



Introducing openESM: A database of openly available experience sampling datasets

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ESM Research: Scattered Landscape

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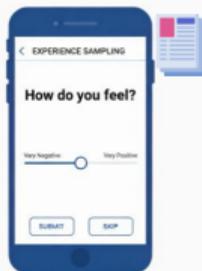


N = 150
Affect

ESM Research: Scattered Landscape



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Affect



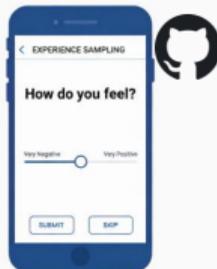
N = 104
Life Events

Logos from (Freepik, 2025a,b; Google, 2025; GitHub, 2018)

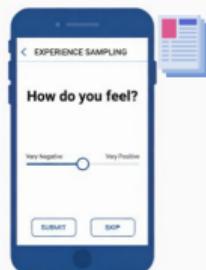
ESM Research: Scattered Landscape



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N = 79
Personality

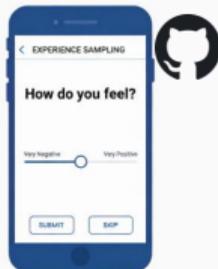


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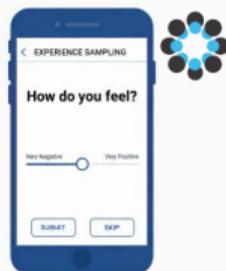
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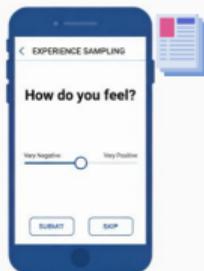
N = 150
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Personality



N = 243
Depression

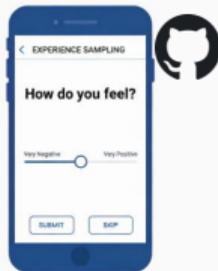


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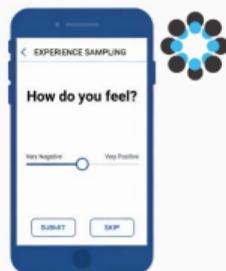
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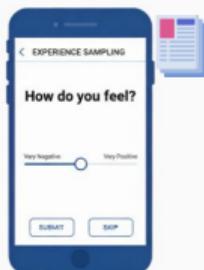
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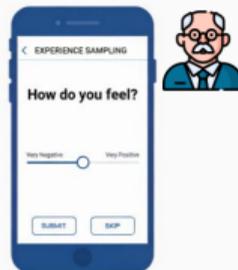
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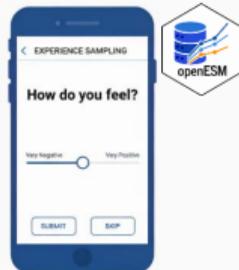


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Work Stress

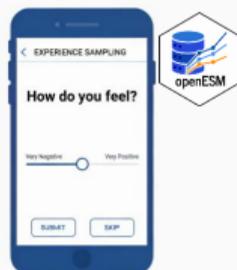
The Solution: openESM



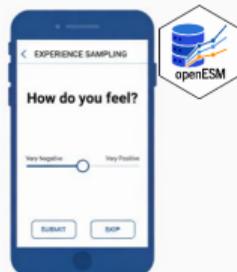
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Introducing openESM

60 harmonized datasets • 16k+ participants • 740k+ observations

¹R logo: <https://www.r-project.org/logo/>

²Python logo: <https://www.python.org/community/logos/>

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Substantive Research

Test theories across contexts

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Design Research

Investigate measurement
choices

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Substantive Research

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Statistical Methods

Benchmark and develop
methods

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What openESM Enables for Measurement Research



Measurement Invariance

Across time-of-day, day-of-study,
populations

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Design Trade-offs

Prompts/day, study duration, number of
items

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Scale Properties

Granularity effects, floor/ceiling, item
wording



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Sampling Schemes

Signal- vs. interval-contingent, fixed vs.
random



A database of open experience sampling datasets

openESM is a database of harmonized openly available experience sampling datasets. The platform enables easy reuse of datasets with consistent and detailed metadata standards to advance reproducible research into daily life.

[Start Exploring Datasets](#)



60

Datasets

Explore our growing collection of datasets.



16.000+

Individuals

Obtain insights from thousands of participants.



