

RESPONSE: COGNITION IN AUTISTIC INDIVIDUALS WITH AND WITHOUT  
ALEXITHYMIA

No Evidence for an Opposite Pattern of Cognitive Performance in Autistic Individuals with  
and without Alexithymia: a response to Rødgaard et al.

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### Abstract

Rødgaard and colleagues confirmed our finding of a negative relationship between performance on the Reading the Mind in the Eyes Test and alexithymia, regardless of autism diagnosis. In their analysis of our cognitive Theory of Mind data, however, they did not control for autistic traits, which covary with alexithymia. Here we demonstrate that when autistic traits are controlled for, there is no significant association between alexithymia and cognitive theory of mind performance in participants with autism.

*Keywords:* autism spectrum disorder, alexithymia, emotion recognition, social cognition, theory of mind

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## General Scientific Summary

We analyse the performance of individuals with autism on a cognitive theory of mind task. A previous commentary article suggested that these individuals' performance varies according to their level of alexithymia. Here we show that it is important to control for levels of autism traits in such analyses, and that when this is done, there is no association between alexithymia and cognitive theory of mind performance in participants with autism.

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The primary aim of our original paper (Oakley, Brewer, Bird & Catmur, 2016) was to determine whether the Reading the Mind in the Eyes Test (RMET; Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001) is a valid measure of theory of mind (ToM), or whether performance on the task instead relies on emotion recognition ability. We predicted that, if the RMET indexes ToM, then autistic traits should predict task performance. However, if the RMET indexes emotion recognition, then alexithymia, and not autistic traits, should predict performance. We are pleased to note that Rødgaard, Jensen and Mottron (2019) confirmed a significant negative relationship between RMET performance and alexithymia, regardless of autism diagnosis, validating our original findings.

In addition to the RMET, our original paper reported analyses for another ToM task - the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006). We included this control task since, unlike the RMET, it does not rely exclusively on facial emotion recognition. In their commentary, Rødgaard et al. (2019) argue that their finding of an association between performance on cognitive items from the MASC and alexithymia is contrary to our original results and modifies the interpretation of our data. However, no reference has been made to the results from our hierarchical regression models, reported in Supplementary Table 2 of Oakley et al. (2016). Here, we showed that dimensional (i.e. not reliant on an autism diagnosis) autistic traits were significantly and negatively related to MASC-Cognitive performance, after controlling for alexithymia and gender. In this model, alexithymia was not significantly related to MASC-Cognitive performance, however gender was. Rødgaard et al. do not seem to have accounted for dimensional autistic traits nor gender in their analyses. Controlling for such factors is essential if one wishes to conclude that alexithymia, specifically, is associated with Cognitive ToM. Although the autism and control

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groups were matched according to alexithymia traits, the association between autistic and alexithymia traits (Hill, Berthoz & Frith, 2004) makes it essential to control for one when investigating the effect of the other. The analyses in the commentary are therefore insufficiently comparable to argue that they are contrary to our original results. Indeed, within the autism group, the data do not indicate a significant association between alexithymia and MASC-Cognitive performance, after controlling for gender and autistic traits ( $\beta=.45, p=.10$ ), contrary to the authors' suggestion.

In addition, the commentary states that 'autistic individuals with and without alexithymia seem to present with distinct profiles of difficulties in ToM abilities.' While an interesting line of enquiry, we believe that this is an overstatement of the interpretations that can be drawn from the reported analyses. This is because the analyses reported in the commentary do not assess autism subgroups with and without alexithymia. Rather, they report the continuous correlation between MASC-Cognitive performance and alexithymia within autism and control groups, respectively. When the analysis above (i.e. controlling for gender and autistic traits) is repeated using alexithymia severity subgroup as a predictor, alexithymia subgroup membership does not predict MASC-Cognitive performance ( $\beta=.47, p=.09$ ).

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