

No evidence for reduced precision-weighting of prediction errors in autistic adolescents Evidence from ERPs and behaviour during adaptation

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INTRODUCTION

PREDICTIVE PROCESSING

Predictive Processing-based theories claim that autistic individuals assign higher precision to prediction errors than non-autistic individuals^{1,2}

> Incoming sensory input is seen as more novel

> Experiences that bias perception in non-autistic individuals should therefore bias autistic individuals less³

ADAPTATION

Exposure to stimuli from one end of a continuum biases later perception away from that end, highlighting new features. This has been reported to be reduced in autism, although results are mixed^{4,5,6,7}

After exposure to many people looking to the extreme left, slightly left gaze is perceived as direct gaze, that is, less left than it truly is

DESIGN

If prediction errors are weighted more highly in the autistic group, they should adapt less than the non-autistic group and show less differentiation in ERPs

Participants were familiarised with gaze 5° left, 0° and 5° right,

then adapted to 25° either left or right,

then shown top-ups in the adapted direction followed again by 5° left, 0° and 5° right

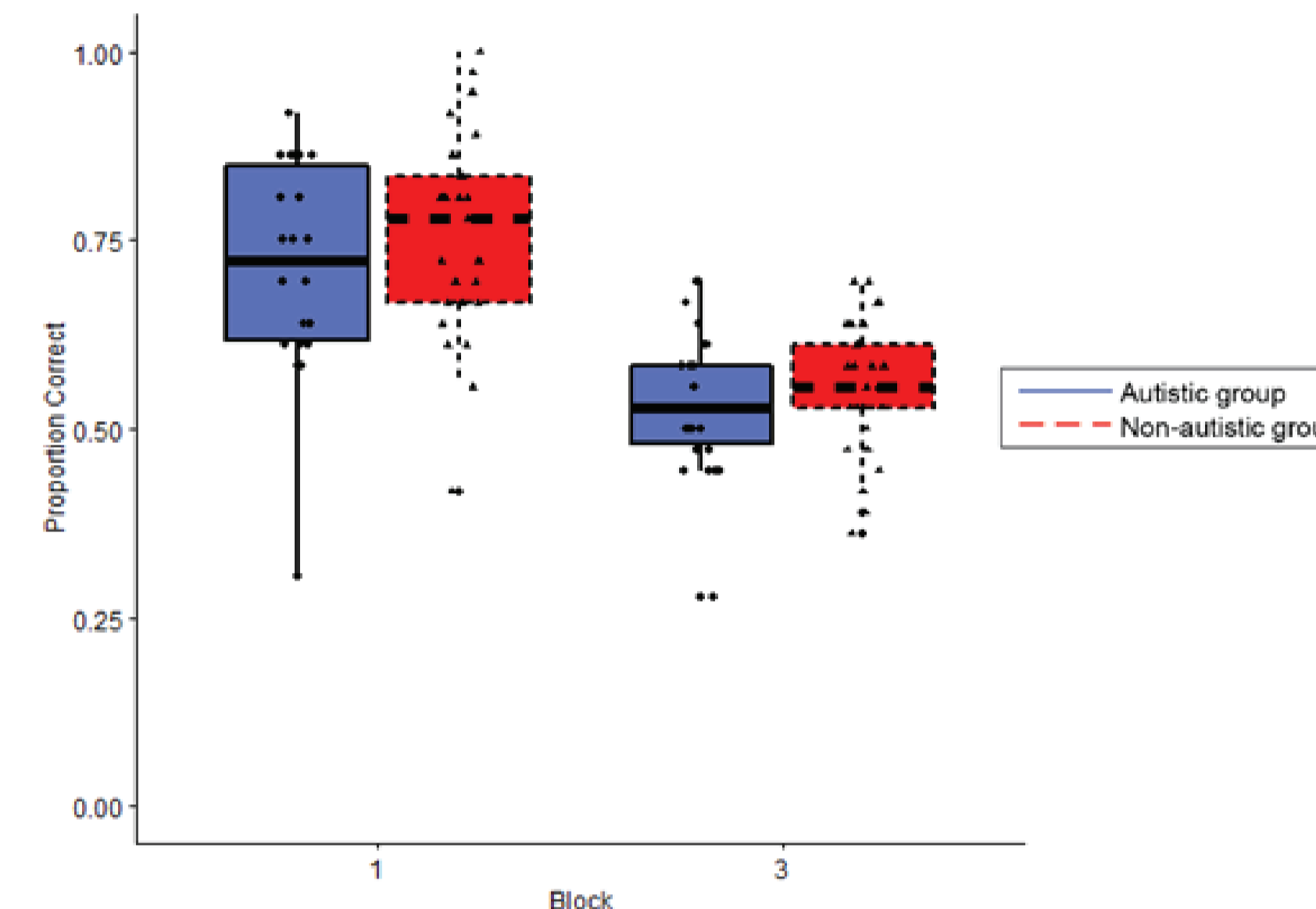
and indicated perceived gaze direction



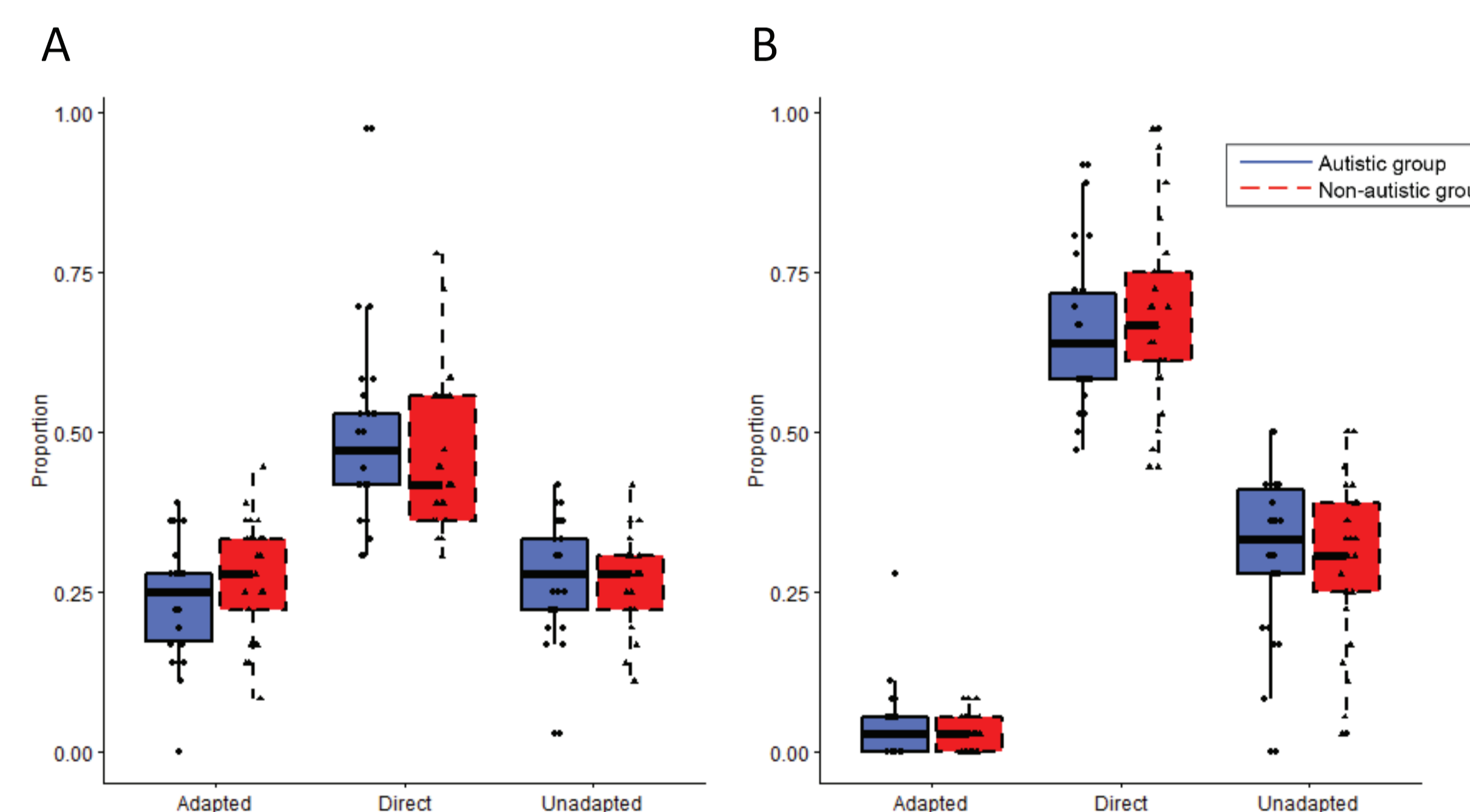
BEHAVIOURAL RESULTS

N=55; 26 autistic, 29 non-autistic adolescents, aged 12-18

The groups did not differ in short-form IQ, $t(46.71) = -0.39$, $p = .70$, but did differ in SCQ, $t(32.83) = 7.57$, $p < .0001$



