Meeting People Where They're At

Methods of studying substance use in one's natural environment

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Outline

- Background
  - Inclusion and exclusion in randomized control trials (RCT)
  - RCTs: Clinical insights from Morkeh
- Naturalistic methods to study substance use
  - Population Based Secondary Analysis
  - Ecological Momentary Assessment

242 799 individuals with ADHD
between 2007 and 2019

Example ADHD Medication

- Secondary analysis of Swedish healthcare data

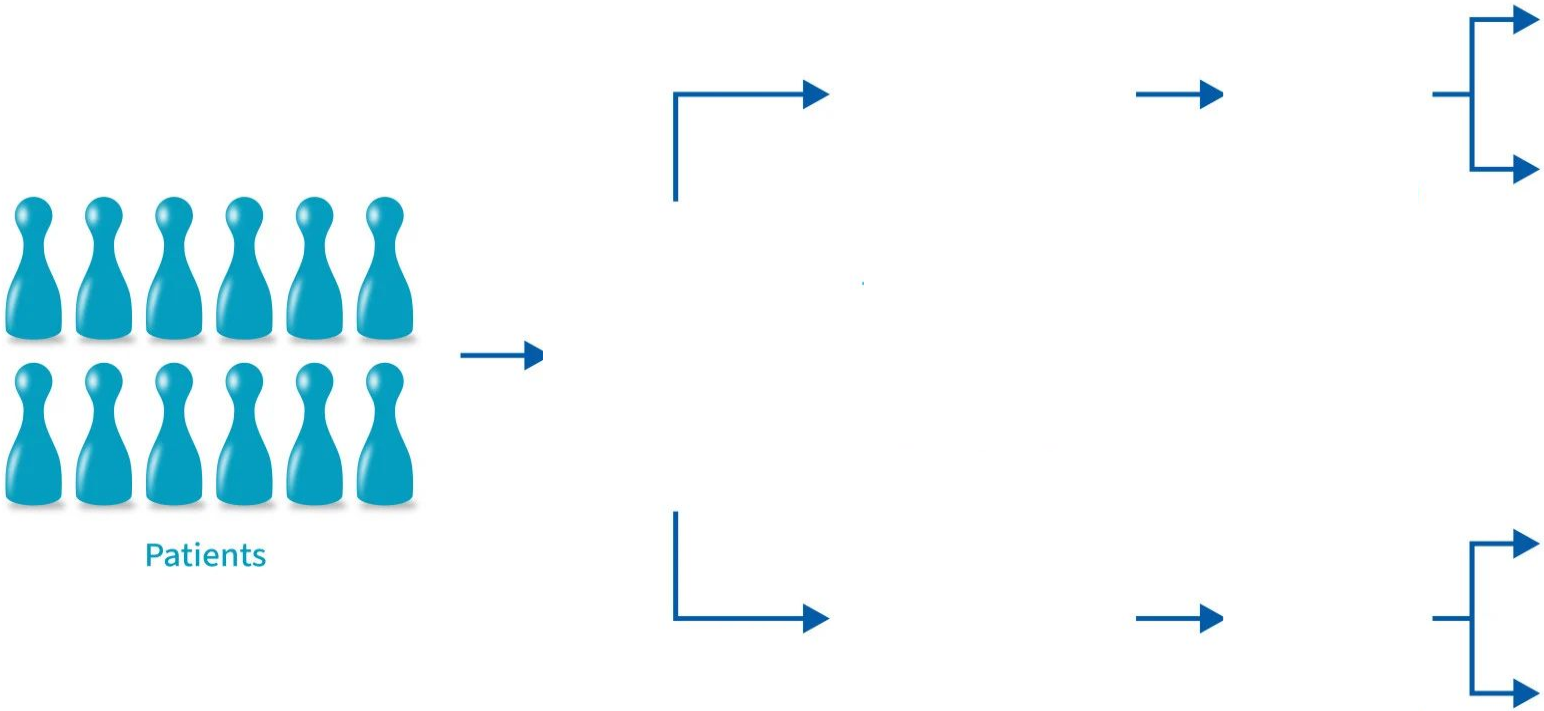
Garcia-Argiba et al, 2025

Randomized Control Trials (RCTs)

Prospective studies that measure the effectiveness of a new intervention or treatment.

