

# The impact of atypical sensory processing on adaptive functioning and maladaptive behaviors in autism spectrum disorder during childhood: results from the ELENA Cohort

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## Background

Sensory processing allow to select, organize and associate several sensory informations from the environment in order to adapt the individual's behaviour. In children with **Autism Spectrum Disorders (ASD)**, atypical sensory processing, adaptive difficulties, and problem behaviours are frequently reported. In the literature, there's an agreement that atypical sensory processing are common in ASD. However, **the prevalence** is variable depending on studies and their association with adaptive functioning and maladaptive behaviours are still unclear.

Our aims were to **estimate the prevalence of atypical sensory processing** and to **investigate their associations with adaptive functioning and maladaptive behaviours**.

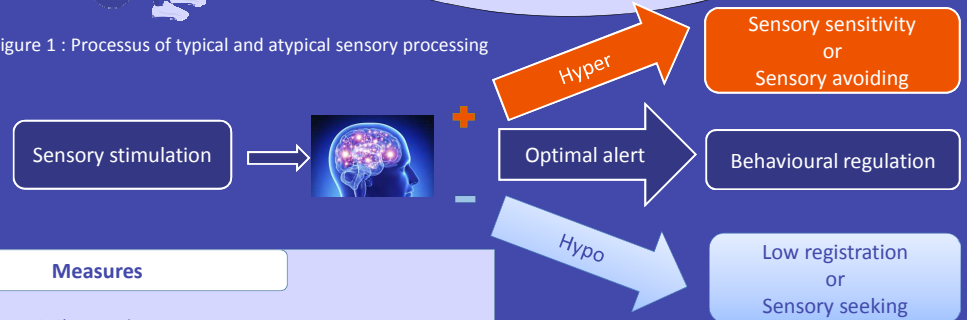
## What is the ELENA cohort ?

It's a **French national** clinical pediatric cohort with ASD. This cohort is a dynamic and prospective study. Participants are aged between 2 and 16 years, and have a **diagnosis of ASD** formally established by a multidisciplinary team according to international criteria (DSM5).

[www.elena-cohorte.org](http://www.elena-cohorte.org)



Figure 1 : Processus of typical and atypical sensory processing



**Participants**  
N=181

83% 17%

3 to 11 years

**Measures**

- Sensory profile** (Dunn, 1999) parental questionnaire : assess sensory processing
- Vineland II** (Sparrow, 2005) parental interview : assess adaptive functioning
- Aberrant behaviour checklist** (Aman, 1985) parental questionnaire : Assess maladaptive behaviours

## Results

Our findings highlight that atypical sensory processing are highly prevalent in children with autism spectrum disorders and that they are not influenced by gender, age or autism severity. All sensory modalities are disturbed in ASD, multisensory processing being the most. Atypical sensory processing is strongly associated with maladaptive behaviours.

Percentage of atypical and typical score at the sensory profile depending of sensory quadrants

