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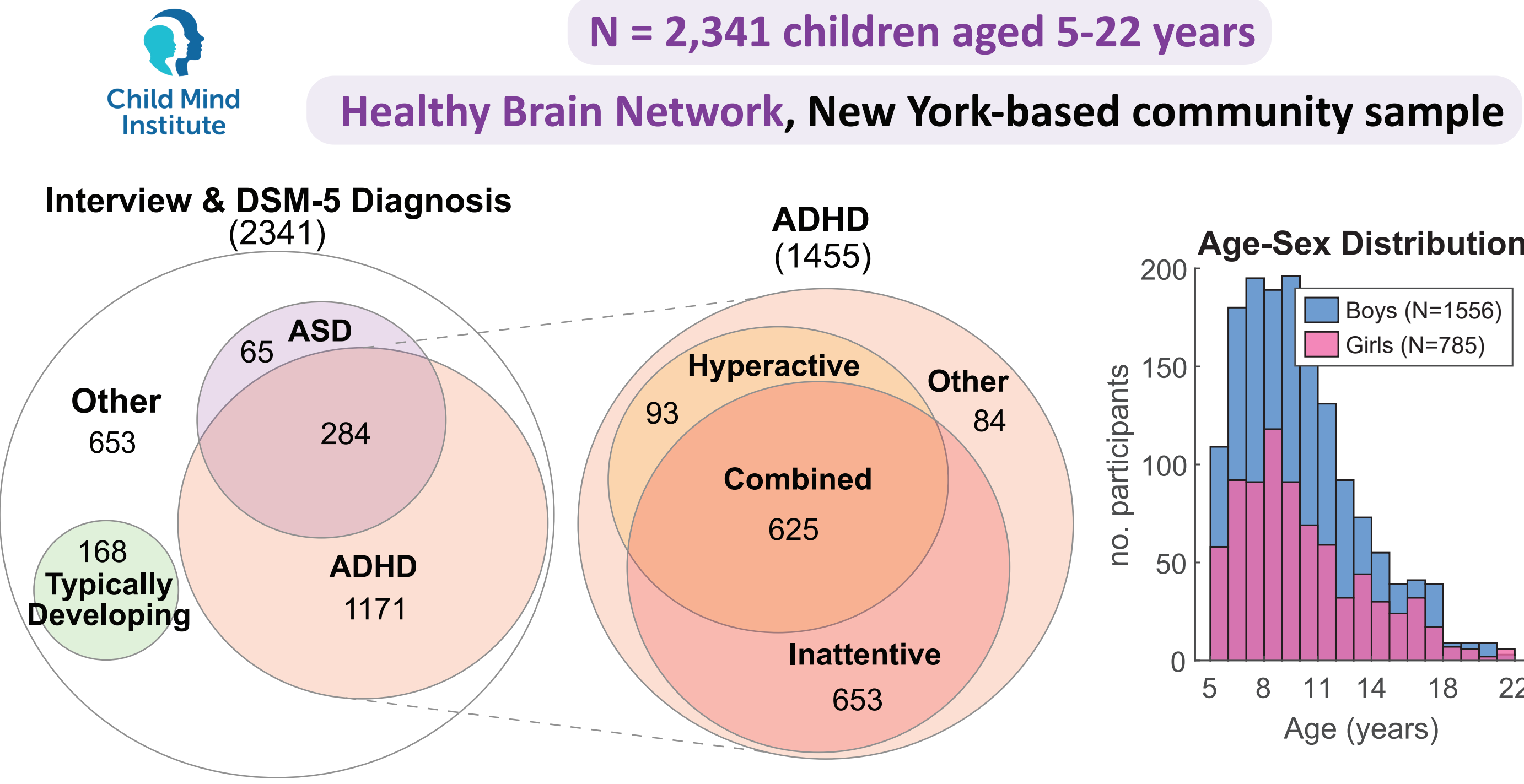
Background

- Attention-Deficit/Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD) frequently co-occur, complicating diagnosis.
- Current clinical assessments are subjective and limited in scale.
- Digital phenotyping offers objective, scalable behavioral markers.

