Better Late Than Never? Reduced Psychophysiological Response to a Human Intruder in High-Functioning Autism

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INTRODUCTION

- Many individuals diagnosed with ASD experience severe and debilitating symptoms of anxiety (Lopata et al., 2010).
- Characterization of both shared and distinct neural mechanisms in autism and anxiety may give insight into the developmental course of autism in the brain as well as improve intervention techniques (Amaral et al., 2008).
- Previous work in our lab (South, Dana, White, & Crowley, 2011; South, Larson, White, Dana, & Crowley, under review) has shown that internal emotional states do not match external behavior in ASD samples.

- We have adapted an ecologically-valid procedure studying emotion regulation in nonhuman primates (Kalin, 2003) that we call the Intruder Paradigm for Humans (IPH).
- Five distinct phases occur while participant attends to a computerized cognitive task (See Figure 2).

METHODS

- Disposable electrodes are used to collect skin conductance response for the duration of the experiment using BioPac MP150.
- SCreen for Anxiety RelatEd Disorders – Parent Report Version (SCARED; Birmaher et al., 1997)

CONCLUSIONS AND FUTURE DIRECTIONS

- ASD group more worried in everyday life (see SCARED) and shows significant hyperactivity in motor movements. Internal SCR under-responsiveness during the IPH may suggest disconnect in brain between internal states and external behavior.
- Hypothesize that ASD are not aware of how to match their internal states with appropriate responses. There is not a total lack of understanding: no statistically significant interactions means ASD are aroused when appropriate and respond with the same pattern as TYP. May contribute to ASD children being a step behind in social situations and other cognitively demanding tasks.
- Working with colleagues in England to build a cognitive model of anxiety in autism – what is it like to experience anxiety when you already have autism? Not understanding the world likely leads to lots of worry about the world.
- Pursuing studies of particular genotypes that link anxiety and autism in this sample; and cognitive models for representing ones’ own internal state versus monitoring others.

RESULTS

- ASD group not responding during low stress computer task.
- Pattern of response is the same.
- Working with colleagues in England to build a cognitive model of anxiety in autism – what is it like to experience anxiety when you already have autism? Not understanding the world likely leads to lots of worry about the world.
- Pursuing studies of particular genotypes that link anxiety and autism in this sample; and cognitive models for representing ones’ own internal state versus monitoring others.

<table>
<thead>
<tr>
<th>Table 1: Participant Demographics</th>
<th>n</th>
<th>Age</th>
<th>Full Scale IQ</th>
<th>Anxiety Score (SCARED)*</th>
<th>ADOS Total (Autism Symptoms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASC</td>
<td>38</td>
<td>12.99 (2.24)</td>
<td>108.08 (12.88)</td>
<td>23.15 (13.76)</td>
<td>12.24 (3.77)</td>
</tr>
<tr>
<td>TDC</td>
<td>33</td>
<td>12.51 (2.56)</td>
<td>107.97 (13.03)</td>
<td>9.58 (7.03)</td>
<td>--</td>
</tr>
</tbody>
</table>

**p < .05; ASD cut-off = 7.**

**Figure 2: Intruder Paradigm**

- Baseline
  - SCR and movement activity recorded during low stress computer task
  - Participant
  - Research Assistant (RA)
  - Intruder (Confederate)
  - Curtain (partially open)

- Isolation
  - When task is done, RA leaves the room
  - Intruder leaves

- Argument
  - RA returns and participant starts next computer task.
  - An ill-dressed male intruder enters the room and argues with the RA at the door
  - RA and Intruder leave

- Intruder
  - Intruder returns, states at wall (60 sec.)
  - Intruder sits in RA’s chair, states at participant (60 sec.)

- Recovery
  - Intruder leaves
  - Participant finishes computer task