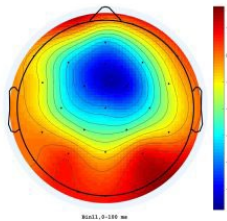
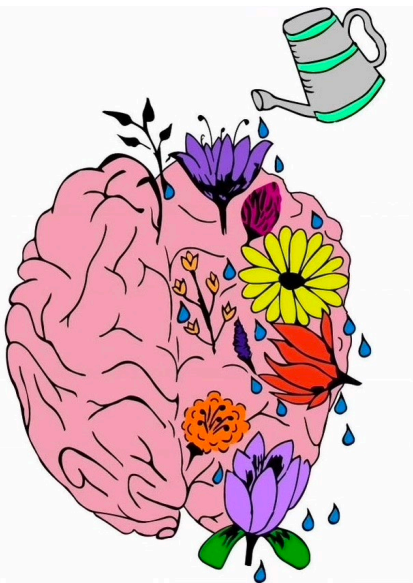


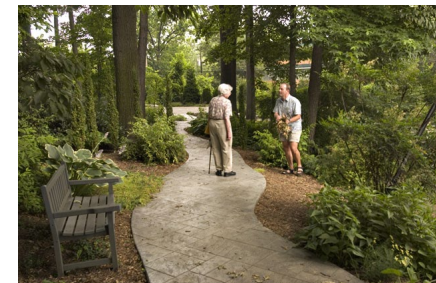
The RAIN Lab Research Agenda

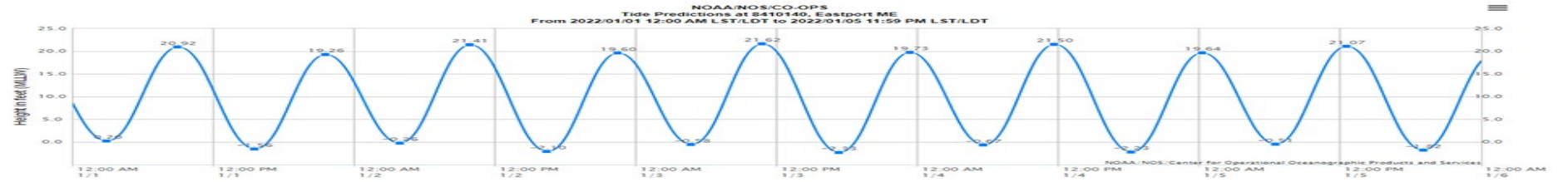
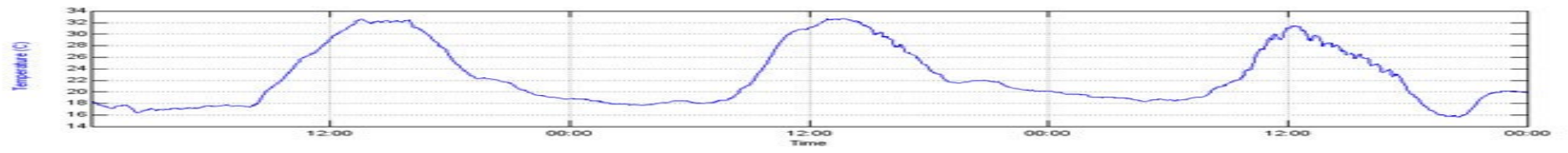


