



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

DIPARTIMENTO
DI PSICOLOGIA
"RENZO CANESTRARI"

PhD Program in Psychology

Seminar

“Eating behaviors & disorders through Smartphone Ecological Momentary Assessment (EMA): from study design and setup to data analysis”

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Department of Psychology

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Abstract

This seminar provides a comprehensive introduction to smartphone Ecological Momentary Assessment (EMA), covering study design, implementation, data analysis and interpretation. Over the past two decades, smartphone EMA has become increasingly popular for studying (eating) behaviors and disorders, as it allows researchers to capture people’s experiences, emotions, and behaviors in real time, multiple times a day. Compared to laboratory and/or retrospective assessment, such as food diaries, EMA offers two major advantages: higher ecological validity – assessing behavior and/or mental states in the moment and in people’s natural contexts – and reduced recall bias through frequent assessments. Delivered via smartphone apps, EMA typically uses brief and intuitive self-report prompts with a small set of items. Its flexibility has made it valuable not only for momentary assessment but also for longitudinal studies (e.g., pre vs post bariatric surgery) and as an intervention tool, enabling the delivery of targeted messages, images, or short video-clips to participants.

The seminar will address the following questions:

- How to design and setup a smartphone EMA study from zero?
- How to analyze and interpret data collected through smartphone EMA?



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- How can smartphne EMA be used to advance our understanding of daily life eating behaviors and/or disorders?

Methods

Smartphone Ecological Momentary Assessment – also called Experience Sampling Method (ESM) – will be introduced and explained as a measurement method. In addition, an EMA dataset on snacking behaviors and accompanying analysis scripts (in R) will be provided as an example.

For the analysis part, please have R and RStudio running on your laptop prior the start of the seminar:

1. Install R (required):

Download the latest version of R from the official CRAN website:

<https://cran.r-project.org/>

Select your operating system (Windows, macOS, Linux) and follow the installer.

2. Install RStudio (recommended IDE):

After R is installed, download **RStudio Desktop** (free version):

<https://posit.co/download/rstudio-desktop/>

Suggested reading:

Maugeri, A., & Barchitta, M. (2019). A Systematic Review of Ecological Momentary Nutritional Epidemiology. *Nutrients*, 11(11), 2696. <https://doi.org/10.3390/nu11112696>

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, 4, 1–32. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091415>

Smith, K.E., Juarascio, A. From Ecological Momentary Assessment (EMA) to Ecological Momentary Intervention (EMI): Past and Future Directions for Ambulatory Assessment and Interventions in Eating Disorders. *Curr Psychiatry Rep* 21, 53 (2019). <https://doi.org/10.1007/s11920-019-1046-8>

Spanakis, G., Weiss, G., Boh, B., Kerkhofs, V., & Roefs, A. (2016). Utilizing Longitudinal Data to Build Decision Trees for Profile Building and Predicting Eating Behavior. *Procedia Computer Science*, 100(0), 782–789. <https://doi.org/10.1016/j.procs.2016.09.225>