# Real-Life Neuroscience: Measuring Auditory and Visual Attention in the Classroom

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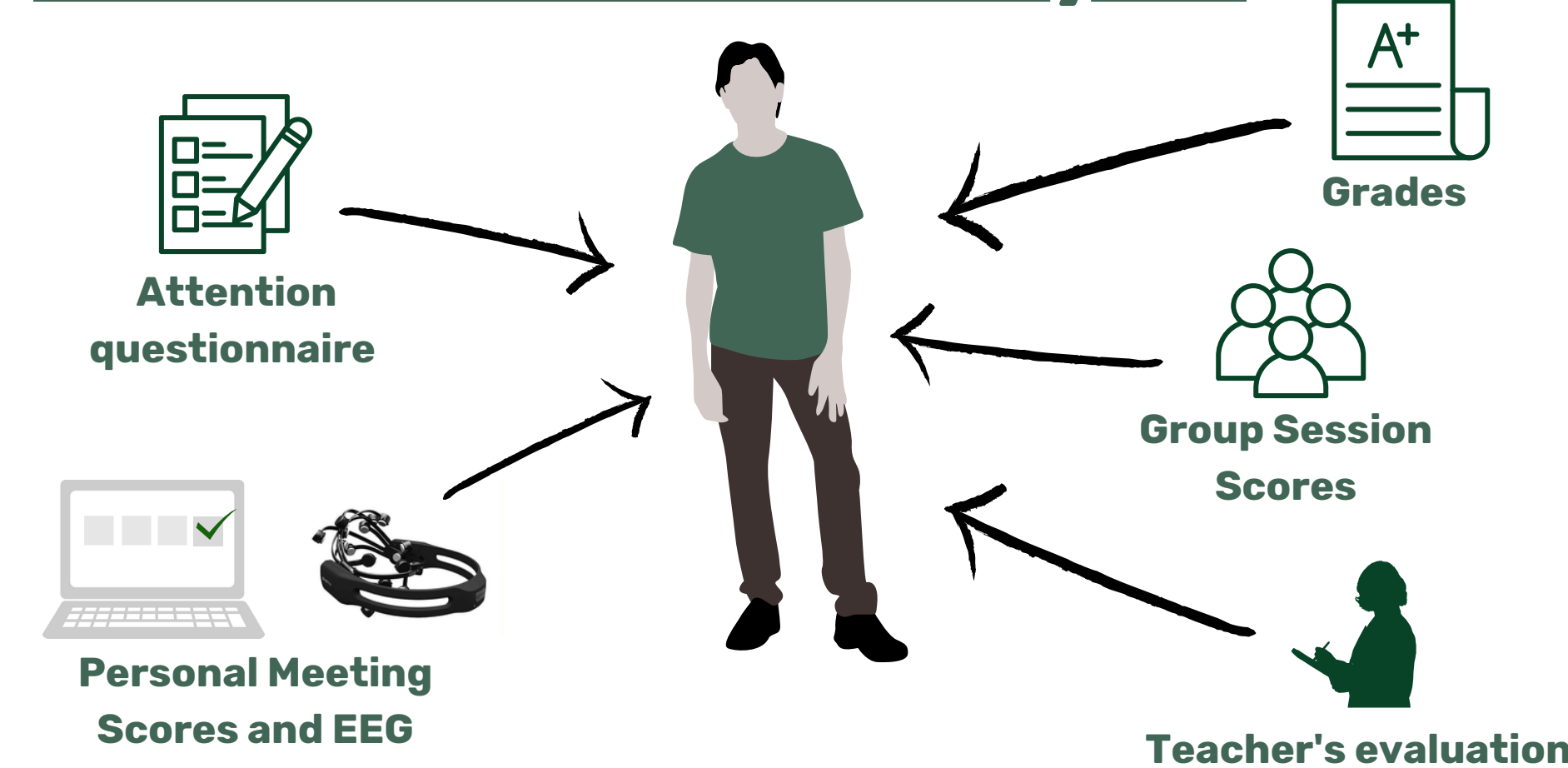
## Introduction

- Paying attention in class is crucial for effective learning
- Our '**lab-to-school**' bridge project takes it a step further by measuring **attention in noisy learning environment**- in their school
- We used well-validated cognitive tasks to assess students' attention abilities under real-life conditions

