Daily Discrimination and Physiologic Stress Arousal: Combining Dynamic Daily Diaries with Electrodermal Reactivity to Study the Effects of Discriminatory Experiences on the Body

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Overview

Purpose. Apply the use of daily diary surveys and wearable sensors to measure the link between discrimination and health; examine how people respond to and recover from discriminatory events.

Goal. To determine if discrimination predicts physiological arousal in the moment around the time of the event.

Background

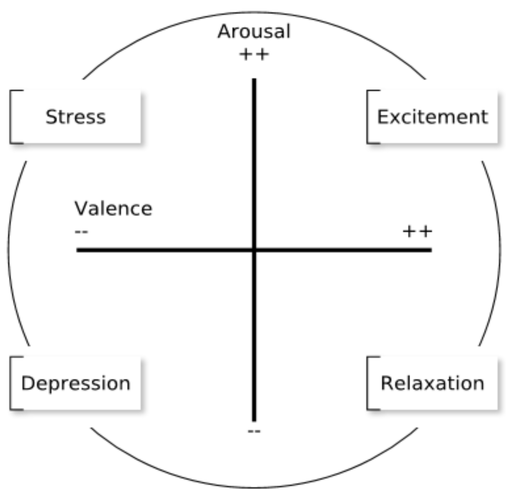

Figure 1. Emotional circumplex model of arousal and valence (Crowley, 2016)

Discrimination and Health Consequences.

- The accumulation of discriminatory experiences (vicarious, interpersonal) ultimately contribute to health disparities where minorities are at higher risk of developing stress-related diseases (Anderson 2013, Carlisle 2015).
- Process occurs via allostatic model of regulation; the body has adaptive qualities that create wear and tear when it experiences chronic stressors (Sterling, 2012).
- Discrimination as a chronic stressor is linked to stress-related diseases such as Hypertension, Cardiovascular Disease, Obesity and Adiposity, and Type II diabetes.

Electrodermal Activity (EDA)

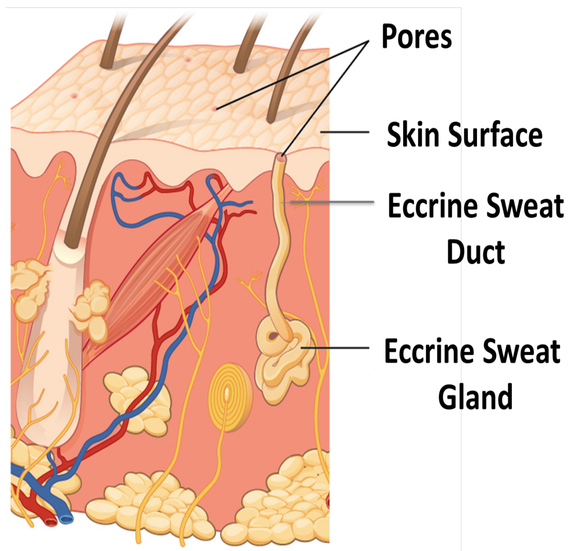

Figure 2. Skin anatomy diagram (OpenStax, 2014)

Innovative Methods

Figure 3. Empatica 4 (E4) Ambulatory electrodermal reactivity monitor for long-term use in combination with daily diary surveys that allow participants to reconstruct their day.

StudentHD Pilot Study

Figure 4. Survey data encoded into rows capturing 15-minute segments during the day with EDA data processed in those same blocks to temporally integrate data; Kahneman's "day reconstruction" method variation.

Sample.

- 28 Participants
- About 1/3 White, Black, Hispanic
- N=15 Female
- EDA: 280,000 samples/20 hours
- 14,645 15-minute epoch
- Participants were compensated

StudentHD Measures

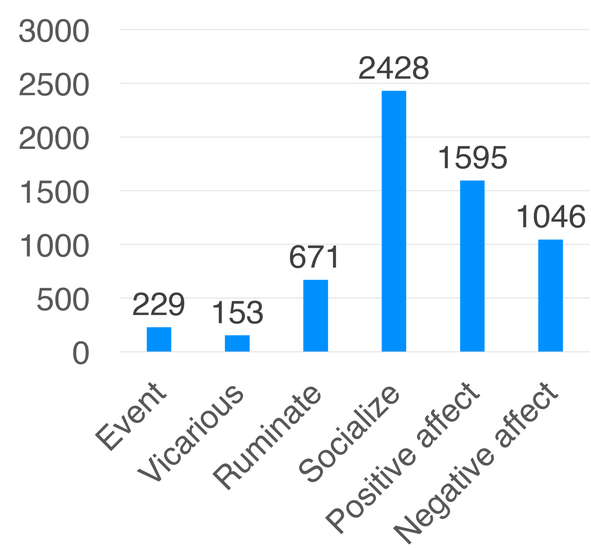

Table 1. Discrimination reports table

StudentHD Results

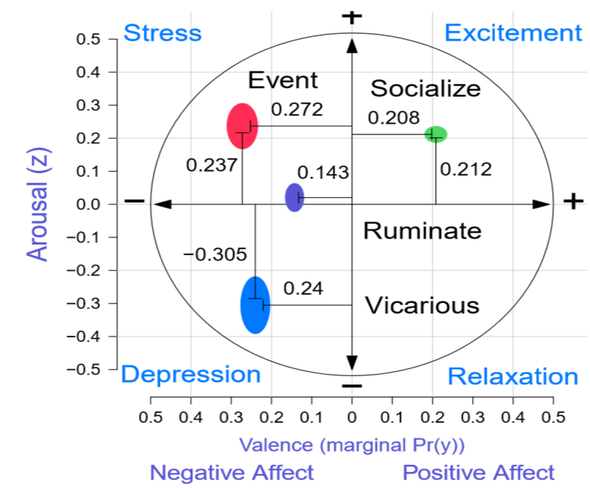

Figure 5. Discrimination events and affect outcomes

Summary and Future Work

Summary.

- Discrimination does predict physiological arousal in moment around time of event.
  - EDA promising for capturing emotional arousal levels in response to real time events.
- EDA differentially associated with interpersonal discrimination or microaggressions from vicarious racism.
- Biosignals and self-report data promising for discrimination studies.

Limitations.

- Small sample size
- Preliminary in nature
- Surveys cognitively demanding

Future Work.

- Add more biosignals
- Minimize measurement errors
- Develop less demanding format
- Develop more dynamic mobile designs
- Use to study different types of discrimination

Acknowledgements

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