First Name:_____ Last Name:_____

Student ID #: _____

PSC 041 Research Methods in Psychology WQ 2023

**Unit 1 Exam Version B**

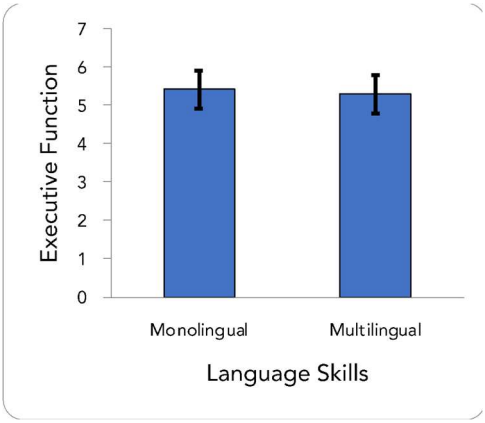
**Research Summary**

**Please answer the following questions in the space provided. Only write on the lines.**

**Adapted from:** Nichols, E. S., Wild, C. J., Stojanoski, B., Battista, M. E., & Owen, A. M. (2020). Bilingualism affords no general cognitive advantages: A study of executive function. *Psychological Science, 6,* 1–20. doi: 10.1177/0956797620903113

It is a common belief that knowing more than one language affords advantages in life. The authors of the article cite popular notions of social, employment, and lifestyle benefits among bilinguals and multilinguals. In the current study, increased executive functioning was examined as potentially being related to speaking more than one language.

The researchers hypothesized that executive functioning would be higher among participants who spoke two or more languages, as compared to their monolingual counterparts. Executive functioning is a set of mental skills including flexible thinking and self-control. Researchers recruited 100 college students as participants. Each participant was asked to complete twelve different tasks designed to measure executive functioning. These included tasks that measured their ability to show self-control by following multi-step directions and those that timed their ability to solve complex problems that required flexible thinking. Each task was scored on a scale from a low of 0 to a high of 10. A composite score was calculated for each participant by calculating the average of his, her, or their results. Participants were then asked how many languages they knew. Participants who indicated that they knew more than one language were asked to write a translation of a paragraph in those languages. The paragraphs were later coded by a native speaker to decide if the participant was fluent in the language or not. Monolingual participants' executive functioning (M = 5.42, SD = 1.31) were compared to those of participants who were fluent in two or more languages (M = 5.29, SD = 1.23). Results indicated no significant differences between the groups' scores ($t$ = 0.98, $p$ > .05). The authors concluded that fluency in more than one language does not afford any significant advantage over monolingualism in terms of executive functioning.



## Hypotheses

*5 pts* 1. Write a specific null hypothesis for this research (be sure to use the variable names).

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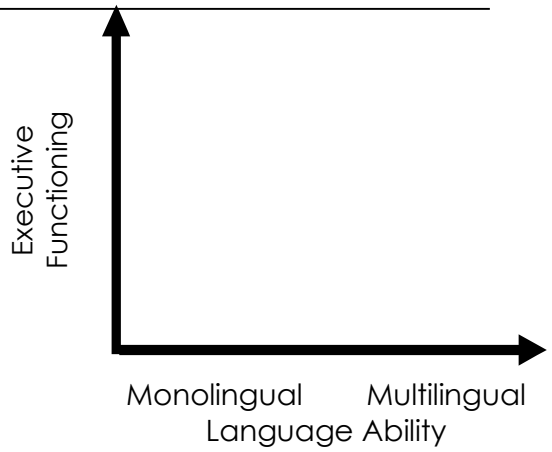
*5 pts* 2. Sketch the null hypothesis:




*5 pts* 3. Write a specific directional research hypothesis for this research (be sure to use the variable names or levels).

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*5 pts* 4. Write a specific non-directional research hypothesis for this research (be sure to use the variable names).

