

Fullproof: Towards the Detection of Impostor Syndrome Using Smartphone Sensors

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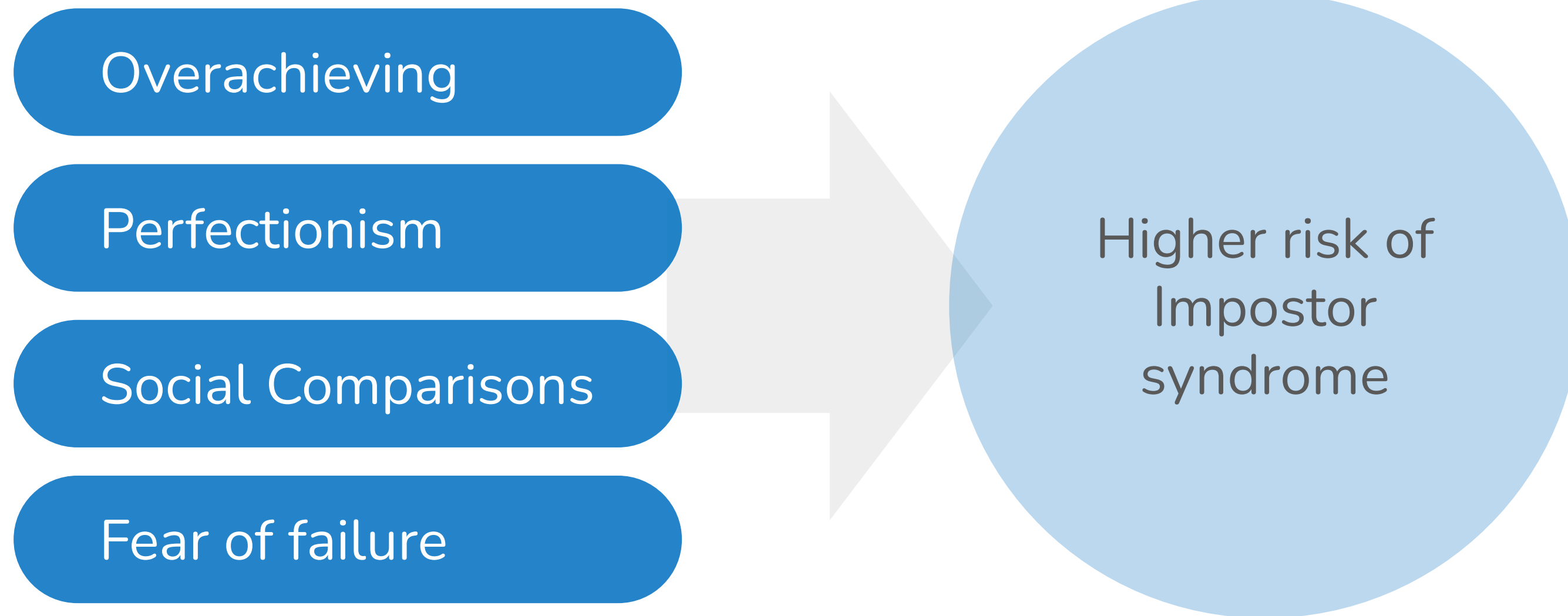
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Impostor Syndrome

