

Daily Stressors and Marital Interactions Affect Diurnal Cortisol and Alpha-Amylase Rhythm in Spouses of Persons with Mild Cognitive Impairment

Tina Savla, Karen A. Roberto, Rosemary Blieszner

Center for Gerontology & Dept. of Human Development, Virginia Polytechnic Institute and State University

Introduction

- Mild Cognitive Impairment (MCI) is characterized by early decline in memory and abilities to carry out a series of steps in sequence
- Spouses defined as “Care Partners” are the first line of support
- Care partners give up certain pleasures, alter their daily activities and take on the other partners' roles to manage MCI; they show noticeable signs of distress
- Stressors may pile up over time and contribute to poor health outcomes
- Problems appearing early in the care cycle have long-term implications for caregivers' health and well-being and the family's overall quality of life

Research Aims

1. To document daily symptoms and behaviors of persons with MCI
2. To assess how MCI-related symptoms, care needs and other stressors influence psychological well-being of care partners
3. To examine effects of MCI-related symptoms, care needs and other stressors on spouse care partner's physiological indicators of health (Diurnal Rhythm of Cortisol and Alpha-Amylase)

Study Sample

30 care partners of a spouse diagnosed with MCI at a memory clinic. Dementia & potential reversible causes of memory loss and confusion (e.g., depression, nutritional deficiencies, health problems) were ruled out.

Study Measures

7 consecutive daily diary interviews + 4 days of Saliva collection

Primary Stressor: Memory & Behavior Problem Checklist calibrated for daily reporting on 5 behavioral categories

Secondary Role Strain: Asked questions about: Time Spent, In-depth assessment of Non-Caregiving Stressors: Arguments; Avoided Arguments; Stressors with other family members, etc.

Study Outcomes:

- Daily Psychological Distress (Negative & Positive Affect)
- Daily Marital Interaction
- Salivary Cortisol (HPA Axis) & Alpha-Amylase (SAM Axis)
 - Saliva collected 5 times each day (wake up, 30 mins after waking, lunch, evening and before bed)

