



## Developmental trajectory of children with autism

Are children with autism different in their early development from typically developing (TD) children? How do they progress as they get older? These are important questions because their answers can inform us about early signs of autism and planning intervention.

The insight into the developmental trajectory of children with autism has been gained by:

1. Prospectively studying, from birth onwards, the development of children who are considered to be at **high risk of autism** i.e. those who have a sibling with autism (the HR group), of whom about 20% may meet criteria for ASD by their third birthday<sup>i</sup>.
2. Getting retrospective information about the early development of a child with autism from parents either verbally or by home video analysis.

The following is a brief overview of these studies<sup>ii,iii</sup>:

Most, but not all, children with autism develop normally till the age of about 6 months. Generally, no social communication or behavioural markers differentiates between the typically developing children and those with autism during the first six months of life<sup>iv,v,vi,vii</sup>.

At some point between 6 and 24 months most children with autism begin to show a different developmental trajectory from typically developing children. Although there is a huge variation in how children with autism develop, there are some general points worth noting:

- Early differences are seen mainly in social communication behaviour and language development. Many children also show difference in non-verbal development, self-regulation behaviour and, some distinct but less discriminant differences, in motor development.
- There appears to be three types of onset of autism spectrum disorders:
  1. Early onset: here the differences are apparent from early infancy - 6 to 18 months.
  2. Plateauing of development: this is the most common type of onset; from about 6 months of age the child stops progressing, or shows very marked slowing down of development, in social communication behaviour and language skills.
  3. **Developmental regression**: this is reported in about 1/3<sup>rd</sup> of children with autism; it generally occurs in the second year, most commonly between 19 to 21 months. The child, who is reported to be developing typically up to that point, begins to lose language and social gained earlier, such as social eye contact, social smile, joint attention or use of words and gestures.





- It is very likely that the other early features of development in autism e.g. **excessive crying**, **sleeping problems**, **feeding problems** and **unusual movement patterns/motor delay** are similar to those seen in other developmental disorders, delays and variations and only become differentiated from such conditions and variations with age. Such early variations may indicate a general vulnerability of development, but their specific nature is not apparent till later.

## Early Developmental Pathway Differences: autism and typical development

### 1. SOCIAL INTERACTION

Domain of development	Typical development	Autism
Social interaction: initiation of interaction	<p>6 weeks: social smile in response; initiates with a smile from 3 months. Uses other communicative and social cues to interact.</p> <p>8-10 months: pointing and showing with gaze alternation</p> <p>From 9 months: eye contact combines with pointing and vocalisation to show – joint attention</p> <p>From 9 months: social games such as peek-a-boo</p> <p>From 12 months playing alongside other children – parallel play</p>	<p>Mostly similar social smile and communicative and emotional cues are present up to 6 months.</p> <p>Infant with autism is less likely to point or show at 12 months</p> <p>Limited switching of eye contact between person to person or person-object-person (gaze alternation) at 14 months.</p> <p>Limited or no use of the combined eye contact, pointing and vocalisation between 15 and 24months.</p>
Response to social interaction	<p>Imitating facial movements from soon after birth.</p> <p>6 weeks onwards: smiling to social cues such as a smile.</p> <p>The ability to follow other person's attention based on cues such as where the person is looking at or pointing to improves in quality and frequency and becomes very precise by 9-10 months.</p> <p>Understands emotional content in the mother's voice e.g. 'no' by 6-9 months.</p>	<p>Similar response to facial movement and social smile, and similar response to face and eye movements up to 6 months.</p> <p>Reduced social smile, attentiveness to the mother and looking at other's face by 12 months.</p> <p>Decrease in vocalisation directed to others.</p> <p>Lower shared positive affect at 12 months.</p> <p>The deficit in responding to other's referential cues e.g. eye pointing and gestures occurs early in the second year.</p>

### 2. LANGUAGE





Domain of development	Typical development	Autism
Understanding	<p>Shows preference for the mother's voice at birth.</p> <p>Understanding of words grows rapidly from a few highly familiar words at 6-9 months to a 100+ words at 16 months.</p> <p>At 18 months children can show an object when named e.g. "show me the cup/ball/spoon".</p> <p>Between 18 to 24 months they understand sentences with two key words e.g. "get your <u>cup</u> from the <u>bag</u>."</p> <p>Between 24 and 30 months children recognise objects by their function e.g. "which one do we drink from".</p>	<p>Mostly similar ability in understanding familiar words before 12 months but reduced understanding of words after that<sup>viii</sup>.</p> <p>Decreased understanding of single words by 18 months.</p> <p>Decreased understanding of 2-3 word phrases by 2 years.</p>
Expression	<p>Cooing at 6 weeks</p> <p>Sound play 4-7 months</p> <p>Babbling 6-9 months</p> <p>Using jargon (word like sounds) 10-14 months</p> <p>First word 12 months</p> <p>50+ words 18 months</p>	<p>Delayed production of first word. Unusual intonation is often present by 2 years, but may be present by 12 months<sup>x</sup>.</p> <p>[There is a high level of variability in language development in ASD and better language production is at times a predictor of a better outcome]</p>

### 3. RESTRICTIVE AND REPETITIVE BEHAVIOURS (RRB)

Typical development	Autism
<p><b>Repetitive motor behaviours are common in typical development, but generally decrease through the first years of life<sup>x</sup>.</b></p> <p><b>Rituals, habits and compulsions increase between age one and two years and decrease again after age four<sup>xi</sup></b></p>	<p>RRB can be hard to distinguish from typically developing infant in the first 18 months<sup>xii</sup>.</p> <p>A higher level of repetitive play behaviour is seen at age 18 months and in older children. Intense visual exploration.</p> <p>Intense visual exploration may be seen as early as 12 months<sup>xiii</sup>.</p>





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- <sup>ii</sup> Lonnie Zwaigenbaum, Susan Bryson and [Nancy Garon](#). Early identification of autism spectrum disorders. *Behavioural Brain Research, Volume 251*, 15 August 2013, Pages 133–146
- <sup>iii</sup> Emily J.H. Jones, Teodora Gliga, Rachael Bedford, Tony Charman and Mark H. Johnson. Developmental pathways to autism: A review of prospective studies of infants at risk. *Neuroscience & Biobehavioral Reviews, Volume 39*, February 2014, Pages 1–33
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