The effect of age and autism traits on Theory of Mind performance across the adult lifespan.

Gavin R. Stewart, Martha Cottam, & Rebecca A. Charlton

Department of Psychology, Goldsmiths University of London, London, UK

Goldsmiths
UNIVERSITY OF LONDON

www.goldagelab.co.uk

GoldAge Research Group

@GavRobStew
@GoldAgeLabUK

Background

- There are known associations between Theory of Mind (ToM) ability and the presence of autism traits in both those with and without autism.
- This has been commonly observed in young adults, but rarely in older adulthood, despite known reductions in ToM in ageing.
- The Broad Autism Phenotype (BAP) describes sub-clinical autism spectrum disorder (ASD) traits.
- Examining ToM in BAP across the adult lifespan can provide information about ageing with ASD traits.

Hypotheses

- Elevated BAP traits and older age will be associated with:
  - Greater real-world ToM task performance difficulties.

Methods

- **Participants:**

  96 community dwelling adults aged 18-91 years.

  Mean = 48.39 years, SD = 26.11; 25 males, 71 females.

  No group differences observed in age, sex, or FSIQ.

- **Autism Traits Measure:**

  Broad Autism Phenotype Questionnaire (BAPQ; Hurley et al., 2007): Cut-off score for high BAP traits >3.15.

- **Theory of Mind (ToM) Measure:**

  Strange Stories Film Task (SSFT; Murray et al., 2017): Series of 15 acted real-world scenarios designed to capture subtle mentalising difficulties.



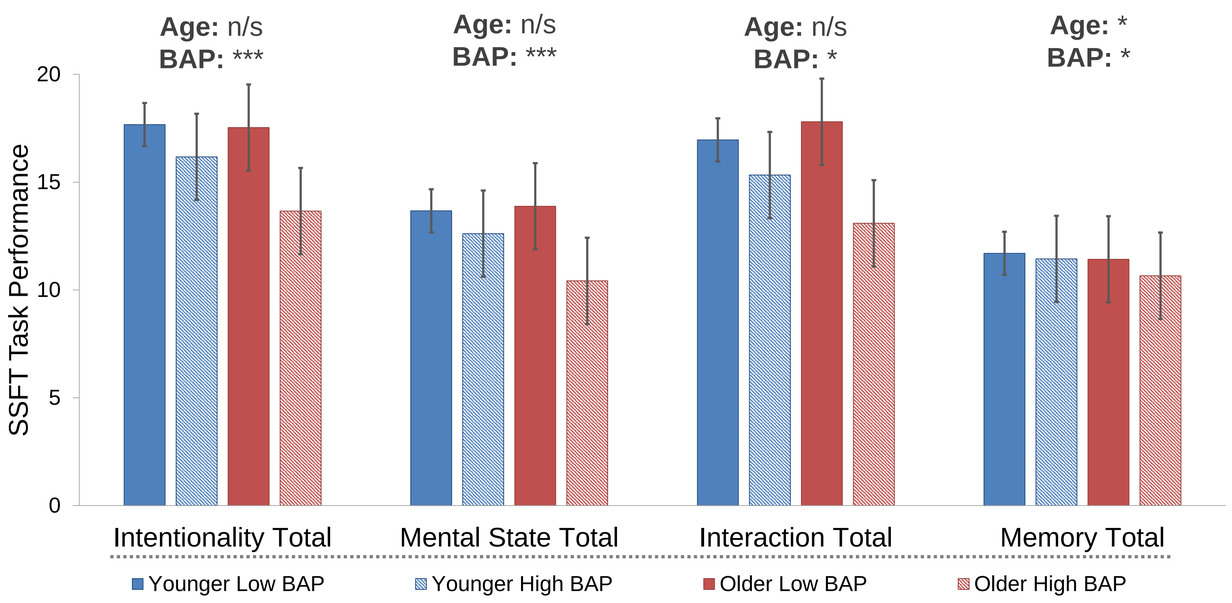
Explores perspective taking through understanding of Intentionality (e.g. Why did Alice say that?), Interaction (e.g. If you were Max, what would you say next?), and Memory (e.g. Where had Alice just come from?).

Table 1: Group demographics, mean age (standard deviation)

	Low BAP (<3.15)	High BAP (>3.15)	Group Differences
Younger (18-59)	24.94 (8.73)	22.83 (7.54)	F = .726, *p* = .399
Sex (m,f)	3:28	4:14	χ2 = 1.464, *p* = .226
BAPQ score	2.62 (.32)	3.61 (.37)	F = 94.88, *p* < .001***
Older (60-91)	73.04 (7.13)	74.38 (8.49)	F = .347, *p* = .559
Sex (m,f)	8:18	10:11	χ2 = 1.396, *p* = .237
BAPQ score	2.62 (.53)	3.51 (.37)	F = 42.29, *p* < .001***

Results, Group differences

Figure 1: Group differences on SSFT ToM performance



* *p* <.05; ** *p* <.01; *** *p* <.001

Results, 2x2 ANOVA

Table 2: Age x BAP ToM task performance, mean (standard deviation)

