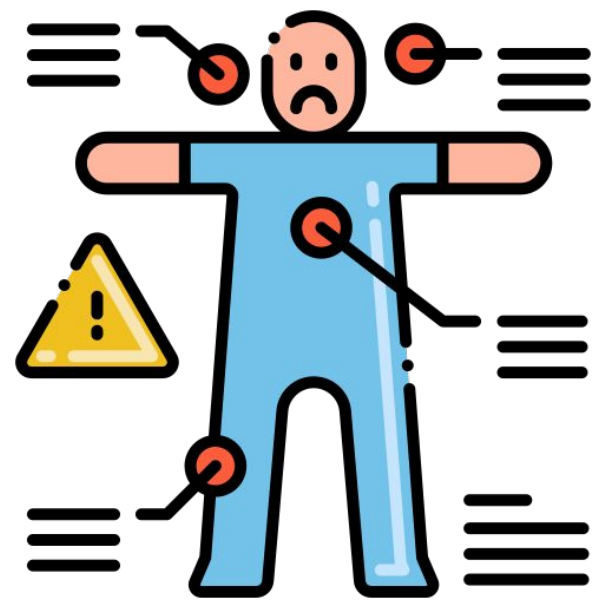# To Screen or Not to Screen?
Predicting Subtle Malingering of Adult ADHD Symptoms in High-achieving College Students

JaeWon Kim, Yuri Kim, Yuna Jeong, Eunyoung Kim, Youngki Lee
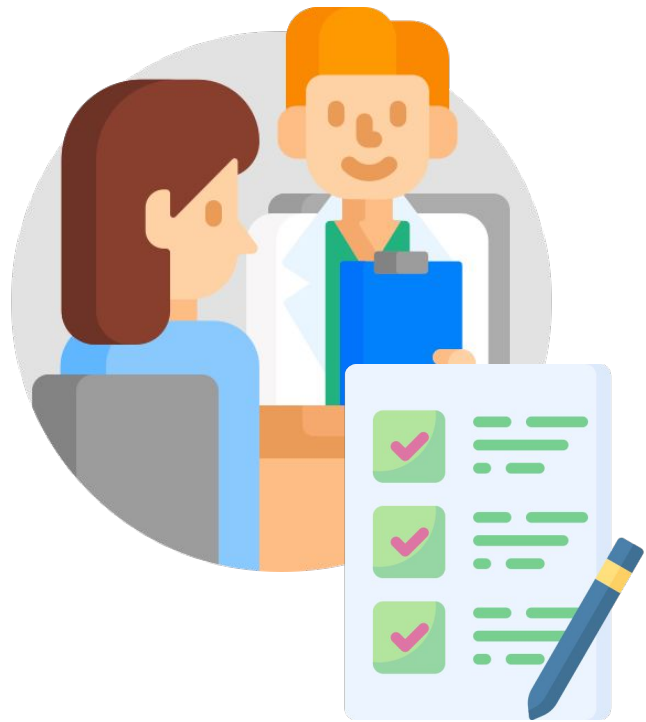
Motivation

