Sleep Research Past, Present, and Future at UALR and Hendrix

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Accreditation Statement

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of The American Academy of Sleep Medicine and the Sleep Professionals of Arkansas & Washington Regional Center for Sleep Disorders. The American Academy of Sleep Medicine is accredited by the ACCME to provide continuing medical education for physicians.

Conflict of Interest Disclosures for Speakers

David Mastin, PhD has no relevant financial relationships with ineligible companies to disclose.

Jennifer Peszka, PhD has no relevant financial relationships with ineligible companies to disclose.

Learning Objectives

Upon completion of this course, attendees should be able to…

- Identify, understand, and implement an instrument for assessing sleep hygiene,

- Appreciate and understand revisions underway for a contemporary sleep hygiene instrument,

- Describe research questions, current findings, and future directions of sleep research at Hendrix College.

Sleep Hygiene

- "Sleep hygiene" originally referred to the cleanliness of the sleeping environment.

- In the 19th Century many beds even had the posts sit in pots of oil to prevent insects/bed bugs from crawling up into the bed.

- Mattresses were manually pulled tight with draw-strings, to provide firmness.

- "Sleep hygiene" literally referred to how clean and hygienic the sleeping space was.

Who coined the term?

❂ In 1939 Nathanial Kleitman wrote *Sleep and Wakefulness* and described practices that interfere with normal sleep and contribute to the insomnia complaint in his chapter: The **Hygiene of Sleep** and Wakefulness

Who coined the term?

In 1977, Peter Hauri described a set of rules on how to get better sleep. This led to Hauri being labelled the father of term **sleep hygiene** (although he never liked the term).

Who coined the term?

- Recently (2012) it has been argued that credit should go to Paolo Mantegazza who first used the term **Sleep Hygiene** in his book Elements of Hygiene (Elementi di Igiene) in 1865.
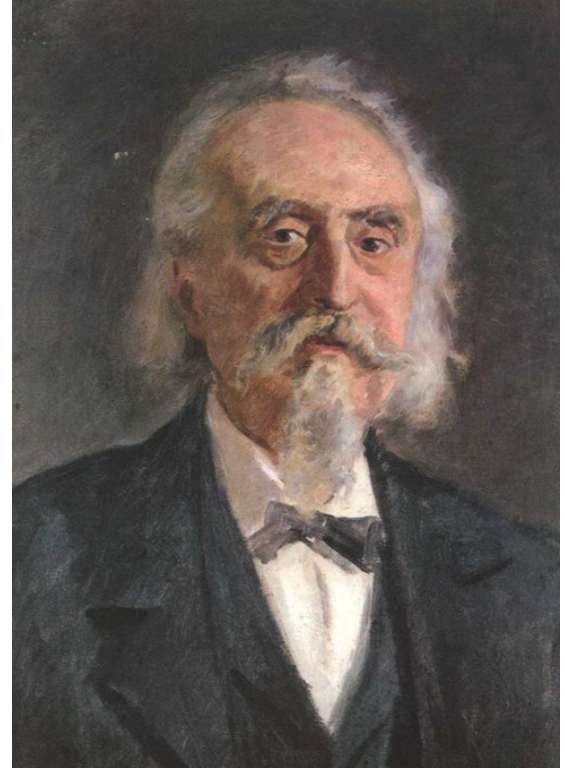
Sleep Hygiene Definition

Sleep hygiene may be conceptualized as practices relating to sleep routine, stimulus-control, health, environmental, and cognitive/affective variables that impact the quality and quantity of sleep (Mastin, 2001).

Sleep Hygiene Definition

☯Sleep hygiene may be described as practicing behaviors that facilitate sleep and avoiding behaviors that interfere with sleep (Riedel, 2000).

Causative vs Formative Indicators

☯Sleep hygiene is assessed by measuring behaviors and environmental variables thought to cause or lead to relatively poor sleep quality rather than measuring outcomes.

Sleep Hygiene Index

Name: _____   **Date:** _____

Please rate all of the following statements using the scale below:
5 Always, 4 Frequently, 3 Sometimes, 2 Rarely, 1 Never

Situations	**Score**
1. I take daytime naps lasting two or more hours.	_____
2. I go to bed at different times from day to day.	_____
3. I get out of bed at different times from day to day.	_____
4. I exercise to the point of sweating within one hour of bedtime.	_____
5. I stay in bed longer than I should two or three times a week.	_____
6. I use alcohol, tobacco, or caffeine within four hours of going to bed or after going to bed.	_____
7. I do something that may wake me up before bedtime (for example: play video games, use the internet, or clean).	_____
8. I go to bed feeling stressed, angry, upset, or nervous.	_____
9. I use my bed for things other than sleeping or sex (for example: watch television, read, eat, or study).	_____
10. I sleep on an uncomfortable bed (for example: poor mattress or pillow, too much or not enough blankets).	_____
11. I sleep in an uncomfortable bedroom (for example: Too bright, too stuffy, too hot, too cold, or too noisy).	_____
12. I do important work before bedtime (for example: pay bills, schedule, or study)	_____
13. I think, plan, or worry when I am in bed.	_____
Total out of 65	_____

Scoring: Higher scores are indicative of more maladaptive sleep hygiene status.

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Scale Development

Please rate all of the following statements using the scale below by circling the corresponding number.	5 = Always	4 = Frequently	3 = Sometimes	2 = Rarely	1 = Never
1. I take daytime naps lasting two or more hours.	5	4	3	2	1
2. I go to bed at different times from day to day.	5	4	3	2	1
3. I get out of bed at different times from day to day.	5	4	3	2	1
4. I exercise to the point of sweating within one hour of going to bed.	5	4	3	2	1
5. I stay in bed longer than I should two or three times a week.	5	4	3	2	1
6. I use alcohol, tobacco, or caffeine within four hours of going to bed or after going to bed.	5	4	3	2	1
7. I do something that may wake me up before bedtime (for example: play video games, use the internet, or clean).	5	4	3	2	1
8. I go to bed feeling stressed, angry, upset, or nervous.	5	4	3	2	1
9. I use my bed for things other than sleeping or sex (for example: watch television, read, eat, or study).	5	4	3	2	1
10. I sleep on an uncomfortable bed (for example: poor mattress or pillow, too much or not enough blankets).	5	4	3	2	1
11. I sleep in an uncomfortable bedroom (for example: too bright, too stuffy, too hot, too cold, or too noisy).	5	4	3	2	1
12. I do important work before bedtime (for example: pay bills, schedule, or study).	5	4	3	2	1
13. I think, plan, or worry when I am in bed.	5	4	3	2	1

Technology and Sleep Hygiene

Technology and sleep hygiene

- Nine of 10 Americans reported using a technological device in the hour before bed

- Those under 30 years of age were more likely to use cell phones in the hour before bed (72% of adolescents, 67% of young adults)

Technology and sleep hygiene

Unlike passive technological devices, the more interactive technological devices (i.e., computers/laptops, cell phones, video game consoles) used in the hour before bed, the more likely difficulties falling asleep and unrefreshing sleep were reported.

Technology and sleep hygiene

- Two separate social technology sleep hygiene questions were used to examine the relationship between daytime sleepiness and social technology use during and around sleep time.

☯These two questions assessing social technology use (active and passive) were added to the original SHI. We speculated these questions capture both social technology use/disruptions of which the user is aware (defined as *active* use) and social technology related disruptions that may occur in the absence of conscious awareness (*passive* use).

Technology questions

- The technology during bedtime questions:

- active "I check e-mail, texts, or social media during my sleep time (between going to bed and waking up)"

- and passive "I sleep with my phone sounds or vibrations turned on where I could hear it if I were awake"

Hypothesis

☯ Social technology related behaviors (e.g. smart phone use around bedtime) may interrupt sleep through device notifications and prompts, be associated with sleep delay, and/or result in early sleep termination.

- Social technology sleep disruption may be conceptualized as related to

- a) sleep delay and/or early sleep termination and

- b) sleep interruption. And we assert that this disruption may occur volitionally (through active use) or accidentally/without intent (through passive use).

❧There were 2058 completed SHIs, with a mean total score of 36 ($SD = 7.14$) and range = 13 – 64 (possible 13 – 65).

❧The addition of two technology questions to create the SHI-2 resulted in 1722 data sets, with a possible range of 15 – 75. The mean increased to 42.7 ($SD = 8.68$) and the range was 15 – 74.

