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## ASSIGNMENT #2: SCIENTIFIC EVIDENCE

This Assignment is worth **20%** of your course mark and is due (submitted to Blackboard) before midnight on **November 26**.

### LEARNING OBJECTIVES:

- Increase your scientifically literacy by conducting research to evaluate a scientific claim.
- Apply critical thinking to evaluate both primary and secondary sources.
- Increase your understanding of the typical “abstract-introduction-methods-results-discussion” format used to present scientific research articles.
- Become familiar using literature search engines (e.g. Google Scholar, Pubmed, MRU Library, etc.).
- Become confident using in text citations and creating a reference list.
- Develop clear and concise writing habits.

### OVERVIEW:

As a post-secondary student, you need your brain to function at its best to receive, remember and understand the immense amount of information in all your classes. Perhaps most importantly, you need maximum brain function to logically question and critically assess all this information.

The media reports a variety of strategies and life hacks that promise to improve your performance in the classroom. There have been dozens of media reports discussing the link between student performance and physical activity. Other reports make the claim that a good night's sleep is necessary to consolidate our memories. There are also proponents that dietary supplements, such as caffeine can have a positive effect on learning and student success. As a busy dedicated student, you should be interested in strategies to enhance your learning while being very skeptical of any promises of a quick and easy solution.

For this assignment you will investigate one of three [claims](#) below and write a report about your findings.

### CLAIMS (PICK ONE):

- 1) [Physical activity has a positive impact on memory and student performance.](#)
- 2) [Eight hours of sleep is critical in forming memories.](#)
- 3) [Consuming caffeine can improve learning and memory.](#)

### GENERAL INSTRUCTIONS:

Your assignment is to research one of the [claims](#) listed above using media sources and primary scientific research. Your findings are to be summarized in a four-page (double spaced) report. You must include and reference a minimum of one media/news article on the topic, as well as at least three primary research articles. More sources can be used but quality is better than quantity. You must include a figure (e.g. graph) from one of your primary sources and use it to support your findings about the claim.

**PLEASE NOTE:** Your objective is not necessarily to prove or refute the claim outright, but rather to report scientific evidence on the topic and to provide examples (or an example) of the claim in the media. It's possible that the claim is valid in some circumstances but not others, and for the media report and the scientific research to agree or be at odds. Either way, you should conclude with a scientifically accurate statement about the claim based on your sources. This is not an opinion piece. Statements you make about the validity of the claim need to be supported with research. What you will be evaluated on is

your ability to use primary research and media articles to develop a clear and concise story that critically evaluates and presents information about your selected claim.

### SPECIFIC INSTRUCTIONS

- 4-double spaced pages (excluding title page, references and figure), 12 Calibri font, 2.54 cm margins. This is purposefully short to challenge you to write clearly and concisely.
- Include a title page with: the title of your report, your name, GNED1101 with your section number, submission date
- Minimum 1 media/news article source
- Minimum 3 primary research sources
- APA reference style → <http://www.bibme.org/citation-guide/apa/>
  - Include in-text citations and a bibliography (reference list)
- Report should be written in paragraph form. You may include headings if you wish.
- You should include a concluding paragraph to summarize your findings about the claim.
- Select a figure/graph from a primary research article related to the claim you are researching. Include the figure in your report after your references (not within the 4 pages of text), and refer to and reference it in your report. Include a figure caption written in your own words.
  - To copy and paste the figure: you can open and crop in PowerPoint, if using a Mac shift+command+4, crop using Adobe reader, take a screen shot etc.
- Your report will be evaluated using the marking outline below. You should use this marking outline as a guide as you prepare your report.
- Your report should look something like:
  - Page 1: Title page
  - Pages 2-5: Report
  - Page 6: Reference list and figure with a figure caption in your own words
- The report is to be submitted to Blackboard. You will find a submission link in the “Assignments” tab.

### THOUGHTS ON EVALUATING EVIDENCE

One of the most important things to consider when evaluating evidence is the source of information. Sources can be scholarly or non-scholarly, and we accept that evidence from a scholarly source is generally more reliable than a non-scholarly source. That doesn't mean that non-scholarly sources are all dispensing inaccurate information; it just means that there are more checks and balances for the scholarly sources.

Another thing to keep in mind is the quality of the *measurable, physical* evidence that is presented. Science can only deal with phenomena that are somehow measurable. How do we know if someone's memory has improved after they have consumed coffee, exercised or had a good night's sleep? We have to have measurements before and after the treatment. Better still, perhaps there is a control group for comparison. While it might be difficult to have a placebo for exercise or sleep (how would someone not notice if they were exercising or not?), but perhaps the researchers used a case-control study that pairs each individual receiving the treatment (e.g., an exercise regime) with a similar individual (e.g., similar in age, height, weight, sex, etc.) who did not receive the treatment. That would help avoid the situation that participants do better on the “after” measurement simply because of their prior experience during the “before” measurement. Also consider how repeatable the experiment is:

could another research group replicate the experimental design (of course, with different subjects) using the Methods section of the paper?

