**COGNITION, 2024**

**ASSIGNMENT**

**Cognitive function and exercise: A Fact-checking report**

This assignment (35 marks) is worth 35% of your final grade for the unit. It must be submitted to pass the unit.

Welcome to the fact-checking assignment on Cognitive Function and Exercise! In this assignment, you'll be evaluating and responding to the work of Dr. Alice Guess, a fictional prominent figure in the study of exercise and cognitive function. Dr. Guess has written a research summary that has sparked debate among her peers. Your task is to critically assess Dr. Guess' essay and compare it against the sources she cited.

You'll find a list of references at the end of Dr. Guess' essay. Despite her reputation, it's important to verify the accuracy and relevance of her cited sources. To support your writing, check the Reading List in Blackboard for resources on communicating complex ideas to a general audience. Additional writing guidance can be found in the 'Assessments' folder (2. Written assignment) on Blackboard, including Newell's 'Readability,' which, while focused on pamphlet writing, offers valuable advice for various forms of writing. The papers used by Dr Guess can be also found on the same folder.

Your main objective is to write a rebuttal to Dr. Guess' essay. This rebuttal should correct any potential inaccuracies and ensure that it reflects the current understanding of how exercise impacts cognitive function. As an expert in the field, you must also include ONE recent study in your rebuttal that is well integrated with your critique. A list of recent relevant studies will be provided for your selection. A rubric outlining the specific criteria for this assignment is also available to guide you. Please note that your focus must be on fact-checking the scientific content itself, not critiquing the writing style, structure, and the way arguments and evidence are presented in Dr. Alice Guess's essay.

**Expectations:**

In this assignment, you are expected to critically examine and verify the accuracy of Dr. Alice Guess's essay on the effects of exercise on cognitive function. This involves thoroughly reviewing the original text found below to identify any inaccuracies or flaws, as well as pointing out accurate information. You should provide corrections, alternative perspectives, or examples where appropriate. Your rebuttal must be an original piece of writing that accurately reflects recent research on the topic. Simply copying and making minor changes to Dr. Guess's essay, such as word replacements or sentence rephrasing, is not acceptable. Your work must be original, and all used sources must be properly cited.

Additionally, you must select and discuss ONE additional recent experimental study on the effects of exercise on cognitive function (see list below). This study should be seamlessly integrated into your rebuttal. The study you choose should NOT be a review or meta-analysis but an experimental paper. Your conclusion should offer insightful reflections based on the fact-checked literature, going beyond the information provided in Dr. Guess's essay. Remember, Dr. Guess merely listed various factors and suggested the need for further research, which may not be highly informative for a general audience.

**Guidelines**

1. **Length**: The essay should be no more than 3 pages in length, excluding the reference page.
2. **Formatting**: The essay should be double-spaced, using a font size of 12 and a font type of Times New Roman.
3. **Margins**: The margins should be set to 2.5 cm on all sides.
4. **References**: A reference page should be included at the end of the essay. The references should be formatted according to the APA 7th citation style.
5. **Headings**: Headings should be used to organise the essay and break up the text into smaller, manageable sections.
6. **Grammar and Spelling**: The essay should be free of grammatical and spelling errors.
7. **Plagiarism**: All sources used in the essay must be properly cited, and the text should be original and written by the student. The essay will be checked for plagiarism.
8. **Title Page**: A title page is not required, but it may be included if desired.

**What does a rebuttal look like?**

**Example of an incorrect claim in the original:** *“It is clear from observations of my neighbour, Joe Doe (2022, personal communication), that the earth is by and large a flat surface. His claim is based on several long runs around the city of Perth (~42 km), Western Australia. Therefore, you should be very cautious when venturing outside the limits of the city, as you might encounter the end of the world.” (63 characters)*

**Example of what a rebuttal could look like:** *“Dr. Forget-me-not made a claim in his recent essay suggesting that the earth might be flat. However, upon reviewing his evidence and other reliable sources, it is clear that the earth is spherical. For example, NASA photographs from space missions clearly show a round planet (NASA, 2022). Of course, we should be cautious when walking in unknown terrain, but the chances of reaching the end of the world are close to none.” (72 characters)*

This outlandish example above is only meant to give you an idea of what a rebuttal could look like. There is no need for you to repeat verbatim what Dr. Guess originally wrote and your work should stand alone.