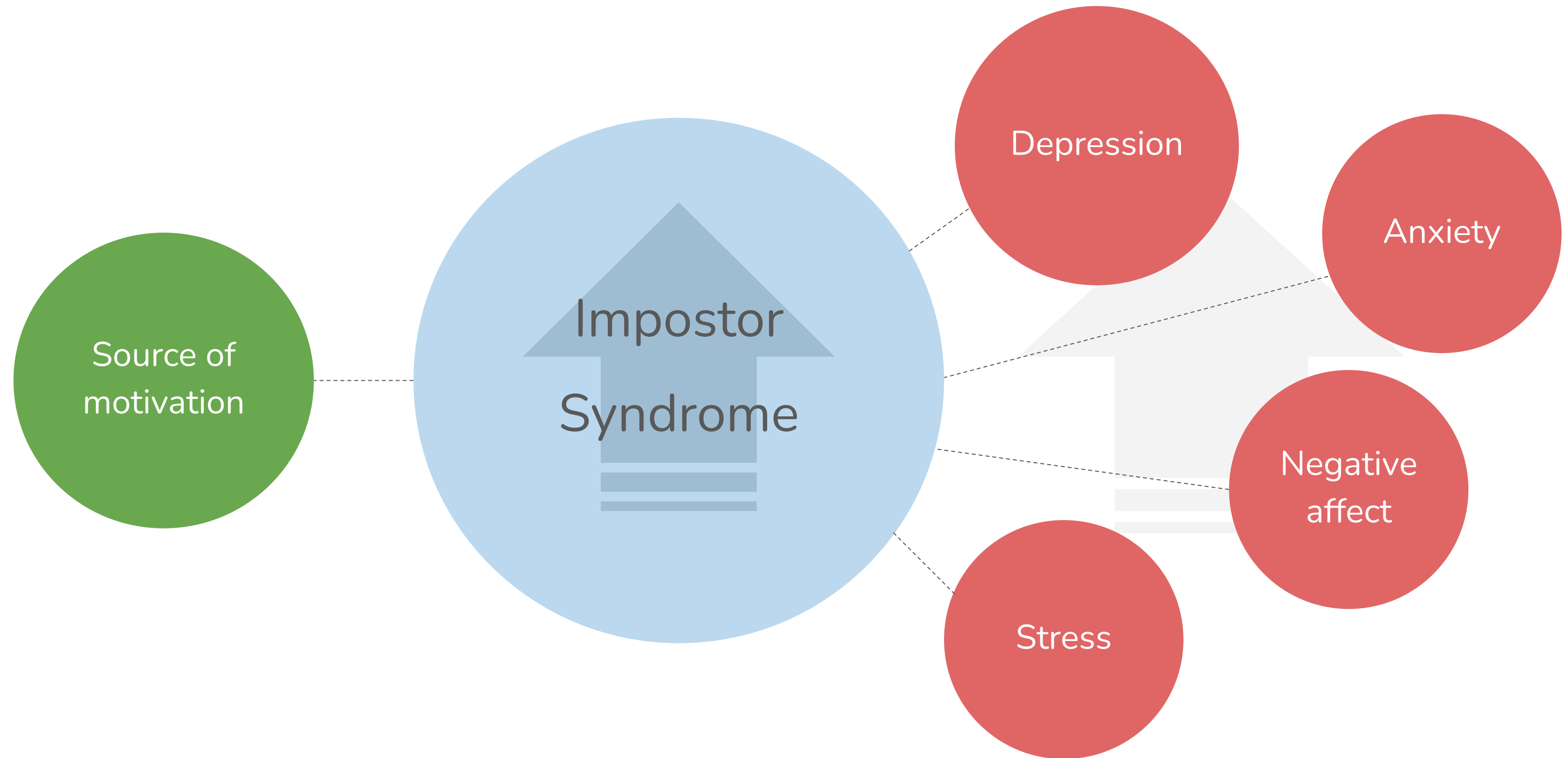


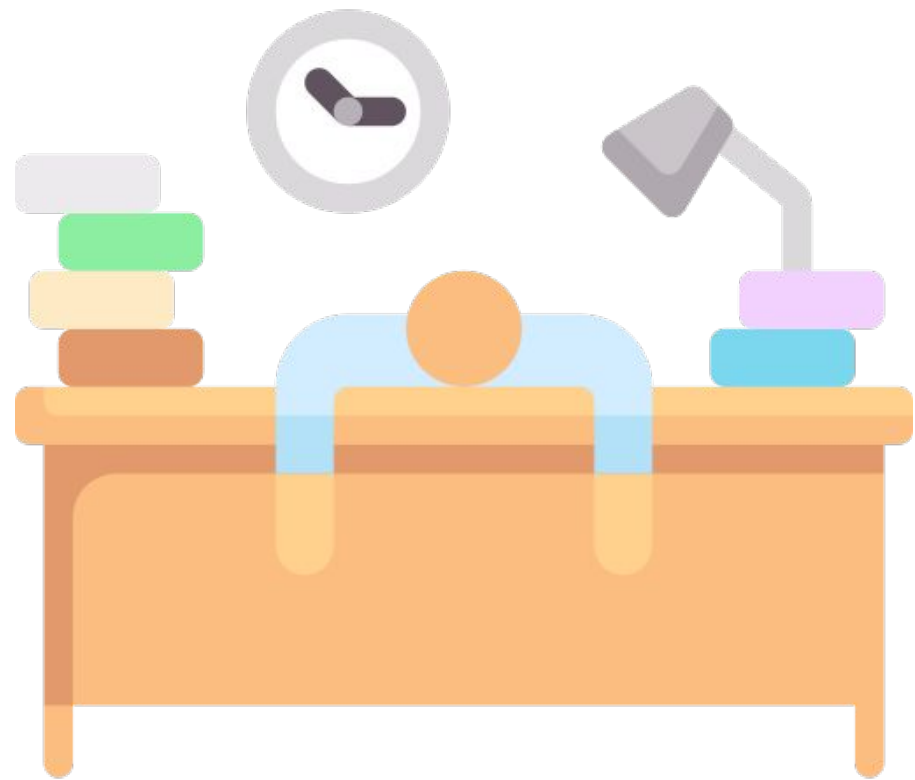
[Illustration by Pablo Stanley](#)

High-achieving university students



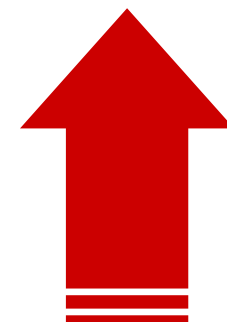