**Group Sessions**

**Personal Meeting**

**Visit The Multidisciplinary Brain Research Center, Bar-Ilan University**
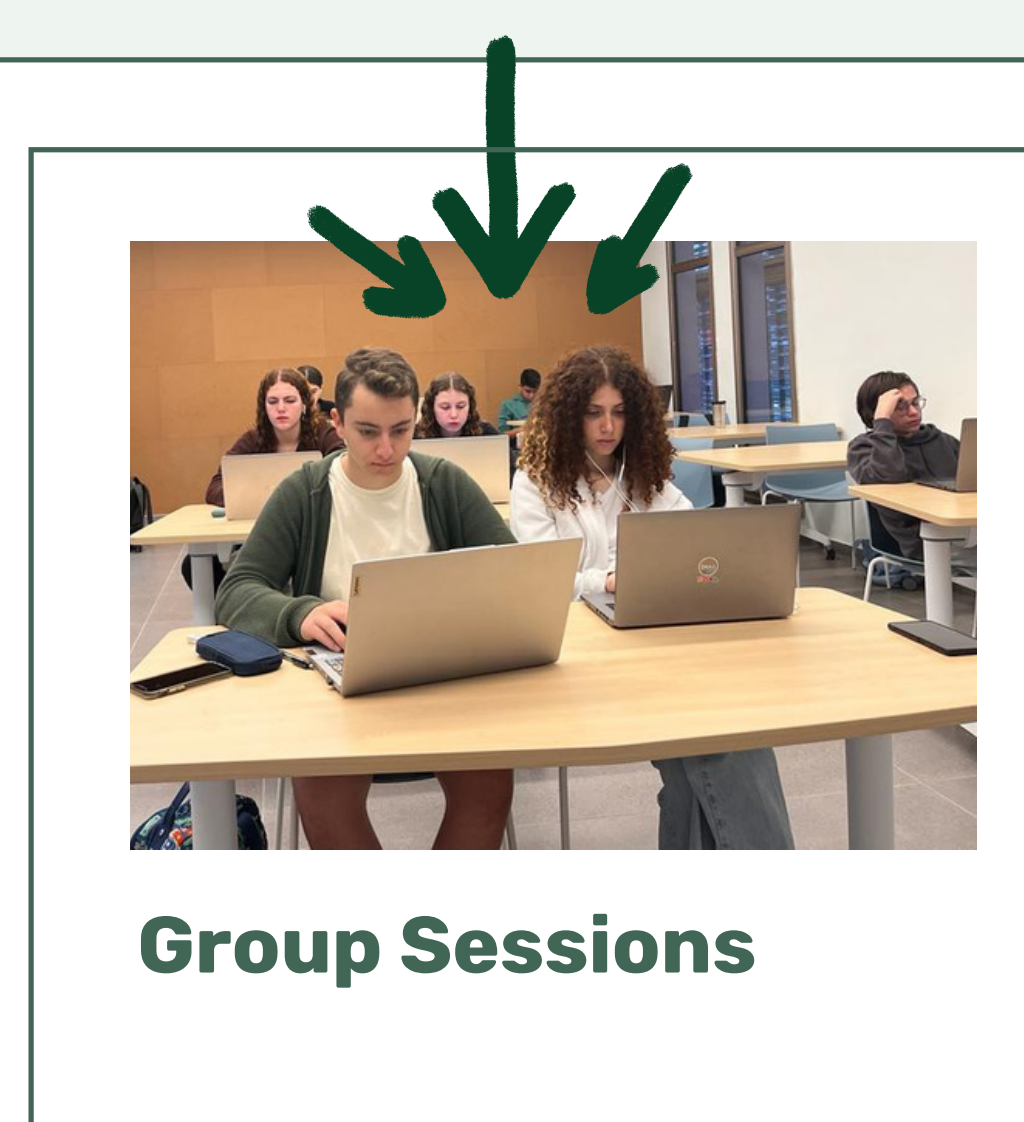
## Objectives

- Measure attention in real learning environment
- Educate and empower children using knowledge on their own brains
- Pave the way towards more real-life longitudinal designs