Objectives

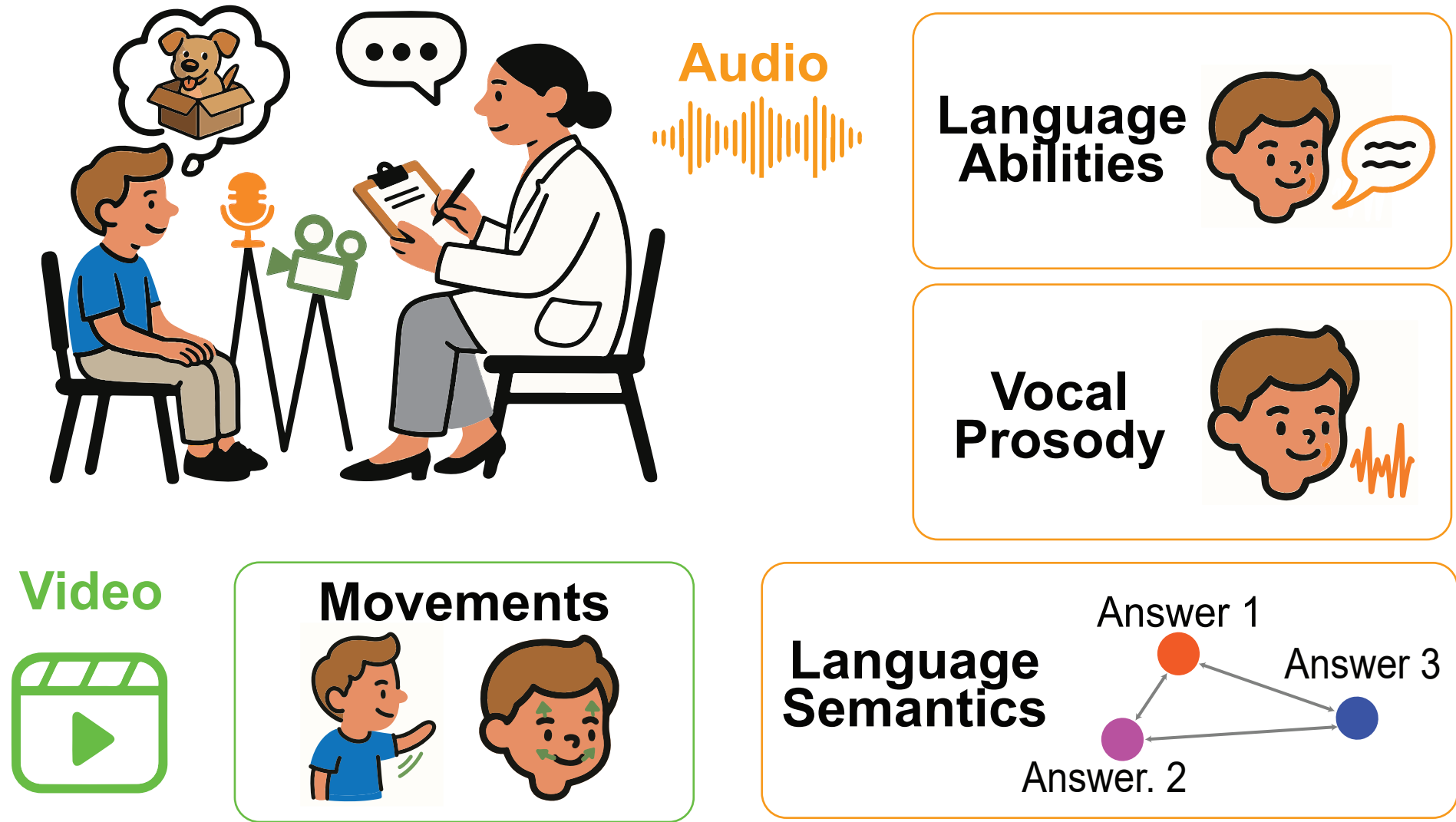
- Identify unique vs. overlapping behavioral signatures of ADHD and ASD.
- Quantify effects of age, sex, and IQ.
- Validate AI-derived markers for naturalistic behavior.

Population



Task

Describe the short film *The Present* during a semi-structured interview.



AI Tools

WhisperX + Large-Language Models

- Transcription & speaker diarization.

Google Text Embeddings

- Semantic analysis of responses.

OpenWillis

- Speech & prosody measures.