Findings

☯Technology use during bedtime was common. Only 13% of the sample reported never engaging in active technology use ($M = 3.42$, $SD = 1.39$) and only 21% reported never engaging in passive use ($M = 3.48$, $SD = 1.62$).

Sleep Hygiene Index 2 for you

☯Your copy

☯Name: SHI2 or SHI Technology?

☯Use and modify as you please

☯Cite copyright holder (Journal of Behavioral Medicine):

Mastin, D. F., Bryson, J. & Corwyn, R. (2006). Assessment of sleep hygiene using the sleep hygiene index. *Journal of Behavioral Medicine, 29*, 223-227.

☯ Thank you!

Introduction:
Jennifer Peszka, PhD

What are you doing with that scale?

☯ Is sleep hygiene related to or predictive of sleepiness?

Epworth Sleepiness Scale

- Sitting and reading

- Watching TV

- Sitting inactive in a public place

- As a passenger in a car for an hour without a break

- Lying down to rest in the afternoon when circumstances permit

- Sitting and talking to someone

- Sitting quietly after a lunch without alcohol

- In a car, while stopped for a few minutes in traffic

0 = Never
1 = Slight
2 = Moderate
3 = High

Sleep Hygiene and Sleepiness

In College Students

☯ Method
- ▪ $N = 131$
- ▪ SHI and ESS

Sleep Hygiene and Sleepiness

		r	r^2
1	I take daytime naps lasting two or more hours.	.363*	.13
2	I go to bed at different times from day to day.	.202*	.04
3	I get out of bed at different times from day to day.	.107	.01
4	I exercise to the point of sweating within one hour of going to bed.	-.115	.01
5	I stay in bed longer than I should two or three times a week.	.241*	.06
6	I use alcohol, tobacco, or caffeine within four hours of going to bed or after going to bed.	-.063	.004
7	I do something that may wake me up before bedtime (for example: play video games, use the internet, or clean).	.190*	.04
8	I go to bed feeling stressed, angry, upset, or nervous.	.344*	.12
9	I use my bed for things other than sleeping or sex (for example: watch television, read, eat, or study).	.130	.02
10	I sleep on an uncomfortable bed (for example: poor mattress or pillow, too much or not enough blankets).	.244*	.06
11	I sleep in an uncomfortable bedroom (for example: too bright, too stuffy, too hot, too cold, or too noisy).	.265*	.07
12	I do important work before bedtime (for example: pay bills, schedule, or study).	-.094	.01
13	I think, plan, or worry when I am in bed.	.249*	.06
	Sleep Hygiene Index Total	.382*	.15

What about your new technology questions?

☯ Method
- *N* = 436
- SHI and ESS

I check e-mail, texts, or social media during my sleep time (between going to bed and getting up).

$r^2 = .104*$

1=Never
2=Rarely
3=Sometimes
4=Frequently
5=Always

Daytime Sleepiness

Social Technology Use
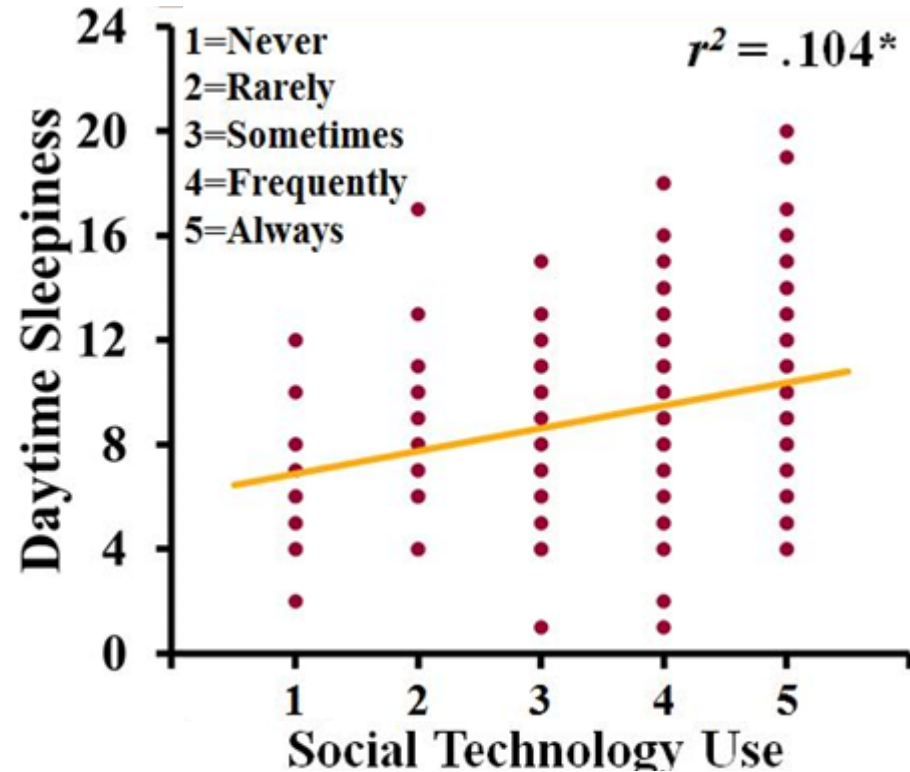
Is Sleep Hygiene predictive of anything besides sleepiness?
LOTS!

- ☯AFISH
- ☯Grades
- ☯Technology Use before Bed
- ☯Nomophobia
- ☯Burnout
- ☯And more…

Sleep Hygiene and Associated Features of Inadequate Sleep

N = 258
UALR
Students

�Sleepy

– I feel sleepy during the day.

☯Preoccupation with Sleep

– I worry about my sleep.
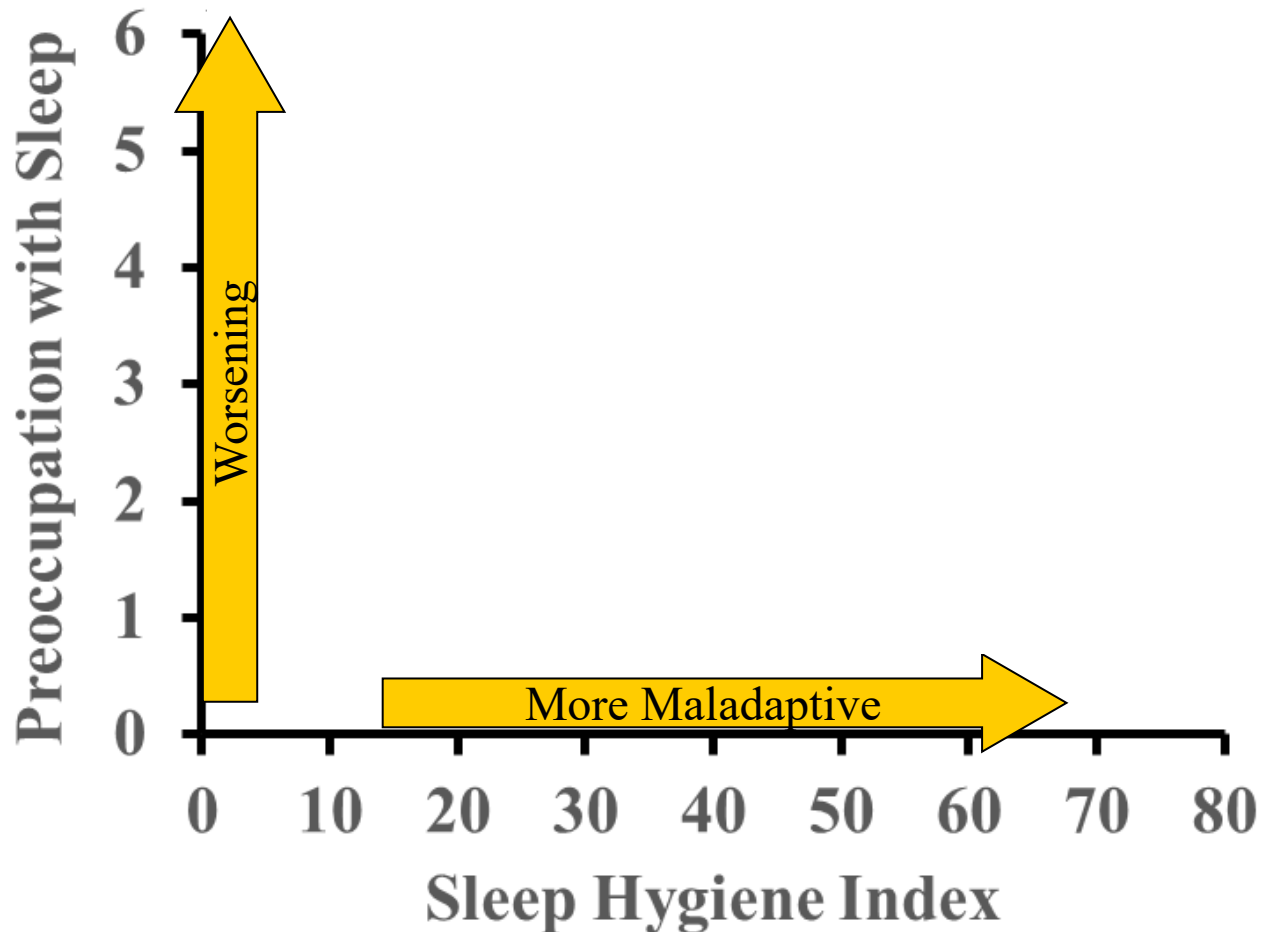
☯Mood Disturbance