The "gold standard" for testing interventions under controlled conditions.

Randomized Controlled Trial



Limitations of RCTs in Psychiatric Research

Restricted Inclusion Criteria

Artificial Context

Demographic Homogeneity

Short-Term Focus

The reliance on RCTs creates a paradox: those most in need of evidence-based guidance are the least represented in trials.

Naturalistic Study

Observational research designs conducted in real-world settings without researcher intervention.

What Are Naturalistic Studies?

Conducted in real-world environments, such as clinics, homes, or communities

Approach diverse participants

Observe and measure outcomes from multiple sources

Naturalistic Studies: A Solution to RCT Limitations

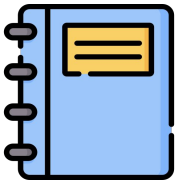
Benefits

- Include participants with comorbidities, diverse backgrounds, and varying life circumstances.
- Offer a more representative understanding of treatment outcomes in heterogeneous populations.
- Capture the complexity of real-world environments and social determinants of health.

Why it Matters

- Reflecting Lived Experiences
- Long-Term Effectiveness
- Targeted Interventions

Tools of Naturalistic Studies



Interviews

Qualitative Methods

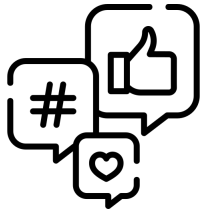
Secondary Data

Secondary Data Analysis

Phone

Wearables

Ecological Momentary Assessments (EMA)



