

## OVERVIEW

### BIG IDEA

Scientists formally communicate their discoveries through peer-reviewed scholarly journals.

### OBJECTIVE

**5.10:** Identify the purpose and conclusion of a scholarly journal article

### AGENDA

1. Data Challenge
2. What is a Scholarly Journal?
3. The Abstract
4. Analyze the Study

### HOMEWORK

Use Google Scholar to find an abstract for a scholarly journal article focused on one risk factor for influenza (your choice). Summarize it in a graphic organizer.

# LESSON 5.10

# Scholarly Journals

### SUMMARY:

Students will grapple with a challenging text in this lesson, gaining a sense of what a peer-reviewed scholarly journal article is, the level of rigor to expect, and practicing some strategies to tackle them.

### STANDARDS:

**RST.11-12.8:** "Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information."

**WHST.6-8.8:** "... quote or paraphrase the data and conclusions of others..."

**WHST.9-10.8:** "...assess the usefulness of each source in answering the research question..."



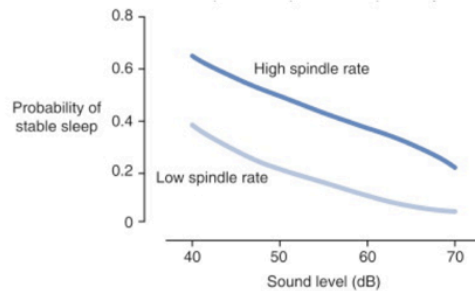
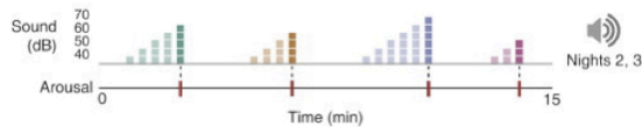
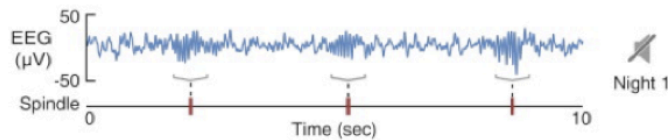
# Scholarly Journal Articles

Obj. 5.10: Identify the purpose and conclusion of a scholarly journal article



### Data Challenge!

Examine the following data representations and make inferences about the purpose and the conclusions of the study from which this data came. Use all your clues and make logical guesses!



Purpose:

Conclusion:

### DO NOW:

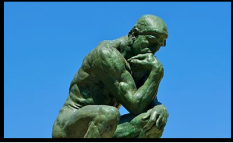
Ask students, what title would you give these graphs? That is another way to think about the purpose. [Be specific! Ex: Brain Activity (shown by spindles) over time for Night 1 (no noise) & Sound levels over time for nights 2-3 (noise)]

Encourage students to ask questions. E.g...

**Graphs I & II:** What is a spindle? How is brain activity measured? Is brain activity the DV? How does sound change brain activity? Why did they measure at night? Were subjects asleep? How was sound different on nights 2 & 3? How long did it last?)

**Graph III:** Why are you more able to have stable sleep with high spindle rate? Does sound volume influence spindle rate? How were high/low spindle rate determined? How many in each?

**Graph III Purpose:** Determine probability of stable sleep for increasing sound levels for high vs. Low spindle rate groups (The overall purpose would be something like: Determine how spindle rate affects sleep stability across a range of sound intensities.)



**Two Heads...**

Two heads are better than one. The previous exercise was probably a challenge. Work with a partner to discuss what you could make of the data and together work to refine your Purpose and Conclusion.



**What is a Scholarly Journal?**

In academic publishing, the goal of peer review is to assess the quality of articles submitted for publication in a scholarly journal. Before an article is deemed appropriate to be published in a peer-reviewed journal, it must undergo the following process:

- The author of the article must submit it to the journal editor who forwards the article to experts in the field. Because the reviewers specialize in the same scholarly area as the author, they are considered the author's peers (hence "peer review").
- These impartial reviewers are charged with carefully evaluating the quality of the submitted manuscript.
- The peer reviewers check the manuscript for accuracy and assess the validity of the research methodology and procedures.
- If appropriate, they suggest revisions. If they find the article lacking in scholarly validity and rigor, they reject it.

Because a peer-reviewed journal will not publish articles that fail to meet the standards established for a given discipline, peer-reviewed articles that are accepted for publication exemplify the best research practices in a field.

Scholarly journal articles in science will typically have the following sections (or similar):

- Abstract (a short summary of the entire study)
- Introduction/Background
- Literature Review
- Methods
- Results
- Conclusions

Source: <http://guides.lib.jjay.cuny.edu/content.php?pid=209679&sid=1746812>

Peer-reviewed, scholarly journal articles are challenging (but essential!) texts in science. Although they are written at a high level, with practice and reading strategies, you can make sense of them! Think about it, all of the scientific discoveries on any topic you can conceive of are available at your fingertips. To start out successfully, be sure you are focusing on critical reading. Work to figure out the purpose of the study, ask why, look up difficult vocabulary, draw inferences, and make connections. Finally, use ALL of your clues--assessing the title, headings, labels, captions, and the overall organization can make a huge difference



**Act I: The Abstract**

In this lesson, we will evaluate a complex abstract. Although it will be a challenging read the first time through, use reading strategies and annotate the text to help you make sense of it. Use the bubbles to track the Purpose, Results, & Conclusion in your own words.