Correlates of Impostor Syndrome





Burnouts

Impaired academic performances



Academic
attrition
rate

Dropout
rate



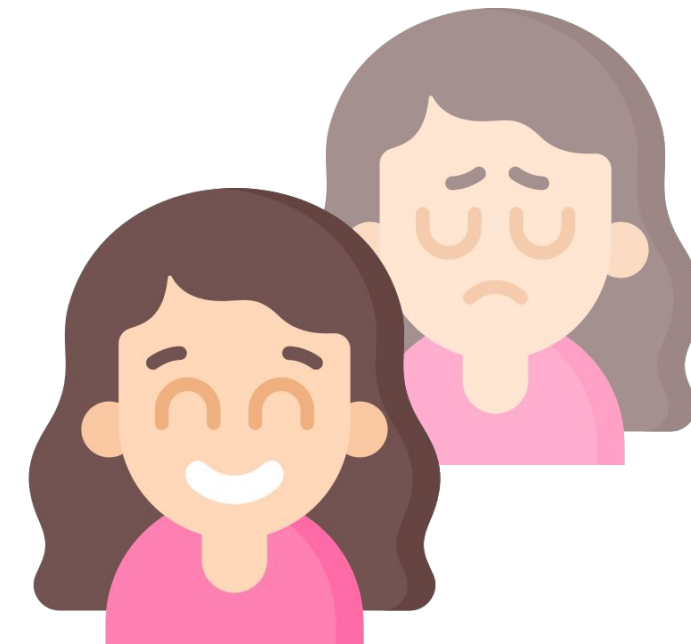
Universities offer counseling and mental health services, but ...