Understand how nature
can influence our
brains & minds

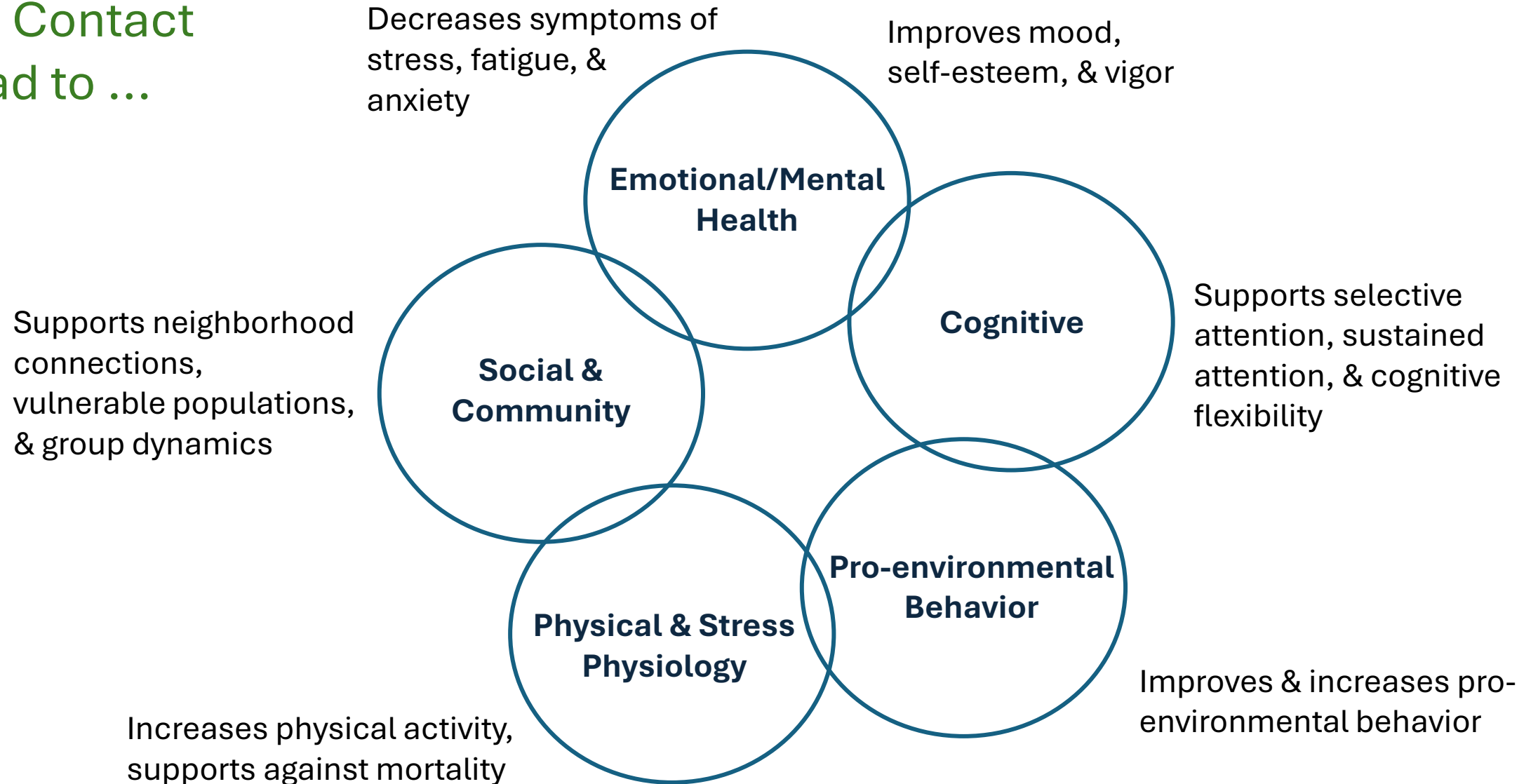
Develop applications to
optimize nature's
cognitive benefits
across the lifespan and
across different
individuals

