First Name:_____ Last Name:_____

Student ID #: _____

PSC 041 Research Methods in Psychology WQ 2024

Unit 5 Exam Version B

Research Summary

For multiple-choice questions, fill in the box to indicate your selection. Do not make stray marks in other boxes. For short answer questions, try to write on the lines and stay in the space provided.

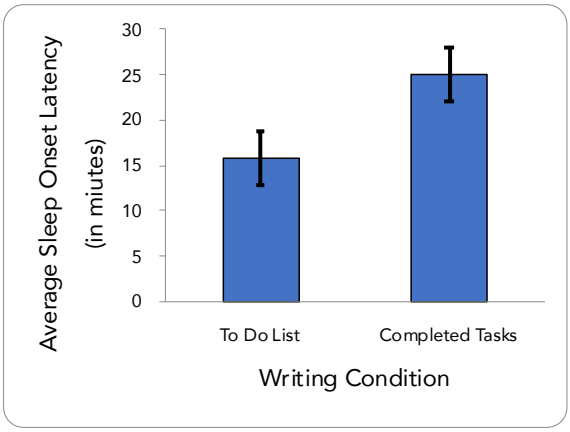
Adapted from: Scullin, M., Krueger, M., Ballard, H, & Pruett, N. (2018). The effects of bedtime writing on difficulty falling asleep: A polysomnographic study comparing to-do lists and completed activity lists. *Journal of Experimental Psychology: General.*

A new bedtime to-do list, courtesy of sleep researchers at Baylor University:
1. Write a to-do list before bed.
2. Go to sleep.
3. Sleep better than all the non-list-writing people you meet tomorrow.

It sounds simple, but there's evidence that it just might work. According to a recent study, participants who took 5 minutes to write a to-do list before bed fell asleep more quickly than participants who wrote about tasks they had already completed. The key, according to researchers, is in mentally "offloading" responsibilities before bedtime, theoretically freeing the mind for sound sleeping.

"We live in a 24/7 culture in which our to-do lists seem to be constantly growing and causing us to worry about unfinished tasks at bedtime," lead author Michael Scullin said. "Most people just cycle through their to-do lists in their heads, and so we wanted to explore whether the act of writing them down could counteract nighttime difficulties with falling asleep."

To test this hypothesis, researchers invited 57 men and women between ages 18 and 30 to spend one weeknight in a sleep lab. The rules were simple: lights out at 10:30 p.m., and no technology, homework or other distractions allowed. Five minutes before bedtime, each participant was instructed to complete a short writing exercise. Half of the participants were randomly assigned to write about anything they needed to remember to do in the upcoming days. The other half were instructed to write about tasks they had completed during the previous days. When the writing was done, participants tucked in for bed.



Researchers measured each participant's brain activity overnight using a technique called polysomnography, which records eye movement, muscle activity and other biological changes. The researchers found that the participants who wrote to-do lists fell asleep an average of 9 minutes faster (M = 15.82, SD = 14.07) than those who wrote about already-accomplished tasks (M = 25.09, SD = 15.94), $t(55) = 2.32$, p = .02. While 9 minutes may not seem like a lot of extra shut-eye, it's comparable to the improvement seen in clinical trials for some sleep medications.

Predictor Variable

Thinking about the predictor / independent variable: Writing Condition

Partial operational definition: All participants wrote for 5 minutes before bed. Half were instructed to write a to-do list; the other half wrote about tasks they had already accomplished.

2 pts 1. The predictor / independent variable is (fill in the box)

☐ **Categorical** ☐ **Continuous**

2 pts 2. How was the predictor / independent variable measured? (fill in the box)

☐ **Observation** ☐ **Physiological**

☐ **Self-Report** ☐ **It was manipulated**

5 pts 3. Is this a causal or associative claim? (fill in the box)

☐ **Causal** ☐ **Associative**

5 pts 4. This variable is (fill in the box)

☐ **between groups** ☐ **within group**

Use this information only for the next three questions.
Another researcher wants to extend this finding using a different operational definition for the predictor variable. This researcher asks participants to choose what to write. The writings are collected and coded for whether or not they include a to-do list.

