



## Delayed or Disordered? A Look At Early Nonverbal Communication Skills in Autism

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It's well known that children with autism have difficulty with nonverbal communication. The Diagnostic and Statistical Manual of Mental Disorders (DSM IV) criteria for autism under "social impairment" states:

"marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction" (American Psychiatric Association, 2000, p. 70)

We know that we need to target these nonverbal skills in our intervention with young children with autism, but how much do we really know about the development of these skills, and do we know which skills to target first? Do nonverbal skills in children with autism develop in the same sequence as they do in typically developing children, but just take longer to develop? Or do they develop in an altogether different order?

If you are unsure, you are not alone. To date, the research has been somewhat inconclusive about the developmental sequence and timing of these gestures in children with autism, and how this development differs from typical development (Paparella, Stickles Goods, Freeman & Kasari, 2011). Knowing the answers to these types of questions can certainly inform SLPs treatment of children with autism. Read on as the answers are revealed, based on a recent article "The emergence of nonverbal joint attention and requesting skills in young children with autism" (Paparella *et al.*, 2011).

## Nonverbal Social Communication Skills in Typical Development

Paparella et al (2011) begin their article with a summary of the development of nonverbal social communication skills in typical development. They provide a sequence and timeline for the emergence of:

- **nonverbal requesting gestures** – these gestures are meant to elicit help, attain an object, or receive assistance in manipulating objects. Examples include reaching, giving, and pointing
- **nonverbal joint attention gestures** – these gestures are used to share interest with another person about an object or an event. Examples include coordinated looks, following gaze, following a point, showing, and pointing.

In typical development, these skills emerge in the following order:

- **Coordinated joint looks: 6 months.** This skill has three steps, and is initiated by the child. The child either looks at an object, then a person, then back to the object, or he looks at a person, an object, and then back to the person. Coordinated joint looks become more intentional around 12 months of age
- **Showing: 10 months** (holding up an object to show it to someone)
- **Following gaze: 12 months** (following someone's gaze to a nearby item or person)
- **Reaching for and giving items in order to request: 13 months.**
- **Following a point: 14 months** (looking in the direction of someone's pointed finger)
- **Pointing with clear communicative intent: 16 months.** Paparella *et al.* (2011) explain that when pointing emerges, it is used for both requesting and joint attention in typical development.

By the time typically-developing children are 20 months of age, they are using a variety of nonverbal means for sharing attention and for requesting.

## Nonverbal Social Communication Skills in Autism

As the studies to date regarding the development of nonverbal social communication skills in autism have been inconclusive, Paparella *et al.* (2011) tried to answer the following questions:

- Do children with autism develop nonverbal joint attention and requesting skills later than children do in typical development but in the same order?
- Do children with autism develop nonverbal joint attention and requesting skills in a different sequence than in typical development?

To answer these questions, they did two studies:

- **Study 1**  
A group of children with autism and a group of typically-developing children at

different stages of language development were studied to determine the timing and order of emergence of nonverbal joint attention and requesting skills.

- **Study 2**

The model of skill emergence which the authors developed in the first study was tested against a different sample of children with autism, using longitudinal data.

## Study 1

Paparella *et al.* studied 35 children with autism (ages 36-72 months) and 18 typically-developing children (ages 20-52 months), who were matched according to expressive language age (ELA). Children were divided according to the following four groups:

- group 1: ELA between 12-20 months
- group 2: ELA between 21-30 months
- group 3: ELA between 31-46 months
- group 4: ELA between 47-64 months

## *Nonverbal Joint Attention Results*

The frequency of five nonverbal joint attention skills was calculated for all of the children in each expressive language age (ELA) group. When at least one third of the children in an ELA group demonstrated a skill (at least once), that skill was considered to be “emerged” at that ELA range. These criteria were used for both the children with autism and the typically-developing children.

The following sequence and timing were observed for joint attention skills (this chart is adapted from Paparella *et al.*, 2011):

<u>ELA</u>	<u>Typically-Developing Children</u>	<u>Children with Autism</u>
Under 20 months	<ul style="list-style-type: none"> <li>- coordinated looks</li> <li>- show (hold up object to show it)</li> <li>- follow gaze</li> <li>- follow point</li> <li>- point (to initiate joint attention)</li> </ul>	<ul style="list-style-type: none"> <li>- coordinated looks</li> <li>- follow point</li> </ul>
Over 20 months		<ul style="list-style-type: none"> <li>- point (to initiative join attention)</li> <li>- show (hold up object to show it)</li> </ul>
Over 46 months		<ul style="list-style-type: none"> <li>- follow gaze</li> </ul>

Paparella *et al.* (2011) found that their data supported the existing literature about the timing and sequence of emergence of nonverbal joint attention skills in typically-developing children. In the autism group, nonverbal joint attention skills emerged both

**later and in a different order** than in typical development. While children with autism demonstrated coordinated looks and followed a point at similar expressive language ages as in typical development (under 20 months ELA), other joint attention skills emerged at later expressive language ages. In terms of the order of emergence, coordinated looks emerged first in both groups of children (TD and autism), but the rest of the nonverbal joint attention skills emerged in a different order in the children with autism than what is seen in typical development.

### *Nonverbal Requesting Results*

The frequency of three nonverbal requesting gestures was calculated for all of the children in each ELA group. The following sequence and timing were observed (this chart is adapted from Paparella *et al.*, 2011):

<u>ELA</u>	<u>Typically-Developing Children</u>	<u>Children with Autism</u>
Under 20 months	- reach - give - point	- reach - give
Over 20 months		- point

The **same order of emergence** was observed in the children with autism and in the typically-developing children (reach -> give -> point). In terms of timing, Paparella *et al.* found that while reaching and giving emerged by 20 months ELA in the children with autism (as in typical development), **pointing emerged at a later ELA** than in typical development (after 20 months ELA).

