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Daily Associations of Emotion and Fatigue in College Students during the Early Stages of the COVID-19 Pandemic:

An Application of Dynamic Structural Equation Modeling

Parisa Rafiee, Elizabeth Pauley, Melissa Rothstein, Amy L. Stamates & Manshu Yang

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THINK BIG WE DO℠

Purpose of Study

- Assess the reciprocal (i.e., bidirectional) relationship between:
  - Feelings of fatigue
  - Affect (negative and positive)
- Do these associations vary across individuals?

Background

- **Fatigue** (Smets et al., 1995)**:** harmless occurrence due to
  - insufficient sleep
  - lack of relaxation
  - increased physical activity
  - everyday life stress

- Mental fatigue may **diminish** ability to **regulate emotions** (Grillon et al., 2015).

Background

- **Emotion Regulation (ER)** (Gross & John, 2003):
  A process helping individuals determine
  - how long emotions last
  - how intense emotions are felt and conveyed
- **ER** can up- or down-regulate (Koole, 2009; Lewczuk et al., 2022).
  - negative affect (i.e., undesirable feelings)
  - positive affect (i.e., desirable feelings)
- **ER** takes effort and may **lead to fatigue** (Van Dellen et al., 2012; Lewczuk et al., 2022).

Measures Used in This Study

- **Negative Affect**
  - Nervousness
  - Anxiety
  - Sadness
  - Dejection
  - Anger
  - Hostility

- **Positive Affect**
  - Happiness
  - Cheerfulness
  - Content
  - Enthusiasm

- **Fatigue**
  - Spent
  - Depleted
  - Drained

Data Collection

- Responses recorded on a 5-point *Likert scale*
- Scores averaged to yield *composite scores*:
  - ***Negative affect***
  - ***Positive affect***
  - ***Fatigue***

Parent Study

- An IRB approved study examining
  - alcohol use, drinking motives, coping mechanisms, and daily stressors, among college students
  - during early stages of the COVID-19 pandemic
- Data Collection
  - ***Micro-longitudinal*** design
  - Data collected electronically ***daily for 21 days*** (May/June of 2020)

Participant Sample in This Study

- 54 undergraduate and graduate students
- From University of Rhode Island
- Predominantly ***female*** (86%)
- Predominantly ***white*** (85%)
- ***18-40*** years old (M = 29.19, SD = 4.46)

Method

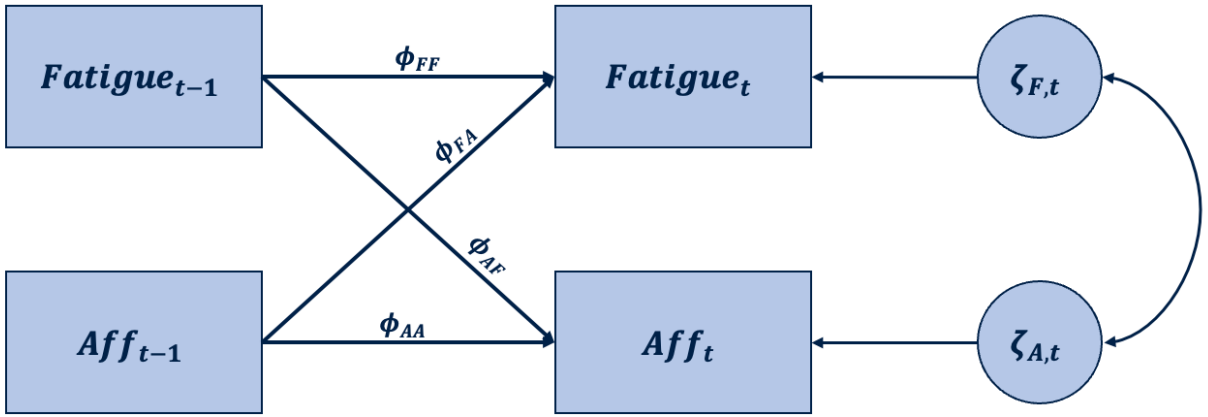
- **Dynamic Structural Equation Modeling (DSEM):** the temporal relationships of fatigue and positive/negative affect (21-day period).
- **DSEM** (Hamaker et al., 2021, Zhou et al., 2021):
  - State-of-the-art statistical method
  - Combines **time-series analysis** with **multilevel SEM**
  - Allows **time-lagged associations** between multiple variables
  - Investigates **individual differences** in these associations