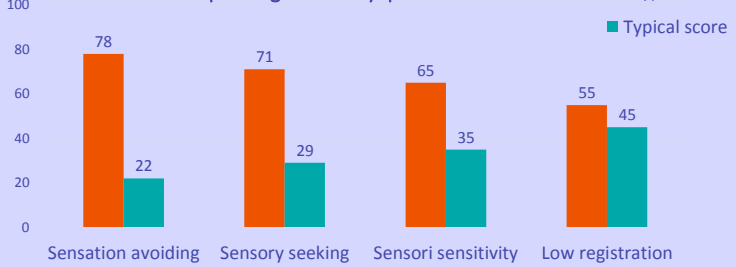


Table 1 Comparison of the Vineland scores between typical and atypical SP groups

|                     | Low registration |               | Sensory seeking    |                    | Sensory sensitivity |               | Sensory avoiding   |                    |
|---------------------|------------------|---------------|--------------------|--------------------|---------------------|---------------|--------------------|--------------------|
|                     | Typical N=83     | Atypical N=92 | Typical N=51       | Atypical N=111     | Typical N=55        | Atypical N=99 | Typical N=34       | Atypical N=117     |
| Communication       | 70.3 (17.6)      | 70.0 (15.7)   | <b>74.0 (19.1)</b> | <b>68.0 (15.2)</b> | 69.7 (18.2)         | 69.0 (14.9)   | <b>63.9 (18.2)</b> | <b>73.3 (15.6)</b> |
| Daily living skills | 75.4 (13.1)      | 72.0 (11.5)   | <b>76.4 (12.8)</b> | <b>71.9 (12.1)</b> | 74.1 (12.0)         | 71.2 (12.3)   | 74.2 (13.4)        | 73.4 (12.5)        |
| Socialization       | 68.0 (12.6)      | 69.0 (9.4)    | <b>71.5 (11.5)</b> | <b>67.1 (11.5)</b> | 68.8 (11.8)         | 67.7 (10.4)   | 67.8 (12.3)        | 69.2 (10.9)        |

Percentage of atypical and typical score at the sensory profile depending of sensory modalities

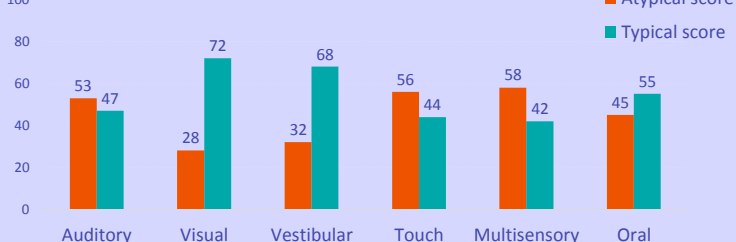


Table 2 Comparison of ABC scores between typical and atypical SP groups

|               | Low registration   |                    | Sensory seeking    |                    | Sensory sensitivity |                    | Sensory avoiding   |                    |
|---------------|--------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|
|               | Typical N=58       | Atypical N=81      | Typical N=43       | Atypical N=85      | Typical N=43        | Atypical N=76      | Typical N=26       | Atypical N=92      |
| Irritability  | <b>31.3 (17.3)</b> | <b>39.0 (19.0)</b> | <b>28.5 (17.8)</b> | <b>39.7 (19.3)</b> | <b>29.1 (17.5)</b>  | <b>39.2 (19.5)</b> | <b>27.2 (20.1)</b> | <b>37.2 (18.5)</b> |
| Lethargy      | <b>22.3 (16.8)</b> | <b>32.8 (16.7)</b> | <b>21.7 (15.7)</b> | <b>32.4 (17.8)</b> | <b>21.5 (17.6)</b>  | <b>31.9 (17.9)</b> | <b>19.8 (16.1)</b> | <b>30.6 (16.8)</b> |
| Stereotypy    | <b>26.2 (19.6)</b> | <b>39.2 (21.3)</b> | <b>27.1 (22.4)</b> | <b>37.8 (21.4)</b> | <b>26.6 (23.2)</b>  | <b>39.2 (21.7)</b> | <b>22.3 (17.1)</b> | <b>36.2 (21.0)</b> |
| Hyperactivity | <b>44.7 (21.1)</b> | <b>51.4 (22.6)</b> | <b>31.4 (19.3)</b> | <b>56.6 (18.7)</b> | <b>39.9 (21.2)</b>  | <b>53.2 (22.4)</b> | <b>41.5 (22.1)</b> | <b>49.1 (22.1)</b> |

## Conclusion

**Sensory processing** is common in the large spectrum of ASD. Thereby, children with ASD and their families need to deal with them in everyday life. In particular, children with a sensory seeking profile have lower adaptive skills and require specific attention. Moreover, we highlight that atypical sensory processing are strongly associated with maladaptive behaviours. Atypical sensory processing might be one of the possible causes of challenging behaviours. For that reason it needs to be taken into account in early intervention in order to prevent subsequent challenging behaviours.

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Consortium ELENA\* : [www.elena-cohort.org](http://www.elena-cohort.org)