Students often fail to identify themselves as having impostor syndrome



Mobile Sensing



Early detection of
Impostor syndrome

Contributions

- In a pilot study with 37 participants, we deployed and evaluated a **passive sensing-based early detection system for impostor syndrome** in high-achieving college students.
- We extracted, analyzed, and categorized **smartphone sensor-based features correlated with the likelihood of impostor syndrome**.

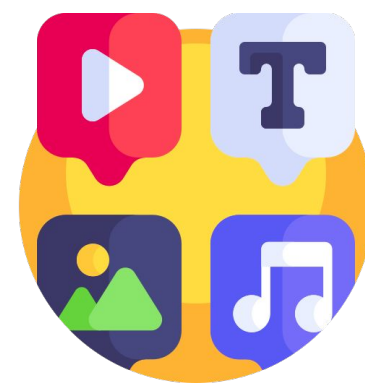
Feature Extraction



GPS



Bluetooth



App usage



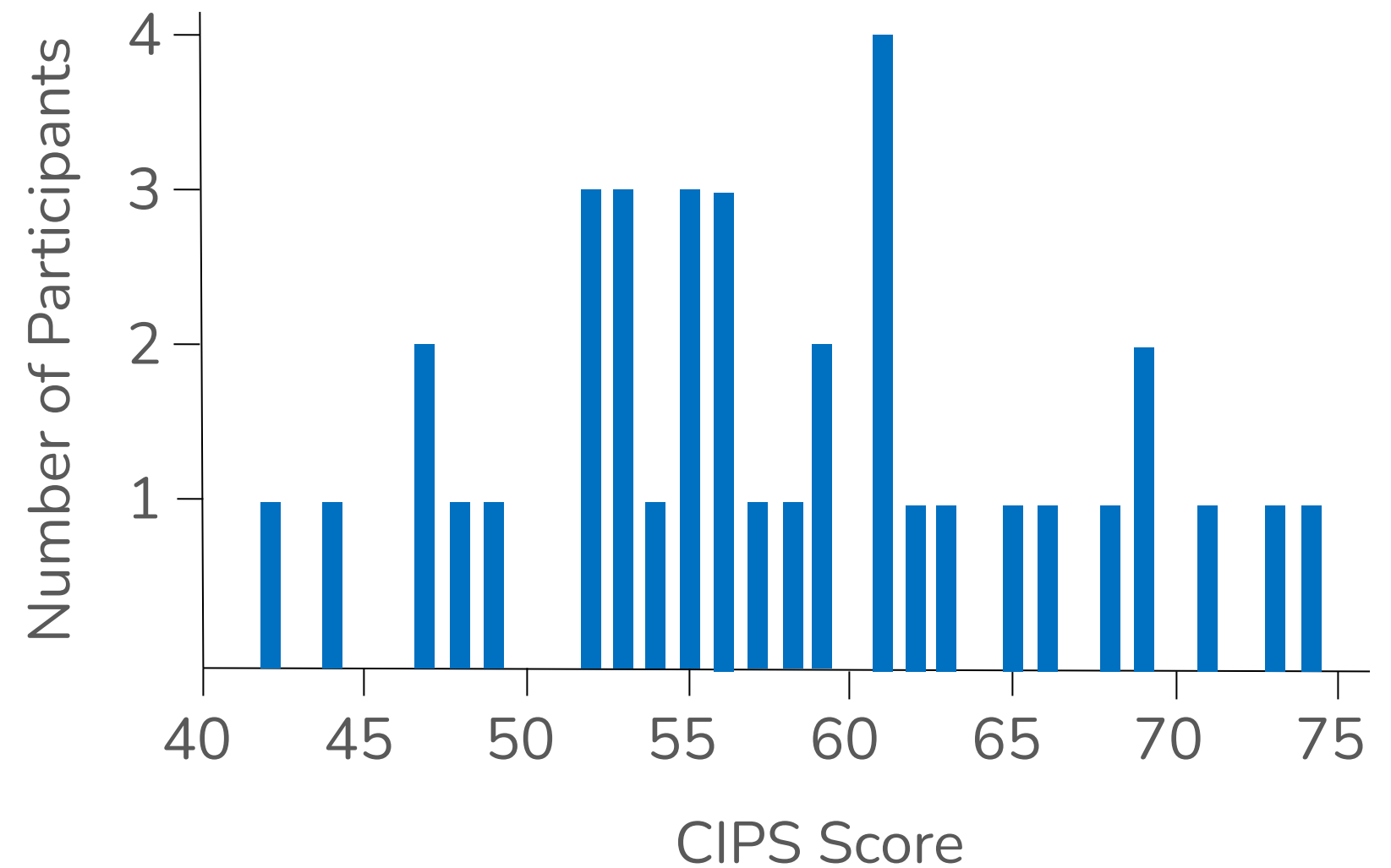
Screen event