18-48%
base rate of malingering

✔ Attention Issues
✔ Worry ADHD

5-35%
misuse of medication

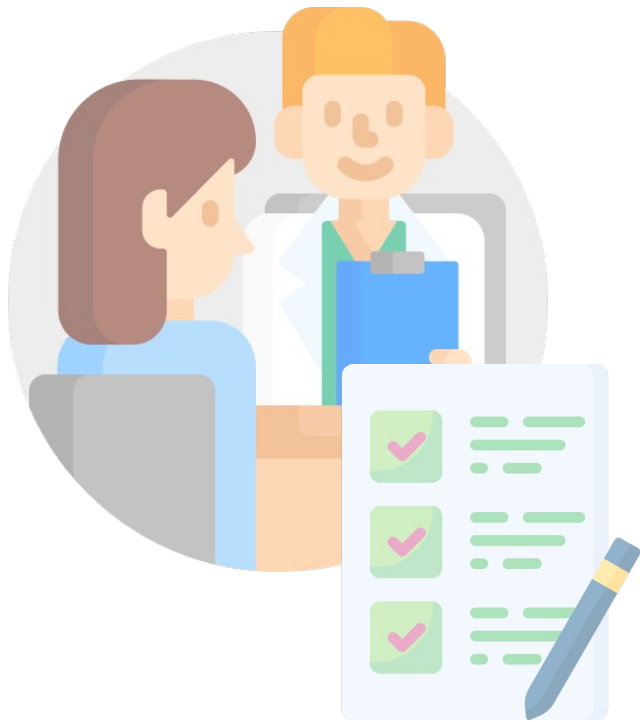# Adult ADHD Diagnosis

Reliance on Self-Report

ADHD diagnosis relies on self-report scales and interviews to determine the persistence of symptoms

Mental Illnesses with Similar Conditions

Inattention, and impulsivity are also symptoms of common mental illnesses such as depression and anxiety.

Adult ADHD Diagnosis

Relies on Self-Report

ADHD diagnosis depends on self-report scales and self-reports of past experiences and consistency of symptoms.

Hard to Distinguish from Other Illnesses

Inattention, inability to concentrate, or impulsivity are also symptoms of common mental illnesses like depression and anxiety.
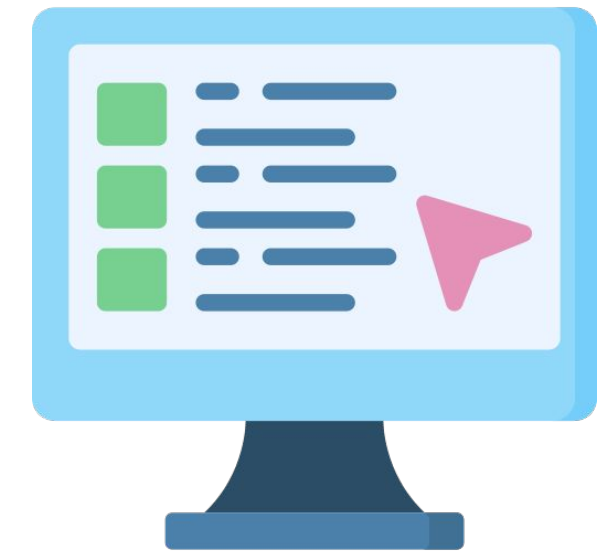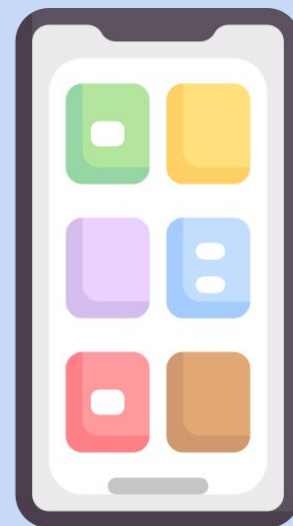
Symptom Validity Tests

- ✔ relatively objective
- ✔ sensitive to consistency
- ✔ not validated yet
- ✔ costly
- ✔ requires expertise on ADHD

Related Work

1 Application of **smartphone sensing methods** to detection of ADHD malingering

2 Study on **subtle** malingering of ADHD

Smartphone Sensing

Digital Phenotyping
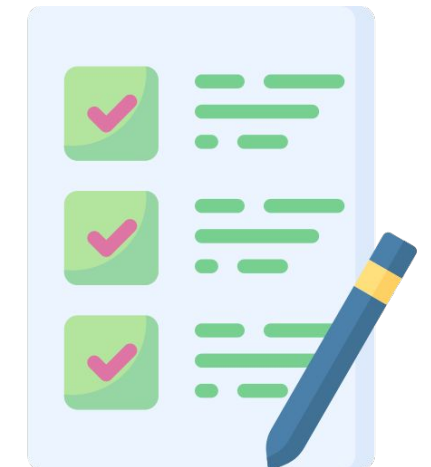e.g. predicting depression
with GPS sensors