## Individual-level analysis

Attention questionnaire

Grades

Group Session Scores

Personal Meeting Scores and EEG

Teacher's evaluation

## Methodology

- Two sessions
- Small groups (5-8)
- Online experiments
- **Questionnaires**

### subjects

- 9th-grade students
- 'Neuroscience' course
- 'Begin' high-school

**CPT-AX**
A----X  A----Y
B----X  B----Y

**FLANKER**
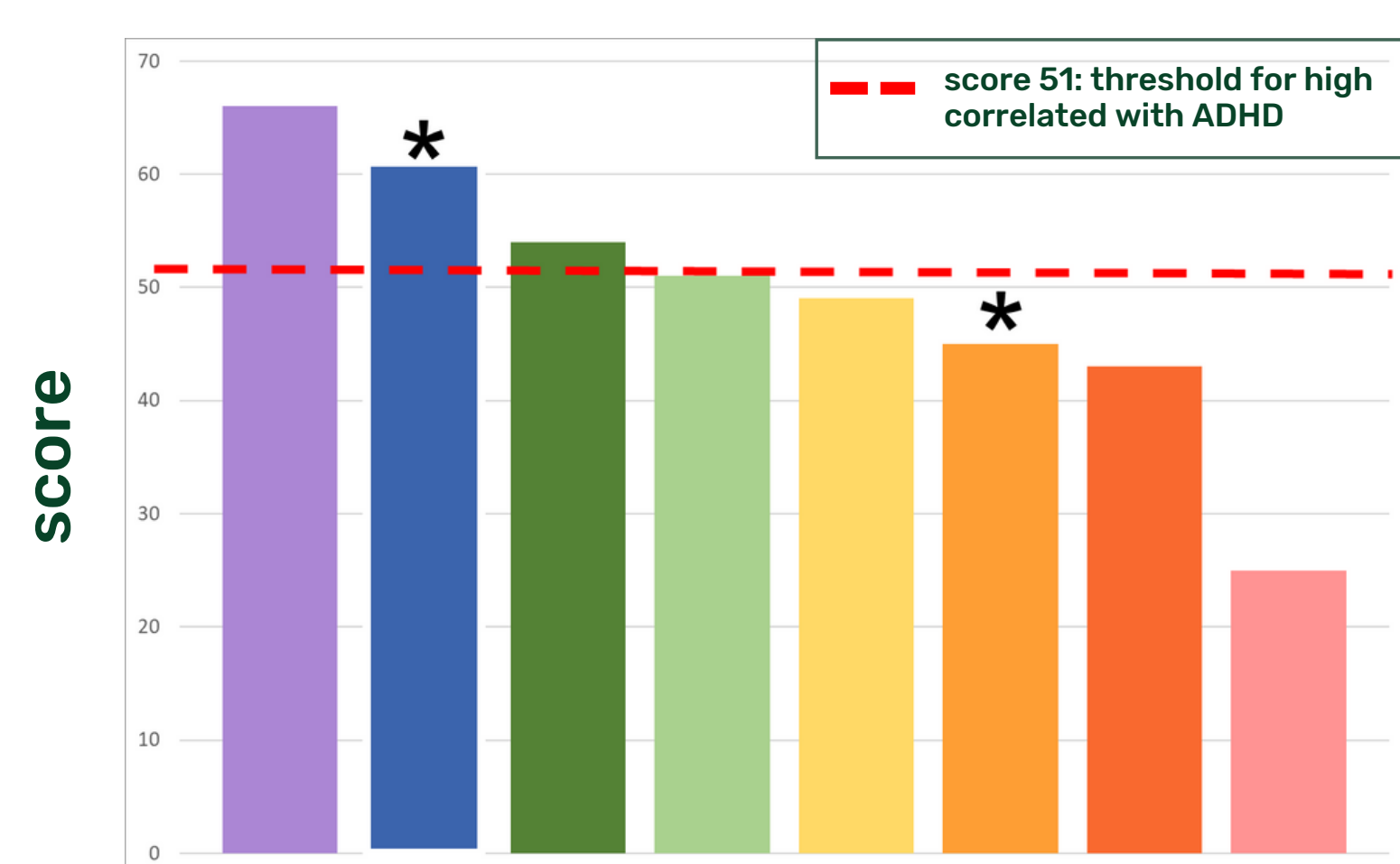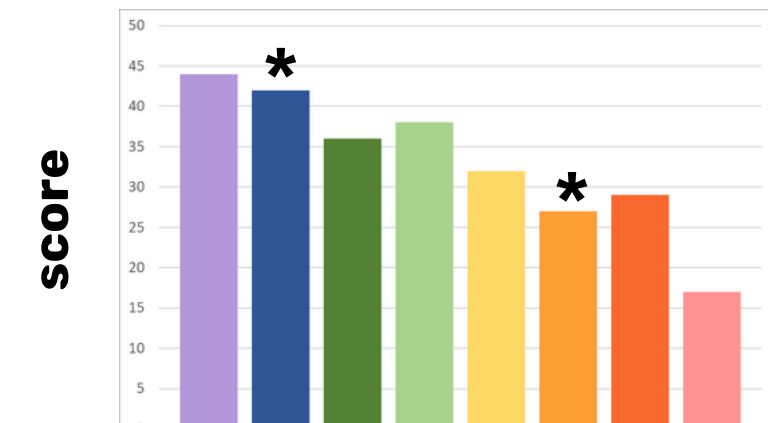< < < < <
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**STROOP**
3   9