100+

Constructs

Investigate a diverse range of psychological variables.



1. Cleaning

Harmonized NAs, removed
redundant columns

E.g., standardized ID, beep, day



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2. Harmonization

Same variable names for
same questions

*E.g., “depressed” across
datasets*



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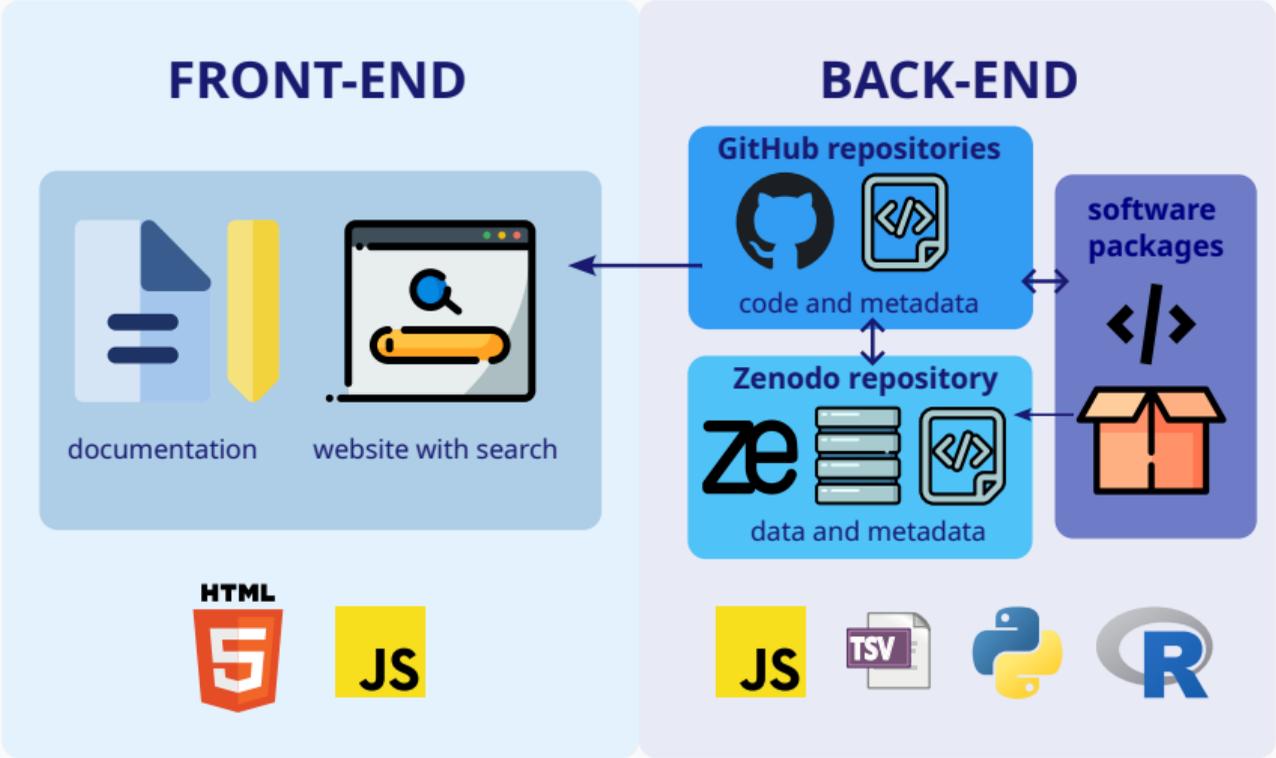


