



Gesture Use in Children with Autism Spectrum Disorder

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In last month's *WigWag Minute*, I wrote about gestures, and about how examining children's gesture use can help us identify their risk for ongoing language delay, as well as inform our intervention. I reviewed the typical development of gestures, as well as the different ways gestures predict the emergence of specific language constructions.

Typical Gesture Development

- **deictic gestures (10 months)** - drawing attention to an object or event in the child's immediate environment (e.g. showing, giving, pointing)
- **ritualized requests (9-13 months)** – requesting by reaching with an open and closed grasping motion, putting an adult's hand on an object, or pulling an adult's hand towards a desired item
- **play schemes (12 months)** – actions carried out on an object that demonstrate the object's function (e.g. drinking out of a toy cup)
- **iconic gestures (develop before a child has acquired 25 words)** – illustrating an aspect of the item or action they represent (e.g. blowing to indicate bubbles, flapping one's arms to represent a bird). Some iconic gestures are culturally defined, such as waving to greet.
- **gesture + speech combinations (18 months)** – children first produce complementary gestures, which contain information that complements the spoken message (e.g. point to a dog and say "dog"). Soon after, children produce supplementary gestures, which provide additional information to the spoken message (e.g. pointing to a dog and saying "big").

(Capone & McGregor, 2004; Goldin-Meadow, 2015)

But does this information apply to children with Autism Spectrum Disorder (ASD)? Our knowledge about gestures in typically-developing and language-delayed children may not apply to our work with young children with ASD. Deficits in nonverbal communicative behaviours are part of the new DSM-V criteria for ASD, and this includes a child's understanding and use of gestures (Autism Speaks, n.d.). Despite this, however, "the literature on gestures in autism remains scarce and contradictory" (Mastrogriuseppe, Capirci, Cuva & Venuti, 2015, p. 469).

Italian researchers from the University of Trento sought to better understand the gesture development in young children with ASD in a recent study. Mastrogiuseppe et al (2015) compared the gestures used by 20 children with ASD with those used by 20 children with Down's syndrome and 20 typically developing children. Their results provide some interesting information that can guide our assessment of gestural development in children with ASD.

Study Design

Mastrogiuseppe et al (2015) explain that most studies regarding gesture use in children with ASD have looked at school-age children or have used retrospective home video analysis. Research has looked at overall gesture production or focused on pointing, but little is known about different gesture functions and types. Moreover, most studies have not analyzed gestures in naturalistic contexts.

Therefore, Mastrogiuseppe et al aimed to document the total number of gestures as well as specific gesture types used by children with ASD during naturalistic interactions with their mothers. By comparing this information with gesture use by children with Down's Syndrome and typically-developing children, a specific ASD gesture profile could be determined.

The children were matched according to developmental age, so all children in the study were at approximately a 24 month old developmental level. The mean chronological age of the typically developing children was 25 months, the mean age of the children with Down's Syndrome was 40 months, and the mean age of the children with ASD was 41 months.

Data about the children's gesture use was collected and videotaped during 10-minute play sessions with their mothers, during which the mothers were instructed to play as they would do at home. All gestures produced by the children were coded and categorized.

Results

When the researchers compared the gesture use among the three groups of children, they noticed a specific profile of gestural behaviour in the children with ASD.

Compared to the other two groups, children with ASD:

- **produced a lower total number of gestures** – this result was consistent with previous studies
- **used fewer “conventional-interactive gestures”** – these are iconic gestures that are culturally defined and arbitrarily related to their meaning, such as waving or nodding one's head for “yes”

- **produced significantly fewer pointing gestures and showing gestures** – while previous research has used structured interaction contexts, this study demonstrated that children with ASD use fewer showing gestures during naturalistic interactions
- **used a significantly higher proportion of ritualized requests**
- **produced fewer “nominal/partner” gestures** – nominal gestures are made with the object or referent in hand, and provide a label for the object. Nominal/partner gestures involve the ability to engage a partner in play, when the child performs an action on the partner’s body (e.g. child brings a toy apple to her mother’s mouth to let her eat). The authors also examined the children’s use of “nominal/onself” gestures (e.g. child drinks from a cup herself) and “nominal/object” gestures (e.g. child brings a toy apple to a doll’s mouth to eat), and found no differences between the three groups of children.
- **produced “instrumental gestures”** – these are contact gestures where the child directly manipulates the partner’s hand/body and uses it as a tool (e.g. place mother’s hand on a container the child wants to open). The authors found that the other two groups of children did not produce instrumental gestures.

Mastrogiuseppe et al (2015) also looked for correlations between gestural production and cognitive development (assessed via the GMDS; Griffiths, 1996) and autism severity (on the ADOS; Lord, Rutter, DiLavore, et al, 2002) for the children with ASD. They found:

- **a positive correlation between the Practical Reasoning subscale on the GMDS and ideative gestures** – ideative gestures are iconic gestures, including those that resemble the referent (flapping arms to represent a bird) and conventional-interactive gestures that are arbitrarily related to their meaning.
- **negative correlations were found between scores on the Language and Interactional subscales of the ADOS and ideative gestures** – a negative correlation means that there is an inverse relationship between two variables (when one is high, the other is low). A high score on the ADOS indicates more impairment/poor functioning. Therefore, this results indicates that higher scores (more impairment) on this ADOS subscale was related to lower production of ideative gestures.
- **a negative correlation between nominal/object gestures and the Language and Interactional subscales and the Language subscale of the ADOS** – again, this was an inverse relationship. Children who showed marked impairment (higher scores) on these subscales of the ADOS were also more impaired (lower production) in their use of nominal/object gestures.

These findings suggest a “casual relation between linguistic and social interactional skills and the production of ideative and nominal gestures” (Mastrogiuseppe et al, 2015, p. 478)

Another interesting finding included:

- **children with Down’s Syndrome produced *more showing gestures than children with TD*** – the authors hypothesize that the older chronological age of the children with Down’s Syndrome may have contributed to this result

What Does This All Mean?

Taken together, these results outline a profile of gesture use in young children with ASD that is distinct from typically developing children and children with Down’s Syndrome. Despite the fact that all of the children in this study were at roughly the same developmental age, they were not using the same types of gestures or using gestures with the same frequency. This points to a disordered profile versus just a delayed use of gestures in children with ASD.

Mastrogiuseppe et al (2015) explain that:

“the assessment of gestures would be a useful tool for therapists and educators of children with ASD, as it stands to improve clinical practice in assessments and interventions for children...” (p. 478).

Furthermore, they highlight that research has shown that some children with ASD can learn to produce gestures and that this can have collateral gains in social communication skills (Whalen, Schreibman & Ingersoll, 2006). However, they also point out that not all children with ASD benefit from gesture training, and the reason for this variability remains unknown.

While the verdict may still be out about intervening in this area, what we can take away from this research is a gestural profile that is specific to children with ASD. Specifically, if we assess children who...

- produce few gestures overall
- use contact (“instrumental”) gestures and ritualized requests
- produce few conventional-interactive gestures (e.g. waving, nodding head, etc), nominal/partner gestures (e.g. feeding mom with a toy cup), pointing or showing

...we should suspect ASD. This may be particularly helpful information when observing nonverbal children who are difficult to assess.

References

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