**ODDBALL**
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The subjects are diagnosed with ADHD: *  Subject numbers: **102**  **104**  **204**  **103**  **303**  **203**  **403**  **302**

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## Questionnaires

**Q-ADHD-RS- TOTAL**
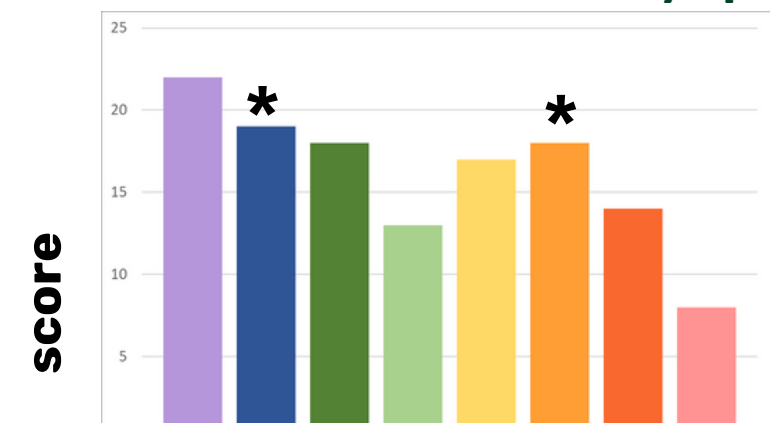

score 51: threshold for high correlated with ADHD

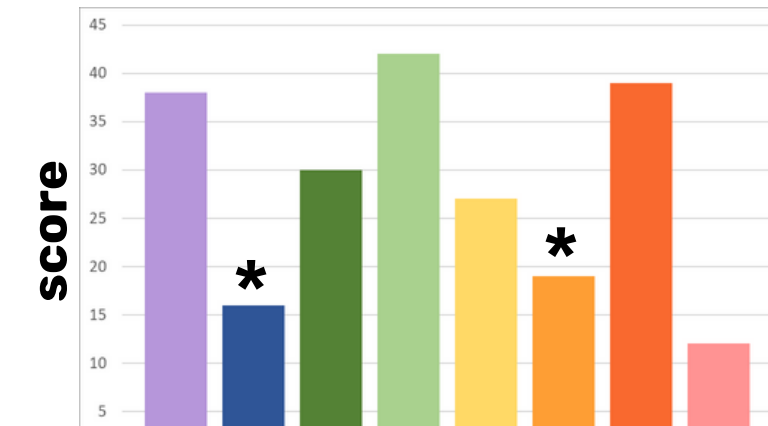**Q-ADHD-RS- Hyperactivity/ Impulsive**

How often do you find it difficult to wait your turn in situations that require waiting?
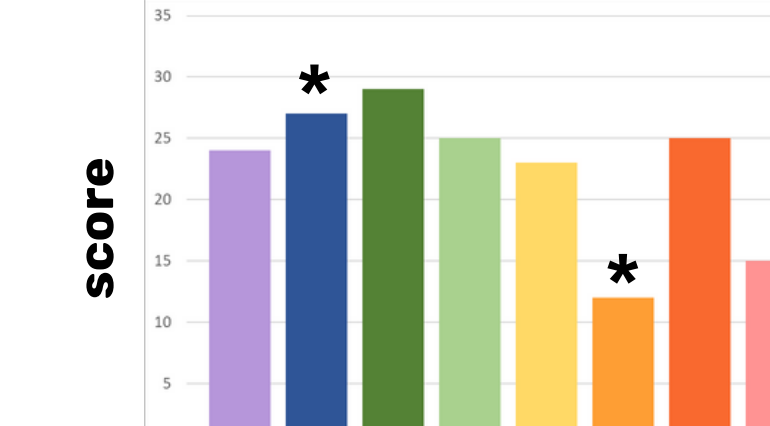Scale 1-5

