



# Leveraging Ecological Momentary Assessment to Improve Treatment Outcomes in Clinical Trials

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Click  
Therapeutics

# Disclosures

Employment – Click Therapeutics, Inc.

# **Ecological Momentary Assessment (EMA) Defined**

**A methodology involving repeated sampling, capturing “life as it is lived, moment to moment, hour to hour, day to day,” and permitting the study of thoughts, emotions, behavior, physiological states in respondents’ natural environment.**

(Doherty, et al., 2020, Shiffman et al., 2008)

# Many Aliases

- **Experience Sampling**
- **Ambulatory Assessment**
- **Ambulatory Self-reporting**
- **Real-time Data Capturing**
- **Continuous Unified Electronic Diary Method**
- **Intensive-longitudinal Study Design**

(Ruwaard, et al., 2018)

# The Shift to Smartphones

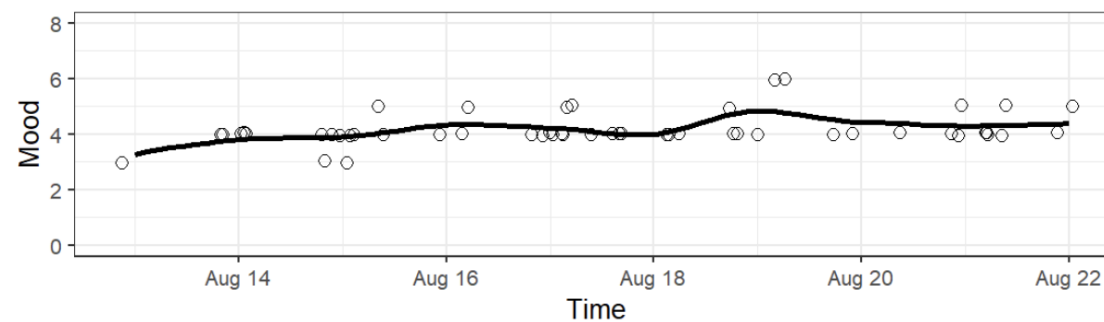
**“The flexibility, interactivity, intimacy, and connectivity of [smartphone] devices has [led to] a predominate conception of EMA in terms of device-prompted questioning... expanding the array and scope of behaviors targeted by EMA...”**

(Doherty, et al., 2020)

# The Relationship Between EMA and Passive Sensing

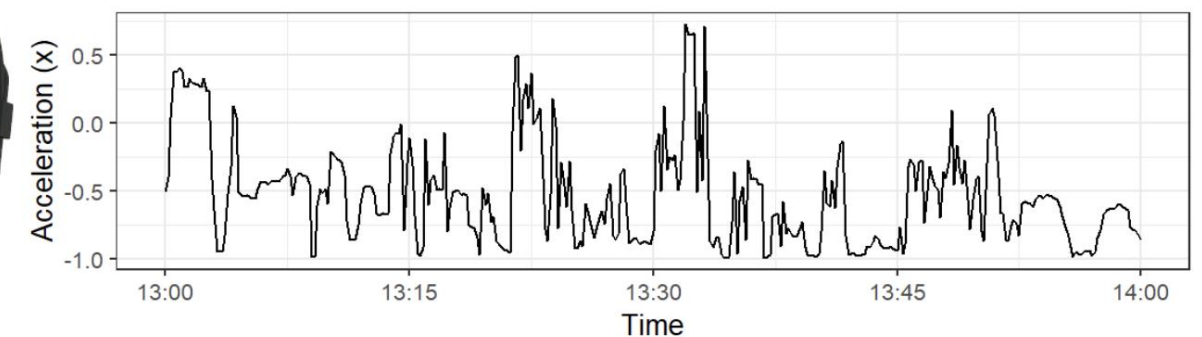
## Active EMA

- Self-report data
- Participants consciously provide information
- Ex: Current mood rating in response to a question prompted on a smartphone