– I feel I am more moody now than I used to be.
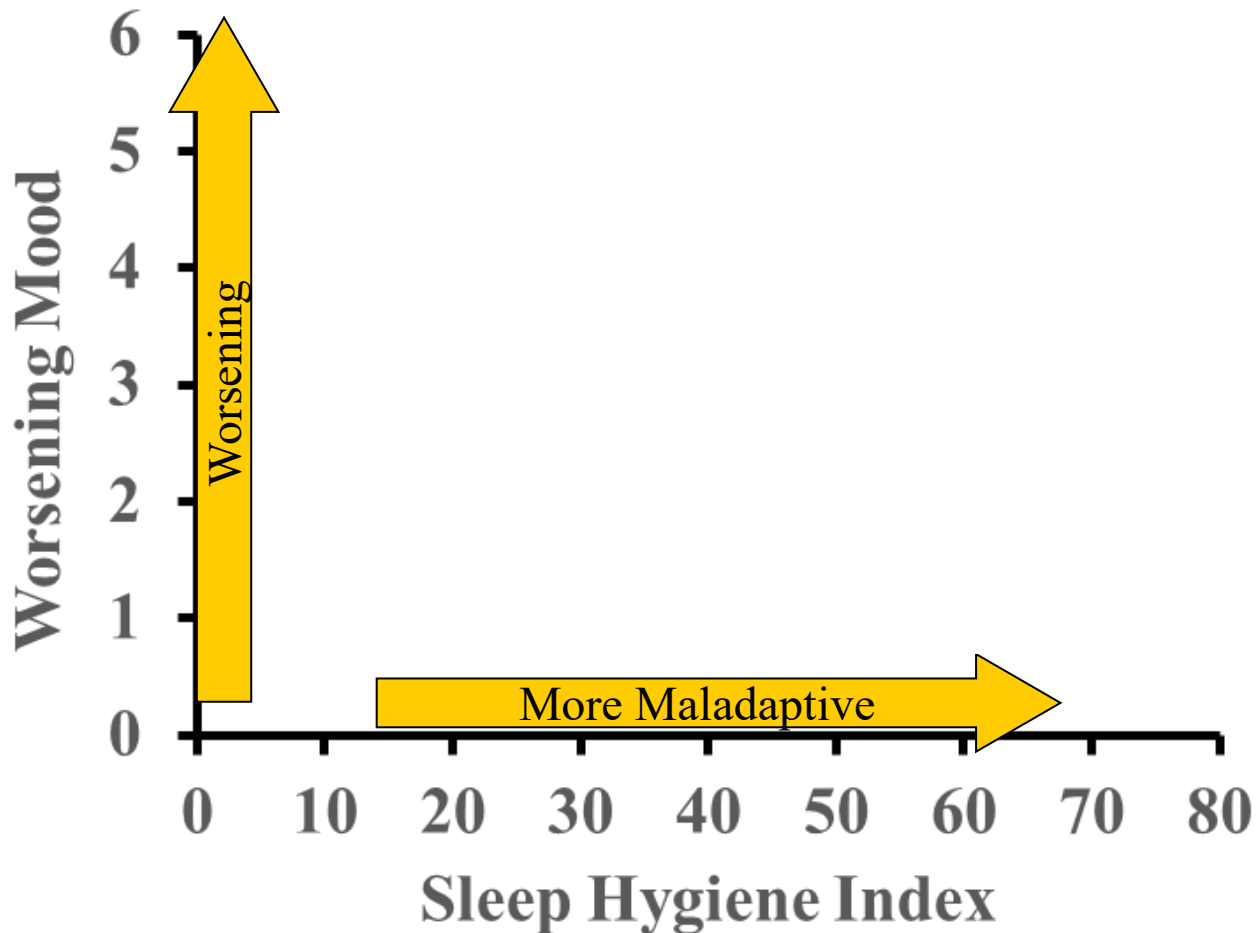
☯Decreased Motivation

– I feel it takes more effort to get things done than it used to.

☯Impaired Cognition

– I have more trouble paying attention and thinking than I used to.