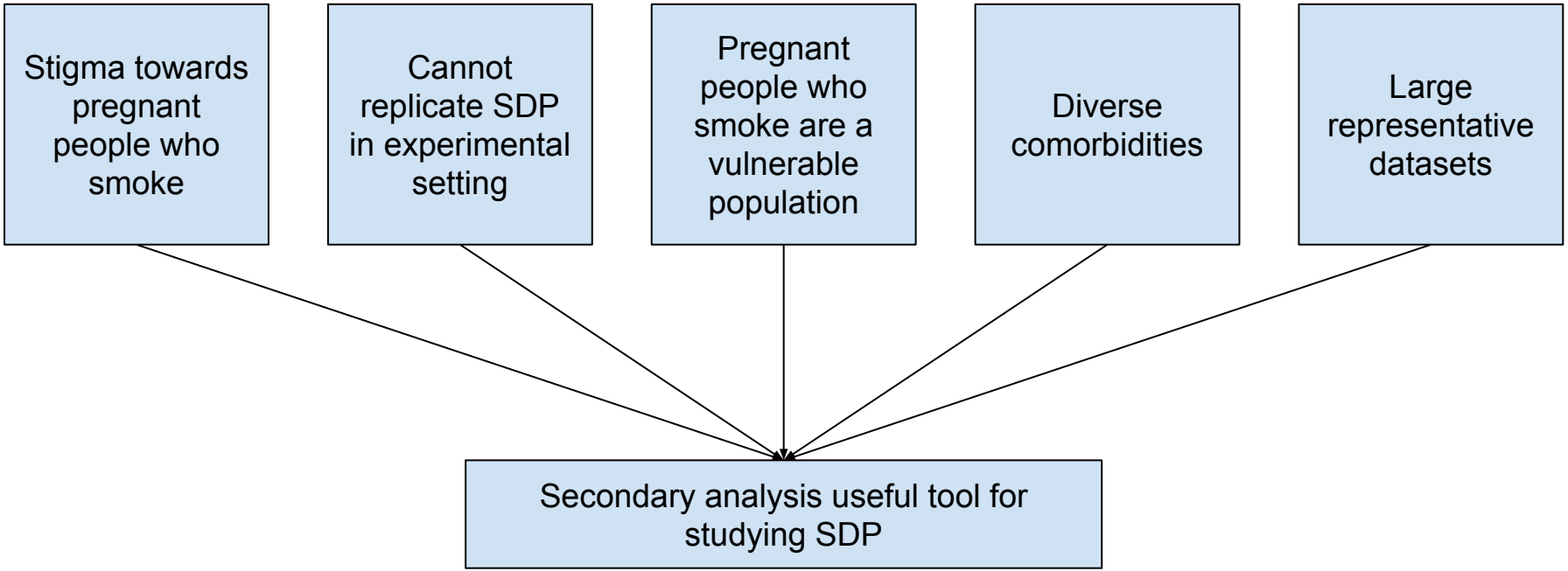
Social Media

Big Data Analytics

Naturalistic Studies: Secondary Analysis

Secondary analysis = study that uses existing data for a new study

Smoking During Pregnancy (SDP)



Kuja-Halkola et al.

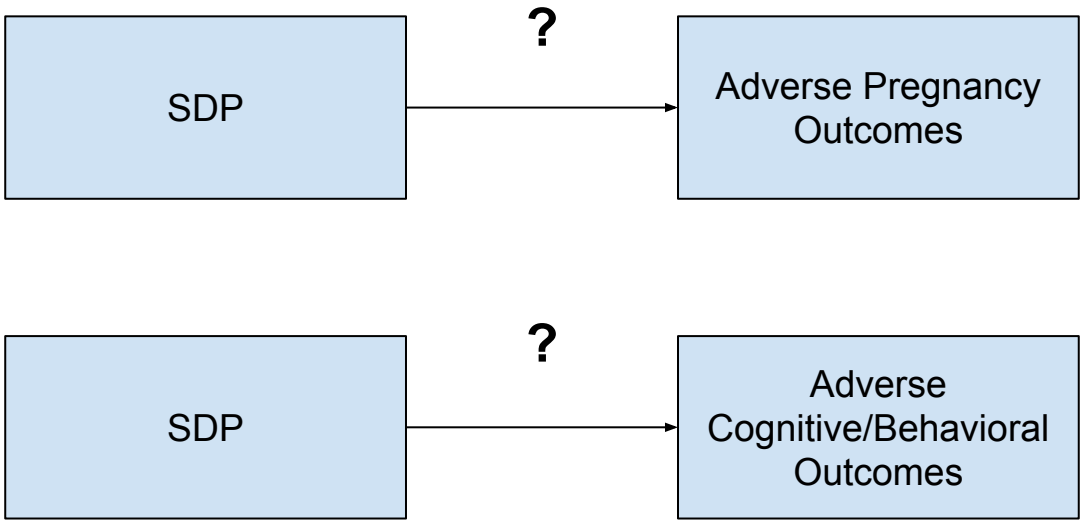
SDP and Adverse Outcomes

What about environmental and genetic confounds?

Drug misuse (%) 4.2 (4.1–4.3) 8.6 (8.4–8.7) 6.4 (6.1–6.7)

Note Values are from the analytic samples (column "After elimination" in Table 1)

Kuja-Halkola et al.



