



# Relationships between Changes in Sleep Hygiene and Changes in Mental Health Facets



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## Introduction

### Sleep and mental health:

Previous research has shown a strong relationship between sleep and aspects of mental health (e.g. 1,2,3). Interactions between disturbed sleep and negative facets of mental health such as depression are well established (e.g. 4) particularly in college populations with poorer sleep being associated with greater depressive symptoms (e.g. 5). Others have shown that in college students sufficient sleep quantity is related to better positive mental health such as emotional balance and greater life satisfaction (6).

### Positive and negative facets of mental health:

*General mental health* may be considered to be comprised of both the presence of positive symptoms (such as resilience and satisfaction with personal relationships) and the absence of negative symptoms (such as depression and anxiety; 7). Therefore, when examining effects on mental health, both aspects should be considered.

### Sleep hygiene and mental health

Sleep hygiene is a set of behaviors and environmental variables that affect sleep quality and quantity (8). It has been suggested that focusing on sleep hygiene instead of sleep outcomes may serve as providing more practical points of intervention for improving well-being (9). If sleep hygiene is related to mental health, then improving sleep hygiene may help to promote subjective well-being (10). Here we examine whether naturally occurring changes in sleep hygiene over the course of a year predict changes in mental health outcomes in college students and a faculty/staff population.

**Research Question:** Do changes in sleep hygiene predict changes in positive and negative facets of mental health in college students and faculty and staff in a college setting?

## Method

### Participants and Procedure

Undergraduate college students ( $N=68$ ) and faculty/staff members ( $N=42$ ) at the same institution completed an informed consent, demographic questions, and 45 minutes of online mental and physical well-being measures on two occasions separated by 1 year. Upon completion, they were entered into prize drawings (e.g. Fitbit, books, \$10).

### Questionnaires

#### Positive mental health symptoms

- Mental health:** *The Mental Health Continuum–Short Form* (11) is a 14-item scale of three facets of well-being: psychological, emotional, and social. Participants indicated frequency (never, once or twice, about once a week, about 2 or 3 times a week, almost every day, every day) they felt aspects of well-being (e.g., happy; interested in life) over the past month.
- Positive emotions:** Participants indicated the frequency (never, rarely, some of the time, often, most of the time) they experienced 10 positive emotions (e.g., grateful; amused; proud) from the *Modified Differential Emotions Scale* (12) over the past month.
- Resilience:** Participants rated their agreement (strongly disagree to strongly agree) with three items from the *Brief Resilience Scale* (13): “I tend to bounce back quickly after hard times.”, “I have a hard time making it through stressful events.”, “I usually come through difficult times with no trouble.”
- Relationship satisfaction:** Participants rated agreement (strongly disagree to strongly agree) with the statement: “I am satisfied with my personal relationship with other people in the Hendrix community.”