2 pts 5. How was this new predictor / independent variable measured? (fill in the box)

☐ **Observation** ☐ **Physiological**

☐ **Self-Report** ☐ **It was manipulated**

5 pts 6. Is this now a causal or associative claim? (fill in the box)

☐ **Causal** ☐ **Associative**

5 pts 7. This variable is (fill in the box)

☐ **between groups** ☐ **within group**

Outcome Variable

Thinking about the outcome / dependent variable: Sleep Onset Latency

10 pts 8. How did the researchers **operationally define** the outcome / dependent variable? Describe it using your own words. Be sure to include the levels or values and indicate how the codes will be interpreted.

2 pts 9. The outcome / dependent variable is (fill in the box)

☐ **Categorical** ☐ **Continuous**

2 pts 10. How was the outcome / dependent variable measured? (fill in the box)

☐ **Observation** ☐ **Physiological**

☐ **Self-Report** ☐ **It was manipulated**

10 pts 11. Evaluate the **construct validity** of the outcome / dependent variable.
ProTips: Give an overall evaluation. Think about the face validity, the procedure, and the method-match to inform your decision. Use specific vocabulary. Be sure to only discuss this one variable.

Evaluate Internal Validity

10 pts 12. For the original research summary, 'being hooked up to a polysomnography machine' is **unlikely to be a confound** because…

10 pts 13. For the original research summary, there is **not a testing effect** because…

Summarize the findings

5 pts 14. How did the researchers summarize the findings? (fill in the box)

- ☐ **compare group means**
- ☐ **compare group frequency**
- ☐ **indicate strength and direction of the overall relationship**

5 pts 15. The error bars _____ overlap. Therefore, there likely ___ a real relationship between the variables? (fill in the box)

- ☐ **do not; is**
- ☐ **do not; is not**
- ☐ **do; is**
- ☐ **do; is not**

5 pts 16. The *p* value is _____ . Therefore, there ___ a statistically significant relationship between the variables. (fill in the box)

- ☐ **greater than 0.5; is**
- ☐ **greater than 0.5; is not**
- ☐ **less than 0.5; is**
- ☐ **less than 0.5; is not**
- ☐ **greater than 0.05; is**
- ☐ **greater than 0.05; is not**
- ☐ **less than 0.05; is**
- ☐ **less than 0.05; is not**

10 pts 17. Does this interpretation follow from this study: "We found that writing a to-do list causes participants to fall asleep faster."

Why or why not?

Evaluate External Validity

10 pts | 18. For this research, the participants were sleeping in a sleep lab. Evaluate this aspect of **external validity**.

Another researcher attempted to replicate this study. They recruited another set of participants from the same population and in the same way. They carefully replicated every step of the procedure. They did not find the same results; there was no difference between the writing conditions in how long it took these participants to fall asleep.

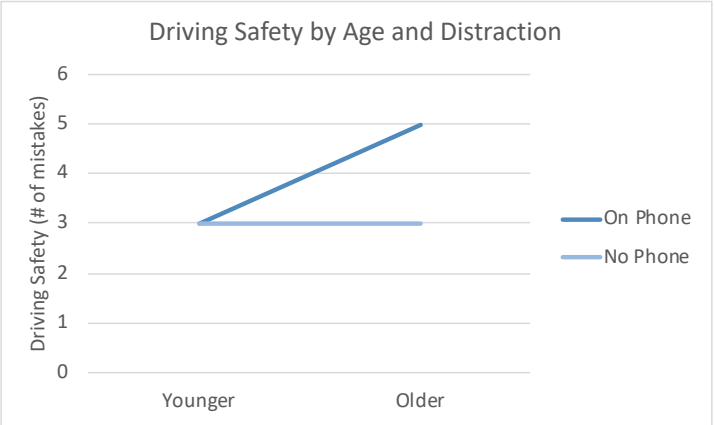
5 pts | 19. This is a failure to
- ☐ **replicate**
- ☐ **generalize**

5 pts | 20. This new finding brings into doubt the
- ☐ **external validity**
- ☐ **internal validity**

5 pts | 21. This new finding …
- ☐ **can be explained in a way that coexists with the original finding.**
- ☐ **indicates that one of the findings is likely to be invalid.**