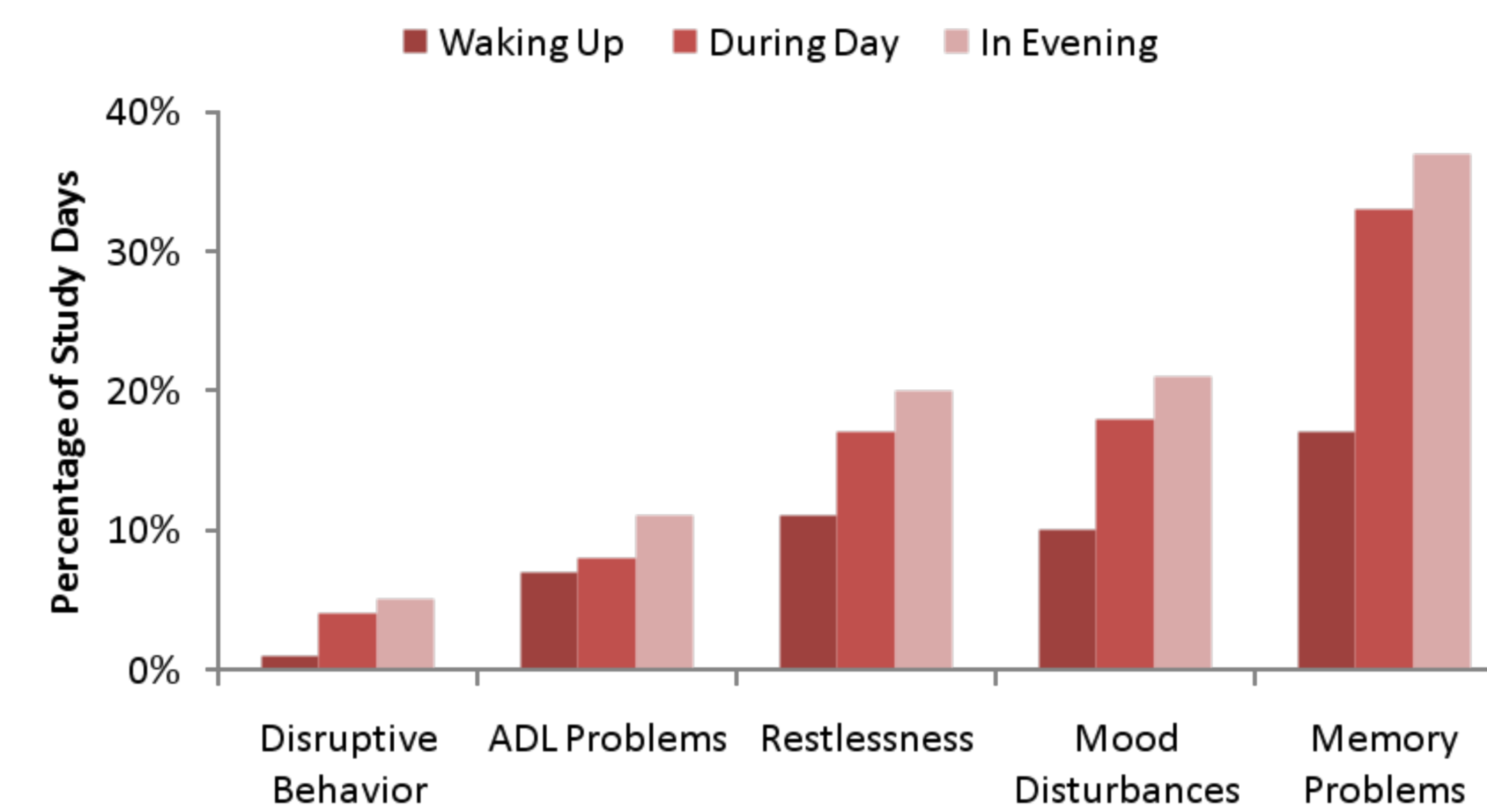
Analysis

We used 2-level multilevel modeling (MLM) as implemented in STATA XT MIXED to examine daily variation in negative affect and positive affect.

We used a 3-level MLM with robust standard errors to simultaneously estimate the diurnal cortisol slope and its acceleration as well as model how daily variations in experiences are related to day-to-day variations in diurnal salivary cortisol slope and AA slope.

Results

Result 1: Distinct Sundowning evident by the increase memory and behavioral problems towards the end of the day