3. Annotation

Hierarchical construct tags
for each item

*E.g., “angry” → anger, negative
affect, affect*

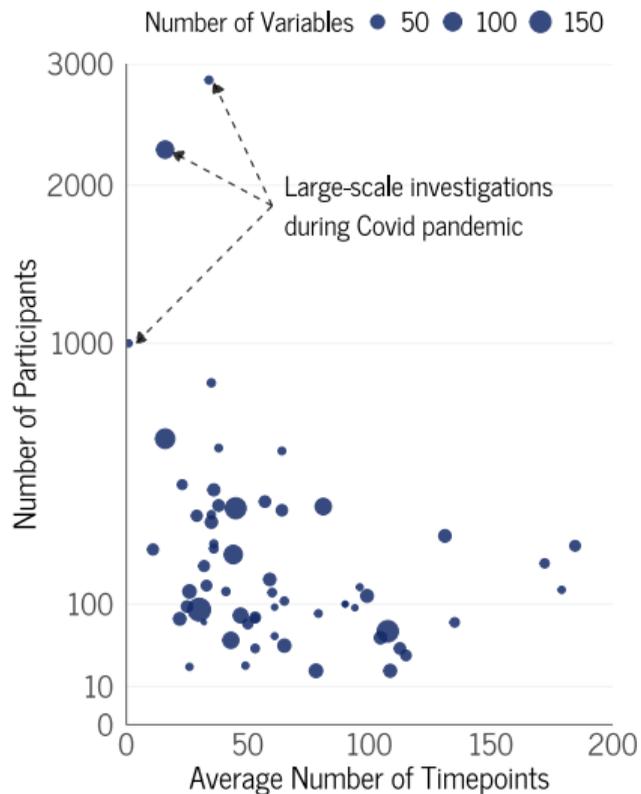
Architecture Behind It



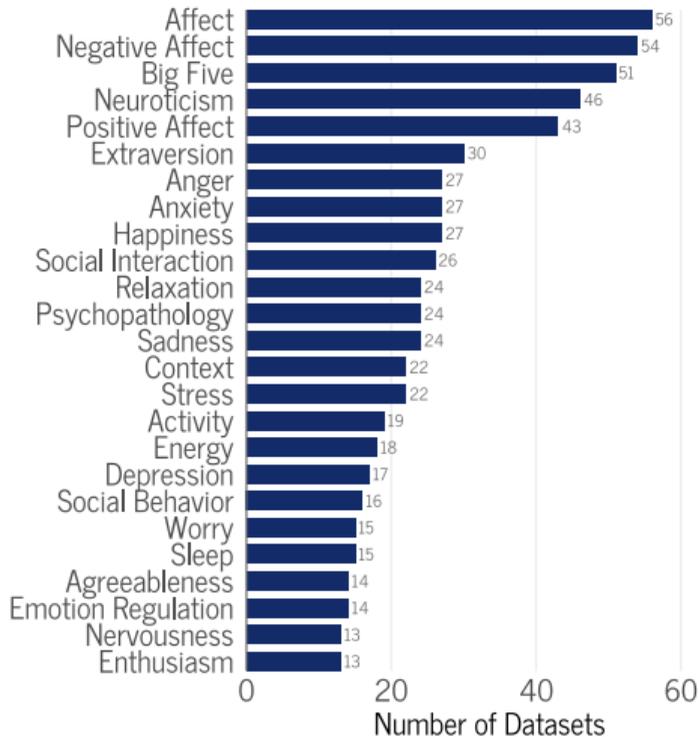
What's inside

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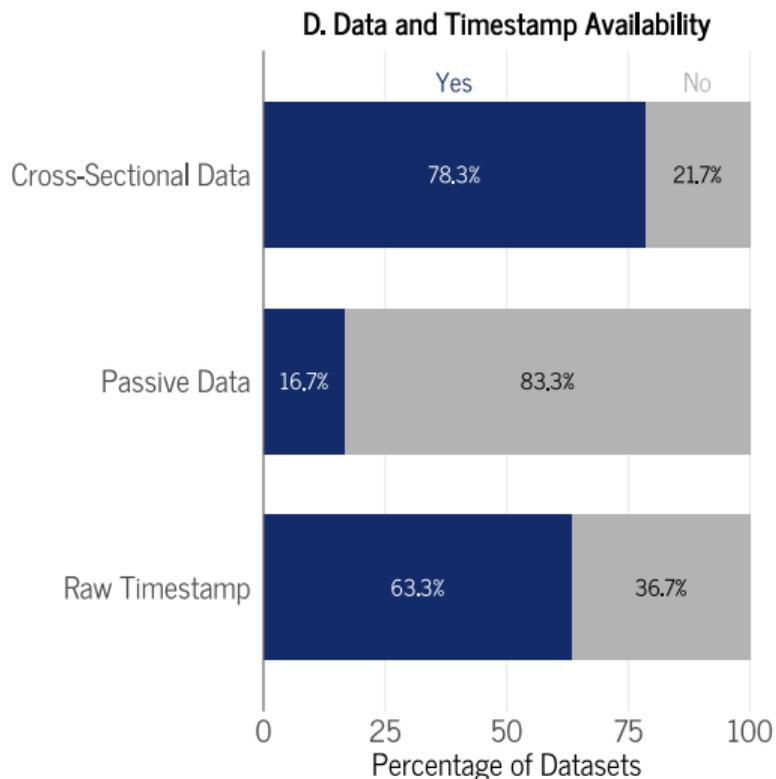
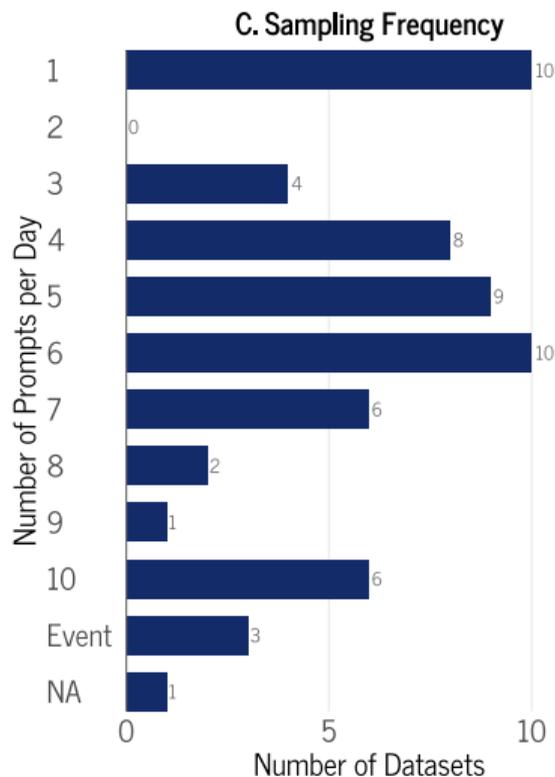