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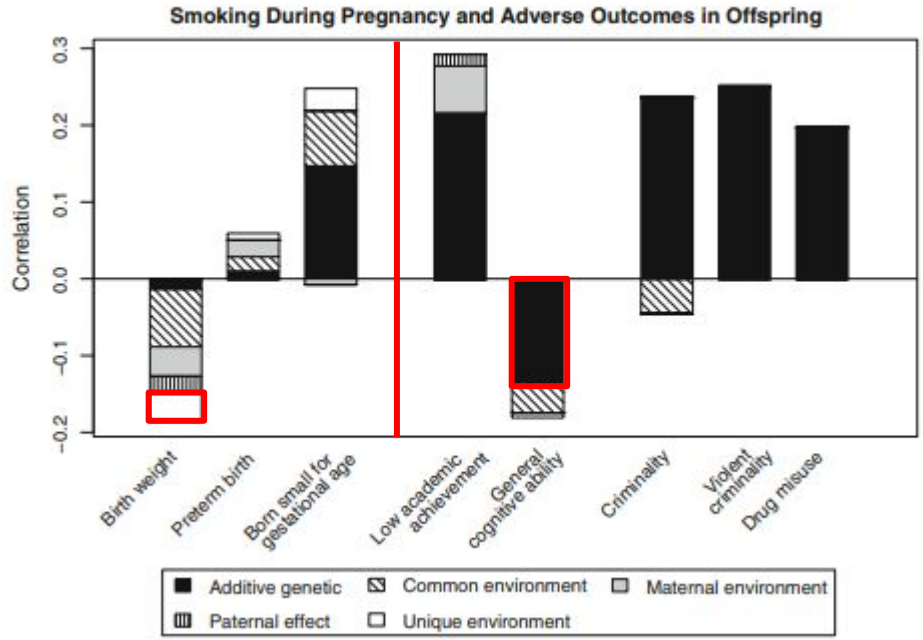


Kuja-Halkola et al.

Secondary Analysis Summary

- Helpful for understanding confounds/comorbidities that experimental conditions and strict controls may “hide”
- Allows research to reach vulnerable populations that are often excluded from RCT and experimental studies
- National healthcare data provides a sample that is more representative of the population as a whole

Naturalistic Studies: EMA

Detecting momentary reward and affect with real-time passive digital sensor data (Akre et al., 2024)

This study explores the use of passive digital sensor data from smartphones and smartwatches to predict momentary changes in affect, motivation, and pleasure in individuals with depression

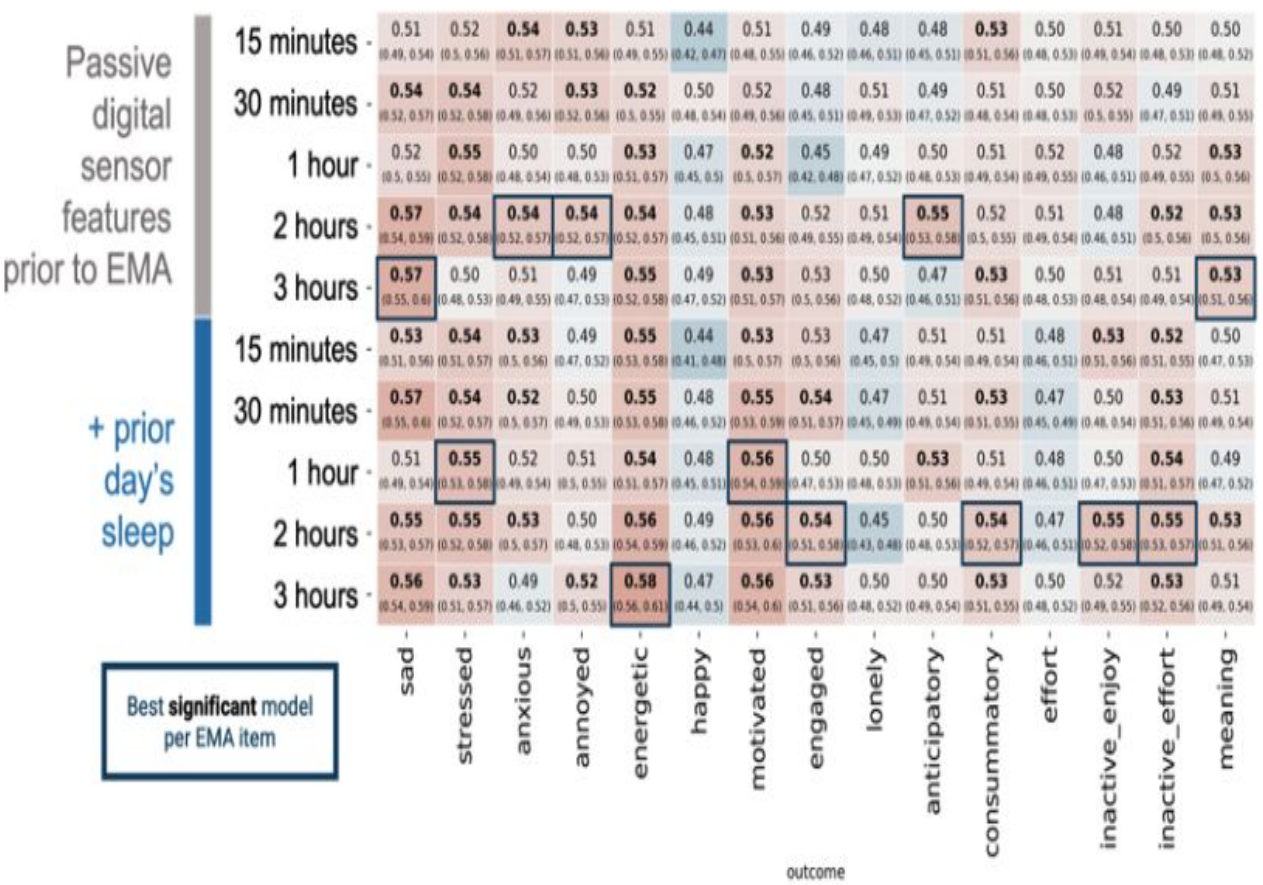
245 participants generating 23,812 ecological momentary assessments (EMA), machine learning models were trained to detect subjective states using physiological and behavioral signals