✓ Long-term, ubiquitous tracking

✓ Robust to malingering

✓ Scalability

Method - Phase 1

ASRS scale (self-report)
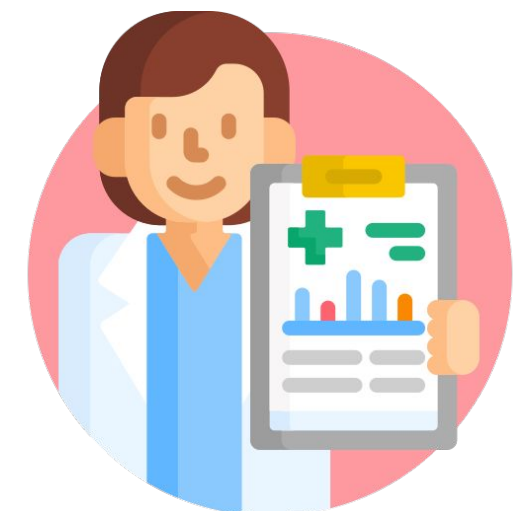
widely used for adult ADHD diagnosis

VS.

Clinician diagnosis

expertise in adult ADHD
and SNU students

Method - Phase 2
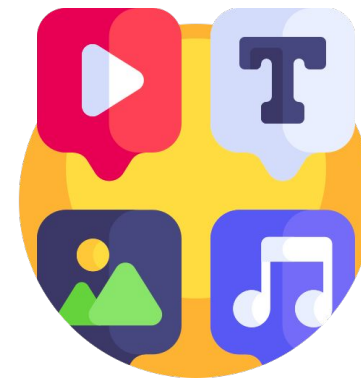
GPS   Bluetooth   App usage   Screen event   Ambient light