**NEW INFO:**

Expect students to struggle, and encourage it. Remind them they are doing college and even graduate level work by trying to analyze and interpret scholarly journal articles.

**NEW INFO:**

Source: <http://guides.lib.jjay.cuny.edu/content.php?pid=209679&sid=1746812>

**THINK:**



### Spontaneous brain rhythms predict sleep stability in the face of noise

Thien Thanh Dang-Vu<sup>1,2,3</sup>,  
Scott M. McKinney<sup>2</sup>,  
Orfeu M. Buxton<sup>1,4</sup>, Jo M. Solt<sup>1,5</sup>,  
and Jeffrey M. Ellenbogen<sup>1,2</sup>

Quality sleep is an essential part of health and well-being. Yet fractured sleep is disturbingly prevalent in our society, partly due to insults from a variety of noises [1]. Common experience suggests that this fragility of sleep is highly variable between people, but it is unclear what mechanisms drive these differences. Here we show that it is possible to predict an individual's ability to maintain sleep in the face of sound using spontaneous brain rhythms from electroencephalography (EEG). The sleep spindle is a thalamocortical rhythm manifested on the EEG as a brief 11–15 Hz oscillation and is thought to be capable of modulating the influence of external stimuli [2]. Its rate of occurrence, while variable across people, is stable across nights [3]. We found that individuals

who generated more sleep spindles during a quiet night of sleep went on to exhibit higher tolerance for noise during a subsequent, noisy night of sleep. This result shows that the sleeping brain's spontaneous activity heralds individual resilience to disruptive stimuli. Our finding sets the stage for future studies that attempt to augment spindle production to enhance sleep continuity when confronted with noise.

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Purpose

Results

Conclusions

**READ:** Possible Answers:

**Purpose:** How does brain activity (high or low spindle rate) affect tolerance to waking up during the night due to noise?

**Results:** People with lower spindle rates are more likely than people with higher spindle rate to wake up to noise.

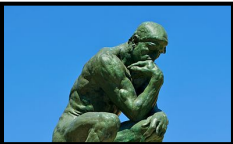
**Conclusion:** People with more brain spindle activity are less likely to wake up to loud noises.

**VIDEO:** Have students watch the 2.5 minute overview of this study by George Zaidan on Pocket Science.

Link (also in PowerPoint):

[http://www.youtube.com/watch?v=Trn2E63\\_9Bw](http://www.youtube.com/watch?v=Trn2E63_9Bw)

Video can also be found by Google searching for: "george zaidan pocket science youtube channel" and navigating to Episode 10 "Sleep through the Noise"



Analyze the Study

Use the abstract and data (from the Do Now) to answer the following questions.

1. According to the study, the ( more / less ) spindles you have per minute, the ( better / worse ) you are at sleeping through noise.
2. Predict: Write a sentence predicting the relationship between about **spindles** and **sleep through light**.
3. In this study, people who probably had poor quality of sleep were most likely those with ( high / low ) spindle rates. Explain!
4. According to the study, which group of people would be most likely to wake up in the middle of the night if the neighbors in the apartment next door started blasting music at 50 dB?
5. Based on the information in the graph, which person is most likely wake up? (Circle one.)
  - a. Suzie has a high spindle rate and at 6:30am her brother runs in to wake her up in the morning, screaming at a 70dB level
  - b. Pablo has a low spindle rate and at 6:00am a bird flies into the window, hitting it with a crash at a 40dB level
6. Based on results from the study:
  - a. How likely is it that Mr. Smith (who has high spindle rates) would wake up if exposed to his wife's 50 dB scream when she goes into labor in the middle of the night? \_\_\_\_\_% likely
  - b. How likely is it that Mr. Taylor (who has low spindle rates) would wake up from his lunchtime nap if exposed to the passing period bell at 40 dB? \_\_\_\_\_% likely



Purpose & Conclusion

Summarize the purpose & conclusion of the article in your own words.

Purpose:

Conclusion:



Influenza Scholarly Study

Use Google Scholar to find an abstract for a scholarly journal article focused one risk factor for influenza (you choose!). Summarize the Purpose, Methods, Results, & Conclusions on a separate sheet of paper.

THINK: Answers:

1. More; Better
2. Those with higher spindle rates are less likely to wake up in the presence of light than those with lower spindle rates.
3. Low; Poor quality of sleep is the lower end of the y-axis (low probability of stable sleep)
4. People with lower spindle rates
5. Suzie (find each point on the graph in Do Now and Suzie will be lower on the y-axis, indicating she is more likely to wake up)
6. 6. 50%; 40%

**Challenge:** Ask students, “The scientists concluded their abstract saying that more studies should be conducted. What other variables could they test?” (Possible answer: How the patterns of sleep stability change when the other senses (sight (light), smell, touch, taste?) are varied.)

ASSESS: Answers:

**Purpose:** How does brain activity (high or low spindle rate) affect tolerance to waking up during the night due to noise?  
**Conclusion:** People with more brain spindle activity are less likely to wake up to loud noises.

HOMEWORK

The purpose of this homework assignment is to challenge students to “get their feet wet” using Google Scholar. They may struggle a bit, but it will be a good way to get exposed to the process of searching for a scholarly journal, even before learning how to do this in a later lesson. Once students find an article, they’ll also gain more practice analyzing complex scholarly texts. If they are successful, they may even be prepared to start the following case study (on influenza) with some of their research already done.