		Low BAP (<3.15)	High BAP (>3.15)	Age Main Effects	BAP Main Effects
Intentionality	*Younger*	17.67 (3.03)	16.17 (3.01)	F = 2.71 *p* = .103	F = 11.16 *p* < .001*** Low > High
	Older	17.53 (3.79)	13.66 (5.23)		
Mental State	*Younger*	13.67 (3.84)	12.61 (3.50)	F = 1.07 *p* = .302	F = 5.63 *p* = .019* Low > High
	Older	13.88 (5.14)	10.42 (5.50)		
Interaction	*Younger*	16.96 (2.99)	15.33 (3.34)	F = .739 *p* = .392	F = 15.24 *p* < .001*** Low > High
	Older	17.80 (4.34)	13.09 (4.83)		
Memory	*Younger*	11.70 (.53)	11.44 (4.63)	F = 6.00 *p* = .016* Younger > Older	F = 5.53 *p* = .021* Low > High
	Older	11.42 (1.14)	10.66 (1.49)		

- **Group differences and interactions:**

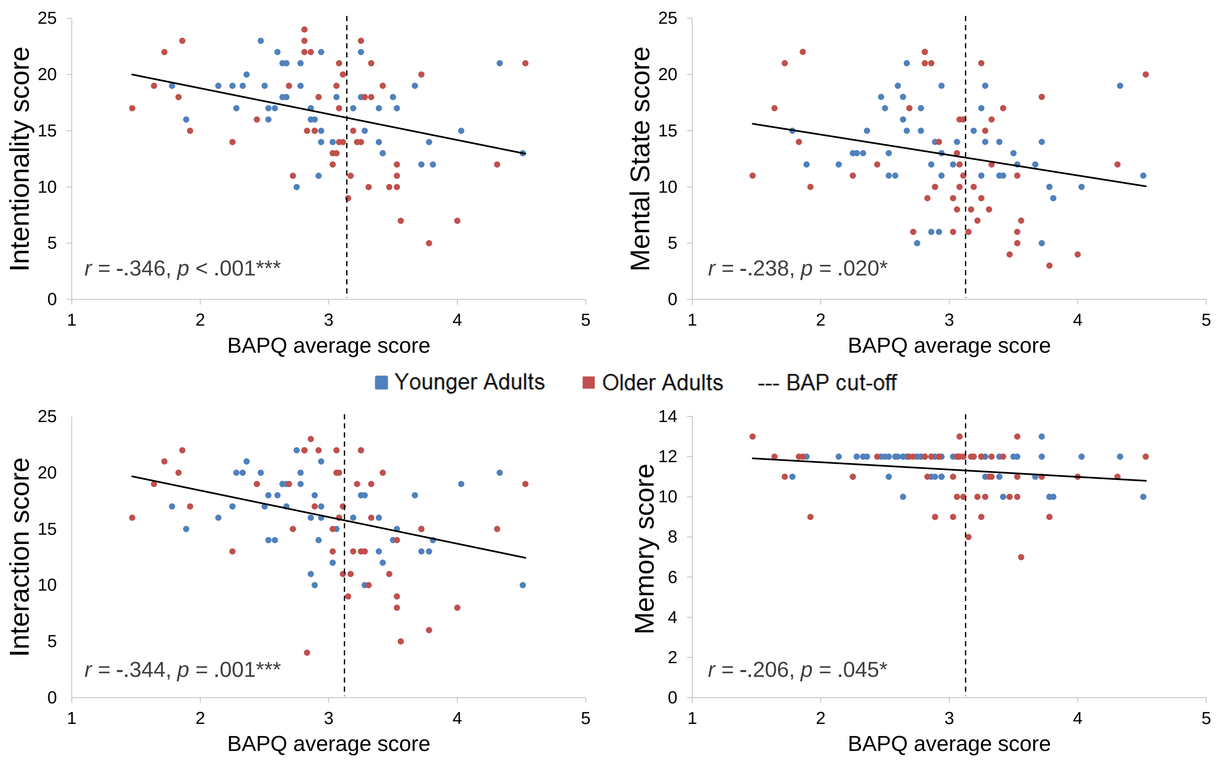
  Age main effects were only observed in SSFT memory subscale, with younger adults performing better than older adults.

  BAP main effects were observed in all SSFT subscales, with low BAP performing better than high BAP.

  No interactions were observed.

Results, Correlational analyses

Figures 2-5: BAPQ average score and SSFT subscales



- **Correlations:**

  Modest negative correlations were found between BAPQ average score with all SSFT ToM subscales.

  In the whole sample, age did not correlate with any variables.

Conclusion

- BAP traits increase difficulties in ToM performance, and could infer additional risk to social understanding across the lifespan.
- Commonly observed age-decrements in ToM task performance were not observed.
- This suggests that real-world ToM tasks may cause older adults to incorporate multidomain information, which could improve performance.
- Future studies should explore whether real-world ToM task scenarios are associated with real-world behaviours across the lifespan.