Method - Phase 3

Psychological
Questionnaire Results

Correlation Analysis

Significant
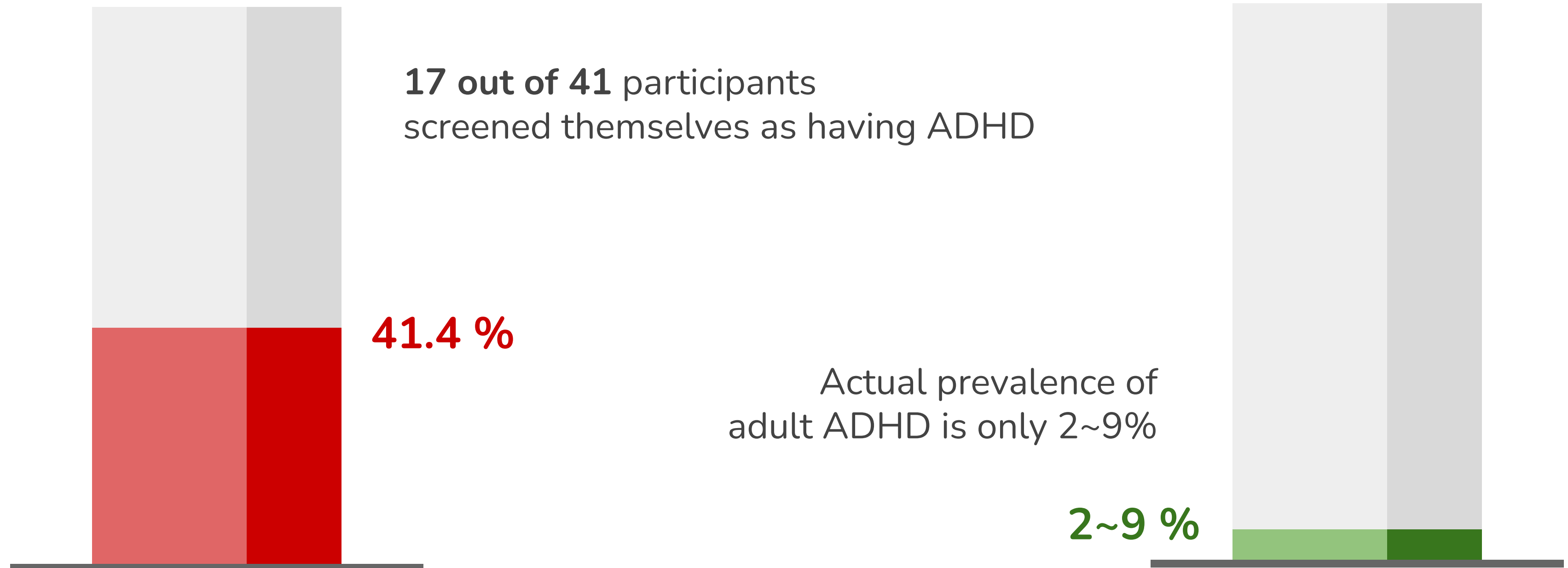Sensor Features
