AUTISTIC GIRLS SMILE MORE THAN AUTISTIC BOYS DURING NATURAL CONVERSATIONS: INSIGHTS FROM COMPUTER VISION

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BACKGROUND

SIGNIFICANCE: Autism in females is vastly understudied and poorly understood – leading to underdiagnosis and missed intervention opportunities. Autistic females may be more likely to "camouflage" in their social behavior, or conform to societal expectations. Societal expectations differ by sex, but standard definitions of autism do not account for inherent sex differences in what is considered "typical" behavior – which may mask unique social profiles in females.

OBJECTIVE: Use cutting-edge computer vision methods to examine the effects of sex and autism diagnosis on a key social behavior that carries gender-differentiated expectations: smiling.

HYPOTHESIS: Autistic females will adhere to sex-based social norms, by smiling more during social interactions than autistic males.

https://www.spectrumnews.org/features/deep-dive/costs-camouflaging-autism/

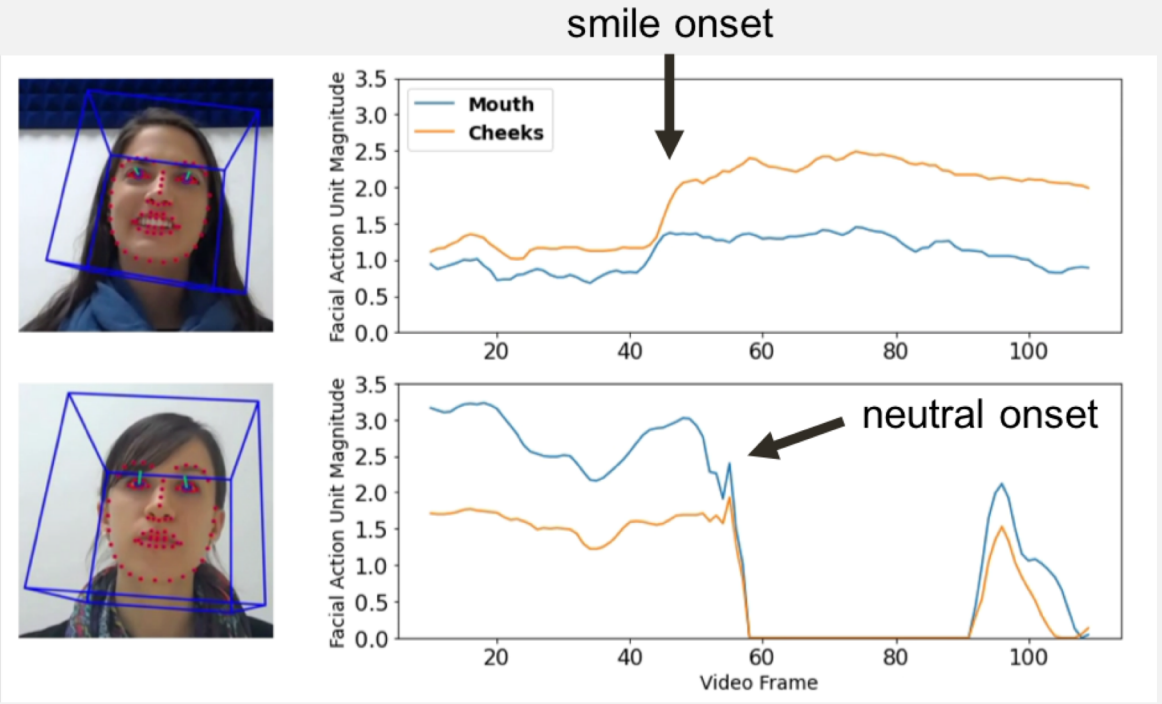
METHODS

PARTICIPANTS: 60 autistic (20 female) and 67 age- and IQ-matched neurotypical (25 female) youth. Males and females matched on autism symptoms per traditional scales (ADOS-2, SCQ).