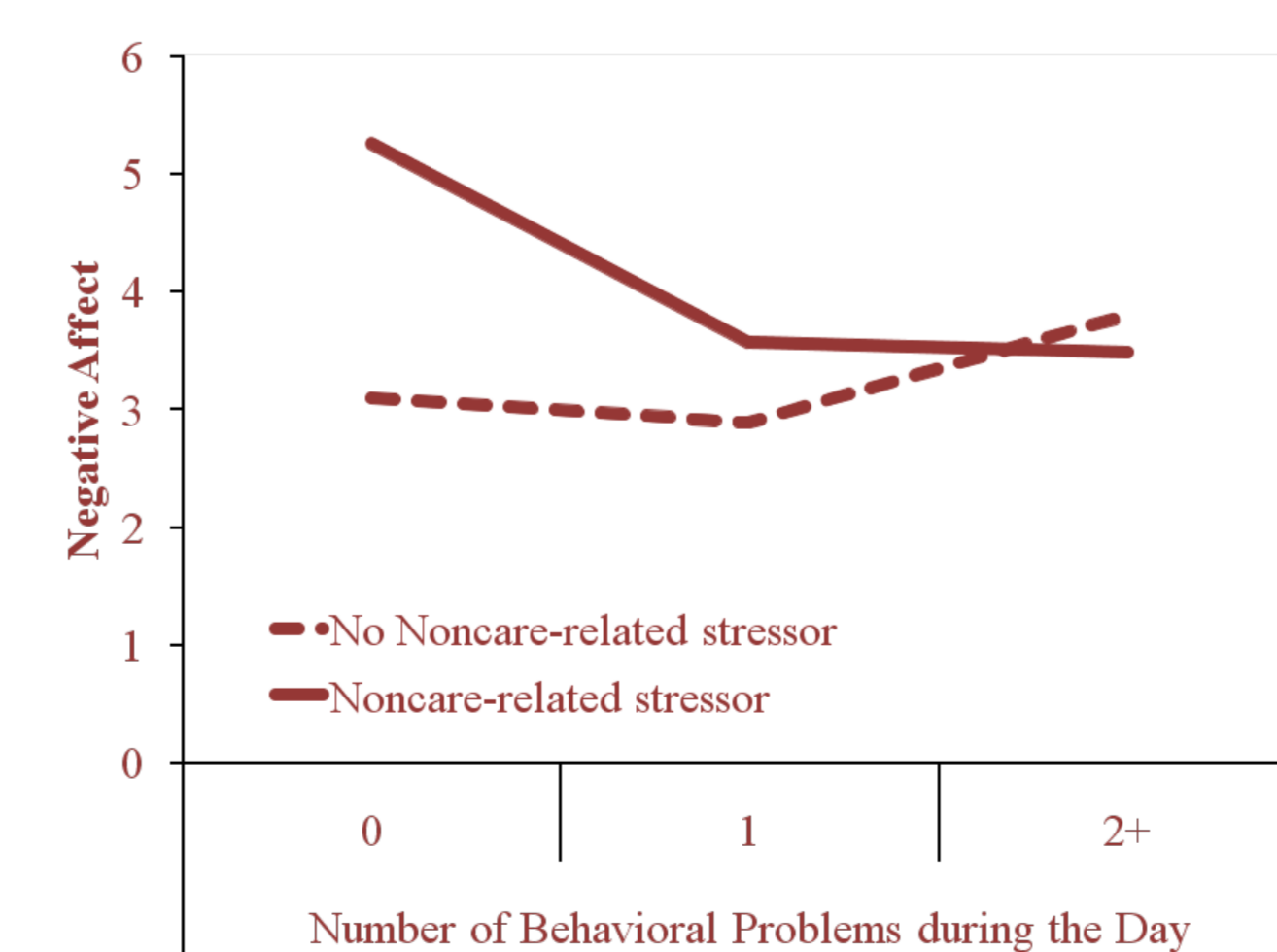


Repeated measures ANOVA indicated significant differences among Restlessness, $F(2, 49.05) = 3.569, p = .04$, Mood Disturbances, $F(2, 44.85) = 5.59, p = .01$, and Memory Problems, $F(2, 57.90) = 11.34, p < .001$.