Key Finding

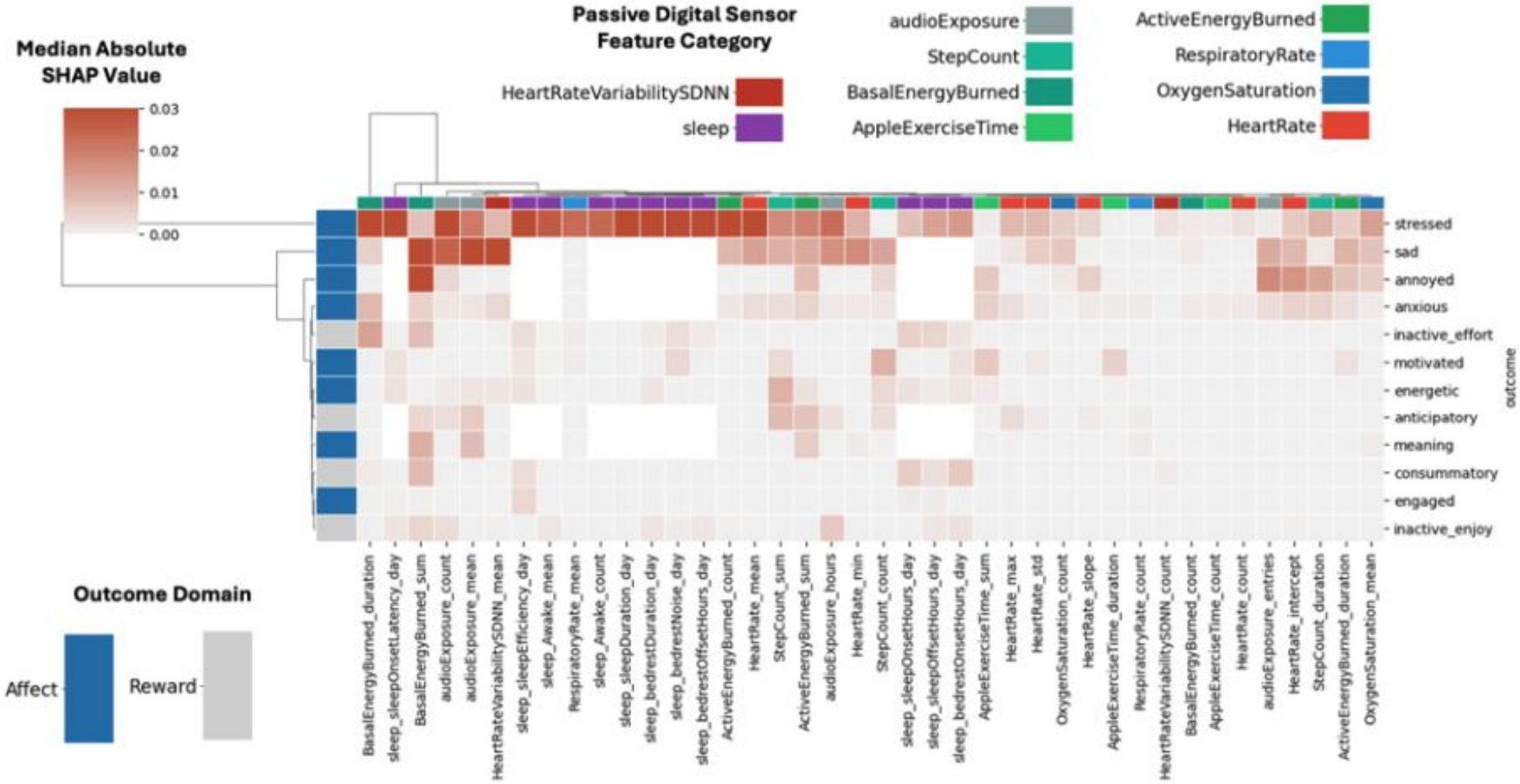
Passive digital sensing can predict momentary emotional states (e.g., sadness, stress, motivation) with accuracy above random chance