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## Predictor Variable

*5 pts* 5. Name the predictor / independent variable

*10 pts* 6. How did the researchers operationally define the predictor / independent variable? Describe it using your own words. *Be sure to include the levels or values and indicate how the codes will be interpreted.*

*5 pts* 7. The predictor / independent variable is (fill in the box)

- □ **Categorical**
- □ **Continuous**

*5 pts* 8. How was the predictor / independent variable measured? (fill in the box)

- □ **Observation**
- □ **Self-Report**
- □ **Physiological**
- □ **It was manipulated** (under the experimenter's control)

Use this information just for Q9.
Another researcher wants to extend this finding using different methods to address a similar research question. This researcher asks participants to evaluate their own language skills. Each participant is asked how many languages they speak.

*5 pts* 9. How was this new predictor / independent variable measured? (fill in the box)

- □ **Observation**
- □ **Self-Report**
- □ **Physiological**
- □ **It was manipulated** (under the experimenter's control)

## Outcome Variable

*5 pts* 10. Name the outcome / dependent variable

_____

_____

*10 pts* 11. 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.*

_____

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*5 pts* 12. The outcome / dependent variable is (fill in the box)

- □ **Categorical**
- □ **Continuous**

*5 pts* 13. How was the outcome / dependent variable measured? (fill in the box)

- □ **Observation**
- □ **Self-Report**
- □ **Physiological**
- □ **It was manipulated** (under the experimenter's control)

**Summarize the findings (from original prompt)**

*5 pts* 14. Is this a value, causal, or associative claim? (fill in the box)

- □ **Value**
- □ **Causal**
- □ **Associative**

*10 pts* 15. How do you know? (include specific information from the prompt)

*10 pts* 16. How do you know that this satisfies Mill's criteria of temporal precedence?

*10 pts* 17. How do you know that this does not satisfy Mill's criteria of elimination of alternative explanations?

*10 pts* 18. Does this interpretation follow from this study: "We found a clear advantage to speaking a single language over speaking multiple languages" Why or why not?

**Multiple choice/ fill in the blank / short answer**.
Select the single best answer. Indicate your choice by filling in the box to the left of your selection. Write short answers in the space provided. 3 points each.

19 Which of the following is the worst operational definition for the construct "sadness"

- □ self-report of the frequency with which the person feels sad on a weekly basis
- □ average heart rate over a 24-hour period
- □ score on a depression scale

20 If you question the internal validity of a study, which of the following questions would you be asking?

- □ How well do the results generalize to the overall population?
- □ Which statistic should be computed?
- □ Were the variables measured accurately?
- □ Does the predictor variable cause changes in the outcome variable?

21 Which of the following is a definition for construct validity?

- □ the degree to which a test or instrument is capable of measuring a concept, trait, or other theoretical entity
- □ the degree to which a study or experiment is free from flaws and can therefore be taken to represent the true nature of the phenomenon.
- □ the extent to which the results of research or testing can be generalized beyond the sample that generated them.

22 Nathan Experimenter wants to know what students think about the food in the dining halls. What is the best method match?

- □ observation
- □ survey
- □ physiological monitoring

23 Natalie Experimenter wants to know if students sit closer to strangers or to friends in the dining halls. What is the best method match for sitting distance?

- □ observation
- □ survey
- □ physiological monitoring

24 What sort of evidence is being used in: "When I slept with the textbook under my pillow I did better in the class"

- □ empirical

- □ rational
- □ anecdotal
- □ scientific

25 An important characteristic of science is that it is public. Which of these statements describes this characteristic?

- □ Scientific inquiry has value independent of any economic value that may result from the research
- □ All natural, social, and psychological phenomena are causally determined by preceding events or natural laws
- □ Science is based on objective, reproducible evidence and not on pure reason, emotion, or subjective experience
- □ All scientific knowledge is open to further testing and revision
- □ A theory or hypothesis is not scientific unless it can be proven false

26 Freud theorized that people have unconscious desires. As they are unconscious, people are unaware of them.
Therefore, if Freud was correct, people are not able to identify their unconscious desires.
But also, if Freud was not correct, people are not able to identify their unconscious desires.
Because these two predictions are the same, which characteristic of science does Freud's theory violate? Write a single word:

_____

27 A researcher wants to know if age is related to the number of coffee drinks adults in the USA drink per week. What type of claim will the research make?

- □ Value claim
- □ Association / correlation claim
- □ Causal claim

28 How do you know?