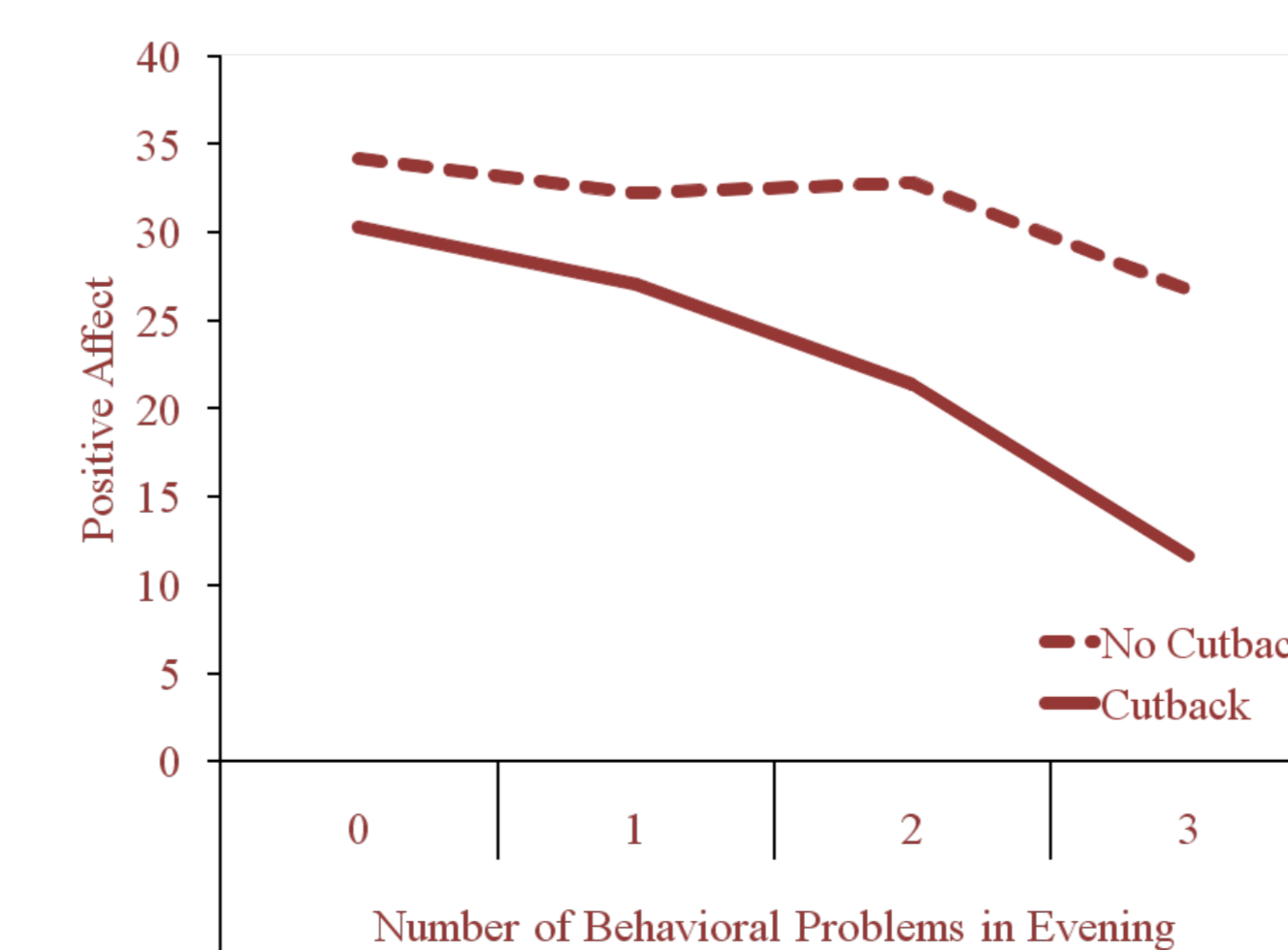
Result 2: Daily Primary & Secondary Stressor Pile Up Influenced Psychological Affect

	Positive Affect	Negative Affect
Daily Primary Stressors		
Number of Behavioral Problems During the Day		-1.36 (0.44)*
Number of Behavioral Problems in Evening	-3.40 (0.96)*	1.26 (0.42)*
Daily Secondary Stressors		
Pleasant Marital Interactions	1.68 (0.57)*	
Unpleasant Marital Interactions		0.73 (0.35)*
Any Cut Back of Scheduled Activities	-3.44 (1.40)*	1.26 (0.58)*
Any Noncare-related Stressors		1.12 (0.56)*

Analyses controlled for background characteristics. Only significant coefficients for daily stressors ($p < 0.5$) presented here.