**Advice**

1. Make sure to fully understand the requirements and guidelines for the assignment. Ask questions on Blackboard if there is anything you are unsure about.
2. Start working on the assignment early to give yourself enough time to research, fact-check, and revise your work: Allow time for redrafting your work.
3. Double-check the accuracy of the information you use.
4. Plan and organize your essay before you start writing to ensure that it is structured and easy to follow.
5. Be mindful of the page limit and make sure that you are staying within the limits set by the guidelines.
6. Proofread your work carefully before submitting it to catch any typos or grammatical errors.
7. If you are struggling with the assignment, don't hesitate to reach out to your unit-coordinator or tutor for help.

Exercise and cognitive function by Dr Alice Guess.

**Introduction:** In a time where prolonged hours in front of computers and focus on virtual tasks are the norm, understanding how to maintain and enhance cognitive health is becoming a critical aspect of psychological research. Cognitive functions, such as attention, memory, and decision-making, are crucial for our daily activities. For example, consider the role of working memory, which allows us to hold and manipulate information over short periods – like remembering and using a phone number we just looked up or counting how much money we have in our wallet. From the impacts of exercise on emotional and episodic memory to the combined effects of physical activity with restful practices like napping, I will next review insightful studies about exercise and cognitive function.

**Recent Research:** Recent studies like Nakamura et al. (2023) have examined the impact of physical activity on various cognitive functions. Their study particularly investigated how acute, vigorous exercise affects emotional memory, which involves remembering feelings associated with past events. The study's unique aspect was testing participants' ability to recall emotionally charged images from a standardized database, the International Affective Picture System, two days after viewing them. Contrary to expectations, it was found that women's ability to recall these images significantly improved after exercise, highlighting the positive impact of vigorous exercise on emotional memory in women. This finding challenges the traditional understanding of exercise's influence on memory types and emphasizes the need for varied research approaches.

Building on the theme of exercise's cognitive impacts, Mograss et al. (2020) explored the combined effect of physical activity and sleep on memory. Their innovative approach involved participants exercising, then taking a nap, and finally undergoing a memory test. This test wasn't about recalling past events but involved a visual recognition task, where participants identified previously seen images. The study's compelling conclusion was that exercise, coupled with a nap, significantly improved memory more than either activity alone. This finding offers a new perspective on how restful activities like napping might play a more critical role in cognitive health than previously thought.

Furthering our understanding, Marin Bosch et al. (2021) studied how a single session of high-intensity exercise can influence memory and its underlying mechanisms in the brain, particularly in young men. The participants engaged in an associative memory task, which involves linking separate pieces of information, after exercising. The study's standout finding was that high-intensity exercise, contrary to moderate-intensity, led to improvements in this type of memory, potentially due to increased levels of brain chemicals like endocannabinoids and BDNF. This surprising result suggests that high-intensity exercise might be more beneficial for certain types of memory processes than previously believed, offering a new direction for cognitive health strategies.

Lastly, Dilley et al. (2019) shed light on the nuanced effects of exercise intensity on memory accuracy. The study distinguished between true episodic memory, which is the accurate recollection of past events, and false episodic memory, which is the mistaken belief that a non-experienced event occurred. Young adults performed memory tasks involving word-lists after different exercise intensities. Notably, while high-intensity exercise boosted true episodic memory, it also increased false memory instances. This raises intriguing questions about how exercise intensity can differentially impact memory accuracy, suggesting a delicate balance in exercise regimens for optimal cognitive benefits.

**Conclusion**: The research reviewed here reveals a multifaceted relationship between exercise and cognitive health. It underscores that physical activity may support memory and brain function. However, factors like the type and intensity of exercise, individual differences, and combinations with activities like napping may influence these outcomes. This body of evidence calls for a tailored approach to physical activity, recognizing that different exercises may lead to distinct benefits. These insights are crucial for developing personalized strategies to optimize cognitive well-being throughout life.

