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Social and Non-Social Autistic Traits Synergise to Impair Facial Emotion Recognition in Men but Not Women: Why You Should Include Sex/Gender in Your Model

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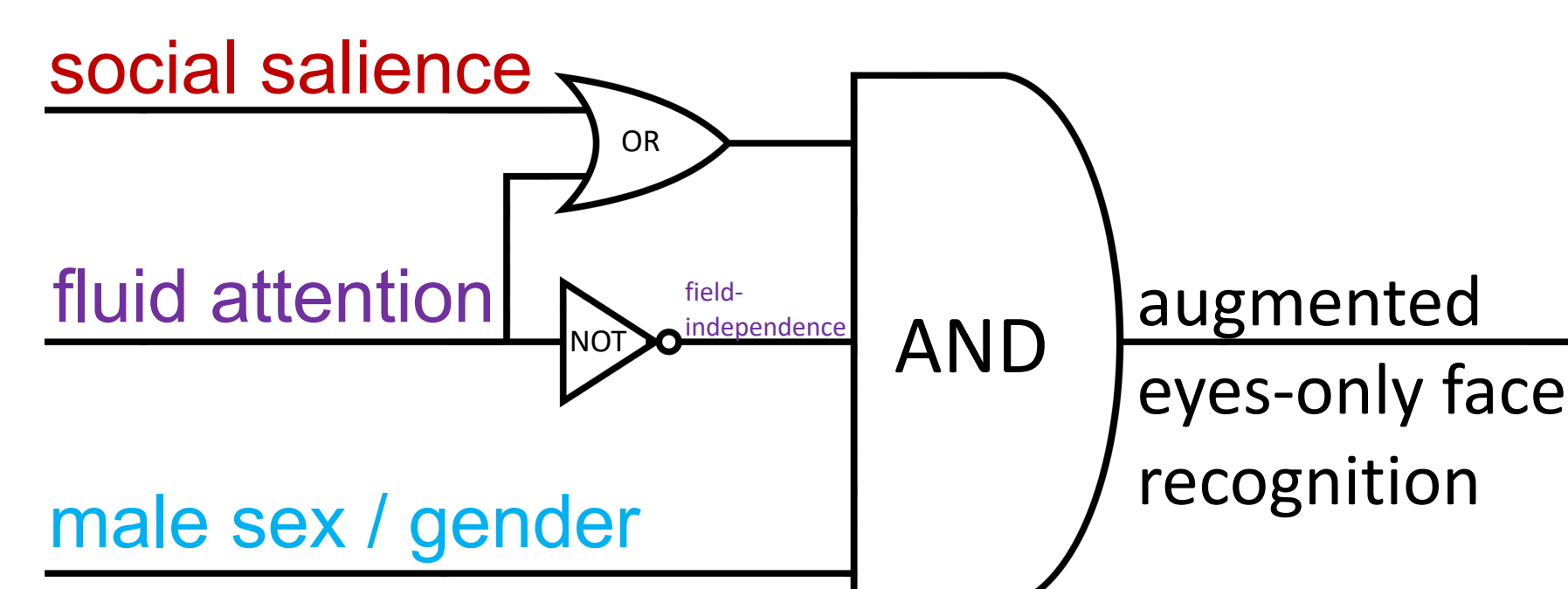


BACKGROUND

Dimensional 'autistic traits' can be measured in the general population.

"Autism Spectrum Quotient" (AQ) measures **social** and **non-social** (attention to detail) traits.

In men, **attention to detail** cuts both ways [1] in face recognition from the eyes: It can synergise with **social difficulty** to **impair**, or synergise with **social prowess** to **facilitate** eyes-only face recognition:

