Examining the visual strategies underpinning a self-processing bias in autistic children
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Background: A plethora of research has shown self-awareness to be impaired in Autism Spectrum Disorder (ASD), particularly in regard to psychological rather than physical self-referential information (e.g., the ‘absent-self’ theory, Frith, 2003; Frith & Happé, 1999; Williams, 2010). Indeed, children with ASD demonstrate impairments in self- and other-referential cognition which may underpin social functioning and communication deficits.

Self-referential cognition is particularly reflected in the self-reference effect (SRE) in memory; the phenomenon whereby there is a memory advantage for information encoded in relation to the self than others (Rodgers, Kupier & Kirker, 1977; Symons & Johnson, 1997). Gillespie-Smith and colleagues (2018) showed that through an ownership paradigm, that SRE was superior among autistic children but was dependent upon measures of individual differences; SRE increased in those autistic children with milder ASD symptom severity and greater socio-communicative ability.

Objectives: The current study extends the research exploring SREs through ownership and specifically build upon the work of Gillespie-Smith and colleagues (2018) by examining eye gaze behaviour in autistic and TD children during a computerised version of a non-evaluative ownership task. In doing so, the extant study aimed to provide insight into the visual strategies utilised by autistic children during a self-other processing task. Moreover, this study sought to explore whether the SRE and visual strategies used are related to socio-communicative ability, ASD severity, ToM ability, chronological age (CA), and verbal ability (VA).

Methods: Using a non-evaluative ownership paradigm to assess self-other processing and eye-tracking technology with 12 autistic children (2 Female, 10 Male) and 10 chronological age- and verbal ability-matched typically developing (TD) (4 Female, 6 Male) controls (aged 5 to 12 years). Social communication ability was measured by the Social Communication Questionnaire (SCQ; Rutter, Bailey, Berument, Lord & Pickles, 2003), and autism severity was
measured by the Asperger Syndrome Diagnostic Scale (ASDS; Myles, Bock & Simpson, 2001). Finally, Theory of Mind (ToM) was measured using three first-order false-belief litmus tests: two location-change tasks (Baron-Cohen et al., 1985; Wimmer & Perner, 1983), and one unexpected-contents task.

Results: The current study found both groups to accurately recall more self-owned than other-owned toys; a demonstration of the self-reference effect (SRE). Amongst autistic participants, the SRE was slightly superior and its magnitude significantly increased as socio-communicative ability decreased. ASD severity, ToM ability, chronological age and verbal ability did not influence the ASD group’s SRE, contradicting some previous findings. Both groups fixated significantly longer on self- and other-owned images than borders and interestingly, the TD group fixated significantly longer on self-owned toy images than the ASD group who fixated slightly longer on self-owned coloured borders in comparison. Finally, only autistic children did not fixate on toys’ faces and their fixation on self- and other-owned items significantly increased as socio-communicative ability decreased.

Conclusion: These findings suggest that autistic children can demonstrate a robust SRE despite lower social-communication skills, ASD symptom severity may not influence the SRE, and autistic and TD children select visual attention differently to encode self-referential information which may consequently underpin their SRE ability.