Collaborative Interactive-Activity**

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## **Abstract**

**Background** Emotional expressiveness (EE) plays a critical role during the interpersonal communication process by delivering communicational cues between partners (Izard & Dougherty 1982), by exchanging socio-emotional information and exposing the other participants feelings and intentions during social situation (Beeger, Koot, Rieffe, Terwogt & Stegge, 2008) and by reflecting emotional states via facial, vocal and postural expression channels (Ackerman, Abe & Izard, 1998). Children with Autism (Autism Spectrum Disorder - ASD) express their emotions as frequent as typically developing children (TD), although they present more neutral, negative and mixed emotions (e.g. sad and happy expressions in parallel) and less positive emotions (Yirmiya, Kasari, Sigman & Mundy, 1989) and use non communicational EE channels that do not correlate with the social context (McGee, Feldman & Chernin, 1991, Bishop & Lahvis, 2011). Minimal Verbal Children with Autism (MVCwA) are characterized by severe social-communicative ASD symptoms (Lidstone, Fernyhough, Meins, & Whitehouse, 2009) and use a narrow range of verbal expressions ranging from vocal expressions to 0-30 spontaneous words in order to communicate (Tager-Flusberg & Kasari, 2013).

**Study Objectives and Hypotheses** Social-communicational impairment, limited use of verbal expressions and frequent use of nonverbal expression channels characterizing MVCwA have an impact on their EE during social interactions (Kasari & Sigman, 1996, Denham, 1998, Saarni, 1999) Yet only few studies have examined it in the recent years (Kasari, Brady, Lord & Tager-Flusberg, 2013) mainly among toddlers,

in a constructed social interaction with an adult partner and in comparison with TD children.

Evaluating the EE of MVCwA during a collaborative interactive activity with an adult and a peer partner may contribute to the investigation of MVCwA as an ASD sub etiology and aid in the design and development of an intervention enabling MVCwA EE adaptation during social interaction. The current study is distinctive in its examination of MVCwA EE during interaction with an adult and a peer partner in a social collaborative context. It aims to examine the difference between MVCwA EE during interaction with an adult partner as opposed to a peer partner and the linkage between the participants' EE and their autistic impairment severity, social impairment severity, chronological age (CA) and verbal and non- verbal cognition abilities (IQ).

The first hypothesis was that the participants' EE frequency will be significantly higher during a functional (needs satisfying) oriented interaction with an adult partner rather than a non-social oriented interaction with a peer partner and that the participants will present more negative and mixed emotions than positive emotions. The second and third hypothesis was that younger participants with lower Autistic impairment severity and social impairment severity will demonstrate higher EE frequency and the fourth hypothesis was that participants with higher verbal and non-verbal cognitive abilities will demonstrate higher EE frequency during collaborative interaction with an adult and a peer partner.

**Method** This study was part of a broader research investigating the joint attention, pragmatic and collaborative abilities in 54 MVCwA participants age 8-16. The participants' background criteria (autistic impairment severity, social impairment

severity, chronological age, verbal and non-verbal cognition abilities) were examined prior to the study.

The participants' EE was videotaped during the execution of three different collaborative interactive assignments (carrying a tray with glasses, pulling a ring through a rope and bouncing a ball on a trampoline) with an adult and a peer partner in their school. The interactions were coded by two special education professionals with the use of an EE coding scale (MVEES), specially created for the current study.

**Results** The results demonstrated the expression of only few clear positive and negative emotions as opposed to 24 varied mixed emotions, mainly through 2-3 EE channels (facial expression, vocalization and gestures) in parallel. As per the first study hypothesis, the participants' EE was significantly higher during interaction with the adult partner as opposed to the peer partner, especially non-communicatively. The significant high frequency presentation of positive and mixed emotions as opposed to negative emotions coincided partially with the first hypothesis. In addition, significant differences in the participants' EE were found between the rope and ball assignments and the tray assignment. As per the second study hypothesis, a negative significant correlation was found between the participants' autistic impairment severity to their positive EE during interaction with a peer partner and their negative EE during interaction with an adult partner, in which participants with lower autistic impairment severity presented positive and negative emotions in higher frequency. The positive significant correlation between the participants' autistic impairment severity to their mixed EE did not coincide with the study Second hypothesis. Even so, it strengthens the correlation between MVCwA autistic impairment severity and their defective EE presentation.

As per the second study hypothesis, a negative significant correlation was found between the participants' social impairment severity and their positive EE frequency during interaction with a peer partner and negative and mixed EE frequency during interaction with an adult partner. The positive significant correlation between the participants' social impairment severity and their negative and mixed EE during interaction with a peer partner did not coincide with the study's second hypothesis. Together with the previous finding it demonstrates the weak correlation between MVCwA social impairment severity and their mixed EE and emphasizes their defective EE presentation. Per the third and fourth study hypothesis, the correlation between the participants' EE frequency and their CA and verbal cognitive ability was weak. However, a positive significant correlation between the participants' non-verbal cognitive abilities and their mixed EE was found, in which participants with higher non-verbal cognitive abilities presented higher frequency of mixed EE during interaction with an adult and peer partners.

**Conclusions** The current study initially examined the EE of MVCwA during collaborative interaction with an adult and a peer partner and the linkage between MVCwA EE and their characteristics as an ASD sub etiology (e.g. the narrow use of the verbal channel as opposed to the extensive use of the non-verbal channel, the higher autistic impairment severity and the wide range of cognitive abilities). It indicates that the idiosyncrasy of MVCwA abnormal EE is demonstrated in their frequented use of various nonverbal expression channels and their wide range and highly frequent presentation of mixed EE, especially non-communicatively.

For future studies, we suggest examining MVCwA EE following the implantation of an EE intervention in their educational setting and the differences and similarities in EE between MVCwA and children with an intellectual disability (ID) matching with CA and IQ, and TD children matching with CA, during social interaction with peer partners.

According to the study findings, the high frequency positive EE MVCwA present during interaction with a peer partner, amplifies the need to develop a constructed intervention that promotes collaborative interaction between MVCwA and peer partners and encourages their mutual enjoyment and synchronization with others.