Co-produce research in
community contexts



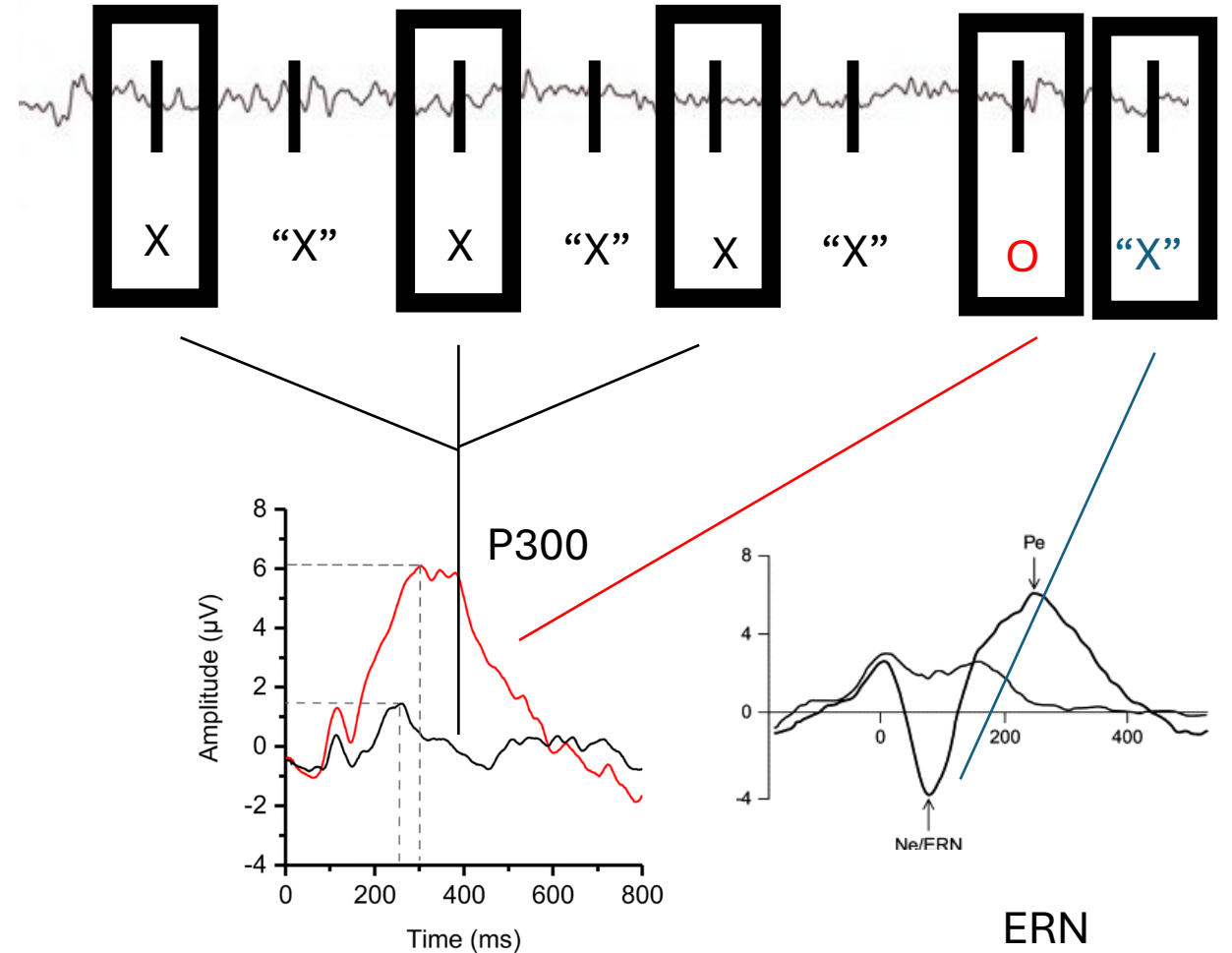


Nature Contact can lead to ...

