The Interaction between Chronotype and Napping on Inhibition in College Students

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Introduction

- College is a critical transition period in the lives of young adults, with more independence and choices to make in their schedules – including sleep
- Sleep is critical for proper physiological and mental functioning in humans
- Circadian rhythms, cyclic fluctuations in physiological and cognitive functions impact sleep and are referenced as morning or evening preferences
- Chronotype, the propensity of an individual to engage in sleep and activity at specific times during a 24-hour period, varies by person and is split into early-morning types (e.g., larks) and late-night types (e.g., owls).
- College students usually exhibit evening preferences
- Inhibitory control (IC) is an executive function, defined as the ability to focus on relevant stimuli which influences academic achievement among college students
- Relation between chronotype predispositions, napping, & inhibition is poorly understood

Primary Aims

- **Aim 1**: Determine if there is a relation between morning or evening preferences and 1) napping frequency and 2) average napping time across the week
- **Aim 2**: Explore whether those who have a greater nighttime preference are more likely to nap and exhibit poorer inhibitory control
- **Aim 3**: Examine whether the relation between nighttime preference and inhibitory control differs based on napping frequency

Method

Participants:

- **N=738**: Average Age: 19.4 years, 81.1% Female, 55.2% Caucasian
- **N=43**: Average Age: 19.3 years, 100% Female, 48.8% Caucasian, 32.6% Asian

Procedure:

- Participants filled out a Daily Diary for 7 days, answering questions about their daily sleep behaviors, such as napping
- Participants answered basic demographic questions, information about naps, and three items from the Morningness-Eveningness Questionnaire (MEQ) pertaining specifically to chronotype
- A subset of participants completed the lab-based D-KEFS test to measure inhibitory control

Results

- **Aim 1 (N=738)**:
  - More than half of students napped throughout an average week (59.9%)
  - Students less likely to nap preferred earlier wake times than frequent nappers
  - Correlational analyses indicated significant small positive relations between MEQ and napping frequency: r = 0.117, p < 0.016
  - MEQ and average napping duration across the week: r = 0.12, p = 0.012

- **Aim 2 (N=43)**:
  - MEQ and IC correlational analyses indicate non-significant relations
  - IC response rates: r = 0.106
  - Error rates: r = 0.1, p < 0.05
  - Napping and IC correlational analyses indicate non-significant relations
  - IC response rates: r = 0.017, p < 0.014
  - Error rates: r = 0.20, p < 0.049

- **Aim 3 (N=33)**:
  - A hierarchical linear regression indicated a main effect such that stronger preferences for evenings were associated with more errors made during the inhibitory control task (b = 0.773, t = 2.059, p = 0.049).
  - Main effect of napping frequency group (nappers vs. non-nappers) were non-significant (b = -1.151, t = 0.912, p = 0.369).
  - However, the interaction effect of chronotype x napping group was significant (b = 1.021, t = -2.732, p = 0.011).

Discussion & Conclusions

- Napping is an important construct for college students – they nap a lot
- Napping frequently impacts students with morning preferences differently than students with evening preferences
- Larks:
  - No nap: do not make many inhibitory errors
  - Nap: more inhibitory errors!
- Owls:
  - No nap: the most inhibitory errors!
  - Nap: less inhibitory errors

Future Directions:

- Recognize sleep patterns in college-aged students
- Implications on academic performance and ability to succeed

References