Accuracy levels were high in both groups, and did not differ in the pre-adaptation block, $t(51.94) = -1.27$, $p = .21$



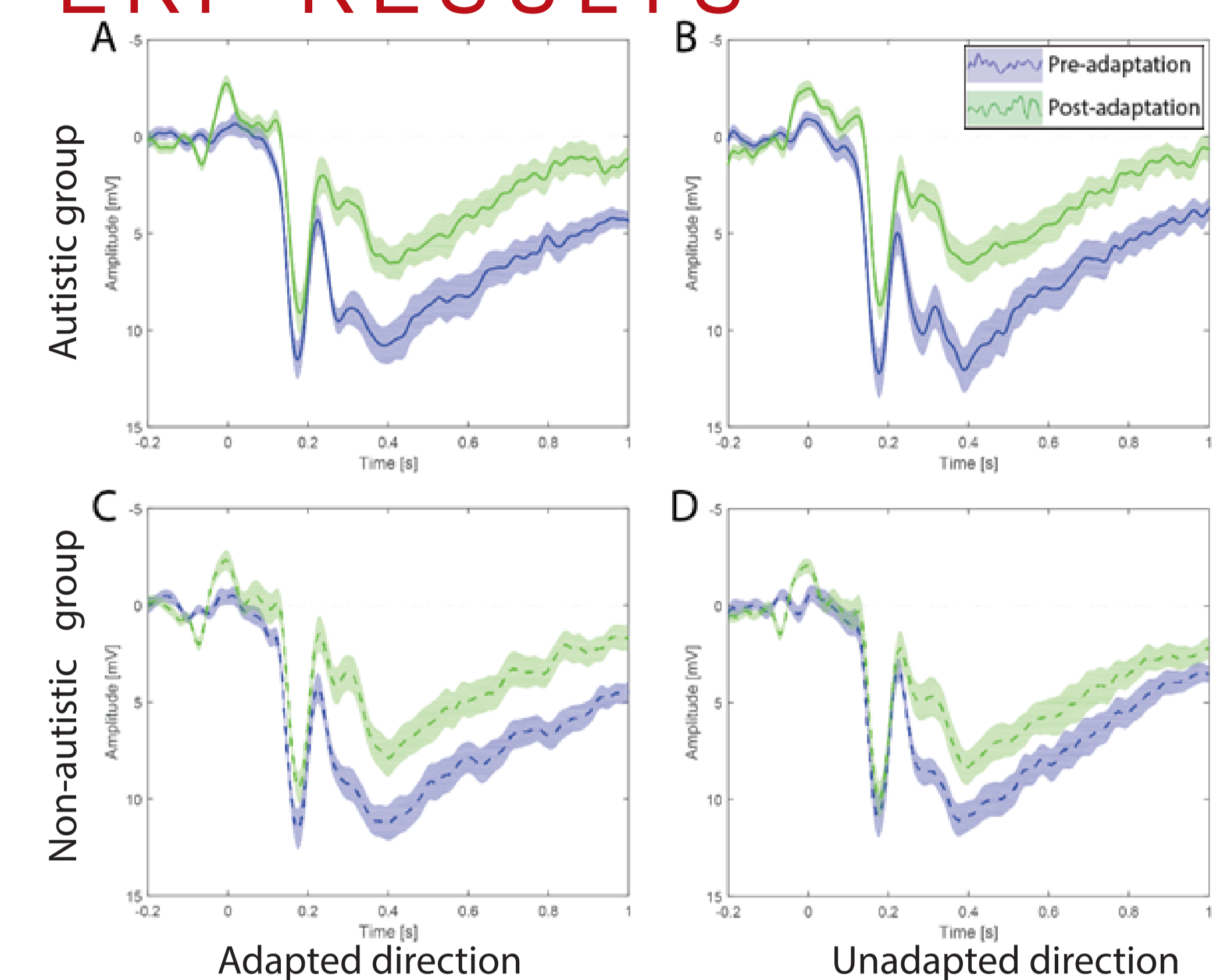
Both groups showed behavioural adaptation, $\beta = -1.49$, $SE = 0.16$, $z = -9.32$, estimated $p < .001$