#### Negative mental health symptoms

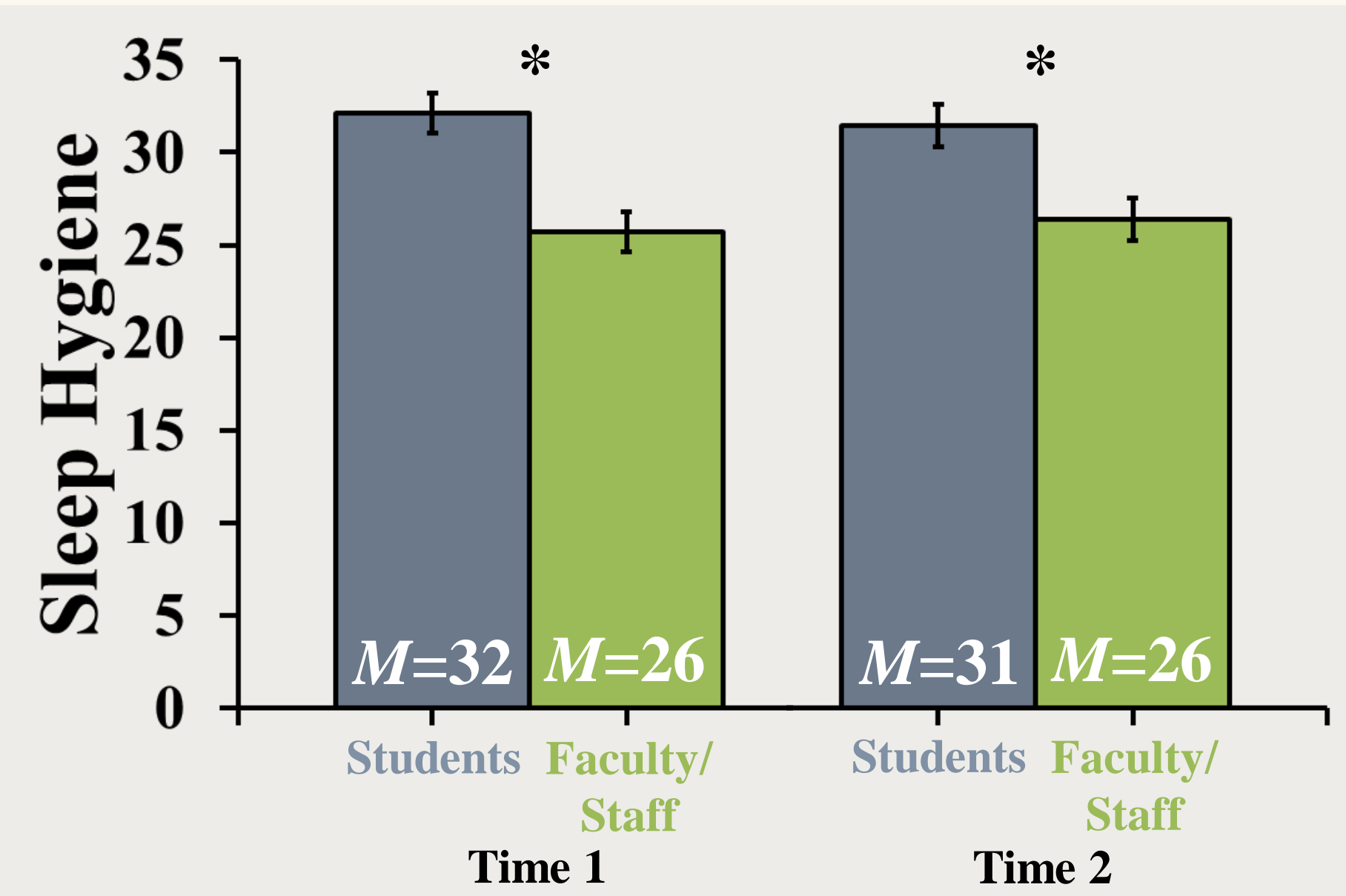
- Depression:** On *The Patient Health Questionnaire-9* (14), participants self reported frequency (not at all, several days, more than half the days, nearly every day) of 8 symptoms of depression (e.g., little interest in doing things; feeling down) over the past two weeks.
- Anxiety:** On *The Generalized Anxiety Disorder-7* (15), participants indicated frequency (not at all, several days, more than half the days, nearly every day) of 7 symptoms of anxiety disorder (e.g., feeling nervous; trouble relaxing) over the past two weeks.
- Perceived Stress:** On *The Perceived Stress Scale* (16), participants indicated frequency (never, almost never, sometimes, fairly often, very often) of stressful feelings and thoughts (e.g., ability to control important things in life; confidence in handling personal problems) over the past two weeks.

#### Sleep

- Sleep hygiene:** *The Sleep Hygiene Index (SHI)* (8) assesses in 13 items frequency of maladaptive sleep hygiene behaviors. Participants indicated how frequently (always, frequently, sometimes, rarely, never) they engage in maladaptive sleep hygiene behaviors (Note: In the present study, the item that assesses how frequently an individual gets out of bed at different times from day to day was inadvertently omitted; thus, total scores range from 12 to 60.)
- Sleepiness:** Participants indicated how frequently (always, frequently, sometimes, rarely, never) they feel sleepy during the day.

## Results

### Students had poorer sleep hygiene than faculty/staff.



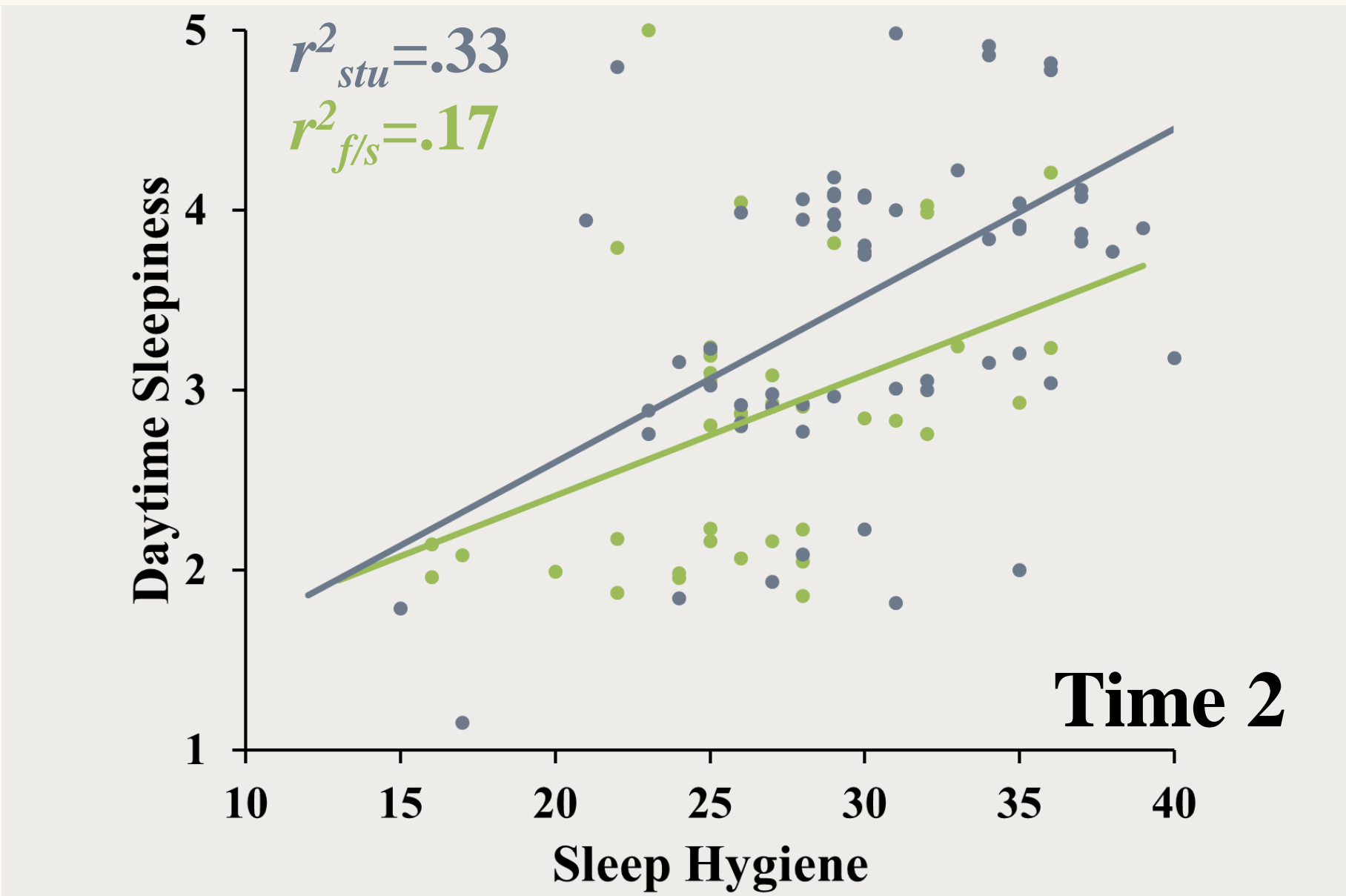
For both years, students engaged in more maladaptive sleep hygiene behaviors than faculty and staff (Time 1 =  $t(120)=5.95, p<.05, d=1.09$ ; Time 2 =  $t(107)=4.39, p<.05, d=.85$ ).