### Study 2

Hoping to confirm the developmental order and timing that was observed in Study 1, Paparella *et al.* studied fifteen different children with autism four times over a one-year period in Study 2. The children's nonverbal joint attention and requesting skills were examined in relation to their ELA at each of the four sessions. The same ELA groupings were used as in Study 1 (12-20 months, 21-30 months, 31-46 months, and 47-64 months).

Paparella *et al.* found that overall, the profiles of this second group of children mapped onto the order they proposed in Study 1. However, there were a few anomalies:

- **absent or infrequent use of skills** - some children never displayed a skill, or displayed advanced skills only once and in an atypical order. For example, two children (one at ELA 16 months, and the other at ELA 18 months) followed another's gaze much earlier than expected. However, these two children only

demonstrated this skill once. Paparella *et al.* suggest that motivation and engagement could be factors that might explain these anomalies (the children may have the capability of using these skills but are not motivated to use them)

- **emergence of pointing** - in study 1, pointing (both to request and to initiate joint attention) emerged after an ELA of 20 months. However, in Study 2, five children displayed both forms of pointing before 20 months ELA. Some of these children pointed just before entering into ELA Group 2 (21-30 months). Paparella *et al.* propose that the development of pointing may precede development in expressive language at this stage. Furthermore, they explain that it remains unclear if an ELA of 20 months can be used as a developmental marker for the emergence of pointing.

## Putting This All Together

Paparella *et al.* provide the following interpretation of their findings from both studies:

- **Nonverbal joint attention skills emerge in an atypical order in children with autism** - the atypical sequence is: coordinated looks, follow point, point, show, follow gaze
- **Nonverbal requesting skills emerge in an order that mirrors typical development** - the sequence is: reach, give, point
- **The nonverbal joint attention skills of *showing* and *gaze following* are significantly impaired in children with autism, as they emerged notably later than expected.**
  - Showing only appeared in about half of the children over 20 months ELA (in both samples of children). Many children didn't demonstrate showing at all, even after an ELA of 30 months.
  - Gaze following was rarely demonstrated in either sample of children with autism. Paparella *et al.* explain that gaze following is a skill that requires a keen awareness of others and the ability to shift attention. Furthermore, they point out that children with autism have been found to focus more on people's mouths than on their eyes. These factors likely contribute to the difficulty children with autism have when it comes to following others' gaze.
- **When pointing emerges, children use it to both request and to initiate joint attention** - there are social aspects to both forms of pointing, which could account for the fact that they emerge around the same time. Paparella *et al.* explain: "a joint attention point lends itself to social cognition, whereas receiving social help motivates a requesting point" (Paparella *et al.*, 2011, p. 580).
- **All forms of joint attention and requesting do emerge in children with autism, but they may appear much later than in typical development** - even children at the earliest expressive language ages demonstrated basic levels of joint attention (coordinated looks).
- **An ELA of 20 months seems to be necessary for the development of many nonverbal communication skills in Autism** - therefore, children with Autism who

are at early stages of development (below 20 months ELA) may not develop certain joint attention skills, such as pointing, showing, and following gaze.

- **Some responsive joint attention skills emerge *after* joint attention skills for initiating have emerged** - a hypothesis posed in some of the autism literature suggests that responsive joint attention skills (e.g. following a point, following gaze) emerge *before* the joint attention skills for initiating (e.g. coordinated looks, pointing, showing). However, this was not supported by the above findings from Paparella *et al.* Instead, the responsive skill of **following gaze** emerged later than the joint attention skills for initiating.
- **Requesting gestures are affected in children with autism, but less so than joint attention skills** - while some literature has suggested that requesting gestures are unaffected in autism, this was not supported by the findings from Paparella *et al.*, as pointing emerged quite late. However, the authors point out that their findings support the notion that requesting skills are less impaired than joint attention skills in autism.

## Implications for Intervention

Based on the findings of Paparella *et al.* (2011), here are some suggestions for targeting nonverbal joint attention and requesting skills with children with autism:

- **Nonverbal requesting skills:** since these skills are delayed but emerge in a typical order, target requesting gestures according to a typical model of development (reaching, giving, pointing).
- **Nonverbal joint attention skills:** it may be more appropriate to target these skills according to the atypical sequence observed by *Paparella et al.*: coordinated looks, following a point, pointing, showing, following gaze.
- **Pointing:** when pointing emerged in children with autism, it was used for both requesting and joint attention. Therefore, keep this in mind when setting up situations to encourage pointing.
- **Showing and Following Gaze:** these skills are particularly challenging for children with autism, and may require more intensive intervention.
- **Child's ELA:** Several of the nonverbal joint attention skills emerged after an expressive language age of 20 months (e.g. pointing, showing, following gaze), and most children developed pointing for requests after an ELA of 20 months. Therefore, for children with autism at earlier stages of development (ELA under 20 months), it may be unreasonable to expect some of these later-emerging skills. SLPs should target earlier developing skills such as coordinated looks, following points, or reaching/giving for requests may be more appropriate. Working on following gaze becomes more appropriate for children who are verbal and higher functioning.

For information about how to target early nonverbal joint attention and requesting skills, you may be interested in the Hanen e-Seminar, "Starting Early... Red Flags and Treatment Tips for Toddlers on the Autism Spectrum". During this e-Seminar, there is a discussion about early gestures in Autism Spectrum Disorder, and how to target pointing and

following a point using strategies from the More Than Words® Program.

[Learn more about "Starting Early... Red Flags and Treatment Tips for Toddlers on the Autism Spectrum"](#)

## *References*

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR: Fourth Edition* (Text Revision). Washington, DC: American Psychiatric Publishing.

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