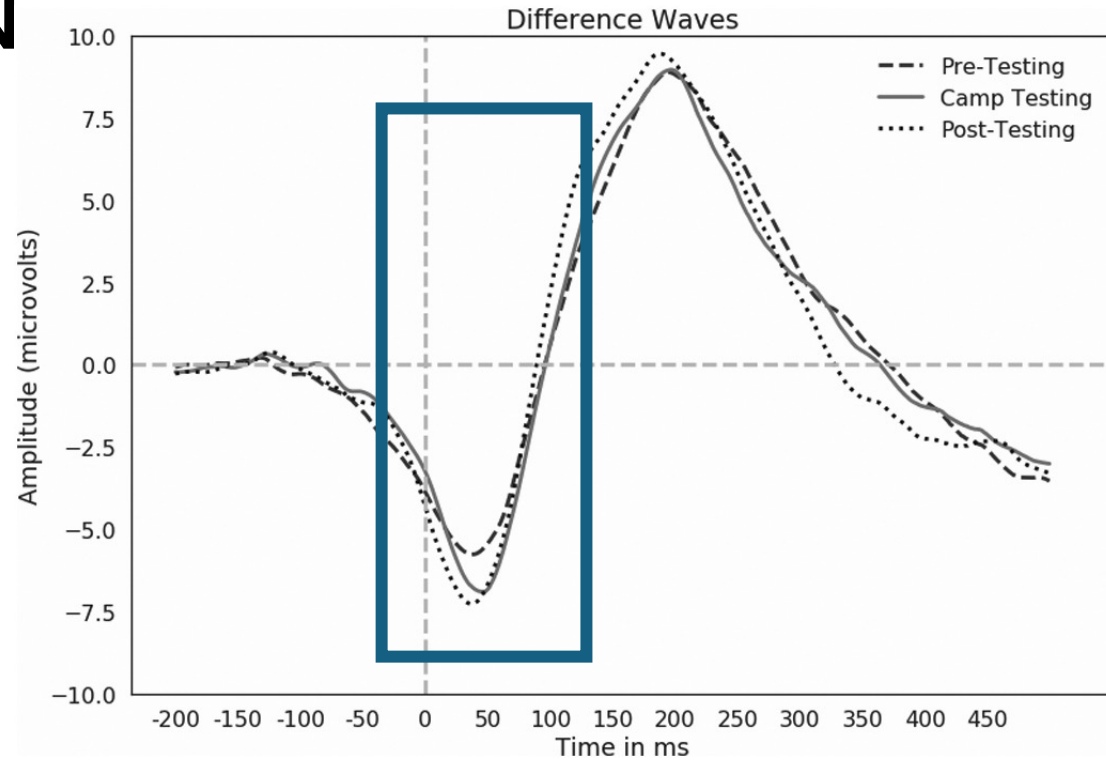


(E.g., Vujcic et al., 2017; Chen et al., 2018; Largo-Wight et al., 2018; Galway et al., 2021; Kim & Miller, 2019; Passmore & Holder, 2017; Stevenson et al., 2018; LoTempio et al., 2023; Bettmann & Hanley, 2024)