**Q-ADHD-RS- Inattentive symptoms**

How often do you have trouble remembering appointments or commitments?
Scale 1-5

**Q- mind-wondering**

"When my thoughts wander they often shift from one topic to another"
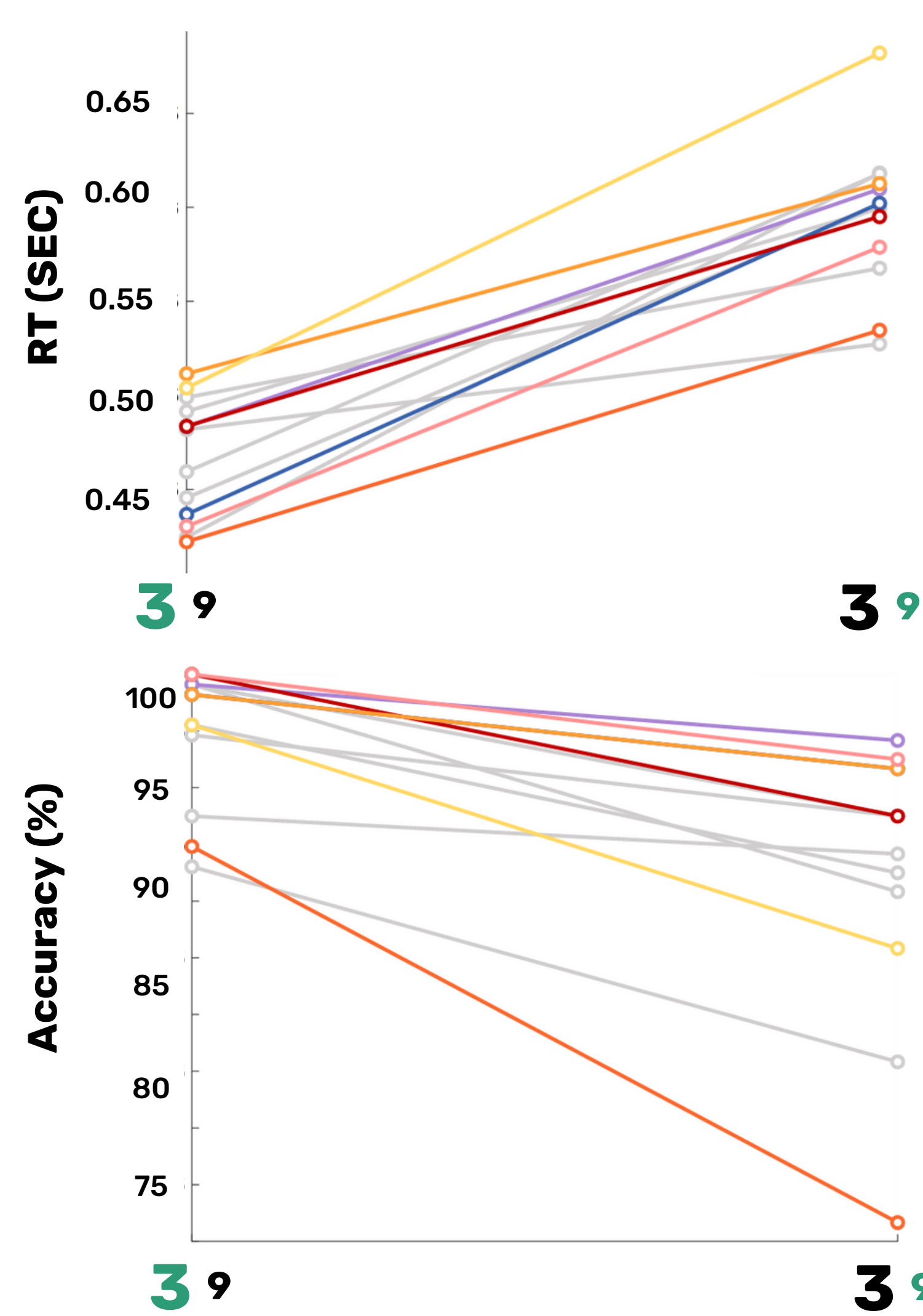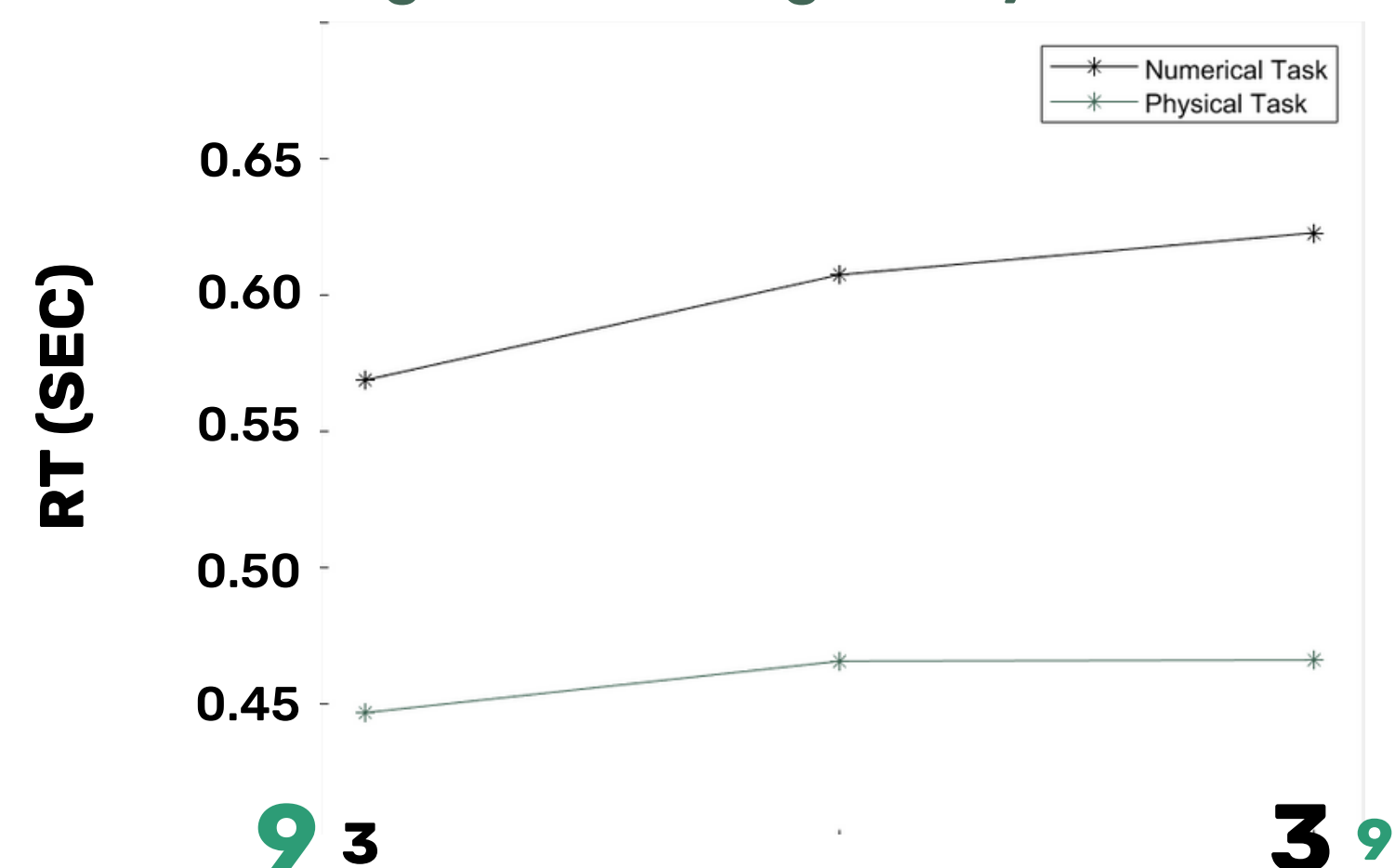Scale 1-7