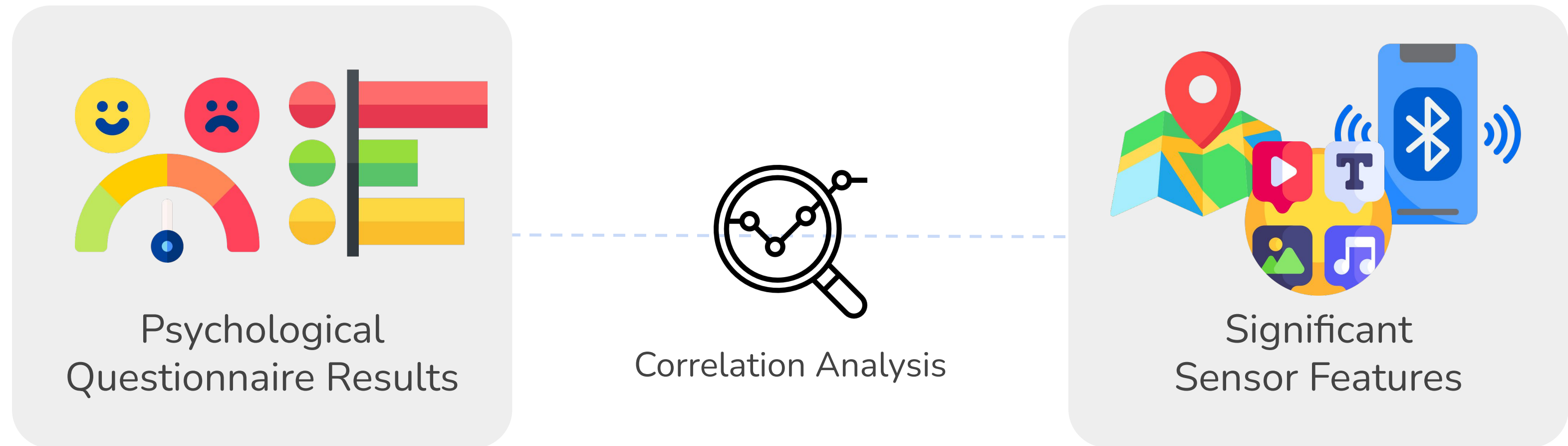
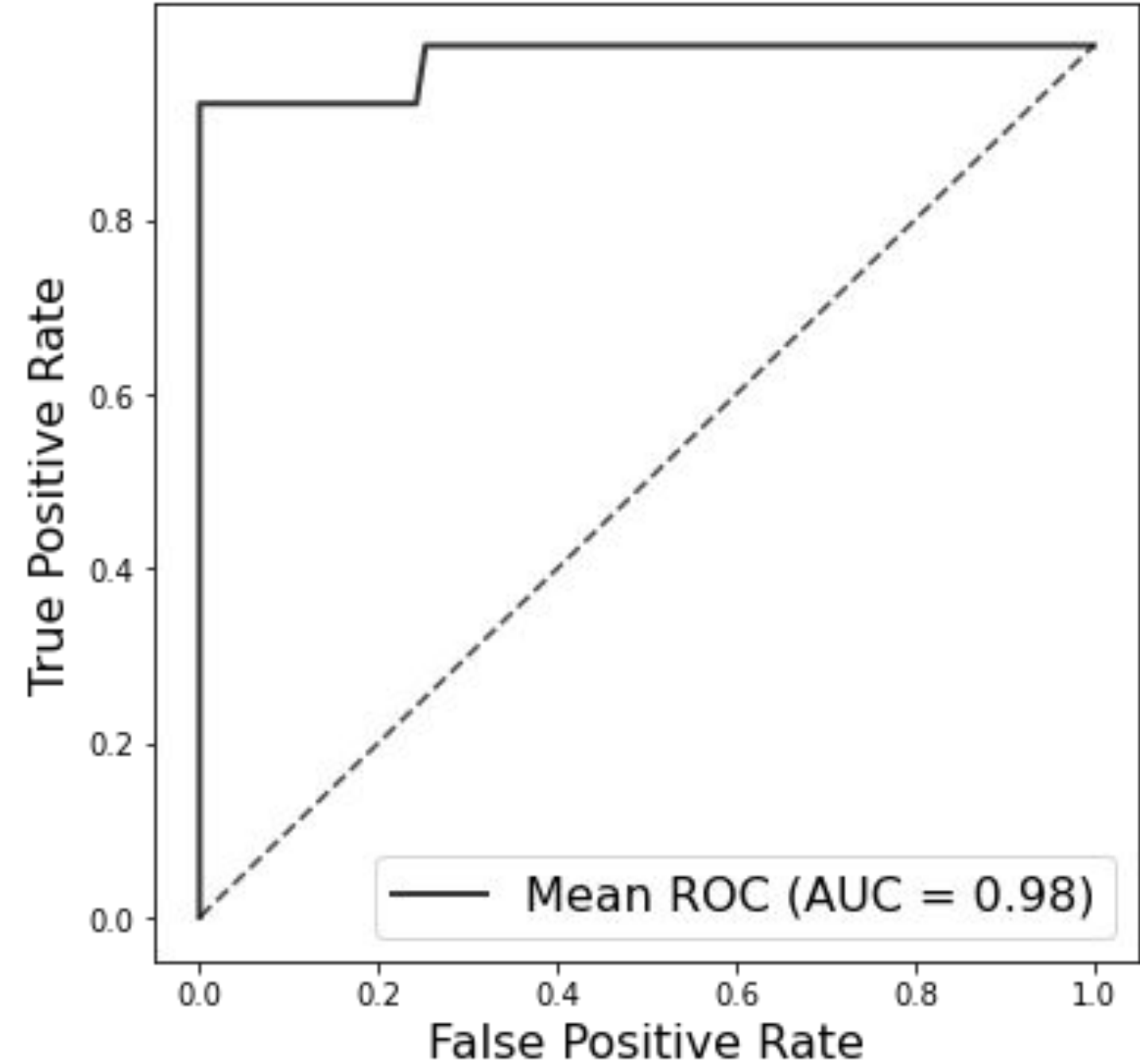Exploratory study to gain psychological insights