Electroencephalography (EEG): a useful tool



Results: ERN

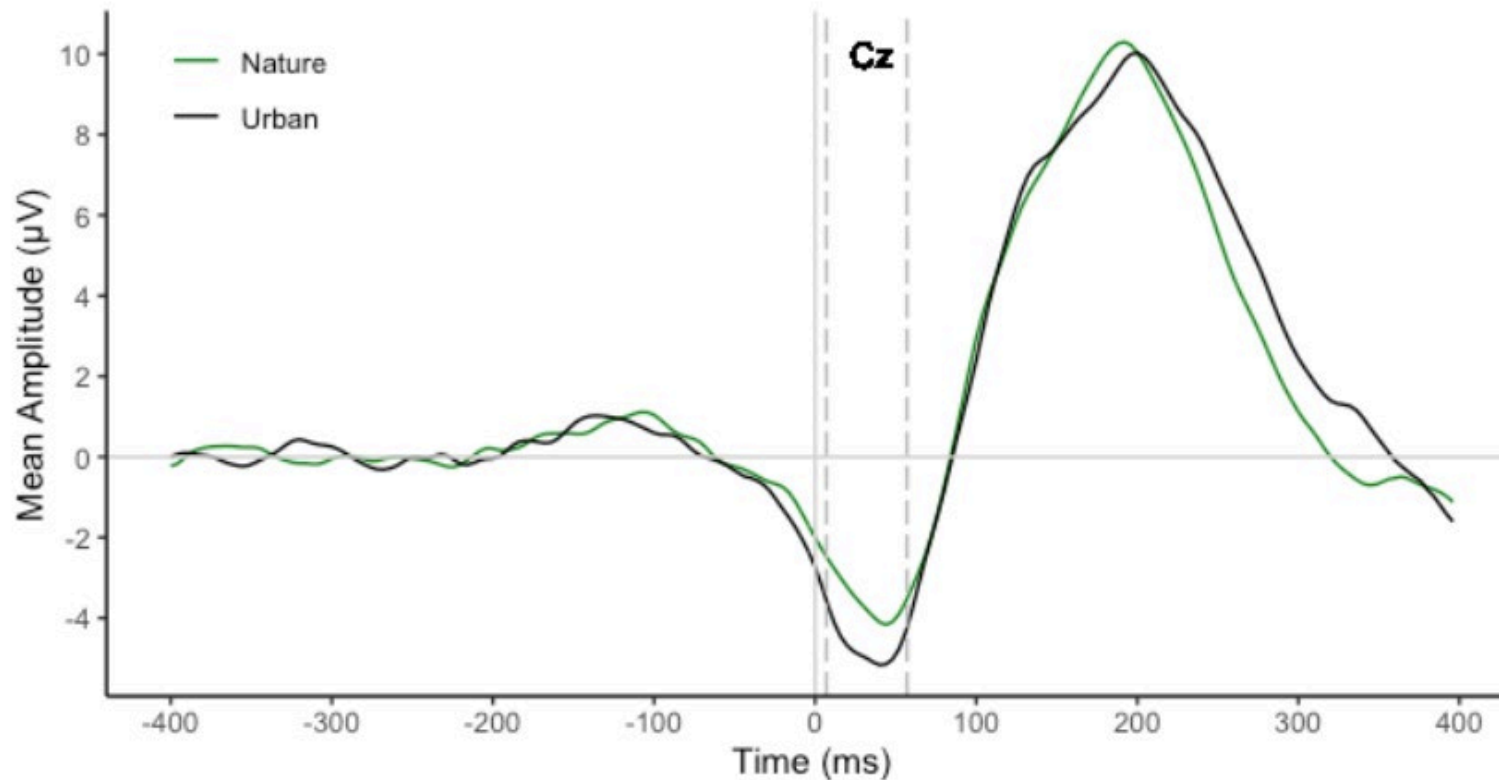


LoTempio et al., 2020
McDonnell et al, 2025
Scott et al, under review



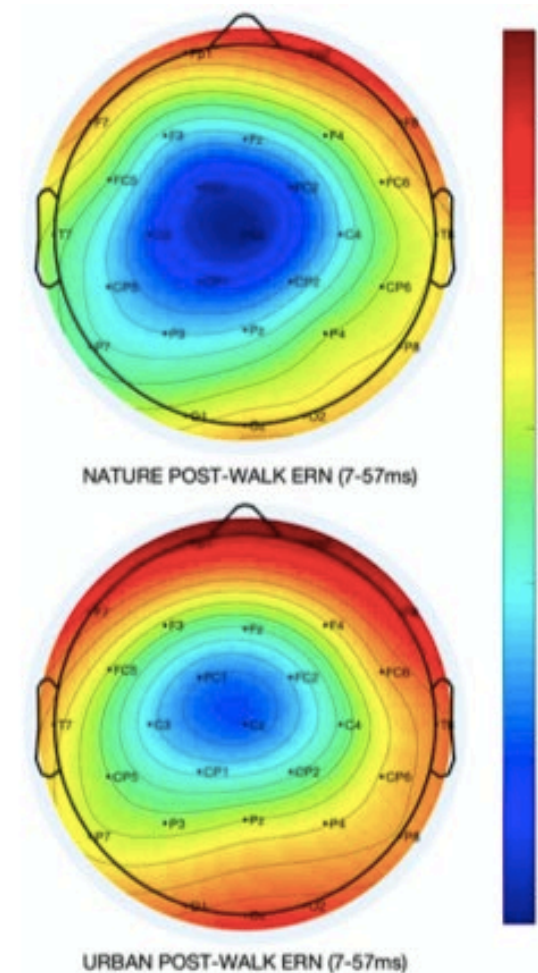
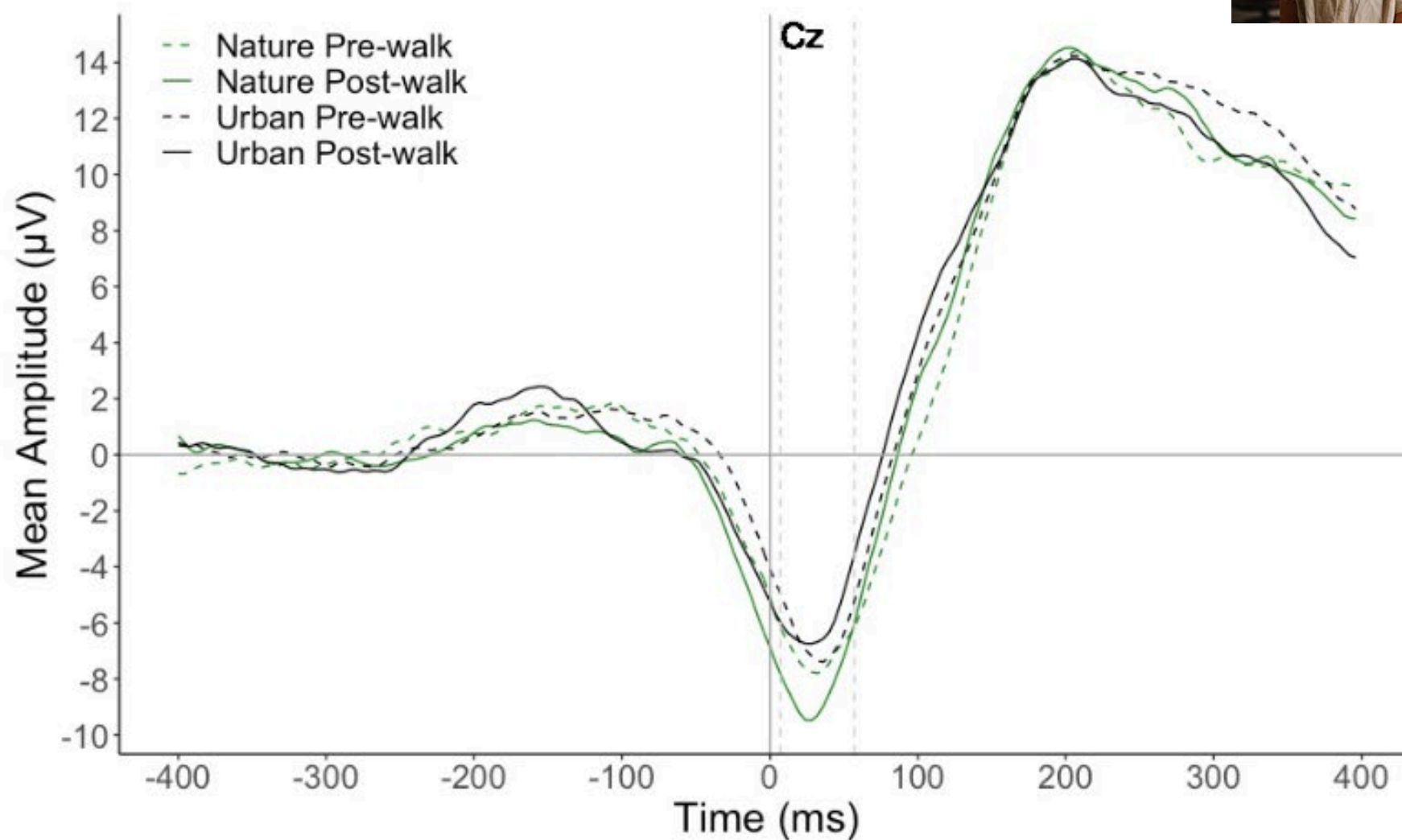
Nature Imagery

- ERN amplitude: No significant difference between waveforms





Nature Walk: Results



Conclusions: Nature & Physiology

- Spending time in nature appears to increase ERN amplitude in nature
- Does not happen with images
- Does not happen when you are outdoors in a concrete area
- Distinct brain change that happens *in nature*.