No difference between groups in the extent of their adaptation, $\beta = -0.18$, $SE = 0.18$, $z = -1.01$, estimated $p = 0.31$

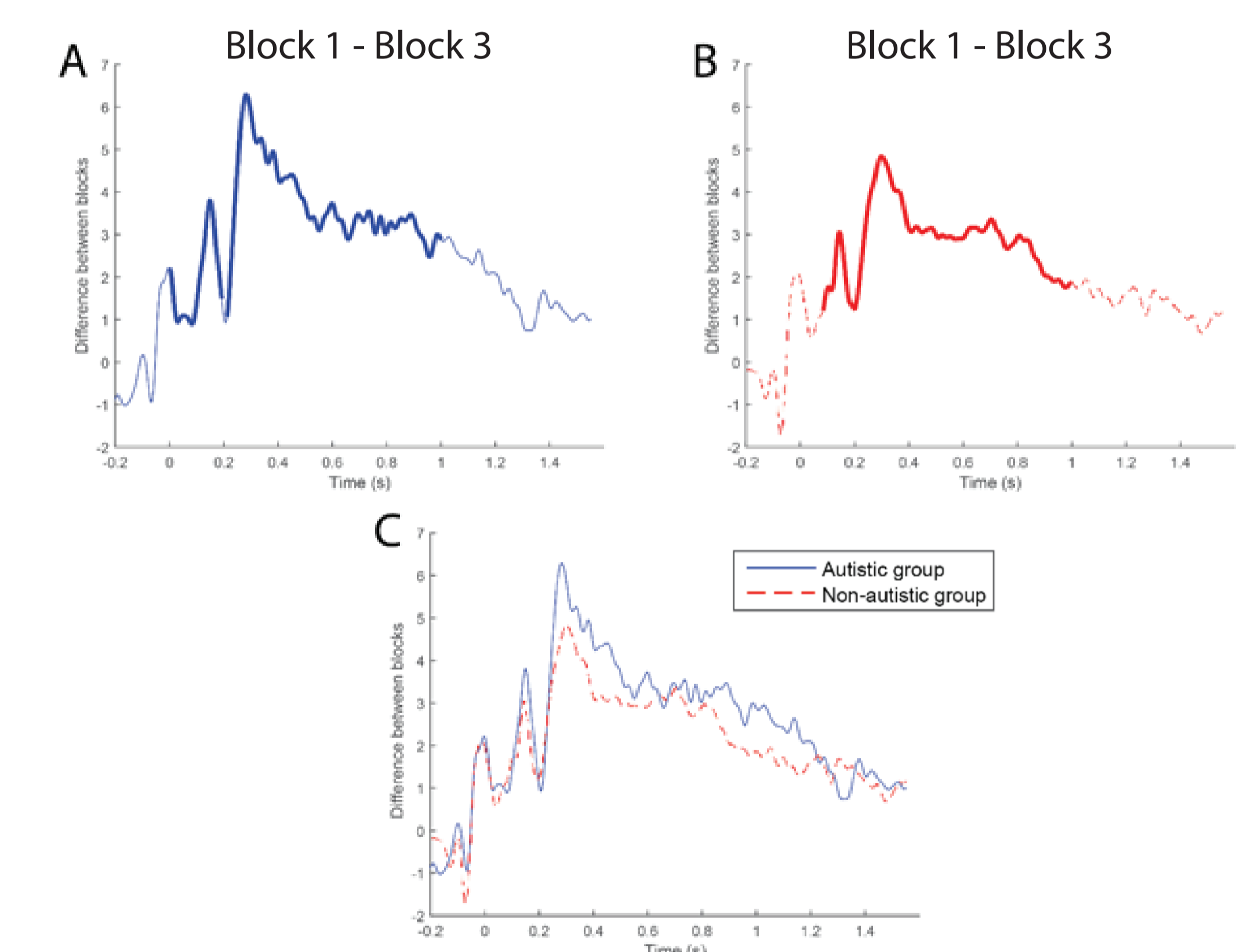
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ERP RESULTS



Occipital P2 decreased from the first block to the last block, but was not modulated by adaptation direction in either group



The groups did not differ in the extent of their habituation of P2

DISCUSSION

The groups did not differ, which is not consistent with Predictive Processing accounts of autism. These accounts have not found much support in other empirical tests over the past few years, so may need to be adjusted

If there are differences in precision-weighting in autism, context and level in the cognitive hierarchy may play a role