TASK: 5-minute natural social interaction with an unfamiliar, non-expert adult

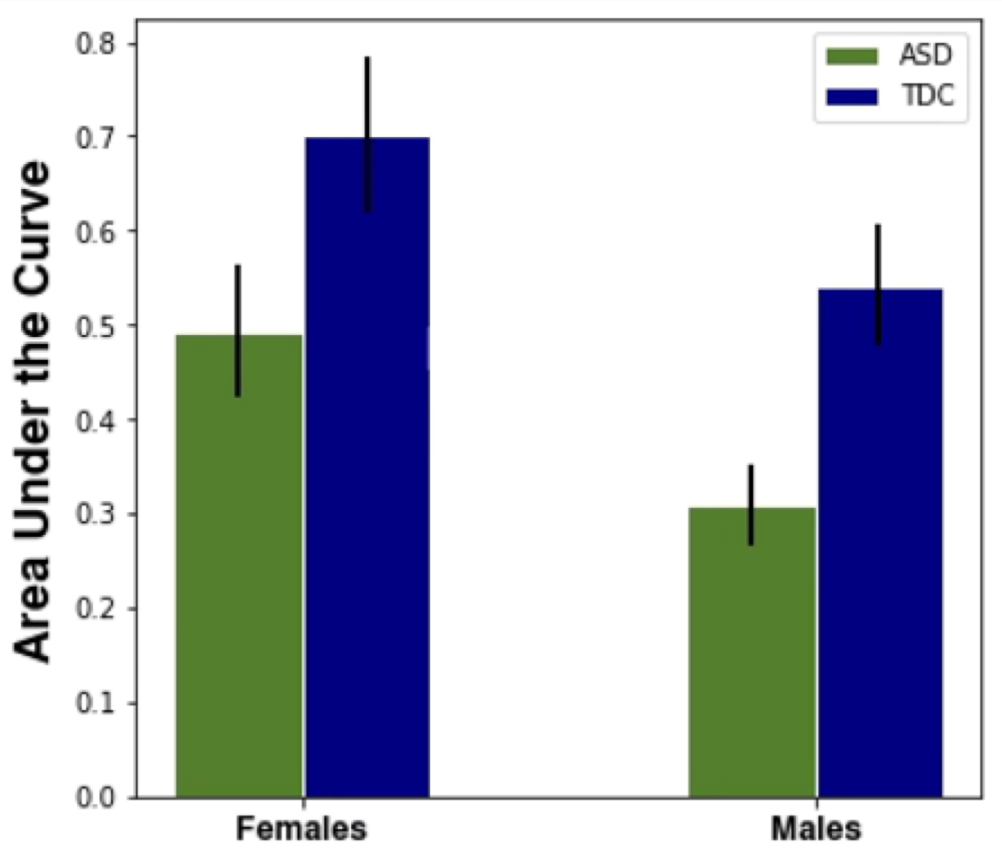
COMPUTER VISION ANALYSIS: Smiling was digitized by frame from video and operationalized as the average magnitude (area under the curve; AUC) of the 2 standard facial movements that comprise a smile (lip corner pulling and cheek raising)

STATISTICAL ANALYSIS: AUC analyzed by 2 x 2 ANOVA with factors of sex and diagnosis



RESULTS

- **Females smiled more** than males ($p < .01$, $\eta^2 = .09$)
- **Neurotypical participants smiled more** than autistic participants ($p < .001$, $\eta^2 = .05$)
- No diagnosis by sex interaction
- **Autistic females' smiling was increased** relative to autistic males ($p < .01$)
- Autistic females were **most comparable to neurotypical males**



DISCUSSION

CONCLUSIONS

- Sex-based expectations for normative facial expressiveness may leave autistic females *appearing more "typical"* in their social behavior than male autistic peers.
- Autistic females may therefore miss diagnostic thresholds for "atypical," placing them at *higher risk of going undetected*.
- Objective, granular *computational behavior analysis has enormous potential* for detecting underrecognized sex differences in autism.

NEXT STEPS

- Move beyond the *presence* of smile activity to analyze sex differences in smile *quality* or prototypicality.
- Explore the *influence of smiling behavior*, and its intersection with gendered social demands, *on social success*.
- Big picture: Advance a *sex-informed conceptualization of autism*, allowing us to detect and treat unique social difficulties in females *earlier and with greater precision*.

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