

# Aging with elevated autistic traits: Theory of Mind performance in younger and older adults.

Gavin R. Stewart<sup>1</sup>, Gregory L. Wallace<sup>2</sup>, & Rebecca A. Charlton<sup>1</sup>

<sup>1</sup>Goldsmiths University of London, UK; <sup>2</sup>The George Washington University, USA

## Background

- There are known associations between Theory of Mind (ToM) ability and the presence of autistic traits in both autistic and non-autistic individuals.
- This has been commonly observed in younger adults, but rarely in older adulthood, despite known age-related reductions in ToM.
- The Broad Autism Phenotype (BAP) describes sub-clinical autistic traits.
- Examining the BAP in older adults can provide information about aging with elevated autistic traits.

## Hypotheses

- Elevated BAP traits and older age will be associated with greater 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 (between non-BAP and BAP), sex, highest education, or FSIQ.

### Autism Trait Measure

Broad Autism Phenotype Questionnaire (BAPQ; Hurley et al., 2007)

- Cut-off score for high BAP traits =>3.15.

		non-BAP (<3.15)	High BAP (=>3.15)	Group Differences
Younger	Age (years)	24.94 (8.73)	22.83 (7.54)	n/s
	Sex (m,f)	3:28	4:14	n/s
	BAPQ score	2.62 (.32)	3.61 (.37)	High BAP ↑
Older	Age (years)	73.04 (7.13)	74.38 (8.49)	n/s
	Sex (m,f)	8:18	10:11	n/s
	BAPQ score	2.62 (.53)	3.51 (.37)	High BAP ↑

## Theory of Mind (ToM) Measures

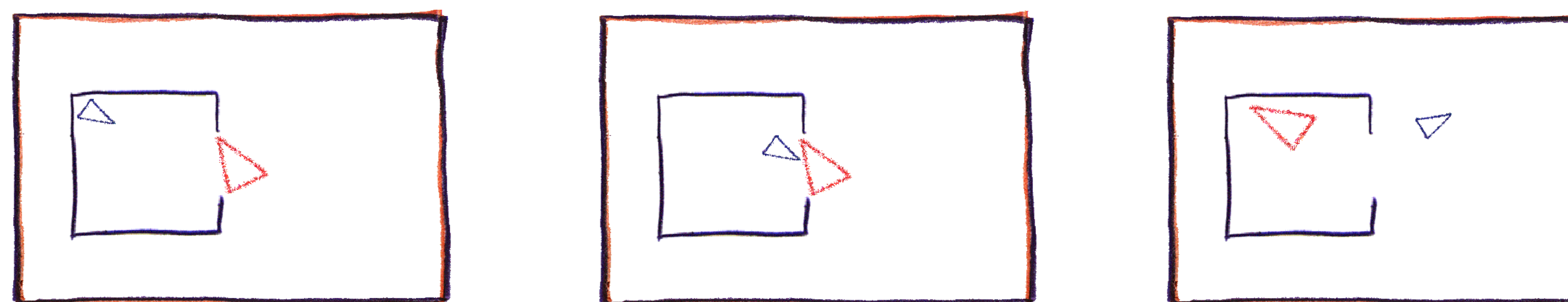
Strange Stories Film Task (SSFT; Murray et al., 2017)

- Series of 15 acted real-world scenarios designed to capture subtle mentalising difficulties, with 12 being ToM focused and 3 being control scenes.
- Explores understanding of:
  - Intentionality (e.g. Q1. Why did Alice say that?),
  - Mental State (i.e. mental state attribution),
  - Interaction (e.g. Q2. If you were Max, what would you say next?),
  - Memory (e.g. Q3. Where had Alice just come from?).



Frith-Happé Triangle Animations (TA; Abell et al., 2000)

- Series of 6 dynamic silent animated scenarios, with 4 being ToM focused and 2 being goal-directed.
- Explores understanding of:
  - Appropriateness (e.g. response accuracy),
  - Intentionality (e.g. scenario description complexity),
  - Mental State (i.e. mental state attribution).