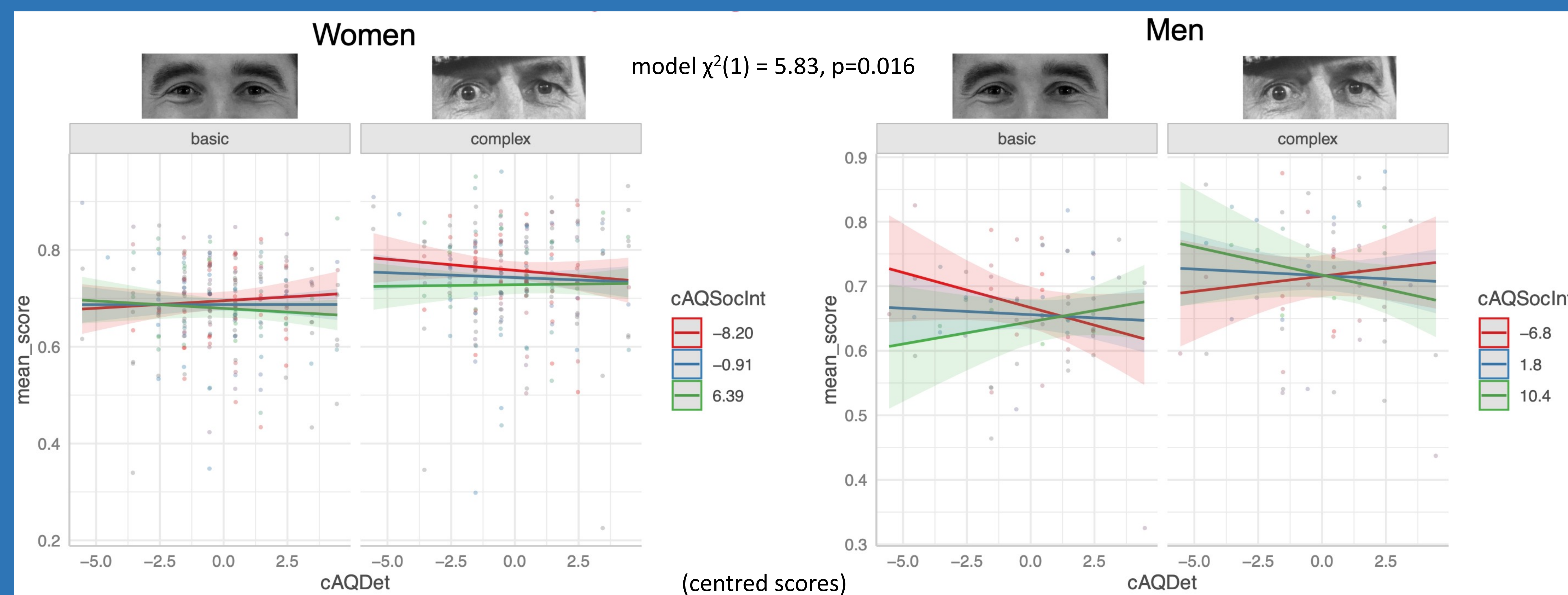


Facial masking during the recent COVID-19 pandemic offered an ecologically valid opportunity to test the extent of this effect [2].

QUESTIONS

→ Might this interaction of sex with social and non-social dimensional autistic trait domains during face recognition extend also to **facial emotion recognition**? That is, does autistic-like attention to detail facilitate eyes-only facial emotion recognition in men with intact social function but impair it in men with autistic-like social impairment?

Social and non-social autistic traits interact differently with sex/gender: Re-analysing a population data set by sex can yield opposite results across sexes and across social/non-social traits.



Women (post hoc $\chi^2(1) = 4.42, p=0.036$): **high neurotypical social ability (low AQSoctInt) → attention to detail (AQDet) slightly lessens accuracy for complex emotions** i.e., these aspects of autistic traits act independently of each other in women [3]

These differences appear early during the pandemic (i.e., before experience with masked faces) but not later during the pandemic (when masking was no longer novel).

Men (post hoc $\chi^2(1) = 8.89, p=0.003$): **high neurotypical social ability (low AQSoctInt) → attention to detail (AQDet) facilitates complex but impairs basic emotions; more 'autistic' social ability (high AQSoctInt) → attention to detail (AQDet) impairs complex but facilitates basic emotions** i.e., these aspects of autistic traits synergise negatively in men making novel, complex perceptual judgements of the eyes

METHODS

→ Facial emotion perception across two time points (early vs. late pandemic: ~10 months apart)

→ N = 302 (68 male) at t_1 , 250 (42 male) at t_2

→ Basic emotion stimuli: happy, sad, angry, etc., from EU Emotion stimuli [4]

→ Complex emotion stimuli: 'Reading the Mind in the Eyes' Test (RMET) [5]

→ **Original model**: AQ x Time x Emotion complexity → accuracy

→ **Updated model**: **Subject's sex** x **AQSoctInt** x **AQDet** x Time x Emotion complexity → accuracy

FINDINGS

→ **Original model** (not analysed by sex): High-AQ individuals' recognition of complex emotions improves from t_1 to t_2

→ **Updated model**: Interactions with sex and AQ subscales. (See centre panel.)

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→ If so, does this impairment encompass only more **subtle facial emotions**, or all facial emotions?

→ Can it be overcome with **training**?