**Q- media**

While you are sending messages on your cell phone or computer, how often do you listen to music?
Scale 1-4

**Regardless to real clinical diagnosis for ADHD, half of the students testified that they have difficulties in various areas related to attention**
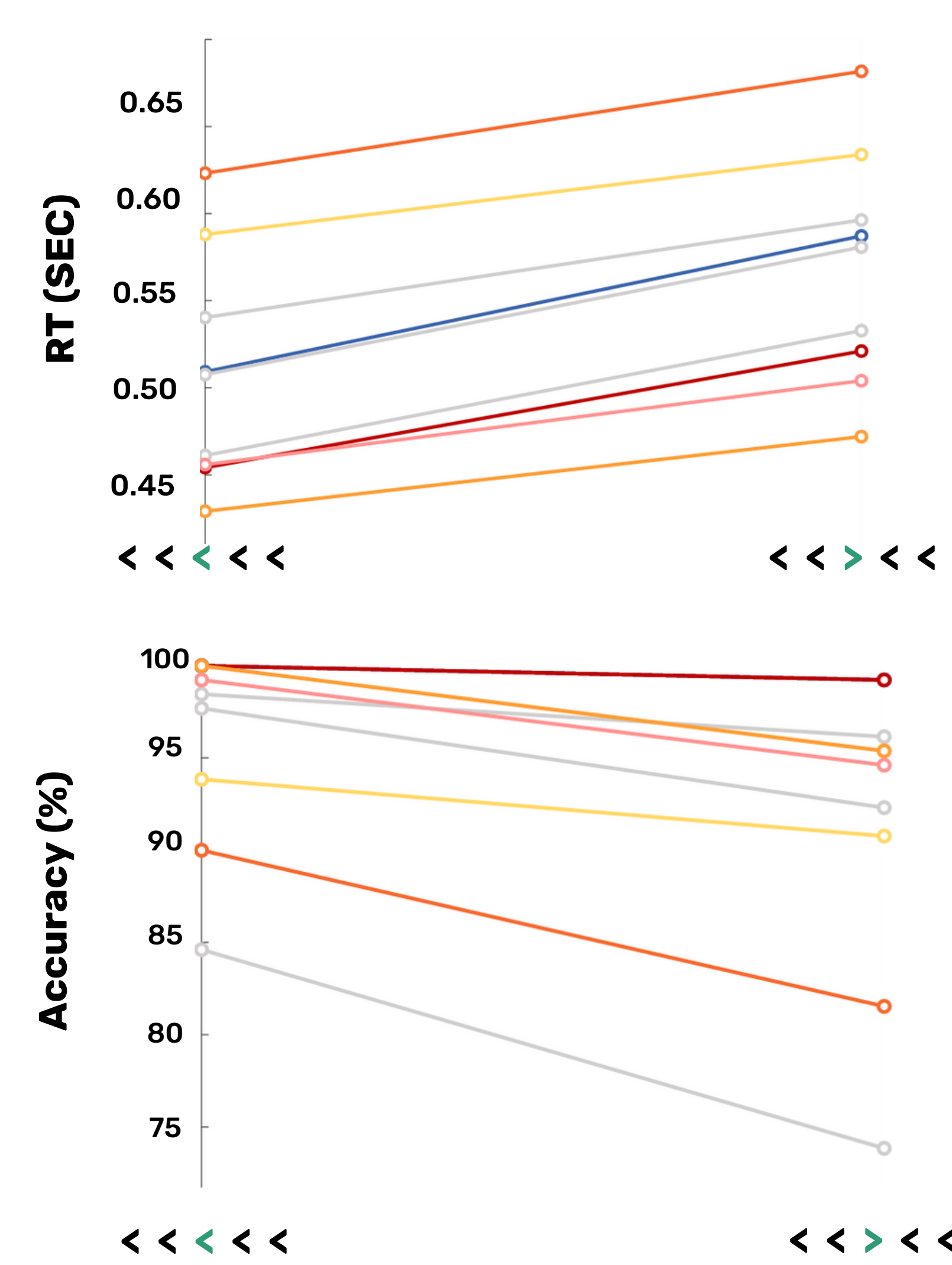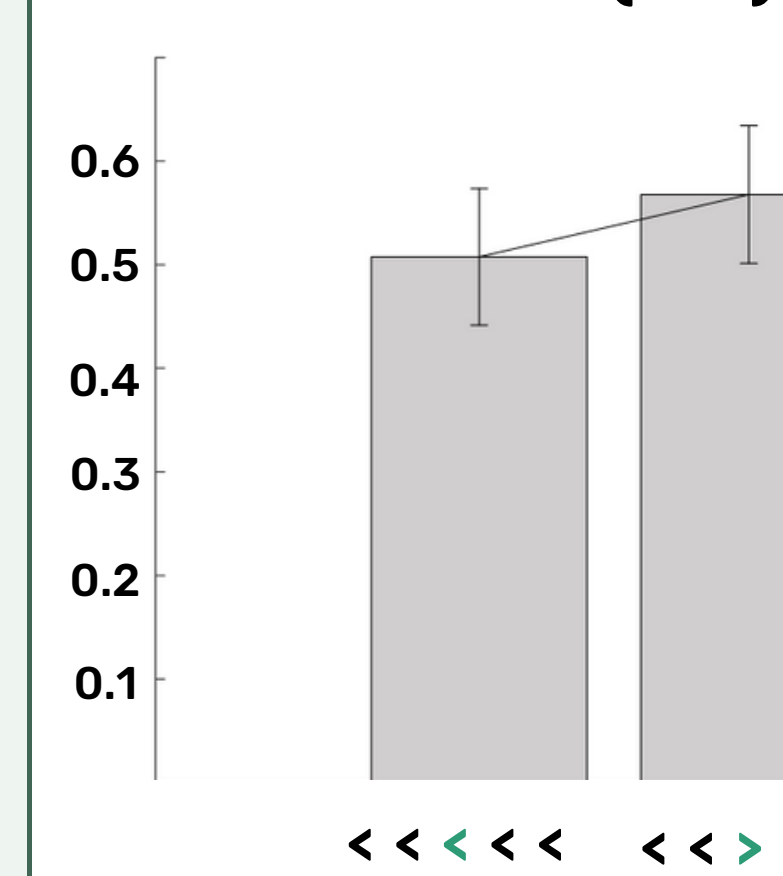
## STROOP