Method: DSEM

- Assumes data are **missing at random**
  - use all the available data without removing cases
  - reduce estimation bias and increase statistical power, as compared to traditional ad hoc methods (e.g., listwise deletion, mean substitution)

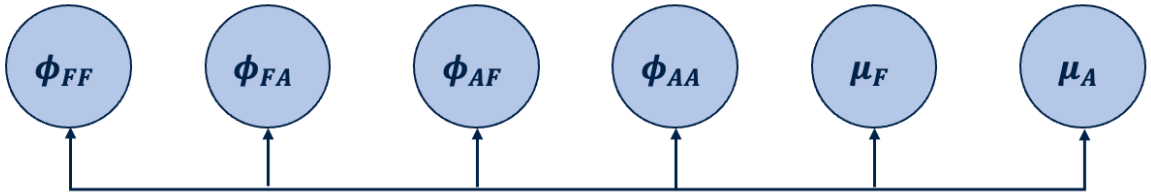
- In the current study, DSEM:
  - assesses the **bidirectional associations** between fatigue and affect at a **daily level**
  - considers how associations vary from **person-to-person**

Model Specification



Within

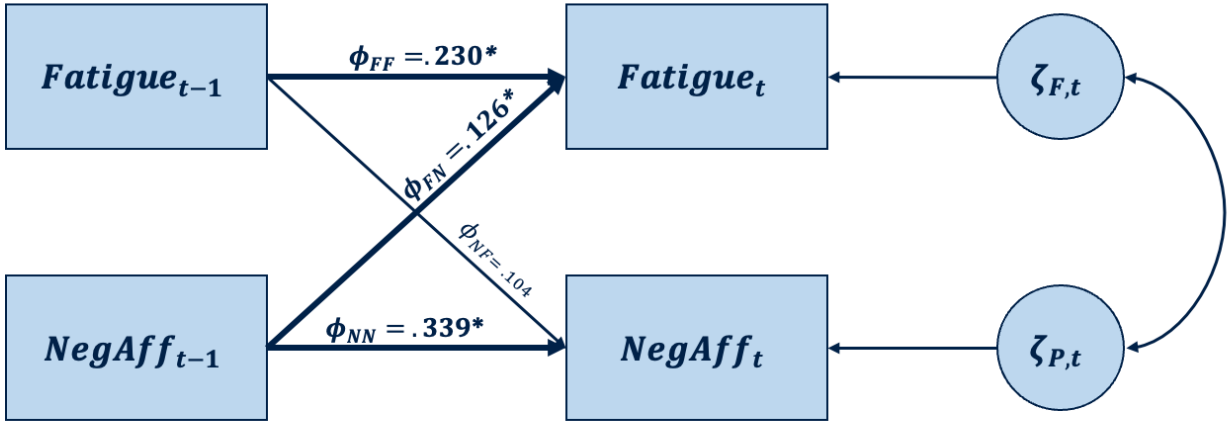
Between



Analysis

- Mplus version 8.0 was used for the analysis, with:
  - Latent mean centering
  - Estimator = Bayes
  - Algorithm = Gibbs
  - 50,000 iterations