Preoccupation with Sleep

Mood Disturbance

Decreased Motivation
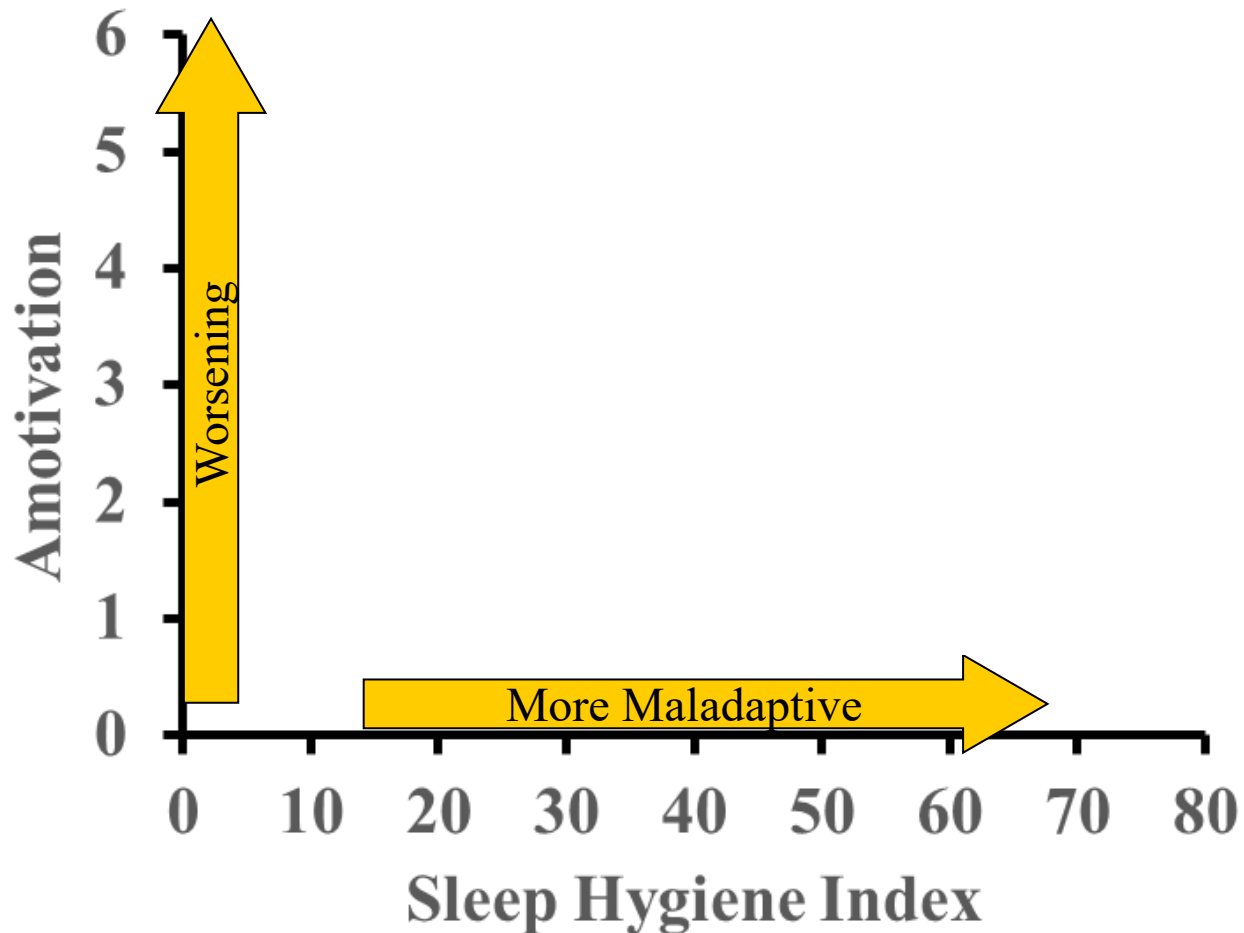
Impaired Cognition

I have more trouble paying attention and thinking than I used to.
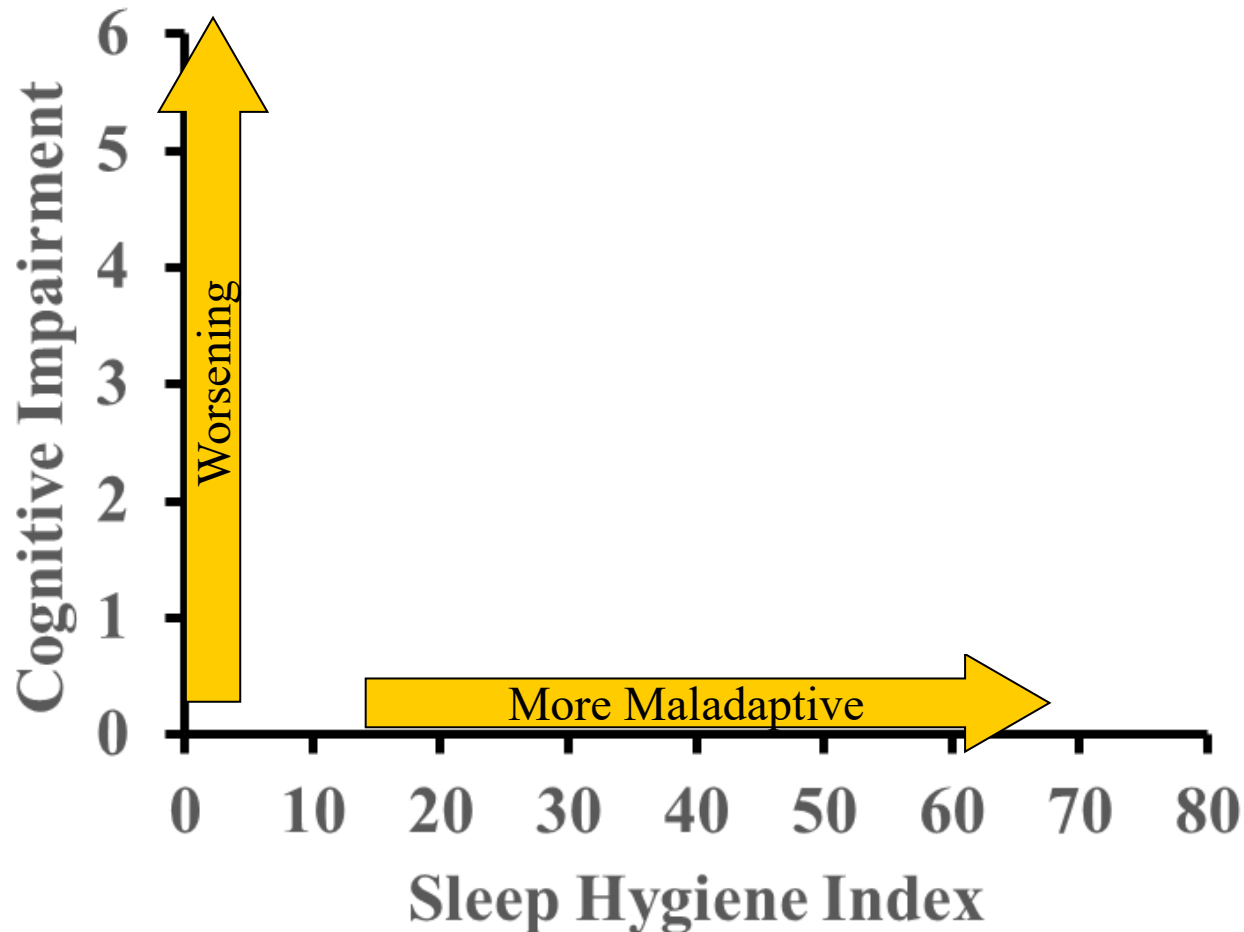
Is Sleep Hygiene predictive of anything besides sleepiness?
LOTS!

☯AFISH
– Sleepiness
– Preoccupation with sleep
– Mood disturbance
– ⇓Motivation
– ⇓Cognitive ability