## RESULTS

### Strange Stories Film Task, 2x2 ANOVA

- Age main effect: Memory subscale (F=6.00\*\*; Younger > Older),
- BAP main effect: All subscales (Fs=5.31-15.23\*\*\*; non-BAP > High BAP),
- Age x BAP Interaction: Trend observed in SSFT Interaction subscale (F=4.52, p=0.06; Older BAP experiencing greater difficulties).

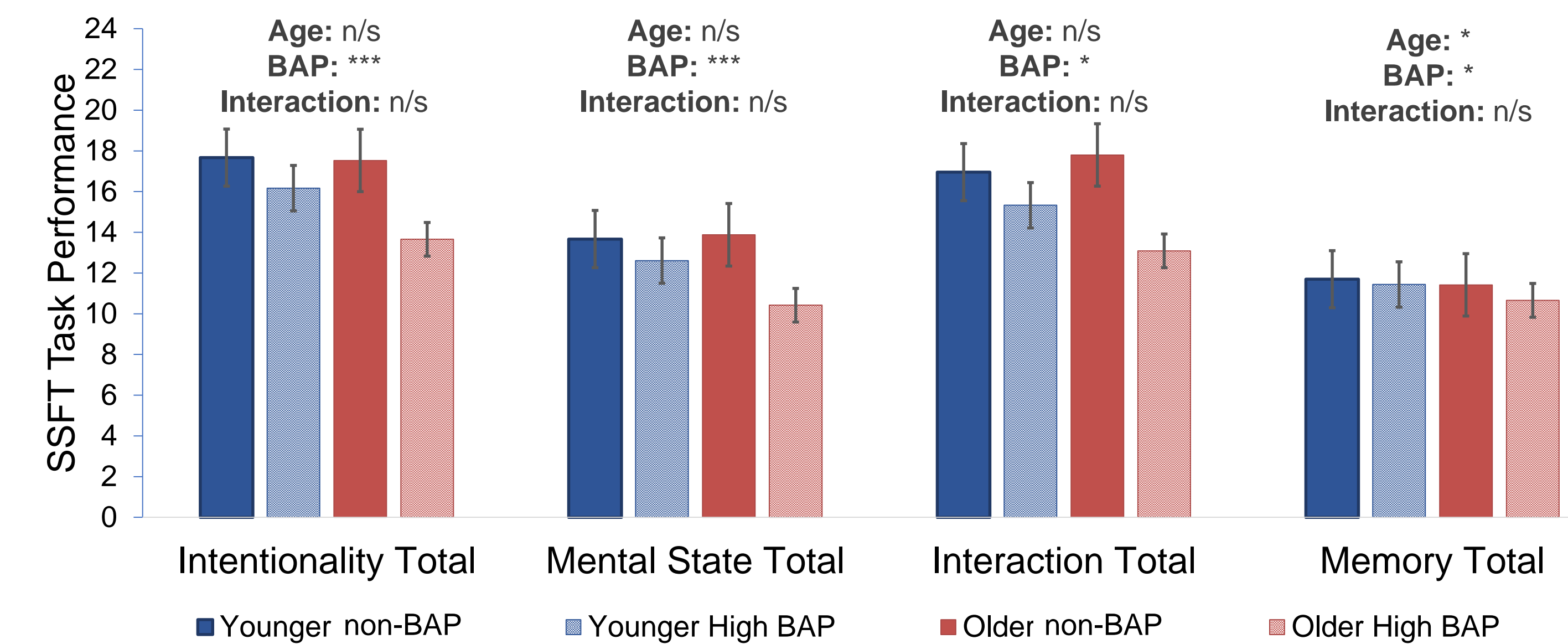


Figure 1: Group differences on SSFT ToM performance. (\* p < .05; \*\* p < .01; \*\*\* p < .001)

### Triangle Animations, 2x2 ANOVA

- Age effect: Intentionality subscale (F=5.33\*; Younger > Older),
- BAP effect: Intentionality subscale (F=7.19\*\*; non-BAP > High BAP),
- Age x BAP Interaction: Intentionality subscale (F=4.52\*\*; Older High BAP adults experiencing greater ToM difficulties).