A. Timepoints, Variables, and Participants



B. Construct Frequencies



What's inside



Example Analysis

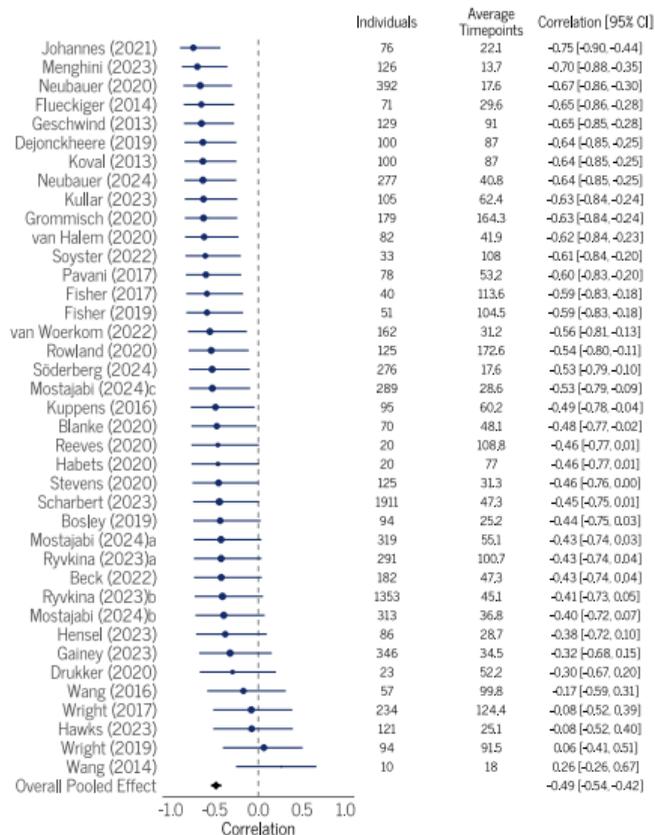
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Example Analysis

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- **Sample:** 39 datasets, 8,456 individuals, 529K observations