☯Grades

Sleep Hygiene and GPA
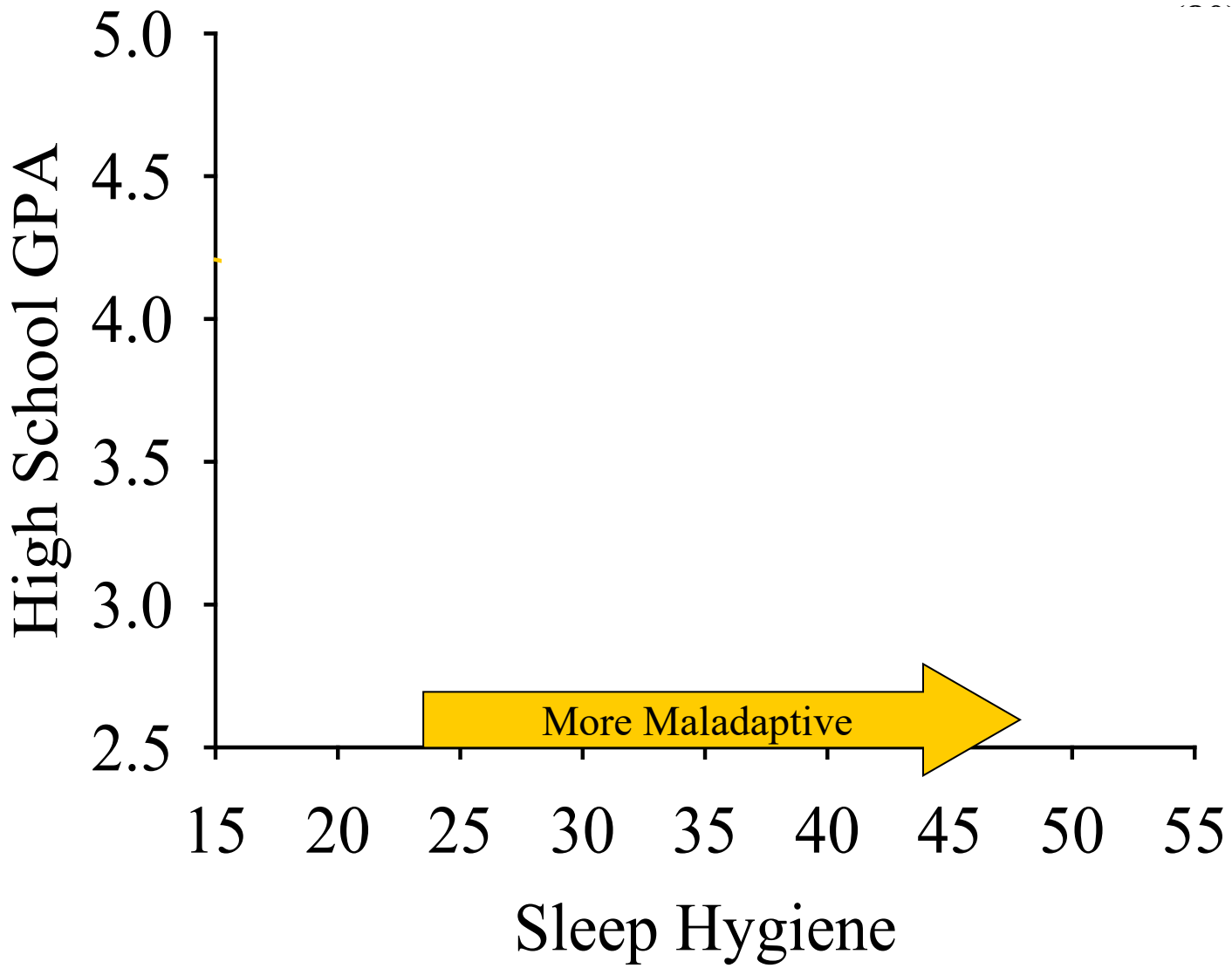
Change in Sleep Hygiene and GPA
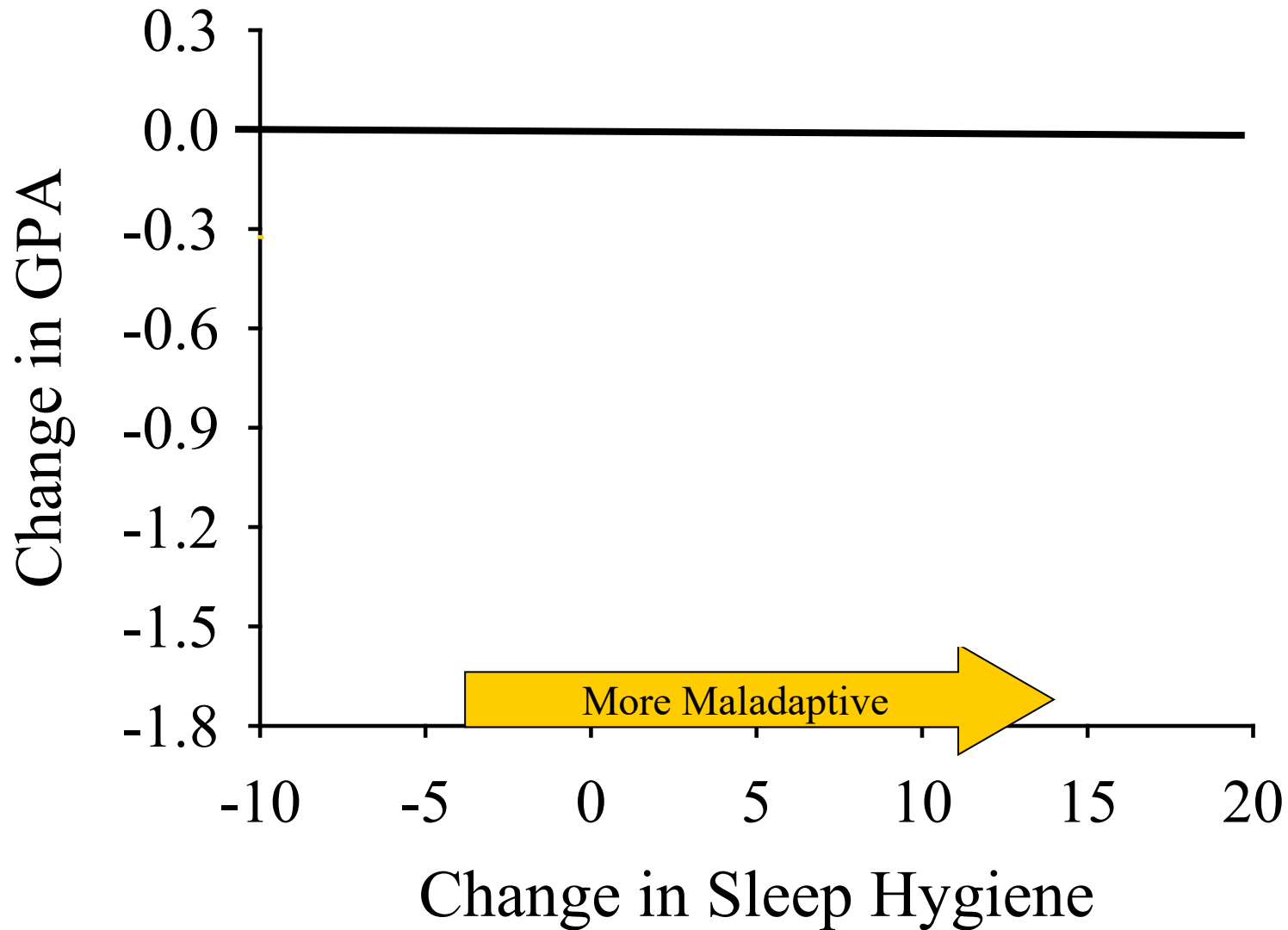
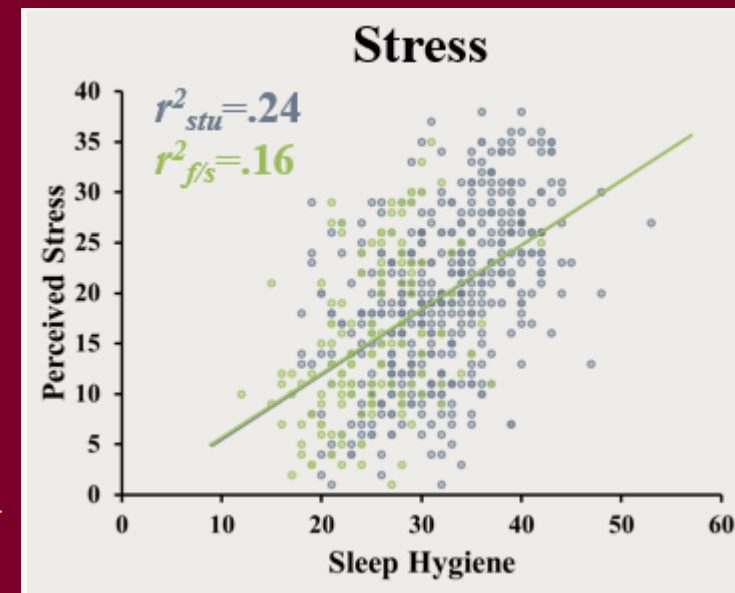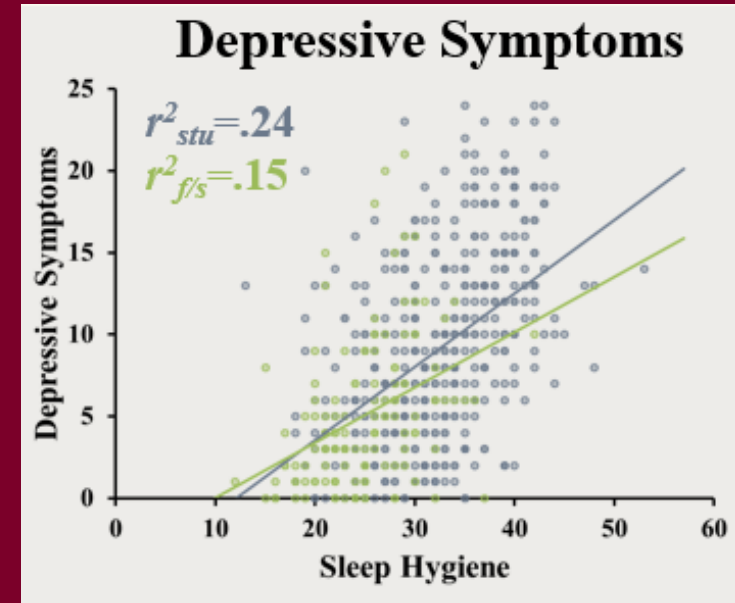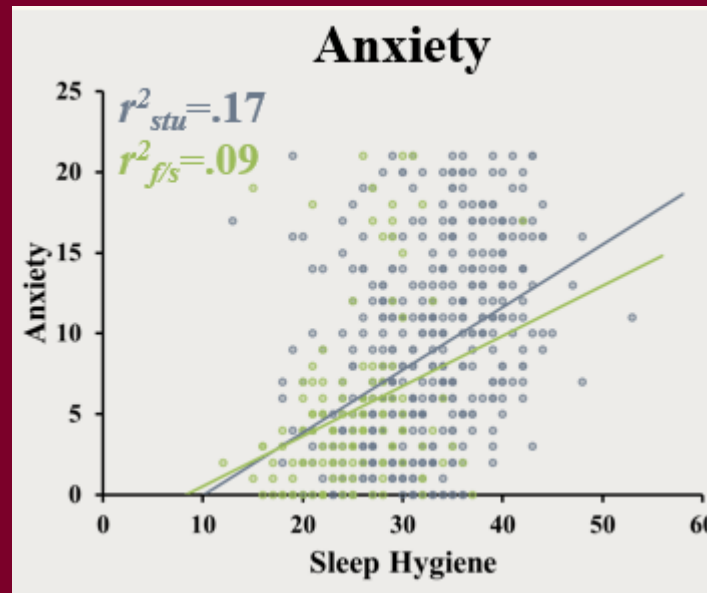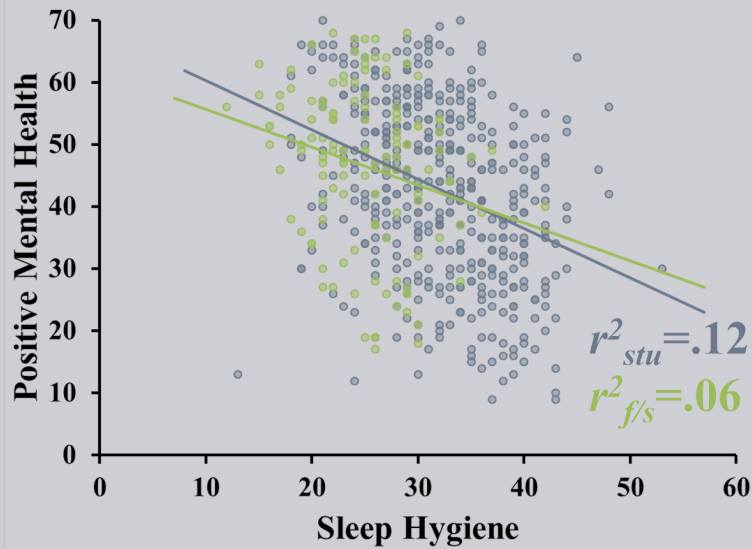Is Sleep Hygiene predictive of anything besides sleepiness?
LOTS!

