Factors associated with empathic responsiveness in children and adolescents with high-functioning ASD

Anke M. Scheeren, Hans M. Koot, Peter C. Mundy, Larissa Mous, & Sander Begeer  
VU University Amsterdam

Background
- A lack of empathic responsiveness, the ability to respond to others’ emotions, has been put forward as a core problem in autism (Kanner, 1943).
- Previous studies have shown reduced empathic responsiveness in groups of children with autism spectrum disorder (ASD) compared to typically developing peers and peers with an intellectual disability.
- However, these studies ignored the large individual differences within the autism spectrum.
- Children with ASD vary in degree and quality of autistic symptoms (Mundy et al., 2007), as well as cognitive abilities such as Theory of Mind and executive functioning (Pellicano, 2010).
- In typical development, individual differences in temperament explain variance in children’s empathic responsiveness (Eisenberg et al., 1998).

Research question
- Are individual differences in (1) temperament, (2) Theory of Mind, and (3) executive functioning associated with variance in empathic responsiveness in children and adolescents with high-functioning ASD (HFASD)?

Objectives
- Linking individual differences in temperament, Theory of Mind and executive functioning to variance in empathic responsiveness in children and adolescents with high-functioning ASD (HFASD).

Measures
- **Temperament:** Emotionality Activity Sociability
  - Temperament Survey (EAS; parent questionnaire; Buss & Plomin, 1984)
- **Theory of Mind (ToM):** ToM task consisting of five social stories derived from Sullivan et al. (1994), Begeer et al. (2011), and Kaland et al. (2008).
- **Executive functioning (EF):** Behavior Rating Inventory of Executive Function (BRIEF; parent questionnaire; Gioia et al., 2002)
- **Empathic responsiveness (ER):**
  - Structured observations of participants’ responses to the simulated emotional states (happiness, sadness, and pain) of an adult interviewer (see also poster 161.187 now)
  - Parent reports of their child’s empathic responsiveness in comparable situations
  - Joint measure of ER: structured observations and parent reports combined

Analyses
- Hierarchical multiple regression analyses with empathic verbal responses as dependent variable and age, verbal IQ (step 1), temperament (step 2), ToM and EF (step 3) as predictors.

Results
- Temperament explained a significant amount of variance (15%) in children’s empathic responsiveness over and above age and verbal IQ (see Table 1).
- ToM and EF failed to explain variance in empathic responsiveness over and above the variance already explained by age, receptive verbal IQ and temperament.
- Temperament was strongly associated with parent reported empathic responses, but did not affect children’s empathic responses to the interviewer.
- An unexpected positive association was noted between children’s inhibition problems (BRIEF subscale) and their empathic responses during the interview.

Conclusions
- Overall, our findings suggest that the role of temperament in children’s empathic responsiveness also applies to children and adolescents with HFASD.
- ToM and EF do not play a central role in the empathic responses of children and adolescents with HFASD.

Discussion
- Individual differences in temperament influence the degree of responsiveness of children and adolescents with HFASD to others’ emotions.
- The unexpected lack of association between children’s ToM and their empathic responsiveness may be due to socio-cognitive nature of ToM tasks, whereas real life social interaction requires socio-perceptual aspects of ToM.
- Children with inhibition problems have the tendency to respond impulsively and may therefore also respond more readily to the emotions of an unfamiliar adult.
- Clinical implication: a child’s (lack of) empathic responsiveness should be seen as the outcome of multiple factors including a child’s temperament.

Table 1. Results of hierarchical multiple regression analyses

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Joint measure</th>
<th>Observation</th>
<th>Parent report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.02</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Verbal IQ</td>
<td>.15</td>
<td>.12</td>
<td>.10</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional</td>
<td>.15**</td>
<td>.06</td>
<td>.14**</td>
</tr>
<tr>
<td>Activity</td>
<td>-.18*</td>
<td>.05</td>
<td>-.21*</td>
</tr>
<tr>
<td>Sociability</td>
<td>.11</td>
<td>.14</td>
<td>.07</td>
</tr>
<tr>
<td>Shyness</td>
<td>.22*</td>
<td>.00</td>
<td>.28*</td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory of Mind</td>
<td>.03</td>
<td>.04</td>
<td>.01</td>
</tr>
<tr>
<td>EF problems</td>
<td>.12</td>
<td>.08</td>
<td>.10</td>
</tr>
<tr>
<td>Total R²</td>
<td>.20**</td>
<td>.12</td>
<td>.17**</td>
</tr>
</tbody>
</table>

Note: * = p < .10; ** = p < .05; *** = p < .01

This study was funded by Nuts OHRA. Conflict of interest: None.