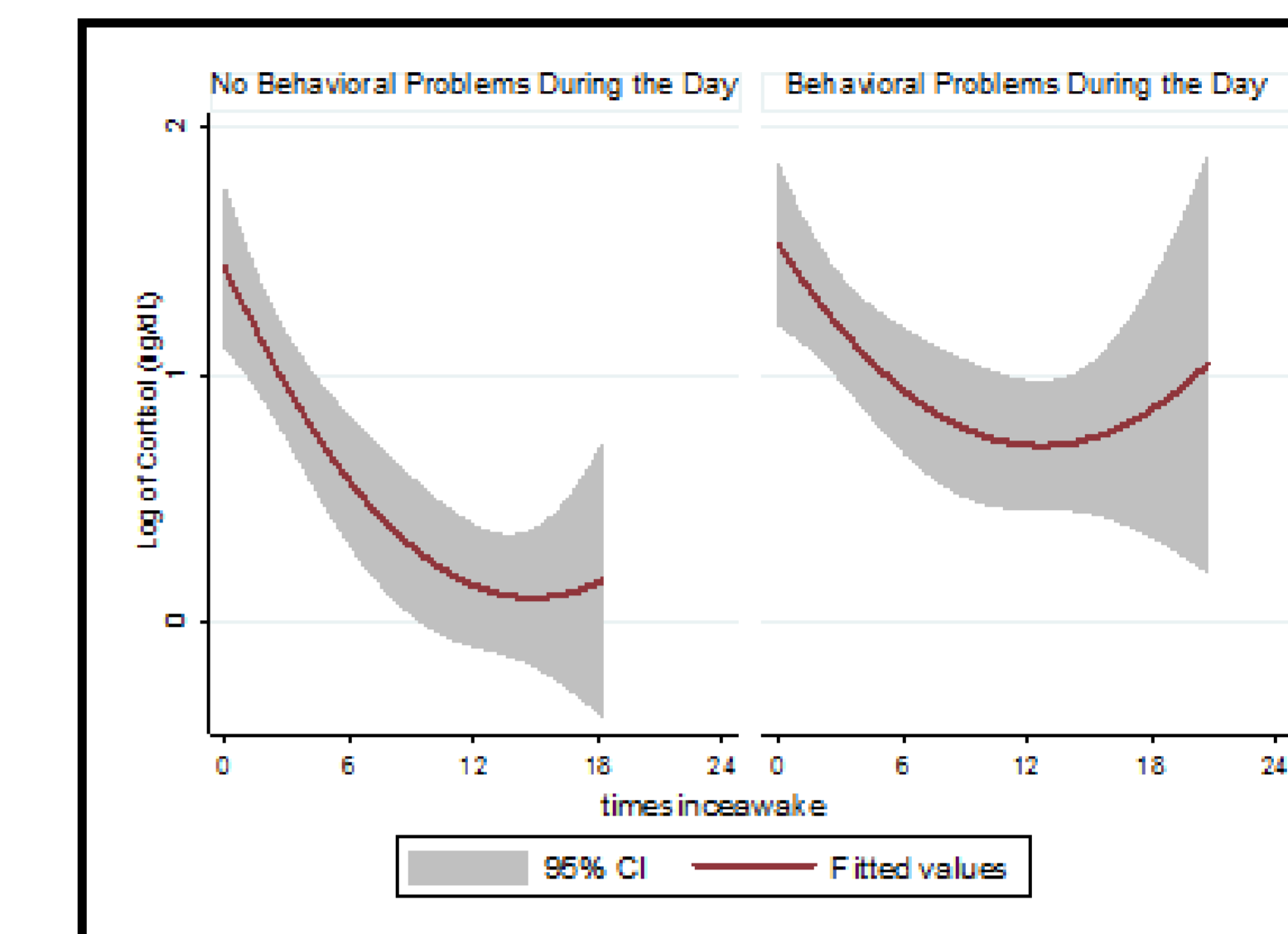


Daily negative affect affected by noncare-related stressors and number of behavioral problems during the day.