RT (SEC)  3  9 → 3  9

Accuracy (%)  3  9 → 3  9

**Average RT for Congruency condition**
RT (SEC)  Numerical Task / Physical Task
9  3 → 3  9

## FLANKER

RT (SEC)  < < < < <  →  < < > < <

Accuracy (%)  < < < < <  →  < < > < <
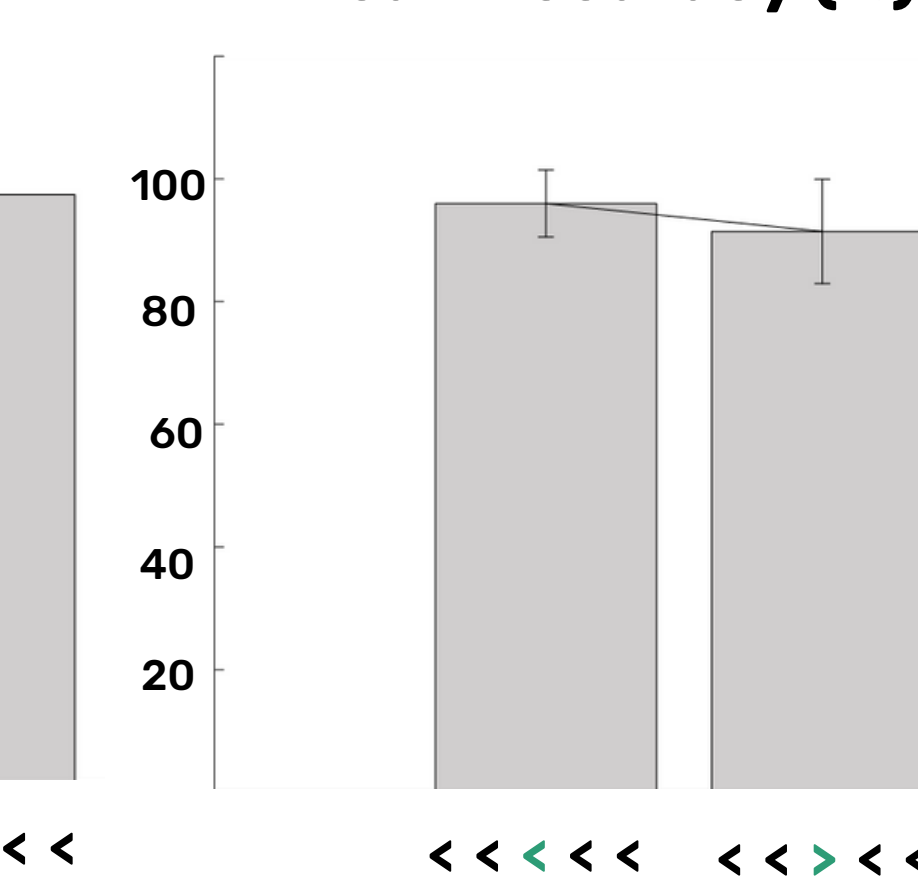
**Mean RT(sec)**
< < < < <   < < > < <

**Mean Accuracy (%)**
< < < < <   < < > < <

1. **Reliable and hypotheses-matched results were collected in a real and noisy environment tasks**
2. **traveled inter subject differences in attention-related behaviors/responses**

## Conclusions

1. Attention is a complex construct which manifests in different ways and varies across individuals
2. Studying these abilities in a "natural cohort" of teenagers allows assessing the distribution of these abilities within the normative population

## What's next?

- Collect data from a larger sample
- Test for correlations between measures
- Test where individuals with an ADHD diagnosis fall within the distribution of their peers