Multiple Choice

Select the single best answer to the multiple-choice questions. Indicate your choice by filling in the box to the left of your selection. Do not make stray marks in the other boxes. 2.5 points each



22. According to this graph, what type of relationship do age and distraction share on driving safety?

- ☐ Additive because the lines are parallel
- ☐ Additive because the lines are not parallel
- ☐ Interaction because the lines are parallel
- ☐ Interaction because the lines are not parallel
- ☐ null

23. Which of these two statements describes the pattern above?

- ☐ The effect of one predictor variable on the outcome variable differs depending on the level of the other predictor variable.
- ☐ The effect of each predictor variable on the outcome variable is the same regardless of the level of the other predictor variable

24. This is a ____ design

- ☐ 2x2
- ☐ 2x3
- ☐ 3x3
- ☐ 2x2x2
- ☐ 2x2x3
- ☐ 4x4

25. How many possible main effects could there be in this study?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4

26. The mean is the most widely used statistic for describing central tendency. However, the mean is heavily influenced by ___.

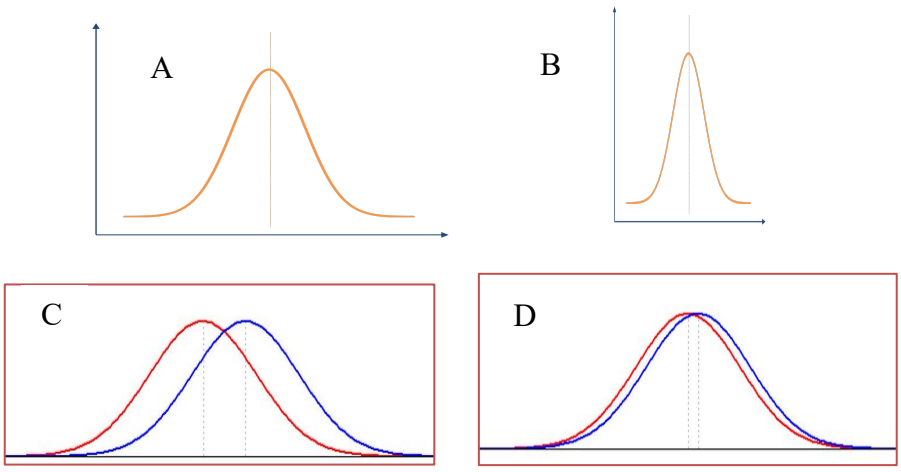
- ☐ spread
- ☐ dispersion
- ☐ outliers
- ☐ the median

27. A Cohen's d value of 0.21 can be interpreted as indicating a

- ☐ small effect
- ☐ weak positive correlation
- ☐ strong positive correlation
- ☐ large effect

28. Which of these sketches shows a small effect size?

☐ A
☐ B
☐ C
☐ D



29. Jesse's class takes a personality test in which extroversion is measured on a scale from 1-7. Based on the distribution of responses from his class, his z-score on extroversion is -2.7. Which of the following sentences best describes this result?

☐ Jesse is slightly below average for his class on extroversion.
☐ Jesse is about average for his class on extroversion.
☐ Jesse is extreme for his class on extroversion.

30. Dr. Smith concludes that his patient does not have Covid-19 but he is wrong. What type of error has he committed?

☐ p-hacking
☐ HARKing
☐ File drawer
☐ Type I – false positive
☐ Type II – false negative

31. Juan wonders if college students enroll in different numbers of units across a year. He wants to test the hypothesis that the mean number of units taken per quarter will vary between Fall, Winter, and Spring quarters. The appropriate inferential statistic would be the

☐ correlation coefficient r.
☐ z-score.
☐ ANOVA.
☐ chi-square.

32. Simran wonders if having a visible tattoo during a job interview is related to being hired or not. The appropriate inferential statistic would be the

☐ correlation coefficient r.
☐ t-test.
☐ ANOVA.
☐ chi-square.

33. Zhara wants to test the hypothesis that the number of days an undergrad attends lecture predicts the score earned on the exams in the class. The appropriate inferential statistic would be the

☐ correlation coefficient r.
☐ t-test.
☐ ANOVA.
☐ chi-square