<u>Affect</u>
Sad
Stressed
Anxious
Annoyed
Energetic
Happy
Motivated
Engaged
Lonely

<u>Reward</u>
Anticipatory
Consummatory
Inactive Enjoy
Inactive Effort
Meaning



Akre et al., 2024



Akre et al., 2024

UCDN Projected Study: Ecological Momentary Assessment of state-dependent decision-making and metacognition across a psychopathology continuum

Focus

Measure the association between naturally-occurring fluctuations in internal states and changes in value-based decision-making

UCDN Projected Study: Ecological Momentary Assessment of state-dependent decision-making and metacognition across a psychopathology continuum

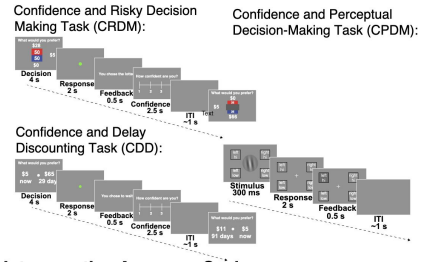
Population

- Healthy Volunteers
- Subclinical
- Clinical

UCDN Projected study: Ecological Momentary Assessment of state-dependent decision-making and metacognition across a psychopathology continuum

Daily Experience Sampling

Decision Making Tasks



Audio Diary

- Accelerometry
- HR
- Electrodermal
- Sleep

Disadvantages with Naturalistic Studies

- Inability to manipulate or control variables
- Cannot explain why behaviors happen
- Risk of observer bias
- Resource Intensive

References

Garcia-Argibay, M., Chang, Z., Brikell, I., Kuja-Halkola, R., D'Onofrio, B. M., Lichtenstein, P., ... & Cortese, S. (2025). Evaluating ADHD medication trial representativeness: a Swedish population-based study comparing hypothetically trial-eligible and trial-ineligible individuals. *The Lancet Psychiatry*.

Kuja-Halkola, R., D'Onofrio, B. M., Larsson, H., & Lichtenstein, P. (2014). Maternal smoking during pregnancy and adverse outcomes in offspring: genetic and environmental sources of covariance. *Behavior Genetics*, *44*, 456-467.

Research guides: Study design 101: Randomized controlled trial. Randomized Controlled Trial - Study Design 101 - Research Guides at George Washington University. (n.d.). https://guides.himmelfarb.gwu.edu/studydesign101/randomized-controlled-trial

Akre, S., Cohen, Z. D., Welborn, A., Zbozinek, T. D., Craske, M. G., & Bui, A. A. (2024). Detecting momentary reward and affect with real-time passive digital sensor data.