

Context, Site, and Sex Shape the Links Between Infants' Mouth-Looking to Talking Faces and Later Language and Autistic Traits

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Lozano, I.¹, Duszyk-Bogorodzka, A.², Capelli, E.³, Viktorsson, C.⁴, Falkiewicz, N., Jones, E.J.H.⁵, Koziol, A.¹, Tomalski, P.¹, Falck-Ytter, T.⁶*, T., Gliga, T.⁶* & Riva, V.⁴*

* Shared Senior co-authorship

¹Institute of Psychology, Polish Academy of Sciences; ²SWPS University; ³Scientific Institute IRCCS E. Medea; ⁴Uppsala University; ⁵Birkbeck - University of London; ⁶University of East Anglia

✉ ilozano@psych.pan.pl

Background

- ❖ Autism and related **language differences** are **less common** in **females** than males (Harrop et al., 2021), but the underlying developmental mechanisms remain unclear.
- ❖ In **neurotypical (NT) infants**, sex differences in early attention to the mouth of talking faces partly explains those in language development: females show greater mouth-looking than males and, in females only, lower mouth-looking at 5.5 months predicts larger vocabularies in toddlerhood (Lozano et al., 2022).
- ❖ In NT-infants, early mouth-looking may constitute a **female-unique early marker** of language development in toddlerhood.

Objectives

To investigate whether **sex differences in mouth-looking** in the first year **also occur in infants at elevated likelihood for autism** (EL-infants), and whether mouth-looking acts as a **female-unique early marker** of language and autistic traits.

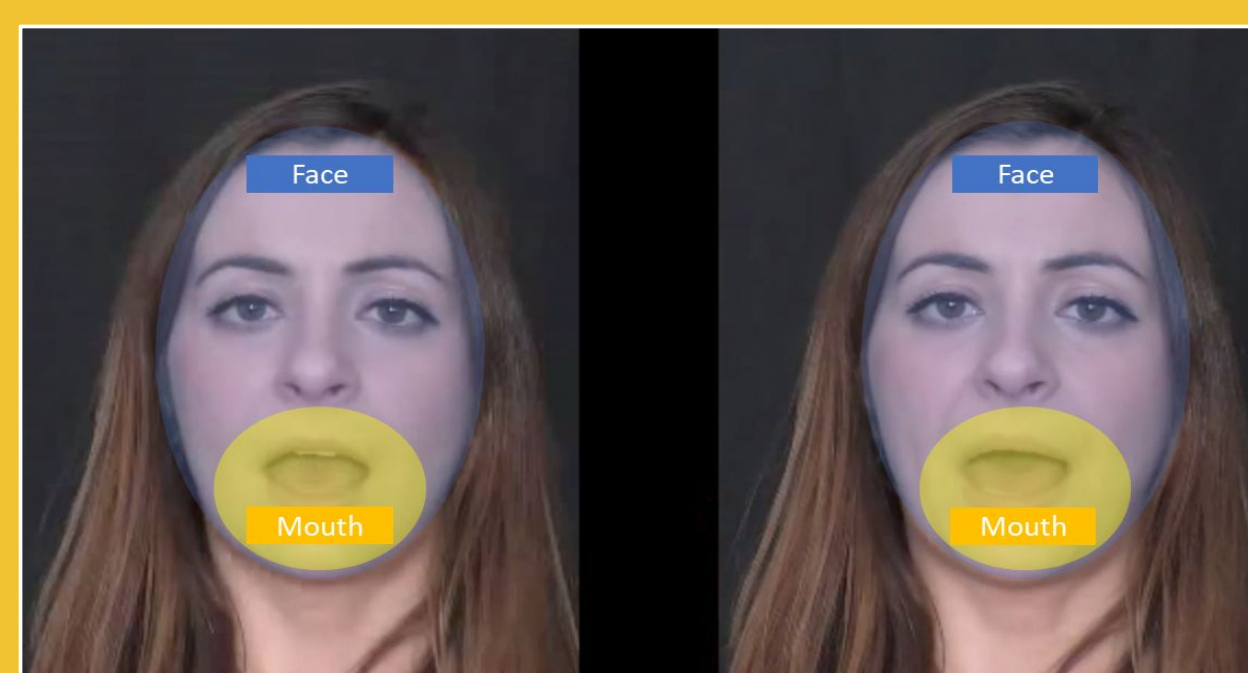
✿ We hypothesised (pre-registered):