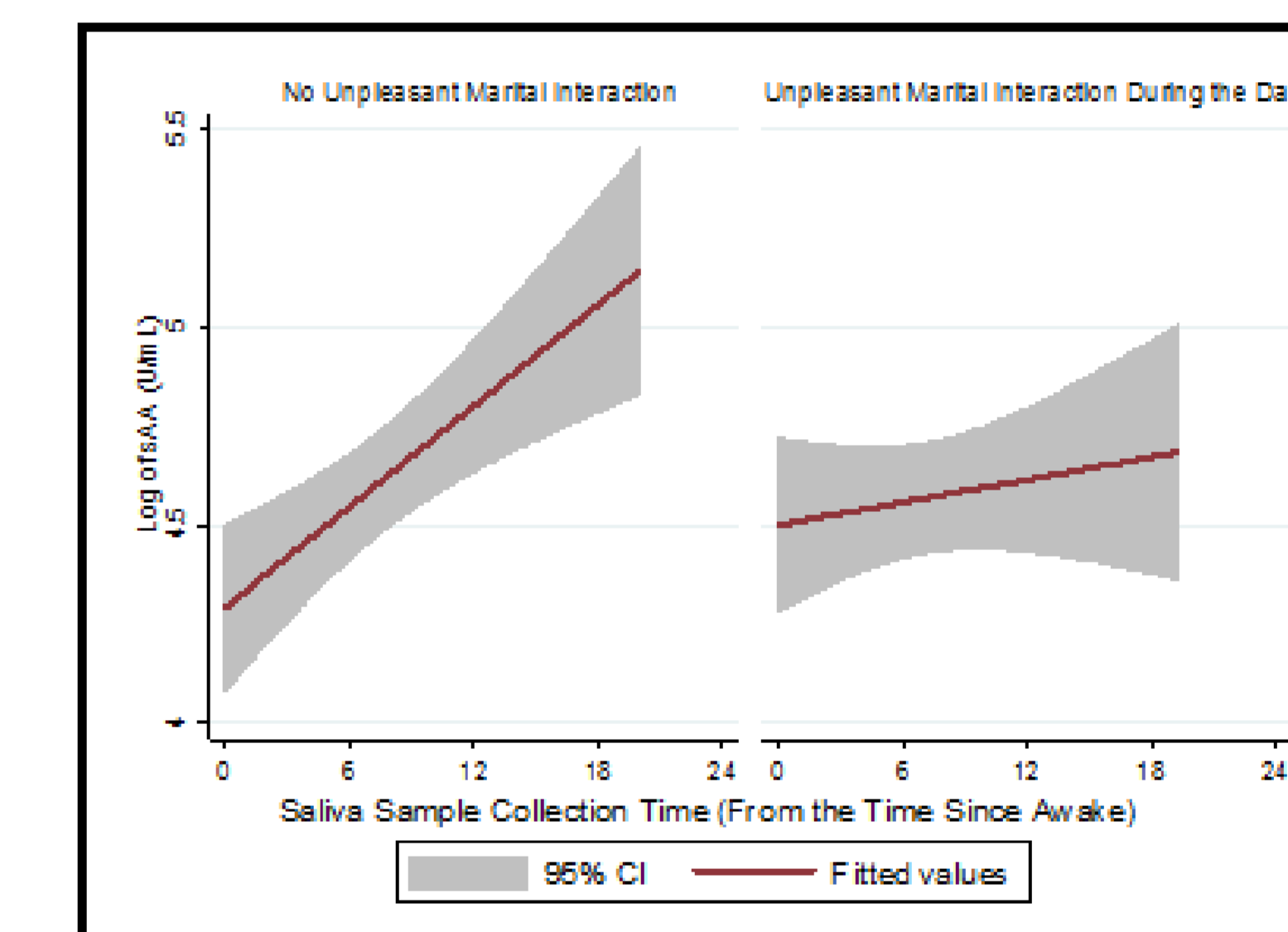


Daily positive affect influenced by cutback of scheduled activities and number of behavioral problems during the day (not shown here) and in the evening.

Result 3: Within-person analysis show that daily stressors affect the diurnal cortisol and sAA slope controlling for other situational factors



On days memory-related problems were reported, significantly higher levels of cortisol were found among care partners



On days unpleasant marital interactions were reported, significantly lower levels of sAA were found among care partners

Analysis controlled for age, physical symptoms, depression and sleep disturbances.

Conclusions

- Caring for a spouse even at the early stages of impaired cognitive functioning is associated with significant psychological distress
- Caring exacts a physiologic toll on the care partners' body
- Elevated diurnal rhythm of cortisol and flat rhythm of sAA signal to dysregulation in the HPA and SAM axes - possibly a precursor of worsening health
- Unclear is the effect of type of stressor (behavioral problems vs. unpleasant marital interactions) on cortisol and sAA

Special Notes

See Savla, J., Roberto, K. A., Blieszner, R., Cox, M., Gwazdauskas, F. (in press). Effects of Daily Stressors on the Psychological and Biological Well Being of Spouses of Persons with Mild Cognitive Impairment. *Journals of Gerontology: Psychological Sciences*.

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For more information contact Tina Savla (jsavla@vt.edu)