Enhanced and impaired sensory discrimination in autism

TO THE EDITOR: We welcome the contribution of Puts and colleagues (2014) and commend their use of rigorous psychophysical tasks in the investigation of sensory discrimination in autism. Here, our intention is to highlight previously published work that stands counter to the findings of Puts et al. in an attempt to ensure that the work is considered in a balanced context. Puts et al. find clear evidence for reduced tactile discrimination in autism, yet there are numerous examples of enhanced discrimination in autism. Enhanced discrimination has been reported in the visual domain (Bertone et al. 2005) and in the auditory domain (Bonnel et al. 2003), and also, in direct contrast to the findings from Puts et al., in the tactile domain (Blakemore et al. 2006).

While lack of replication in autism research is not uncommon, we were intrigued to see that the putative explanation given by Puts et al. (2014) for reduced sensory discrimination, namely reduced lateral inhibition, is in contrast to the suggestion of increased lateral inhibition put forward by other authors, e.g., Bertone et al. (2005), for enhanced discriminatory abilities in autism. Both positions draw on evidence of atypical minicolumnar organization in the brains of autistic individuals (Casanova et al. 2002, 2003) to support their argument. However, it has not yet been demonstrated how abnormalities in minicolumnar structure would affect lateral inhibition, and in turn, behavior. Furthermore, altered minicolumnar structure has also only been found in frontal and temporal areas in the brains of autistic individuals. Therefore, caution is warranted when using this evidence to make assumptions about the neural underpinnings of performance on sensory discrimination tasks.

Puts et al. (2014) highlight examples of sensory hyposensitivity in those with autism spectrum disorder (ASD) and suggest that their data provide empirical support for differences in the perceptual experience of those with autism. However, there are also examples of hypersensitivity experienced by those with ASD such as noticing minor details in the environment (Hayes 1987) and an enhanced capacity for absolute pitch (Heaton et al. 1998). While it is tempting to link psychophysical task performance with real-life experience, a direct link between task performance and perceptual experience in autism has not yet been shown.

This latest investigation of sensory discrimination in autism highlights the need for further understanding of the relationship between atypical sensory experiences and performance on psychophysical tasks in autism. This is particularly pertinent as neither enhancements nor impairments seem to be common across sensory modalities, nor do they occur in all individuals with autism (c.f. Jones et al. 2009). Future studies will benefit from measuring psychophysical task performance across sensory modalities within the same individuals, as understanding the nature of within-participant variation of perceptual sensitivity across modalities should reveal more about the potential neurological etiology of altered sensory discrimination in autism.

DISCLOSURES
No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS
A.H.D. and E.M. conception and design of research; A.H.D. and E.M. drafted manuscript; A.H.D. and E.M. edited and revised manuscript; A.H.D. and E.M. approved final version of manuscript.

REFERENCES

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