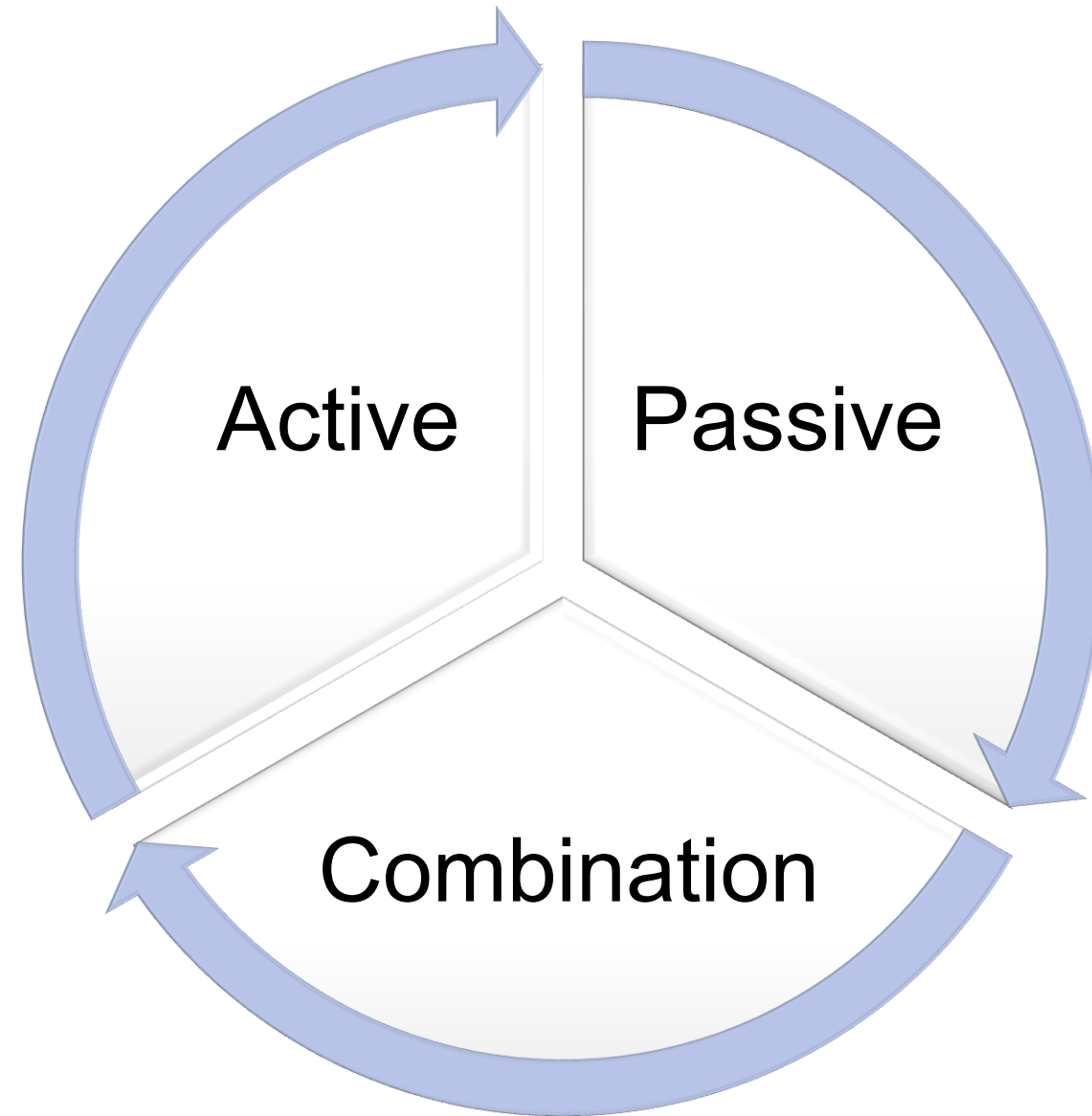
## Passive EMA

- Observational data
- Without active involvement of participants
- Collected through wearables or log files
- Ex: Heart-rate, social media engagement



(Doherty, et al., 2020; Ruwaard, et al., 2018)

# Forms of EMA



# Why EMA?

## Minimize

- Retrospective bias
- Recent and salient events
- Availability heuristic
- Effective valence effect
- Mood congruent memory effect