Model 1: The reciprocal relationship of negative affect and fatigue



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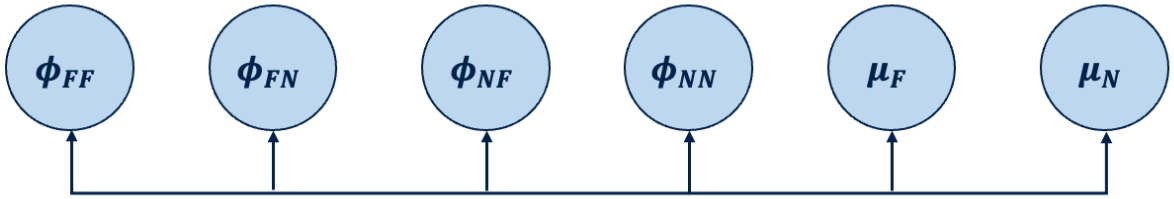
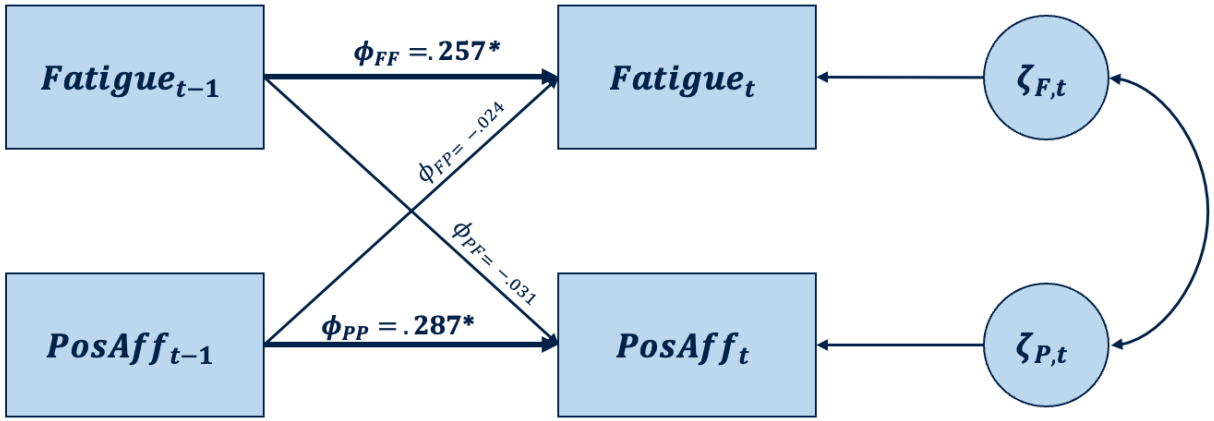


Model 2: The reciprocal relationship of positive affect and fatigue



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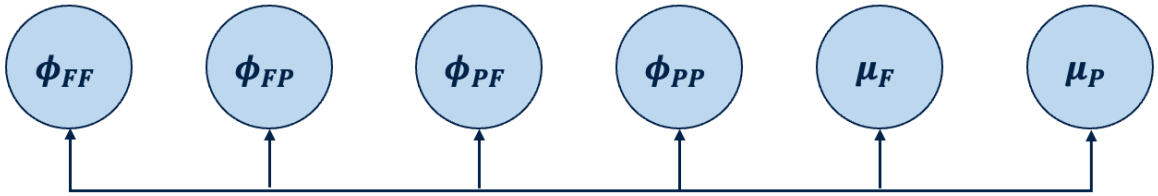

Discussion

- **Unidirectional association** between fatigue and negative affect
- **No association** between fatigue and positive affect
- **Negative affect predicted following-day fatigue:**
  - higher negative affect during COVID-19
  - extra effort to down-regulate
  - elevated fatigue on the following day
- **Positive affect did not predict following-day fatigue:**
  - Down-regulating negative affect may take more efforts than up-regulating positive affect

Limitations

- **Small sample size**
  - Limited power for between-person associations
- **Limited diversity** of sample:
  - Predominantly **white**
  - Predominantly **female**
  - Mostly **young adults**
- Only **one assessment** per day:
  - Might not capture transient emotion regulation and fatigue within a day.

Future Directions

- Explore if momentary relationships between affect and fatigue **remains**:
  - with **more frequent** assessments within a day
  - using a **larger** and **more diverse** sample
  - **beyond the pandemic** time period

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Thank You!

Any Questions?

For further information, please contact:

Parisa Rafiee
Email: prsrafiee@uri.edu