Experiment

✓ Currently enrolled in school

✓ Android phone users

✓ Undergraduate students

✓ Total of 41 → 37 participants

✓ 22 days experiment

Results - Phase 1

17 out of 41 participants
screened themselves as having ADHD

41.4 %

Actual prevalence of
adult ADHD is only 2~9%

2~9 %

Results - Phase 2

Our LR model

ROC AUC	0.98
F-score	0.89
Accuracy	92%
Sensitivity	0.87
Specificity	0.96

SVT

Sensitivity	0.2-0.5

Self-Report Questionnaires

Sensitivity	0.8
Specificity	0.89

Sensitivity	0.9
Specificity	0.8

Results - Phase 3

anger
boredom proneness
procrastination
rebelliousness
bipolar disorder
...

ADHD
Malingering

promotion-focus
initiative
agreeableness
flourishing
gratitude
...

extraversion
novelty-seeking
neuroticism
self-acceptance
smartphone addiction
risk propensity
.
.
.
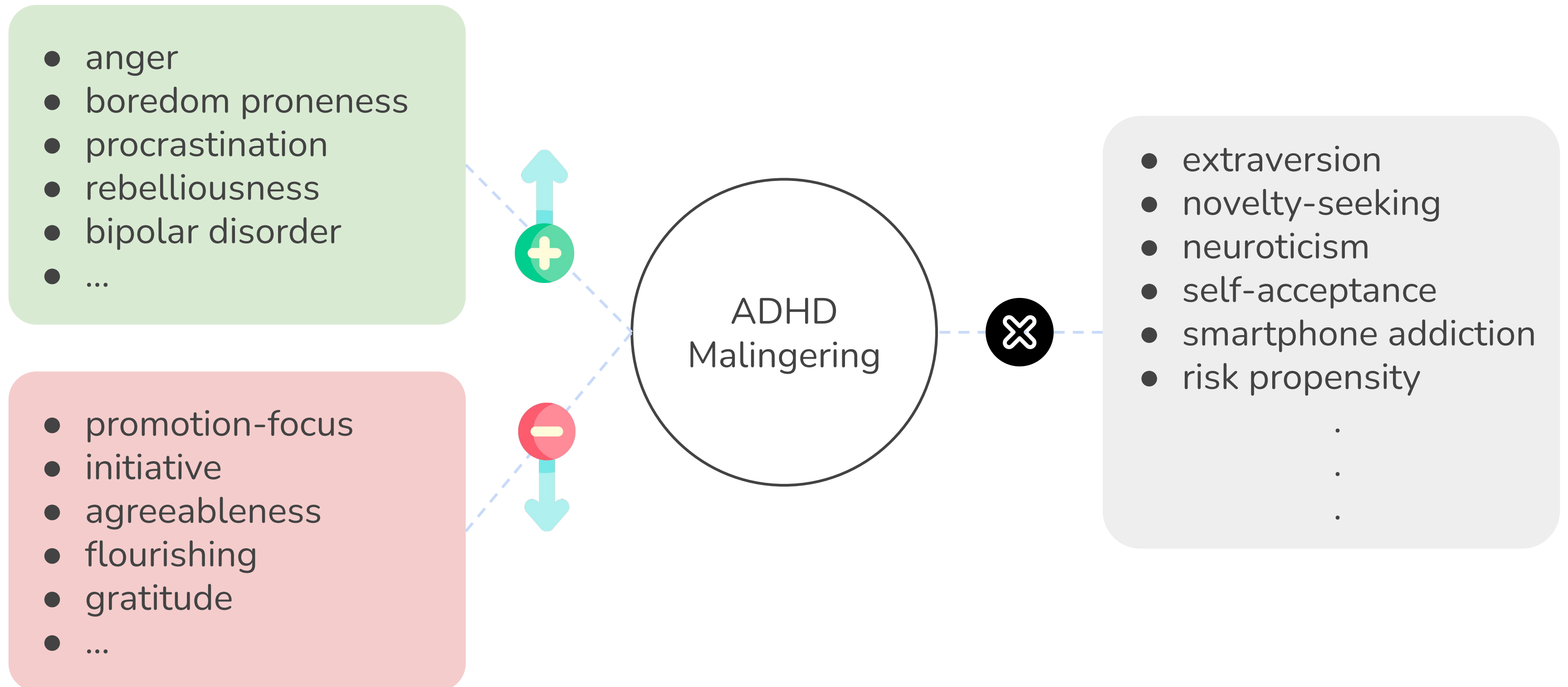
Conclusion

✓ Revealed the ADHD self-report scale is insensitive to subtle malingering, and confirmed the presence of subtle malingering through clinician diagnosis

✓ Built a machine learning classification model using smartphone sensing data with greater predictive accuracy than existing tools

✓ Used self-assessments on psychological scales to infer and explore the psychological characteristics of subtle malingerers

Thank You :)