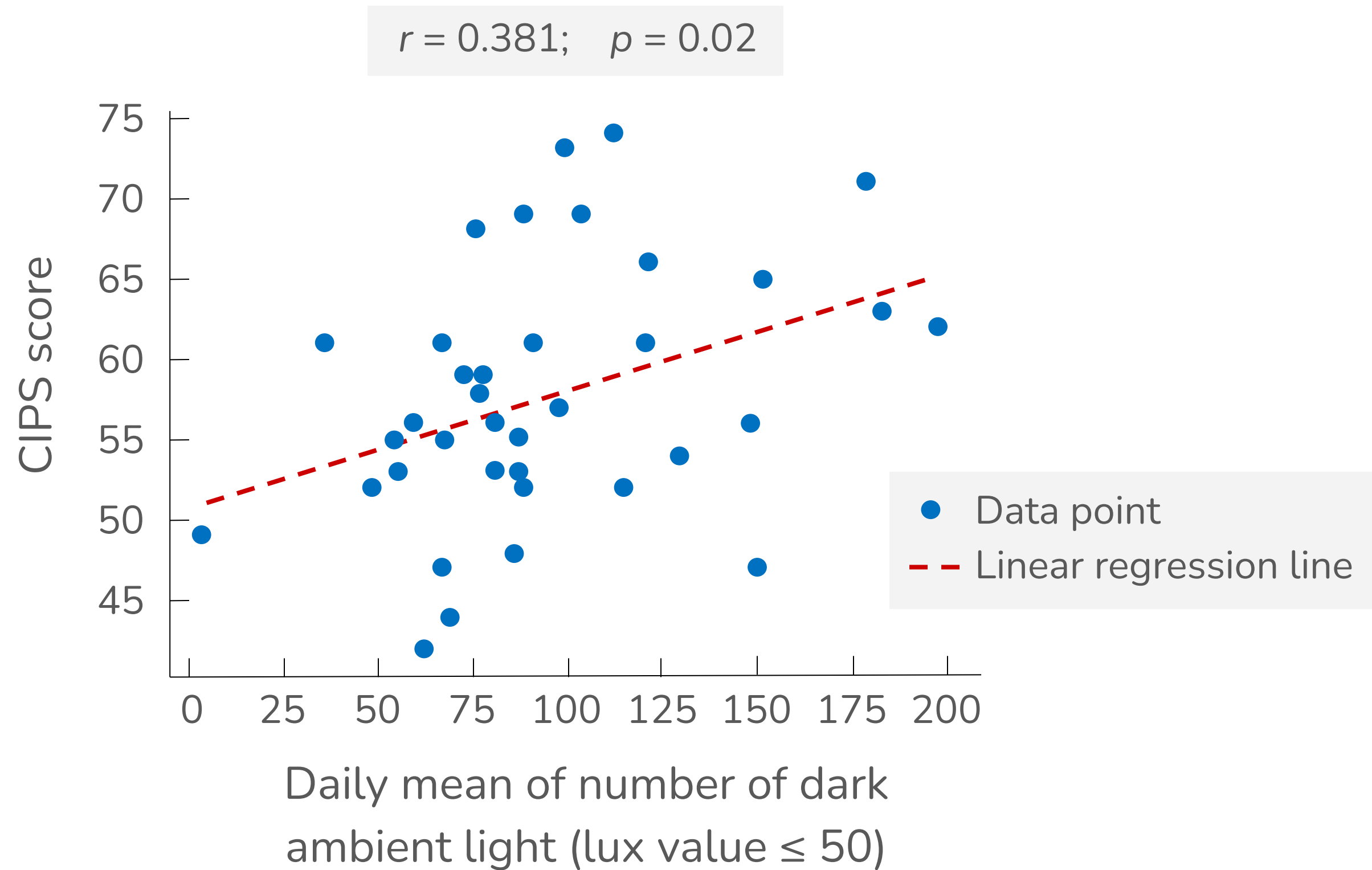
Ambient light

Assessing Impostor Syndrome

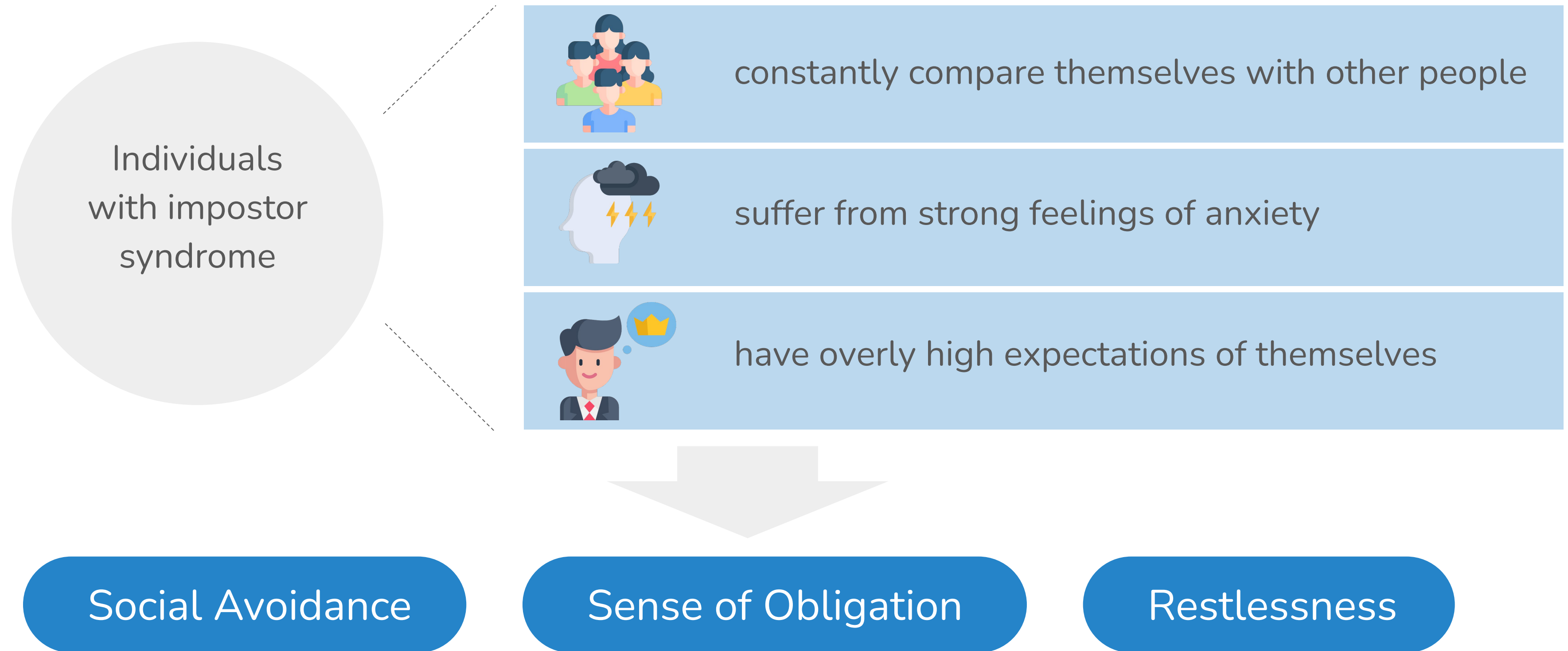
- 3-week study
- Participants: 37 undergraduate students
- Clance Impostor Phenomenon Scale (CIPS)
 - score range: 20-100
 - cutoff for high risk: 62
 - 10 students were screened