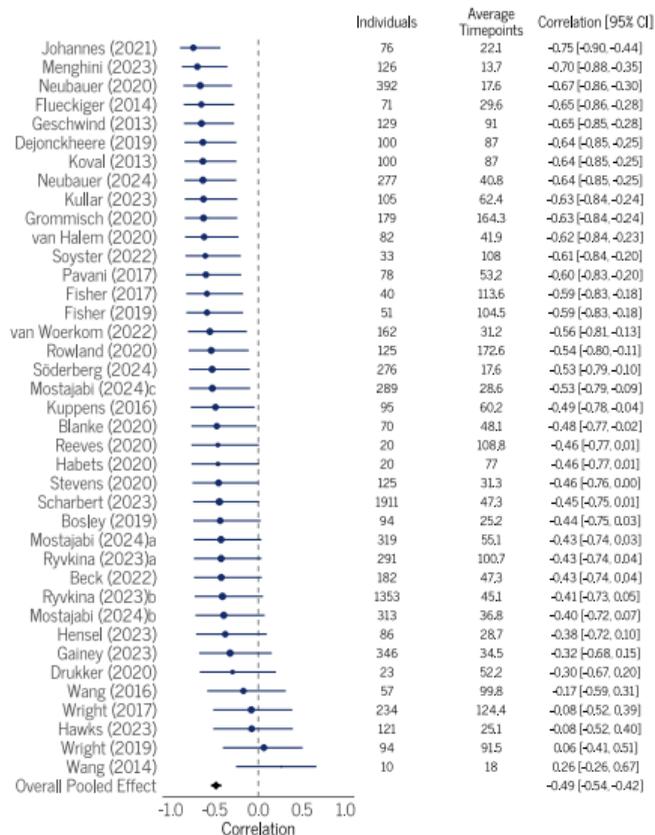
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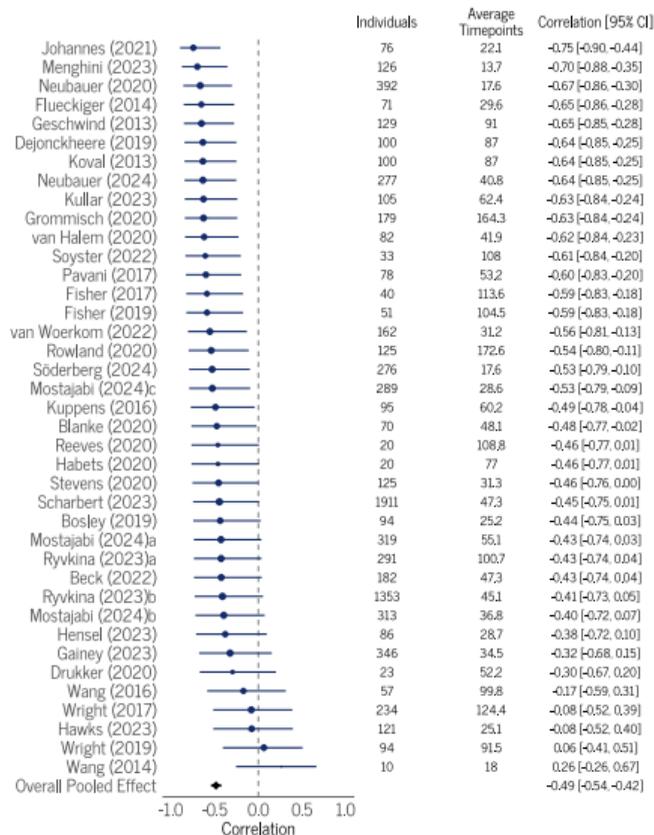
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- **Design insight:** More prompts/day → stronger negative correlation
- **Robustness:** Stable across 12 preprocessing/modeling choices



Next Steps



Community

Involve researchers, expand
non-WEIRD data

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Data & Metadata

Extend coverage and
documentation

Next Steps



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Involve researchers, expand non-WEIRD data



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Extend coverage and documentation



Software

Add benchmarking and filtering tools

Next Steps



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Involve researchers, expand non-WEIRD data



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Goal: Turn openESM into a continuously evolving community resource for cumulative ESM research

Thanks to the team



Jonas Haslbeck



Matthias Kloft



Anabel Büchner



Yong Zhang



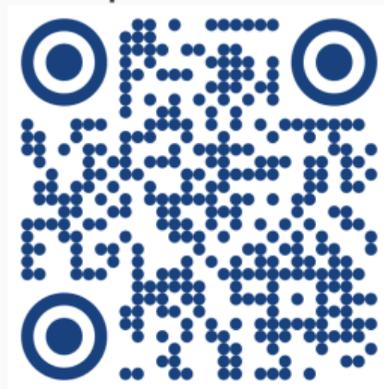
Eiko Fried



Daniel Heck

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Paper & Slides



References i

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