☯AFISH

☯Grades

☯Mental Health

College Students *N* = 466

Faculty/Staff *N* = 131
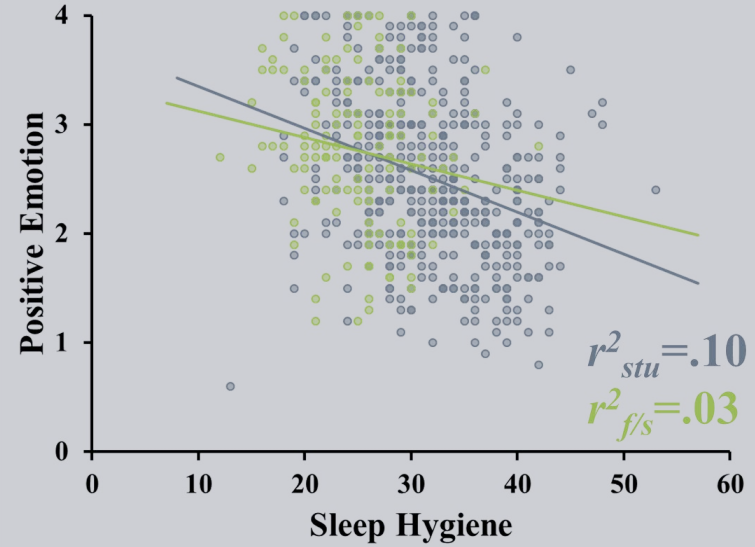
Negative Mental Health

Depressive Symptoms

$r^2_{stu}=.24$
$r^2_{f/s}=.15$

Depressive Symptoms
Sleep Hygiene

Anxiety

$r^2_{stu}=.17$
$r^2_{f/s}=.09$

Anxiety
Sleep Hygiene

Stress

$r^2_{stu}=.24$
$r^2_{f/s}=.16$

Perceived Stress
Sleep Hygiene

Positive Mental Health

Positive Mental Health

$r^2_{stu}=.12$
$r^2_{f/s}=.06$

Positive Emotion

$r^2_{stu}=.10$
$r^2_{f/s}=.03$

Relationship Satisfaction
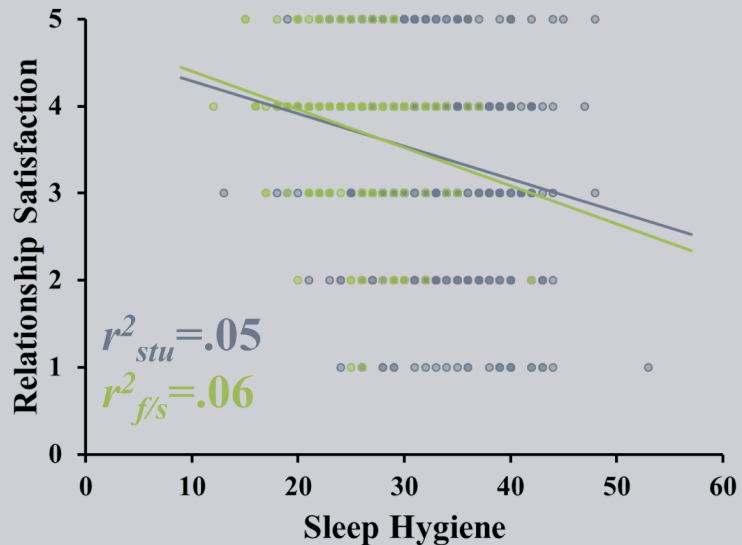
$r^2_{stu}=.05$
$r^2_{f/s}=.06$
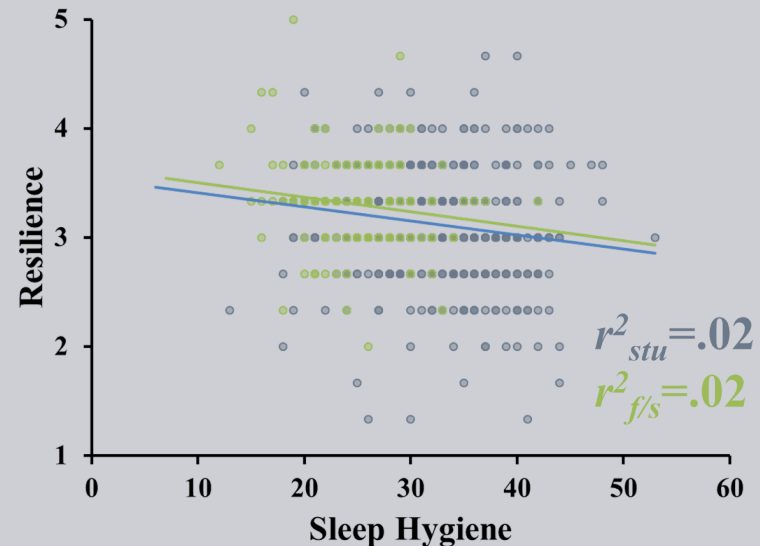
Resilience

$r^2_{stu}=.02$
$r^2_{f/s}=.02$

(x-axis: Sleep Hygiene)

Is Sleep Hygiene predictive of anything besides sleepiness?
LOTS!
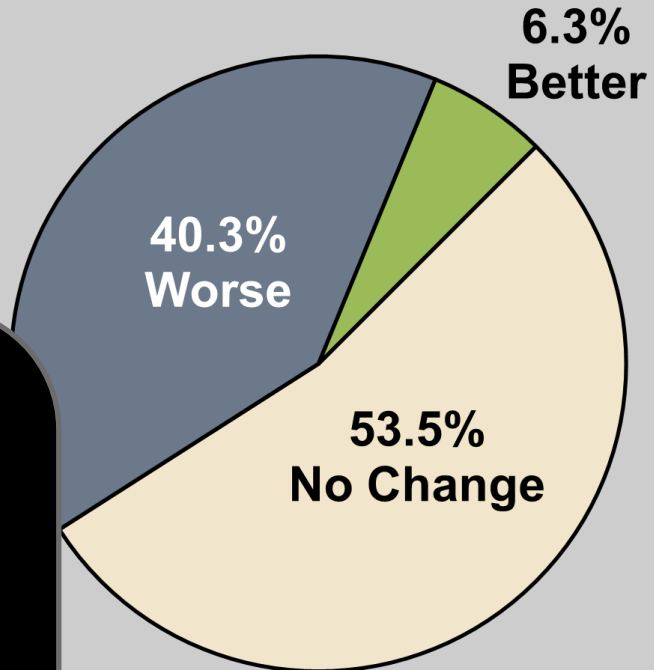
- AFISH
- Grades
- Mental Health
- Adjustment during COVID

Did the pandemic initially impact sleep hygiene?
Early Pandemic compared to Before

Part 1: April/May 2020
N = 180 (146 female)
-Retrosp...
Wha...
-E...
W...