- H1.** Females will show **greater mouth-looking** than males in the first year
- H2.** Mouth-looking in infancy will predict better language **only in females**
- H3.** In EL-infants, mouth-looking will predict autistic traits **only in females**

Do these potential sex effects **generalise across time (6-24 months), cohorts (Sweden, Italy, UK), and contexts** (screen-based vs. 'live' eye-tracking; ET)?

Screen-based ET

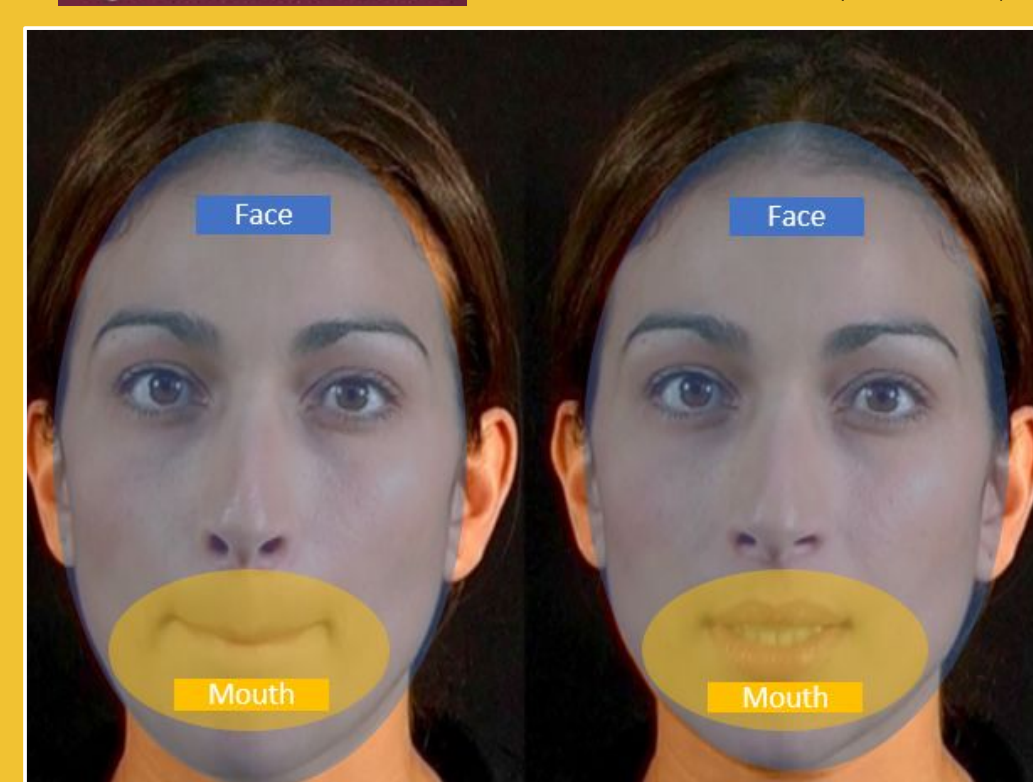
IRCCS EUGENIO MEDEA **MEDEA Lab (Italy)**



Audiovisual syllables

(Capelli et al., 2026; Guiraud et al., 2012)