### Over the course of 1 year, sleep hygiene worsened for $\approx 1/4$ of each group



We defined a change in sleep hygiene as an increase or decrease by at least  $1/2$  a standard deviation of the average group change (2.7 points for students and 2.15 for faculty) in a participant’s sleep hygiene score.

### For both groups, poorer sleep hygiene was related to greater sleepiness.



For both groups, poorer sleep hygiene was significantly associated with greater sleepiness (*students*:  $r(68)=.576; p<.05$ ; *faculty/staff*:  $r(37)=.410; p<.05$ ).

### Changes in sleep hygiene predicted changes in NEGATIVE aspects of mental health for students but not faculty/staff.

Measure	College Students						Faculty/Staff					
	B	SE B	$\beta$	t	p		B	SE B	$\beta$	t	p	
Depressive symptoms	.412	.094	.477	4.39	<.001		.170	.146	.183	1.17	.252	
Anxiety	.520	.115	.543	4.54	<.001		.056	.141	.061	0.40	.693	
Stress	.671	.143	.551	4.68	<.001		.176	.276	.116	0.64	.527	

To examine the relationship of changes in sleep hygiene and mental health, multiple regression analyses were conducted predicting Year 2 mental health from Year 2 sleep hygiene scores, controlling for Year 1 scores.

### Changes in sleep hygiene did not consistently predict changes in POSITIVE aspects of mental health for students or faculty/staff.

Measure	College Students						Faculty/Staff					
	B	SE B	$\beta$	t	p		B	SE B	$\beta$	t	p	
Positive Mental Health	-.366	.255	-.163	-1.43	.158		-.498	.320	-.180	-1.56	.129	
Positive Emotion	-.039	.014	-.363	-2.71	.009		-.006	.020	-.049	-0.32	.752	
Resilience	-.011	.010	-.169	-1.09	.280		.011	.013	.154	0.89	.381	
Relationship Satisfaction	-.049	.026	-.276	-1.90	.062		-.014	.021	-.102	-0.66	.515	

## Conclusions

We found students had poorer sleep hygiene than faculty and staff in the same campus setting and that inadequate sleep hygiene was related to greater sleepiness (indicating more disturbed sleep) for both groups. Further, worsening sleep hygiene over the course of a year was related to worsening negative mental health symptoms in students, but not faculty/staff. Worsening sleep hygiene was largely unrelated to changes in positive mental health. Although the importance of sleep hygiene as a target of therapeutic intervention has yet to be well established, these data suggest sleep hygiene as a potential target of therapeutic intervention for negative mental health issues in students. For example, sleep hygiene may be associated with well-being through its effects on primary (hassles) and secondary (psychological strain) stressor appraisals (9). These appraisals may be pathways through which sleep behaviors influence psychological and social functioning. Because the changes we examined in sleep hygiene occurred naturally in these samples, future research should examine changes in mental health brought about by sleep hygiene interventions. These data suggest sleep hygiene may play a more important role in negative mental status outcomes (over positive) and for college students (rather than a general adult population). However, given the small number of respondents participating at both time points, further research is recommended.

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