**References**

Dilley, E. K., Zou, L., & Loprinzi, P. D. (2019). The effects of acute exercise intensity on episodic and false memory among young adult college students. *Health Promotion Perspectives*, *9*(2), 143-149. <https://doi.org/10.15171/hpp.2019.20>

Marin Bosch, B., Bringard, A., Logrieco, M. G., Lauer, E., Imobersteg, N., Thomas, A., Ferretti, G., Schwartz, S., & Igloi, K. (2021). A single session of moderate intensity exercise influences memory, endocannabinoids and brain derived neurotrophic factor levels in men. *Scientific Reports*, *11*(1), 14371. <https://doi.org/10.1038/s41598-021-93813-5>

Mograss, M., Crosetta, M., Abi-Jaoude, J., Frolova, E., Robertson, E. M., Pepin, V., & Dang-Vu, T. T. (2020). Exercising before a nap benefits memory better than napping or exercising alone. *Sleep*, *43*(9). <https://doi.org/10.1093/sleep/zsaa062>

Nakamura, M., Kawata, Y., Hirosawa, M., Ota, T., & Shibata, N. (2023). Differential effects of acute exercise on emotional memory in men and women. *Frontiers in Sports and Active Living*, *5*, 1062051. <https://doi.org/10.3389/fspor.2023.1062051>

**References for inclusion in your essay** (Choose just **ONE** of them to include)**:**

Chang, Y. T. (2020). Physical Activity and Cognitive Function in Mild Cognitive Impairment. ASN Neuro, 12, 1759091419901182. <https://doi.org/10.1177/1759091419901182>.

Loprinzi, P. D., Roig, M., Tomporowski, P. D., Javadi, A. H., & Kelemen, W. L. (2023). Effects of acute exercise on memory: Considerations of exercise intensity, post-exercise recovery period and aerobic endurance. Memory & Cognition, 51(4), 1011-1026. <https://doi.org/10.3758/s13421-022-01373-4>.

**Rubric**

**Introduction:**

* Briefly introduce the topic of the rebuttal
* Provide a different practical example of cognitive function than the one given by Dr. Alice Guess

An excellent introduction introduces the topic of your rebuttal, provides an original, correct, and clear example of a cognitive function. The writing is clear and concise, with appropriate terminology and definitions for a general audience. An excellent answer does not simply copy and paste or paraphrase the example given in the original text, as originality is a key component of a high-quality response. (5 points)

**Recent research:**

**Fact-Checking**

* Identify and describe any inaccuracies in Dr. Guess's essay
* Provide corrections for each inaccuracy, accurately describes the findings and explain what they suggest
* Ensure all sources are properly cited in APA format
* Identify and acknowledge accuracies, explaining them in your own words

An excellent response identifies all accuracy and inaccuracies about recent research on the topic, states the correct facts and is clearly written. The writing style is engaging and easy to understand, with well-organised paragraphs, few errors, and appropriate citations in APA format. An excellent answer does not simply copy and paste or paraphrase the information given in the original text, as originality is a key component of a high-quality response. (10 points)

**Additional Research:**

* You must choose only ONE additional recent study related to exercise and cognitive function (from the list provided above)
* Accurately describe the study and its findings
* Integrate the study into the rest of your recent research text

An excellent response describes the additional research article accurately, integrates it well with the rest of the text, and uses it to provide new insights into exercise effects on cognitive function. The writing is clear and concise, with appropriate terminology and definitions for a general audience. The source is properly cited in APA format. An excellent answer does not simply copy and paste or paraphrase information contained in the original text chosen, as originality is a key component of a high-quality response. (10 points)

**Conclusion:**

* Provide an insightful and logical discussion on how exercise can improve or hinder cognitive function
* Use evidence from the fact-checked literature to support your discussion
* Incorporate the additional recent study into your discussion
* Conclude your rebuttal with a summary of the main points and a call to action for further research or practical application.

An excellent conclusion is well-organised, supported by evidence, logical and well-written. The sources are properly cited in APA format. An excellent answer does not simply copy and paste or paraphrase the example given in the original text, as originality is a key component of a high-quality response. (8 points)

**References:**

* Include a reference page at the end of your rebuttal in APA format
* List all sources used in your writing, including the additional recent study

An excellent assignment provides in‐text references for all sourced materials which are referenced in APA format. The reference list is complete and in APA format. (2 points)

**Important information**

It is important to emphasize that this assignment requires students to critically examine and fact-check their own work on the topic of exercise and cognitive function. The submitted text must be original and written by the student, and will be thoroughly checked for plagiarism.

While it is acceptable to ask AI for help with grammar, typos, and generic feedback on your writing, it is not acceptable to ask AI to generate text for you to submit as your own. Doing so is unethical and can be easily detected. Instead, it is advisable to focus on developing your own understanding and mastery of the topic to produce high-quality work that truly reflects your abilities and critical thinking. I strongly recommend that students avoid sharing their work with others, as doing so is unethical and could result in academic misconduct. If you share your work, even with the best intentions, it could end up online and be copied by others. This would be detected by Turnitin and result in unwanted consequences.