Birkbeck **CBCD (UK)**



Methods

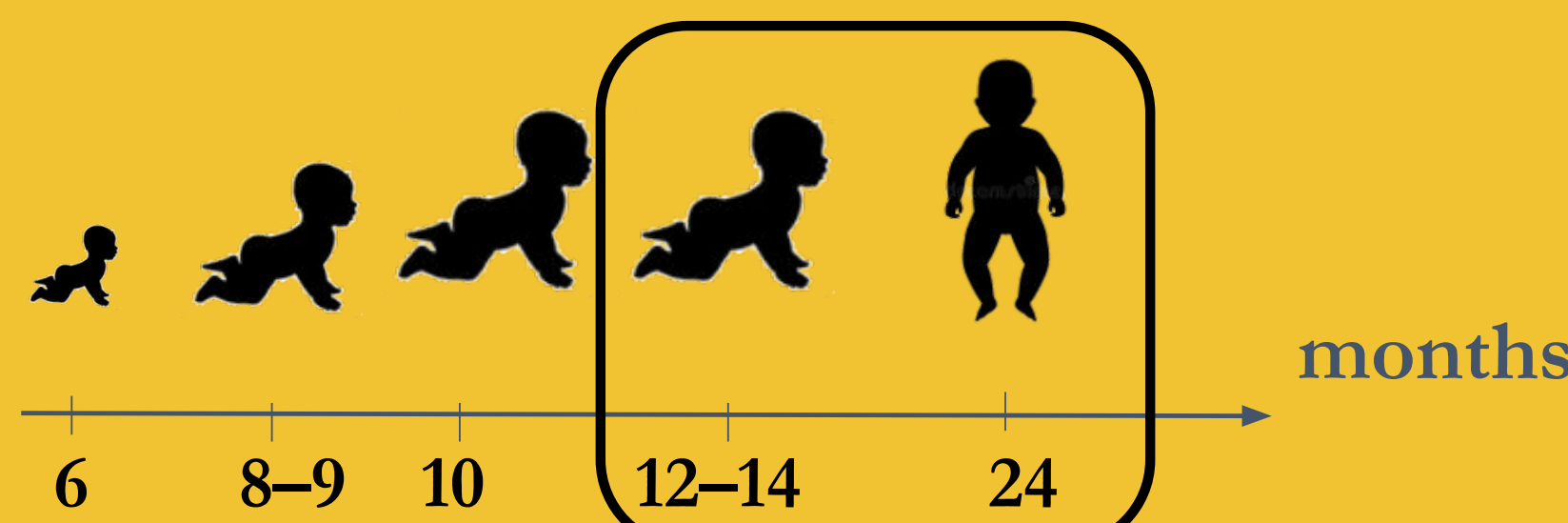
$N = 360$; 51.04 % females

EL-infants
($n = 253$)



TL-infants
($n = 107$)

Secondary analyses of longitudinal data across time, cohorts and contexts



'Live' ET

DiVE Lab (Sweden)



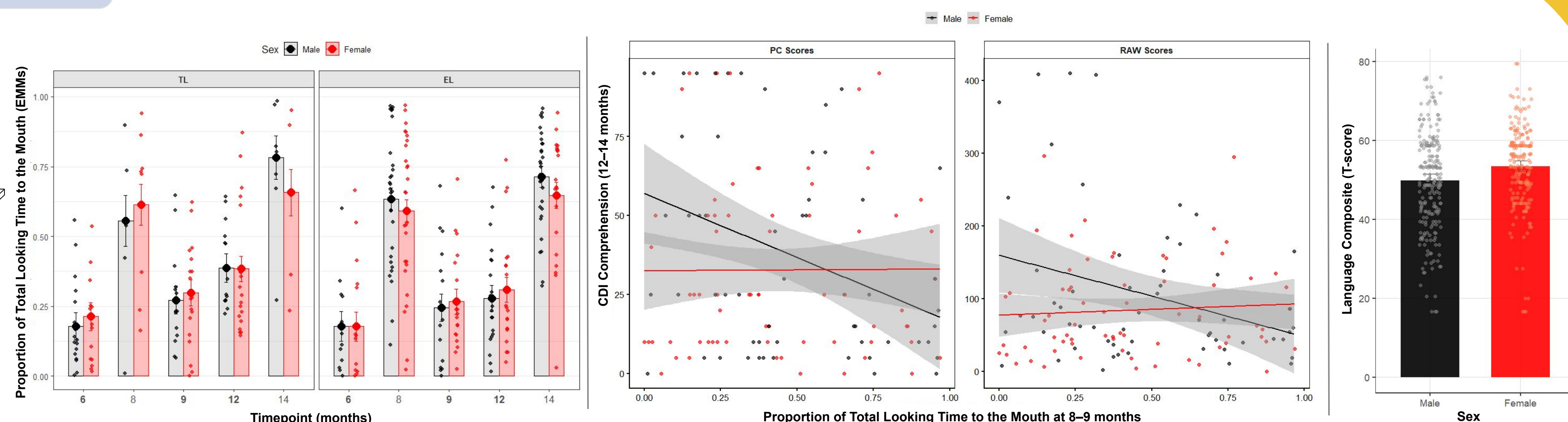
Audiovisual *fluent* speech

(Nyström et al., 2017)