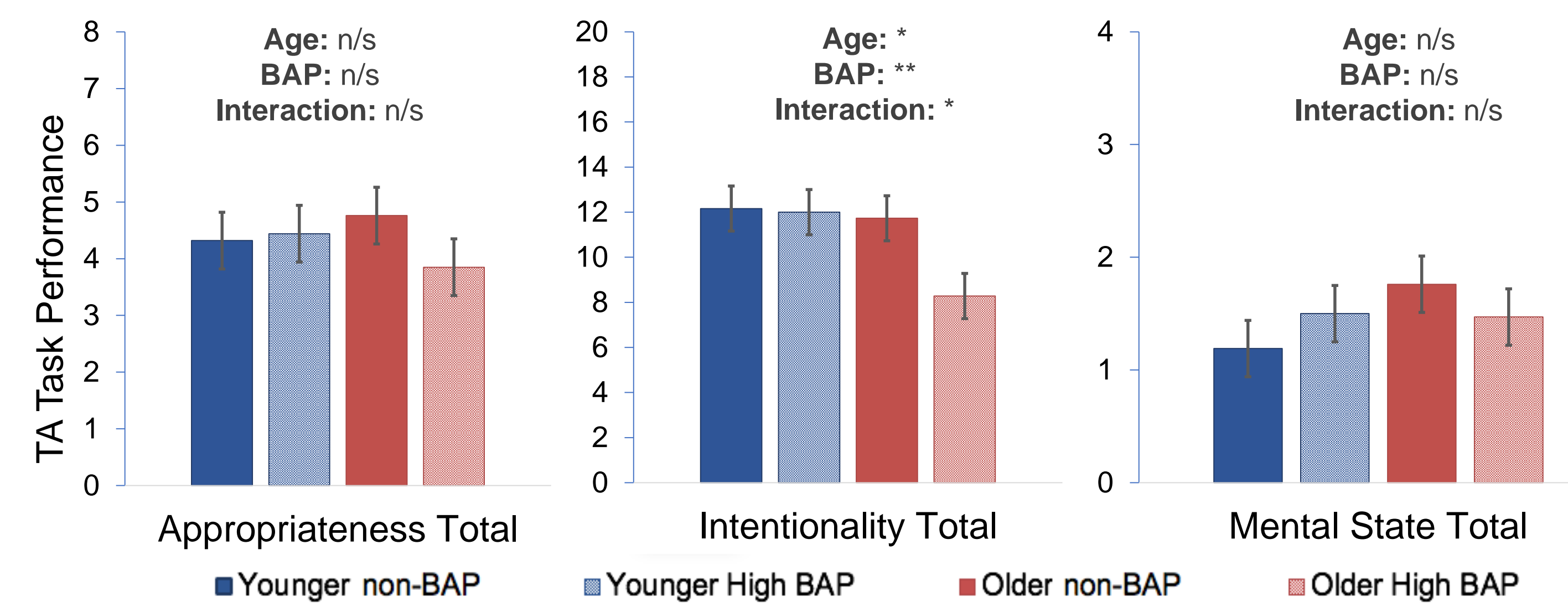


Figure 2: Group differences on TA ToM performance. (\* p < .05; \*\* p < .01; \*\*\* p < .001)

## Conclusion

- Across adulthood individuals with elevated BAP traits show poorer ToM task performance.
- Commonly observed age-decrements in ToM task performance were not observed in task designed to reflect real-world scenarios.
- However, elevated BAP traits may confer additional risk to social understanding in older age.
- Future studies should explore whether real-world ToM task scenarios are associated with real-world behaviours.
- Also whether elevated autistic traits and older age form a compounded risk to ToM performance.