6.3% Better

40.3% Worse

53.5% No Change

Did the pandemic ...eep

Later Pand...

Part 2: 2 weeks later
N = 64 (52 female)
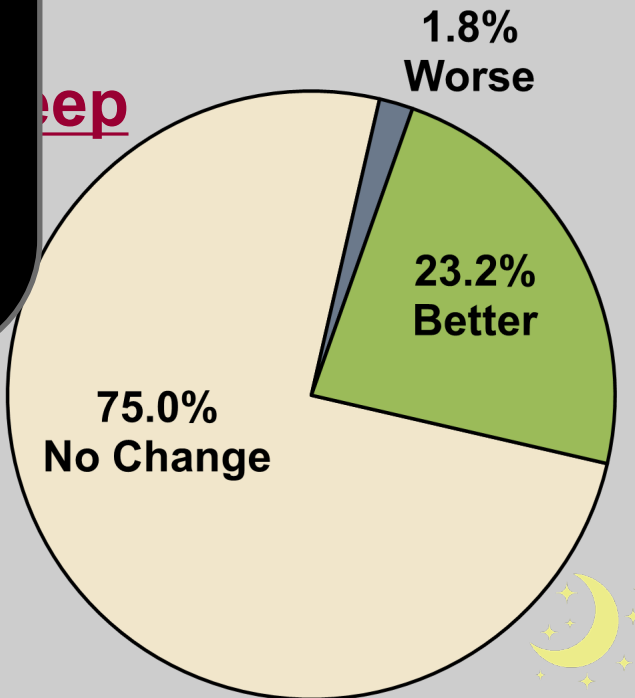-Later pandemic report
What are you like NOW?

With time, some participants were able to readjust to their "new normal", but many people continued to get worse or retain their new poorer sleep practices.

1.8% Worse

23.2% Better

75.0% No Change

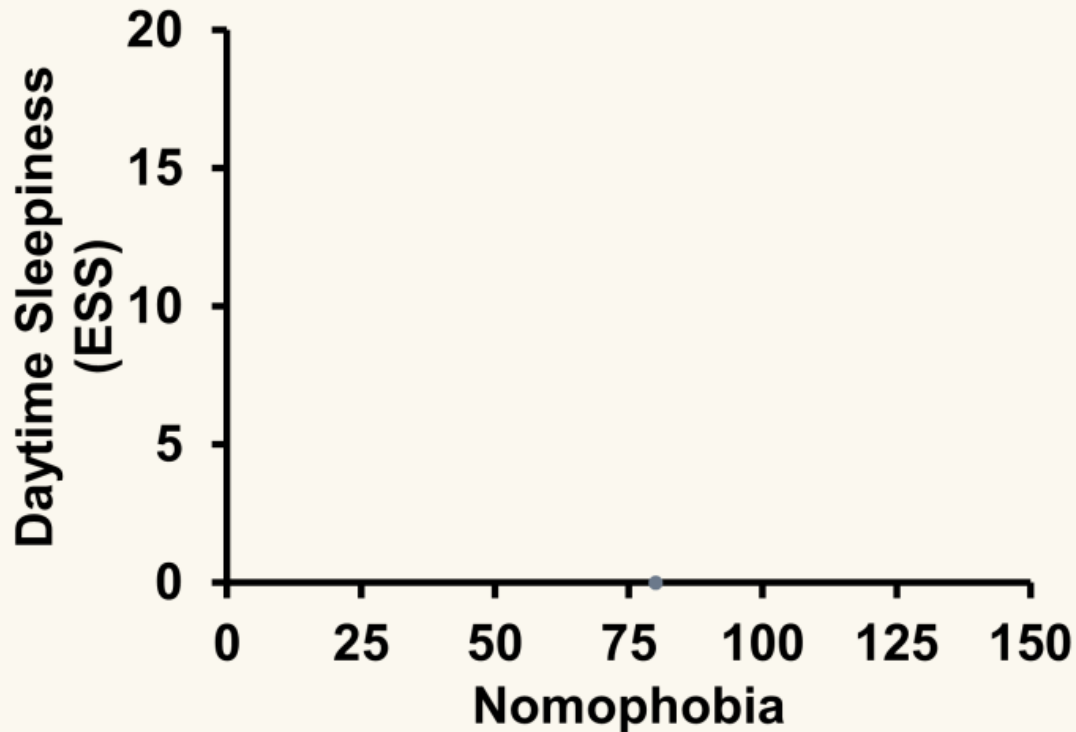Is Sleep Hygiene predictive of anything besides sleepiness? LOTS!

- AFISH
- Grades
- Mental Health
- Adjustment during COVID
- Nomophobia

⇧ Nomophobia is related to ⇧ Sleepiness.

⇧ Nomophobia is related to ⇧ Maladaptive Sleep Hygiene behaviors including Sleep Time Technology Use.

Relationships Between Nomophobia and Sleep Hygiene Variables (*p<.05)		
Sleep Hygiene Index Items	**r**	**r^2**
1 I take daytime naps lasting two or more hours.	.101*	.010
2 I go to bed at different times from day to day.	.144*	.021
3 I get out of bed at different times from day to day.	.103*	.011
4 I exercise to the point of sweating within one hour of going to bed.	-.035	.001
5 I stay in bed longer than I should two or three times a week.	.027	.001
6 I use alcohol, tobacco, or caffeine within four hours of going to bed or after going to bed.	-.009	<.001
7 I do something that may wake me up before bedtime (for example: play video games, use the internet, or clean).	.059	.003
8 I go to bed feeling stressed, angry, upset, or nervous.	.055	.003
9 I use my bed for things other than sleeping or sex (for example: watch television, read, eat, or study).	.180*	.032
10 I sleep on an uncomfortable bed (for example: poor mattress or pillow, too much or not enough blankets).	.097*	.009
11 I sleep in an uncomfortable bedroom (for example: too bright, too stuffy, too hot, too cold, or too noisy).	-.028	.001
12 I do important work before bedtime (for example: pay bills, schedule, or study).	.040	.002
13 I think, plan, or worry when I am in bed.	.182*	.033
SHI Total	**.166***	**.028**
Technology Use and Exposure During Sleep Time	**r**	**r^2**
14 I check e-mail, texts, or social media during my sleep time (between going to bed and waking up).	.249*	.062
15 I sleep where my phone makes lights, sounds, or vibrations during my sleep time where I could hear/see it if I were awake	.058	.003
16 I sleep where my bed partner or roommate checks e-mail, texts, or social media during my sleep time.	.005	<.001
17 I sleep where my bed partner or roommate's phone makes lights, sounds, or vibrations during my sleep time where I could hear/see it if I were awake.	-.034	.001

Is Sleep Hygiene predictive of anything besides sleepiness?
LOTS!

