Emotion and cognitive flexibility in ASD: a behavioural and fMRI study

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Abstract

Patients with Autism Spectrum Disorder (ASD) display difficulties in changing strategy during daily activities or adapting their perspective, especially during social interactions. However despite number of evidence of deficits in both socio-emotional processing and cognitive flexibility in ASD, the interactive effects of difficulties in these two domains remain unexplored. Our aim is to investigate this interaction by assessing behavioural and brain correlates of cognitive flexibility when applied to emotional stimuli. Thirteen adults with ASD and 15 age-matched controls participated in an event-related fMRI paradigm using an emotional version of the Wisconsin Card Sorting Task (WCST). The cards presented were surrounded by a coloured frame and represented emotional faces. Participants have to match cards on one of three possible dimensions according to a non spoken rule: frame colour, face identity or facial emotion. Behavioural results revealed that compared to controls, patients succeeded in fewer categories, committed more perseverative errors when switching to Emotion matching, and displayed longer RT for Emotion and Identity conditions. fMRI results showed activity in the neural network typically recruited during WCST in both groups. However switching to a new rule lead to larger brain activity in ASD than controls in the anterior cingulate cortex, striatum, cerebellum and the frontal and orbito-frontal regions, together with lower activity in the temporal poles. Results are discussed according to the sorting rule.Findings are consistent with the difficulties in processing socio-emotional stimuli in ASD and suggest that cognitive flexibility abilities are modulated by the nature of the information to be processed

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