## CITATIONS AND PLAGERISM

### What is plagiarism?

Plagiarism occurs when you present the ideas, words, images, or other work by others as though they were your own. Cases of plagiarism are often accidental, but ignorance is not an excuse. Here are a few guidelines to help you avoid committing plagiarism:

- 1) Avoid including direct quotations from sources. Sometimes this is unavoidable (e.g. interview data) however, in this assignment you should be able to put the ideas and findings of your sources into your own words (paraphrase). You must still provide a citation in this case, but quotation marks are not necessary when paraphrasing.
- 2) If you are using more than four words from a source you must indicate this with quotation marks. [e.g. "To be or not to be..." (Shakespeare, 1603)]
- 3) Take a workshop! There are a variety of Academic Success Workshops provided by Student Learning Services including: Paraphrasing, not plagiarizing, and APA referencing.  
<http://www.mtroyal.ca/AcademicSupport/ResourcesServices/StudentLearningServices/Workshops/index.htm>
- 4) Review the guidelines for APA referencing  
<http://www.bibme.org/citation-guide/apa/>  
<https://www.mendeley.com/guides/apa-citation-guide/>
- 5) Consider using a reference manager. Not necessary for this short assignment, but reference managers are extremely helpful to collect, organize, and cite sources. Thank me later. ☺  
Mendeley → [https://www.mendeley.com/?interaction\\_required=true](https://www.mendeley.com/?interaction_required=true)  
Zotero → <https://www.zotero.org/>  
Papers → <https://www.readcube.com/papers/>

### Intext APA citation example:

This is an example sentence with an in text citation in APA format (Strzalkowski, Peters, Inglis, & Bent, 2018b). Of course, Strzalkowski et al. 2018 is an inappropriate reference for that statement, but it provides an example of correct intext citation format, just like the citation for this sentence (Vallbo, 2018). An example of a reference list for these in text citations is provided below. Note, in APA style, the format of intext citations is different the first time a reference is cited (Strzalkowski, Chau, Gan, & Kiss, 2018a) compared to subsequent times (Strzalkowski et al., 2018a).

### References:

Strzalkowski, N. D. J., Chau, A. D., Gan, L. S., & Kiss, Z. H. T. (2018a). Both 50 and 30 Hz continuous theta burst transcranial magnetic stimulation depresses the cerebellum. *The Cerebellum*, 45, 1–9.  
<http://doi.org/10.1007/s12311-018-0971-0>

Strzalkowski, N. D. J., Peters, R. M., Inglis, J. T., & Bent, L. R. (2018b). Cutaneous afferent innervation of the human foot sole: what can we learn from single-unit recordings? *Journal of Neurophysiology*, 120(3), 1233–1246. <http://doi.org/10.1152/jn.00848.2017>

Vallbo, Å. B. (2018). Microneurography: how it started and how it works. *Journal of Neurophysiology*, 120(3), 1415–1427. <http://doi.org/10.1152/jn.00933.2017>

<b>Marking Outline</b>		
<i>In writing your report ask yourself the following questions:</i>		
	<b>Assignment criteria</b>	<b>Marks</b>
<b>Writing style and format</b>	Is the report well organized with arguments and statements easy to follow?	/10
	Is the writing clear and concise? Does every word/sentence have a purpose?	
	Are there spelling and grammatical errors?	
	Is the report the required length?	
	Is there a complete title page?	
	Does the report look "polished" or is it clear the writing was "rushed"?	
<b>Report content</b>	Is there a well-organized opening paragraph that presents the claim being researched?	/20
	Is the theory behind the claim presented clearly?	
	Is the evidence in the report presented clearly?	
	How appropriate are the media/news sources?	
	Are the media/news sources used effectively in the report? Do they provide background and context for the claim, link to the primary research, highlight any controversies etc.?	
	How appropriate are the primary research articles?	
	Are the primary research articles used effectively to critically evaluate the claim being researched?	
	Are some limits of the research findings presented, such as the context in which the study was done, the outcome measures, the population tested etc.?	
	Is the interpretation of the research accurate?	
<b>Figure</b>	Is there a well-organized concluding paragraph?	/5
	How appropriate is the selected figure?	
	How well is the figure discussed and used in the report?	
	Is the interpretation of the figure accurate?	
<b>References</b>	Is the figure caption written in the author's (student's) own words? Does the figure caption accurately describe the figure?	/5
	Are in-text citations used correctly? Are they included where they need to be in the correct APA format?	
	Is the reference list formatted in the correct APA style?	
<b>TOTAL GRADE</b>		<b>/40</b>

Specific Feedback	
<b>Commendations:</b> Feedback about the major strengths of the critique and what was done well	• ...
<b>Recommendations:</b> Feedback on key areas that need improvement	• ...
<b>Corrections:</b> Feedback on areas that did not meet the assignment requirements	• ...

\*\* This will be used to provide you with specific feedback on your report, what you did well and areas to focus on to improve. This feedback will not be exhaustive but rather highlight the major areas to keep in mind as you develop your writing skills.\*\*



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