Measuring Everyday Stress

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Why study everyday stress?

*Dynamics* of everyday experiences can elucidate how stress impacts health over the long term.

**Goals**

1. Describe how to conceptualize & measure everyday stress
2. Leverage mhealth/digital approaches for stress phenotyping
Conceptualizing & Measuring Everyday Stress

Daily stressors
- Arguments
- Work overloads
- Network stressors

Acute effects
- Emotions
- Physical function
- Cognition

Long-term effects
- Mental health
- Physical health
- Mortality

Measurement of daily stress involves extraction of theoretically informative features from time series data

Daily Stress Phenotyping (v 1.0)

Events

Exposure: frequency of daily stressors

- education
- cognitive function

Emotions

Emotional “Reactivity”: coupling of events & affect across time

- education
- cognitive function
- Inflammation
- Chronic health Dx (10-year)
- Mortality rates

High reactivity person

Daily stress signatures relate to current and predict future functioning, health, and well-being

Low reactivity person

Stawski et al., 2010; Sin et al., 2015; Piazza et al., 2013; Charles et al., 2013; Chiang et al., 2018
Daily Stress phenotypes are dynamic

Changes non-monotonically across life course

Less stable at older ages

Daily stress signatures are embedded in and vary across developmental, social, and personal contexts

Almeida et al., 2022; Sliwinski et al., 2009
Everyday Stress Phenotyping (v 2.0)

Components of Everyday Stress Responses

- **Anticipation**: effects prior to stressor onset
- **Reactivity**: peak of the initial increase
- **Recovery**: persistent effects

Stress anticipation negative impacts working memory
Stress anticipation prolongs recovery of negative affect
Prolonged recovery predicts chronic health conditions

**Ambulatory measurements** (e.g., EMA, passive sensing) permits finer temporal resolution

Epel et al., 2018; Hyun et al., 2018; Kramer et al., 2022; Leger et al., 2018
Exposure to Disappointment and Deprivation

Lack of positive social interactions $\rightarrow$ worse cognitive performance

Having positive social interactions $\rightarrow$ better cognitive performance

Effects of positive interactions larger for individuals with fewer overall interactions

Everyday stress can come from bad things happening OR from not meeting basic human social (or material) needs

Effects are larger for individuals with fewer overall interactions (a window into daily effects of social deprivation/isolation?)

Zhaoyang, Scott, Martire, Sliwinski (2021)
1. **Over-reliance on self-report exposure assessment**
   - Geographically linked social context; sensor-based exposomics (e.g., air quality, noise, traffic, weather, “crowdsensing”)

2. **Little is known about stability and variability of daily stress**
   - Time-varying effects of social, personal, and environmental contexts
   - Bridging the “temporal gap” from days to decades

3. **“Non-events” that trigger and prolong stress are understudied**
   - For example, social deprivation and material (e.g., food) insecurity

Zawadzki et al., 2019; Pasquini et al., 2022;
Key Take Home Points

Contemporary approaches to measuring everyday stress

Prioritize “data streams and parameters” over “data points and scores” from questionnaires

Daily Stress Phenotypes

Reflect multiple features (e.g., anticipation, reactivity, recovery)

Related to function and well-being in the short-term and long-term

Vary and change across developmental, social, and personal contexts

Knowledge gaps in measurement of everyday stress

More “objective” exposure assessments of social and physical context

Capture daily effects of deprivation, resource insecurity, impactful non-events
Thank you!

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