## Maximize

- Idiographic research
  - as compared to nomothetic methods
- Longitudinal validity
- Understanding of the dynamic interplay between symptoms
- EMI or JITI

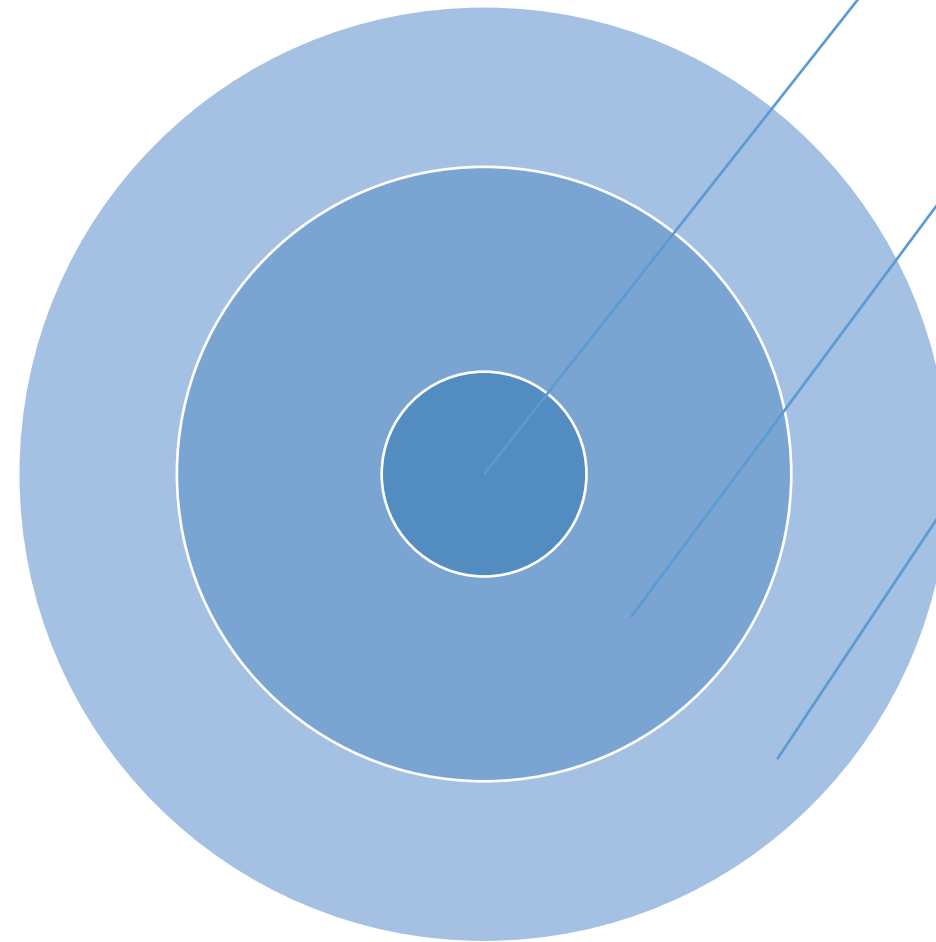
(Doherty, et al., 2020, Shiffman et al., 2008)



# Methodological Considerations

**“EMA design encompasses technologies, protocols, and the interplay between them... Designers must attend to varied interconnected and competing values and concerns”**

Doherty, et al., 2020



Parameters of interest  
Form of EMA  
Questions and scales  
Sampling  
Time contingent  
Event contingent  
Duration

Indication  
Participant engagement  
Reporting burden  
Data validity  
Honest disclosure

Theory-driven

# EMA Utility Across the Treatment Development Lifecycle



## Challenges

- Need to train, monitor, motivate, and support participants
- Cope with technical difficulties
- Low contextual control
- Substantial study preparation work and large datasets

## Limitations

- Unclear generalizability of research findings due to selective samples
- Unclear practice effects and issues related to reactivity
- Issues pertaining to feasibility and tolerability of prolonged and intense periods of data collection
- Issues of privacy, ethics, and informed consent