- ☯AFISH
- ☯Grades
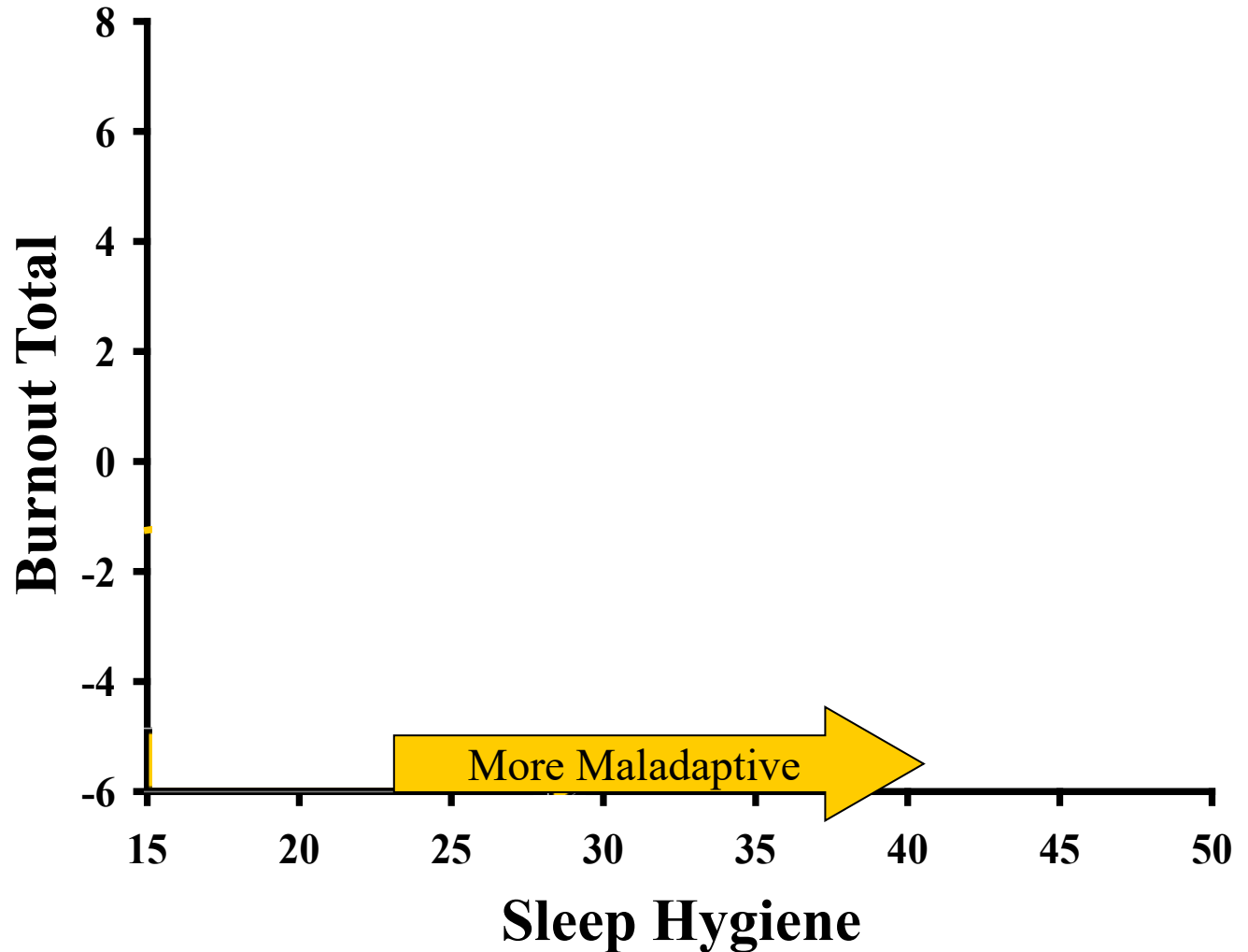- ☯Mental Health
- ☯Adjustment during COVID
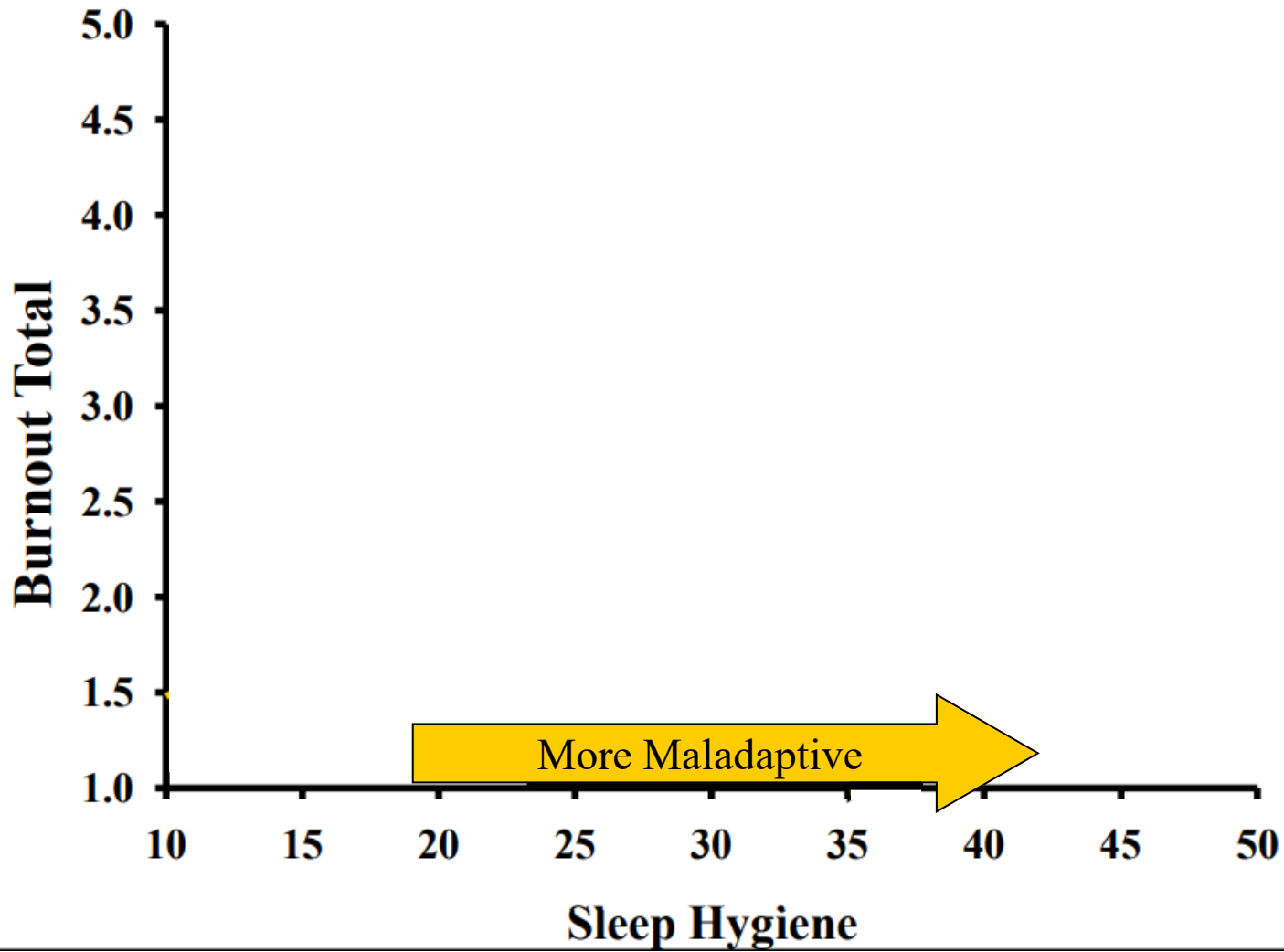- ☯Nomophobia
- ☯Burnout

College Students ($N = 141$)

⇧ **Maladaptive Sleep Hygiene behaviors were related to**
⇧ **Burnout**

Y-axis: **Burnout Total** (−6 to 8)
X-axis: **Sleep Hygiene** (15 to 50)
Arrow label: More Maladaptive

Methodist Ministers ($N = 192$)

Is Sleep Hygiene predictive of anything besides sleepiness?
LOTS!

- AFISH
- Grades
- Mental Health
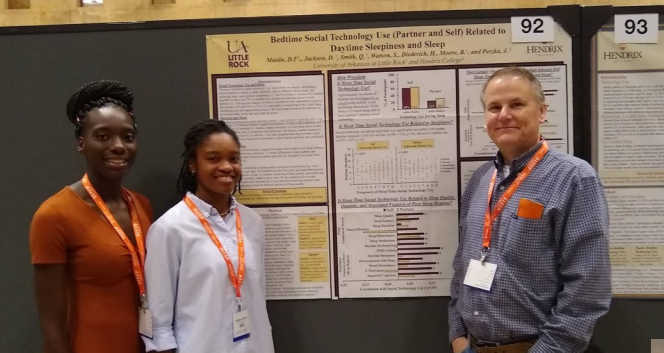- Adjustment during COVID
- Nomophobia
- Burnout
- And more…

Conclusions

- Sleep Hygiene continues to be an interesting construct 🦋

- Sleep Hygiene is strongly related to
  - sleepiness, associated features of inadequate sleep hygiene, and many other psychological variables.

- Smart/cell phone use is the latest in sleep hygiene disruption.

Thanks

UA LITTLE ROCK

HENDRIX

Questions?