Overexcitability and sensory profile of highly gifted children and impact on emotional difficulties

Cognitive Psychology and Neuropsychology Department, UMONS, Belgium

isabelle.simoesloureiro@umons.ac.be

Introduction

Overexcitability (OE), defined as intense sensations for internal or external stimuli is often described in highly gifted children (HGC) and can trigger anxiety (Harrison & Van Hanegan, 2011). However, literature about the link between high intelligence, overexcitability and anxiety remains quite inconsistent (Peyre et al., 2016). In this study, we assessed the overexcitability (via the sensory profile) and the interoceptive sensitivity (defined as the attention to one's internal body signals) in HGC compared to typical children to explore which aspects are linked to anxiety sensitivity and symptoms.

Methodology

1. PARTICIPANTS

Clinical and demographical features

<table>
<thead>
<tr>
<th>Group</th>
<th>HGC (N=20)</th>
<th>Control children (N=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age²</td>
<td>132.15 +/-18.68</td>
<td>129.95 +/-18.78</td>
</tr>
<tr>
<td>Sex</td>
<td>11 boys/9 girls</td>
<td>11 boys/9 girls</td>
</tr>
<tr>
<td>IQ²</td>
<td>132.45 +/-8.6</td>
<td>105.5 +/-7.6</td>
</tr>
</tbody>
</table>

² Means and standard deviations in months; 

Total intellectual quotient for HGC and General Ability Index for control group

2. MATERIAL

2.1. Sensory profile

Information processing of:

- Auditory
- Visual
- Tactile
- Oral
- Multisensory
- Balance
- Tonus
- Emotion

2.2. Body Perception

Body perception questionnaire (Porges, 1993)

Measure of interoceptive sensitivity

2.3. Anxiety

3.1. Revised-Children’s Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1999)

- Total anxiety
- Physical anxiety
- Worries/oversensibility
- Social worries/attention

3.2. Childhood Anxiety Sensitivity Index (CASI) (Stassart et al., 2015)

- Total anxiety sensitivity
- Physical concerns
- Mental incapacities concerns
- Social concerns
- Fear of losing control

Results

1. GROUP COMPARISON

1.1 Sensory profile

Comparison of HGC and control children with student’s t tests

* Significant difference: p<0.05

For HGC

<table>
<thead>
<tr>
<th>Measure</th>
<th>HGC (N=20)</th>
<th>Control children (N=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory</td>
<td>31.15</td>
<td>38.9</td>
</tr>
<tr>
<td>Visual</td>
<td>32.8</td>
<td>51.45</td>
</tr>
<tr>
<td>Oral</td>
<td>46.3</td>
<td>41.65</td>
</tr>
<tr>
<td>Tonus</td>
<td>39.55</td>
<td>71.25</td>
</tr>
<tr>
<td>Tactile</td>
<td>32.96</td>
<td>27.85</td>
</tr>
<tr>
<td>Balance</td>
<td>43.95</td>
<td>30.7</td>
</tr>
<tr>
<td>Multisensory</td>
<td>47.9</td>
<td>58.3</td>
</tr>
</tbody>
</table>

1.2. Body perception

Compared to control children (66.1 +/-13.05), HGC (73.3 +/-13.05) present a trend toward more interoceptive sensitivity (t=1.744; p=0.089)

1.3. Anxiety

No difference were found except a trend toward difference for more social concerns in HGC (t=1.965; p=0.057)

2. BACKWARD REGRESSION ANALYSES

For HGC

(A) Physiological anxiety

(1) F(1,19)=5.98; p=.025; R²=.250; β=.500

(B) F(3,19)=5.11; p=.011; R²=.490; β=.497

Physical concerns

Total anxiety sensitivity score

(A) Oversensibility

(1) F(4,19)=6.40; p=.003; R²=.631; β=.541

(B) F(1,19)=10.81; p=.004; R²=.375; β=.613

Discussion and conclusions

Our results suggest a specific sensory profile in HGC, with a heightened sensitivity and intensity of experience. More particularly, HGC experience an enhanced sensitivity for auditory, visual, tactile, balance, emotional and multisensory information as well as a higher interoceptive sensitivity. These observations are consistent with the theory of a particular nervous system overreaction in HGC (Chang & Kuo, 2013). These results shed new lights on the sensory profile in HGC and the role of attention and interpretation of body signals information in anxiety/oversensibility. Further research could investigate the link between emotional difficulties in HGC and disturbed perception, interpretation of and worries about symptoms.