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### Automated analysis of head movements in youth at clinical high-risk for psychosis during clinical interviews

# 01 INTRODUCTION

- Social deficits are a hallmark of schizophrenia spectrum disorders and contribute to functional impairments<sup>1</sup>.
- Individuals at clinical high risk (CHR) for psychosis exhibit altered social behavior, yet research has primarily focused on perception and interpretation rather than performed social behaviors<sup>2</sup>.
- Head movements play a key role in communication, influencing conversational flow and social engagement<sup>3</sup>.
- Advances in **automated video-based motion tracking** enable precise and scalable analysis of social behavior.



### **Objective:**

This study examines spontaneous head movement alteration in individuals at CHR using an automated approach.

## 02 METHODS

N = 90 Individuals at CHR for psychosis- CHR



### MediaPipe

Machine-learning – based body pose estimation program <sup>4</sup>

Video-recorded clinical interviews - first 5-min of the SIPS

Task

Head movement variables

- Total amount of movement
- Amplitude
- Speed
- X Y Z

- Symptoms
  - SIPS
  - Positive
  - Negative



05

100

# 03 RESULTS

#### Head movements by group Х Ζ 12.5 Amplitude Yaw 7.5 5.0 r = -0.231, *p* = .032 0.15 2.5 > Speed of the second sec CHR HC CHR HC CHR HC Group Х 0.20 \* 0.05 0.15

#### Time (s)

# 04 DISCUSSION

200

CHR individuals exhibit **reduced speed** in spontaneous head turns during social interactions, suggesting **subtle social motor alterations**.

300

- Findings highlight a link between motor behavior and communication deficits in psychosis risk.
- Automated movement analysis provides an objective, scalable method to assess social behavior.
- Future research should explore longitudinal changes and integrate speech-event annotation to better contextualize findings.



- No group difference in total amount of movement
- CHR individuals had significantly slower head turns (Y yaw)

U = 2860, *p* **= .0019**, *d* = -0.41

#### **Disorganized communication (SIPS P5)**

The higher the P5 symptoms (i.e., disorganized communication), the lower the speed of side-side head-

movements.

 May improve risk detection and inform early intervention strategies.

**MPLICATIONS** 

- Supports integration of **automated motion analysis** in clinical assessments.
- Highlights potential for targeting nonverbal behavior in therapeutic interventions.



#### References

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