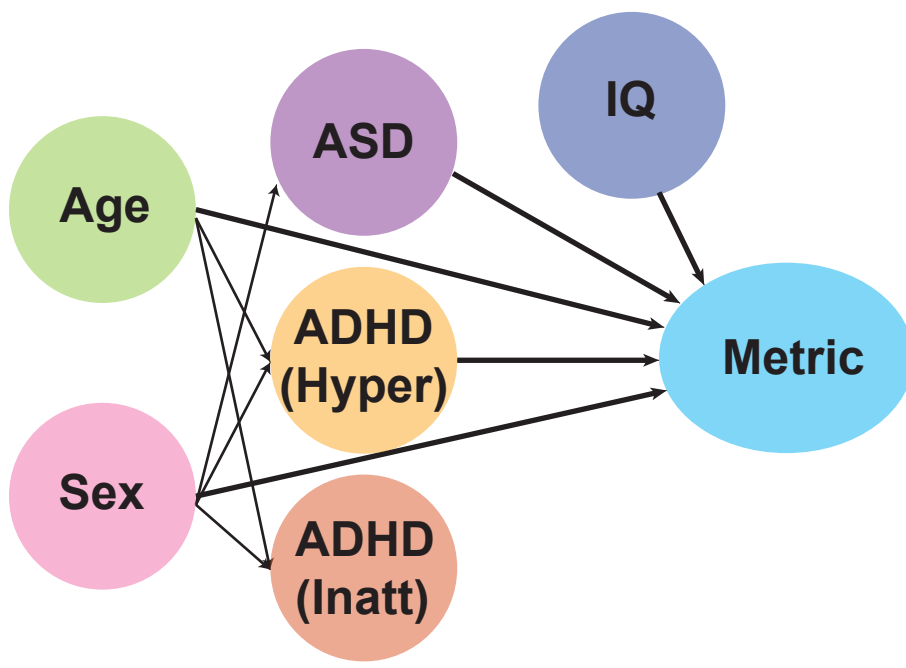
Mediapipe Holistic Model

- Body and Facial movement measures.