Nature and Aging

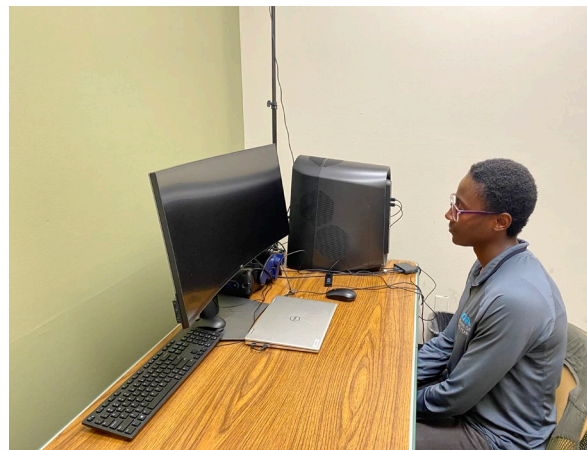


Johnson et al., under review

1. HRV
2. EF Tests
3. Subjective Mood & Stress



1. HRV
2. EF Tests
3. Subjective Mood & Stress

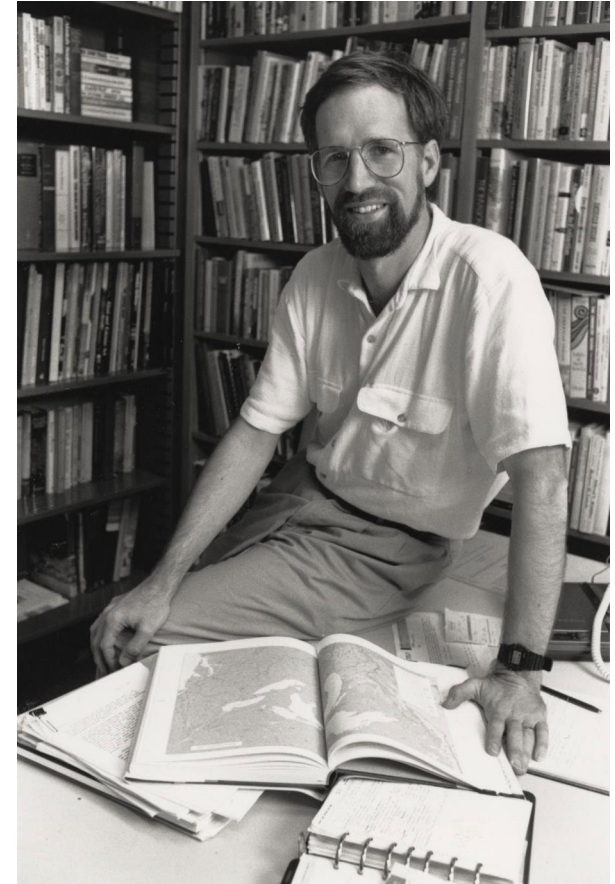


What when and how?

- Some research suggesting 120 minutes per week for increased mental health (White et al., 2019)
- Some research suggesting that time spent in nature is more important than type of nature (Shanahan et al., 2016)
- VR is less effective than real-world nature in some studies for mental health (e.g. Browning et al., 2020), but just as effective for ecological behavior (Deringer & Hanley, 2021)
- Some research suggesting perceived “naturalness” of space can mediate the relationship between nature and mood (McDonnell et al., in prep)
- Lack of comprehensive guidelines

The trouble with “Wilderness”

- There is no clear boundary between humans and nature
- “Wilderness” is a relic of colonialism and a Western creation
- Protection of “wilderness” for the interest of rich White recreationists in cities
- Failure to consider nearby nature as meaningful
- Protection of “pristine” space as the expense of everyday spaces



Cronon, 1996

Participants and Representation in Research

- Bias in research toward WEIRD participants (Gallego—Riofrío et al., 2022)
- Most research in US, Canada and Europe
- A lot in East Asia
- Very little in the rest of the world
- Lack of plurality in “nature” and “health”

Western
Educated
Industrialized
Rich
Democratic