Correlation Analysis



Sensing Feature Categories



Social Avoidance

Feature	<i>r</i>	Sensor Data
mean of daily freq. of dark ambient light (lux value \leq 50)	0.381*	Light
places visited count during evening	-0.343*	Location
std. of daily max. distance between two visited places during night	-0.29	Location
mean of daily max. distance between two visited places during day	-0.288	Location
std. of daily radius of gyration during night	-0.285	Location
std. of daily total distance traveled during night	-0.28	Location
mean of daily radius of gyration during day	-0.263	Location
std. of daily max. distance between two visited places during day	-0.259	Location
mean of daily duration of dark ambient light (lux value \leq 50)	0.254	Light
std. of daily total distance traveled during day	-0.246	Location
std. of daily radius of gyration during day	-0.228	Location
frequency of interaction with close devices	-0.227	Bluetooth

* $p < .05$

Sense of Obligation

Feature	<i>r</i>	Sensor Data
std. of daily freq. of dark ambient light (lux value ≤ 50)	0.424**	Light
mean of daily freq. of dark ambient light (lux value ≤ 50)	0.381*	Light
max. of daily duration of productivity app usage	0.375*	App Usage
mean of daily duration of productivity app usage on weekends	0.333*	App Usage
mean of daily duration of productivity app usage	0.321	App Usage
mean of daily duration of productivity app usage on weekdays	0.280	App Usage
mean of daily duration of dark ambient light (lux value ≤ 50)	0.254	Light
mean of daily duration of entertainment app usage on weekends	-0.230	App Usage
total duration of productivity app usage	0.229	App Usage
std. of freq. of daily screen unlock event during night on weekdays	-0.217	Screen
std. of freq. of daily screen unlock event during night	-0.216	Screen

* $p < .05$, ** $p < .01$

Restlessness

Feature	<i>r</i>	Sensor Data
std. of freq. of hourly max. of screen on event by day of the week	0.412*	Screen
std. of freq. of daily screen on event with duration ≤ 1 sec	0.332*	Screen
std. of freq. of hourly max. of screen on event	0.237	Screen
std. of duration of daily screen on event	0.219	Screen
std. of freq. of daily screen on event	0.216	Screen
mean freq. of daily screen on event with duration $1 \leq$ sec	0.215	Screen

* $p < .05$

Restlessness

Feature	<i>r</i>	Sensor Data
std. of freq. of hourly max. of screen on event by day of the week	0.412*	Screen
std. of freq. of daily screen on event with duration ≤ 1 sec	0.332*	Screen
std. of freq. of hourly max. of screen on event	0.237	Screen
std. of duration of daily screen on event	0.219	Screen
std. of freq. of daily screen on event	0.216	Screen
mean freq. of daily screen on event with duration $1 \leq \text{sec}$	0.215	Screen

* $p < .05$

Restlessness

Feature	<i>r</i>	Sensor Data
std. of freq. of hourly max. of screen on event by day of the week	0.412*	Screen
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mean freq. of daily screen on event with duration $1 \leq$ sec	0.215	Screen

* $p < .05$

Future Work



Data-driven research



Social and clinical sciences

Thank You :)