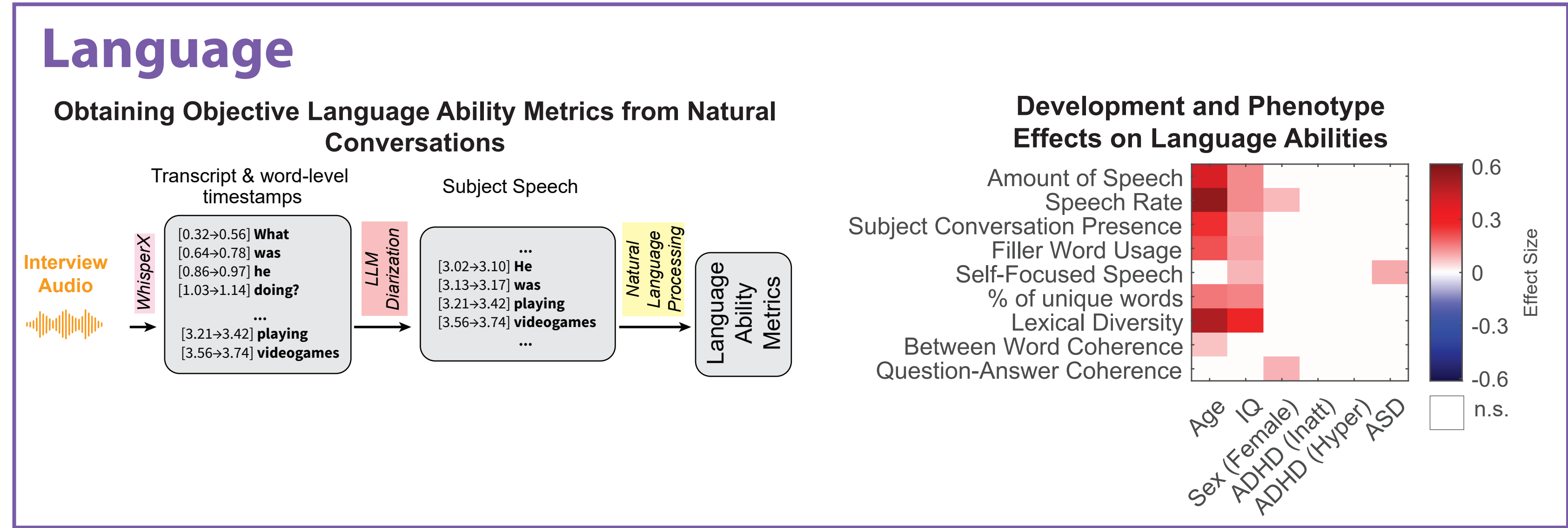
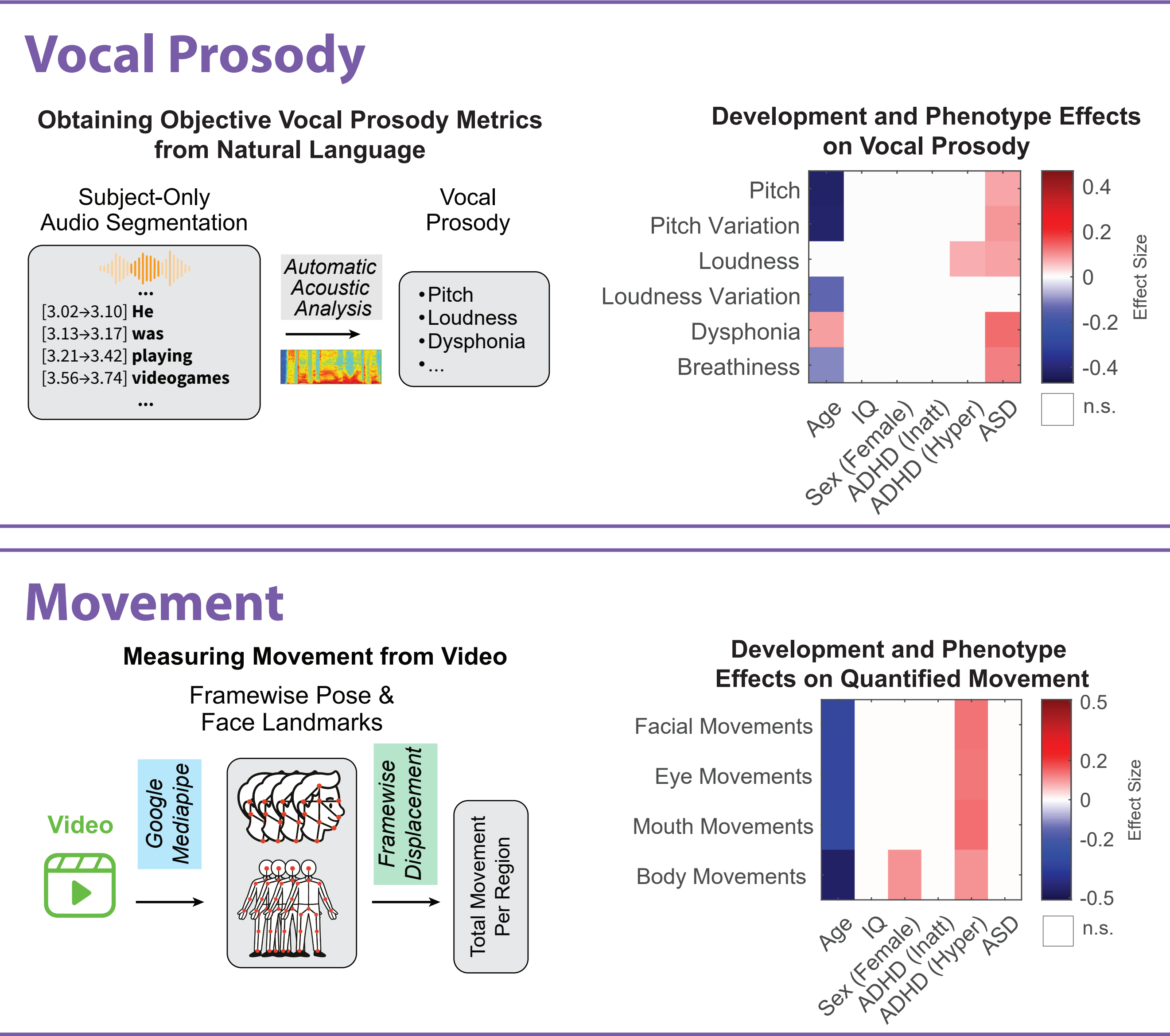
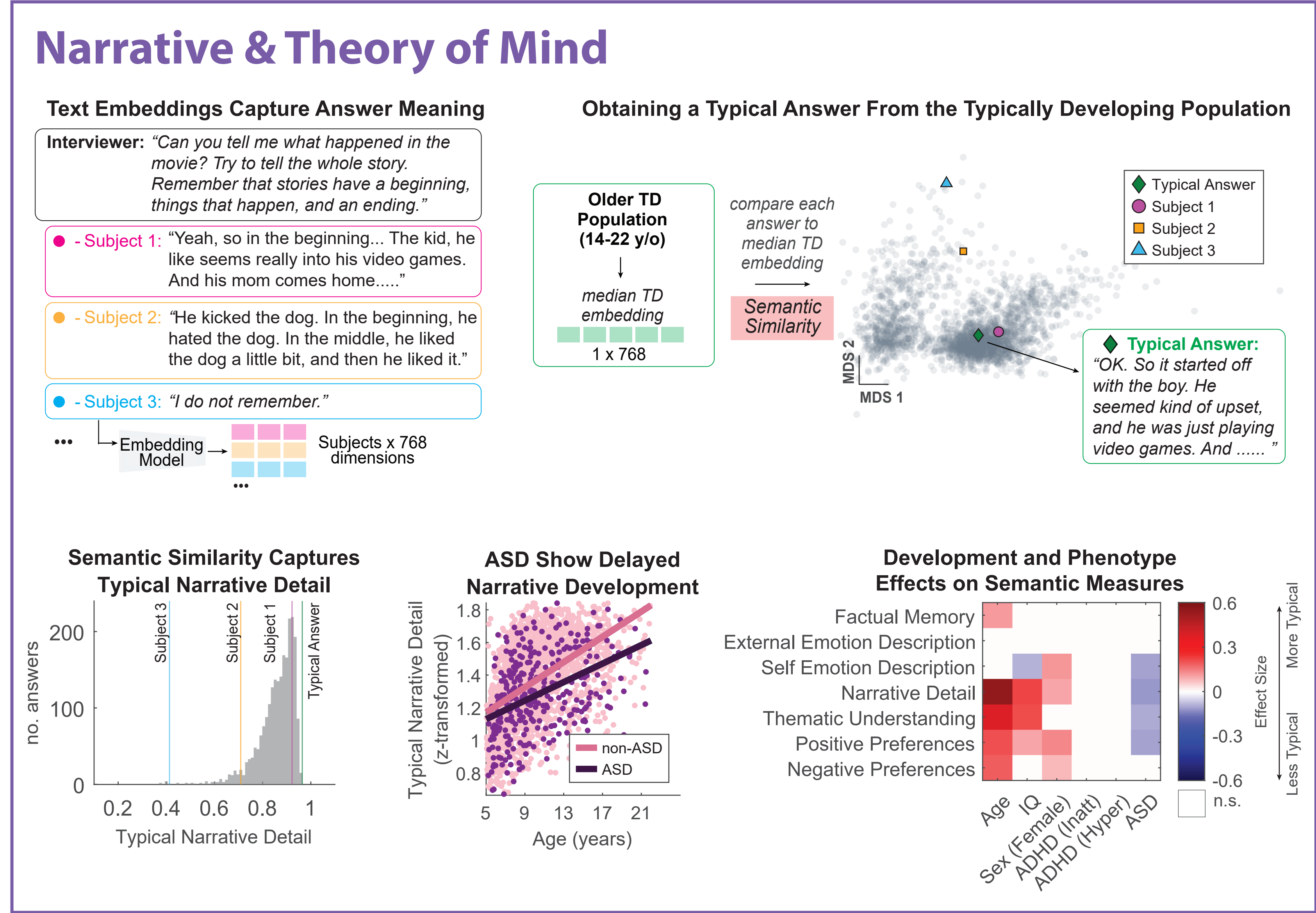
Analysis

Multivariate regression controlling for age, sex, IQ, and comorbidity

$$\text{Metric} \sim \text{Age} + \text{IQ} + \text{Sex} + \text{ADHD-Inatt} + \text{ADHD-Hyper} + \text{ASD}$$



Results



Highlights

- Distinct, quantifiable signatures differentiate ASD and ADHD.
- ASD: intact language structure, but impaired narrative, Theory of Mind, and atypical prosody.
- ADHD-Hyperactive: increased movement as a specific marker.
- Developmental modeling is essential to separate pathology from maturation.
- Digital phenotyping offers data-driven complement to clinical assessments.
- Scalable, objective behavioral analysis may open path for developmental diagnostics using naturalistic data.

Check it out!

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Code

github.com/asortubay/AI_behavioral_analysis

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Article Preprint



Live Face Tracking demo