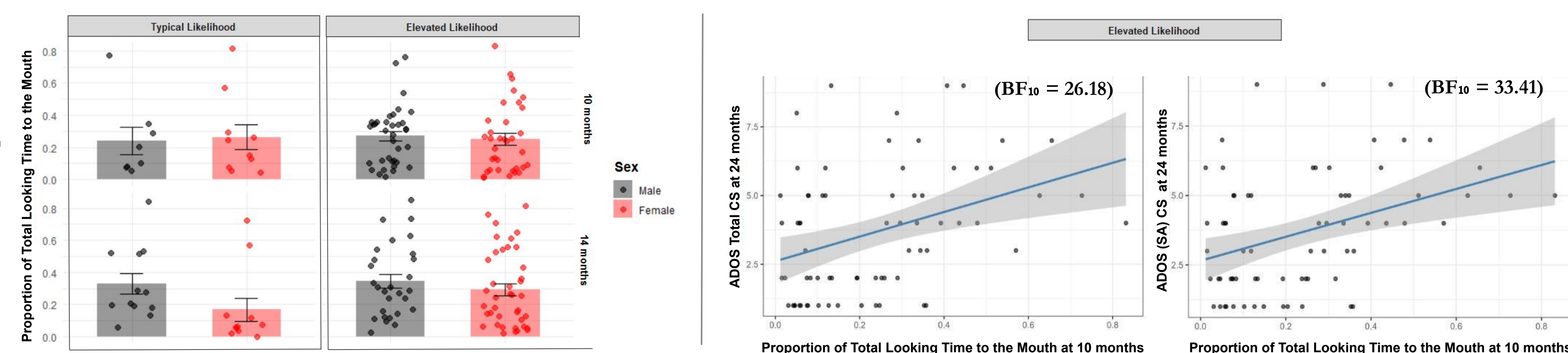
Language skills & autistic traits



Results



- ❖ Linear Mixed Models (LMMs): **no sex differences** in mouth-looking (PTLT Mouth) across likelihood groups, cohorts, or time.
- ❖ Linear regressions: across cohorts, **reduced mouth-looking at 8-9 mo** predicted **higher receptive language** (raw and percentile) **at 12-14 mo in males** (both $ps = .014$) but not females (all $ps \geq .660$).
- ❖ Across cohorts, **female had greater vocabularies** (receptive and expressive) than males at 24 mo.



- ❖ Bayesian LMMs: **strong** evidence for **no sex differences** in mouth-looking ($BF_{01} = 24.19$) across likelihood groups and time.
- ❖ **Inconclusive evidence** for sex-specific links with later language and autistic traits (all BF_{10} and $BF_{01} \sim 1.00$).
- ❖ Exploratory analyses: in EL-infants, **across sexes**, **strong-to-very strong** evidence that **greater mouth-looking** at 10 mo predicted **higher socio-communicative differences and autistic traits** at 24 mo.

Conclusions

- ❖ **No sex differences** in mouth-looking
- ❖ Mouth-looking as a sex-specific early language marker may depend on **context, cohort, and stimuli**.
- ❖ In light of prior work, mouth-looking may predict language in both sexes, but at **different times in development**, possibly reflecting males' longer reliance on visual speech cues.
- ❖ **Increased mouth-looking to live talking faces at 10 mo** may be a sex-independent early marker of **autistic traits** at 2 years in EL-infants, opening avenues for early intervention.
- ❖ Sex stratification should be **nuanced** when studying links between early social attention and later language and socio-communication in autism.
- ❖ Future research should strive to understand the *mechanisms* behind sex differences.

References

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