

Influence of childhood aerobic fitness: learning and memory



**ASSIGN
BUSTER**

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DIRECTIONS: Please follow the Assessment 2 instructions carefully. Type your answers straight into this document.

1. USE APA STYLE REFERENCING TO PROVIDE DETAILS OF YOUR ARTICLE
HERE (2 MARKS):

Raine, L. B., Lee, H. K., Saliba, B. J., Chaddock-Heyman, L., Hillman, C. H., Framer, A. F. (2013). The Influence of Childhood Aerobic Fitness on Learning and Memory. *PLoS ONE*, 8(9). Doi: 10. 1371/journal. pone. 0072666

2. DESCRIBE THE MAIN PURPOSE OR PROBLEM PRESENTED IN THIS
ARTICLE (5 MARKS):

The main purpose of the article was to determine whether aerobic fitness enhances learning abilities, specifically memory, on a task where participants were asked to remember and recall fictitious names and locations on a map (Raine et al., 2013). Multiple strategies and procedures were implemented to better see and understand how fitness affects learning (Raine et al., 2013).

This purpose was brought about through research which indicated a link between physically inactive children and certain health issues, such as being overweight, as well as decreased cognitive abilities, in terms of tasks pertaining to perception, memory and cognition (Raine et al., 2013).

3. LIST THE HYPOTHESES OR RESEARCH QUESTIONS (5 MARKS):

It was hypothesized that, in difficult situations, children who took part in physical exercise would have enhanced memory and learning (Raine et al., <https://assignbuster.com/influence-of-childhood-aerobic-fitness-learning-and-memory/>)

2013). Also, the researchers proposed that the results would show when the enhancement of memory and learning occurs; it could either be during initial learning, retention or both (Raine et al., 2013).

4. DESCRIBE WHETHER THIS RESEARCH COULD BE CLASSIFIED AS “ LABORATORY” OR “ FIELD” RESEARCH (3 MARKS):

Field research entails research taking place in a more uncontrolled ‘ real world’ environment such as a zoo. For this reason, this research cannot be reasonably classified as field research and is therefore, laboratory research because it was conducted in controlled conditions in a facility (Raine et al., 2013). This can be seen through tests which participants underwent, such as the VO2max test which required a motorised treadmill (Raine et al., 2013). It can be assumed that the treadmill was used safely inside a facility.

5. DESCRIBE THE SAMPLE THAT WAS USED IN THIS RESEARCH (5 MARKS):

The sample originally consisted of forty-nine children, aged 9-10 (27 participants were females), however, one participant was excluded from the analysis so the number of participants in the end was forty-eight (Raine et al., 2013).

6. DESCRIBE THE TYPES OF METHODS THAT WERE USED (5 MARKS):

On day 1, after giving consent, the legal guardians and participants completed a series of questionnaires, including the: Pre Participation Health Screening, Attention Deficit Hyperactive Disorder Rating Scale IV, health history questionnaire, a demographics questionnaire and the Modified Tanner Staging System (Raine et al., 2013). The last test the participants completed is the maximal oxygen consumption test which tested their

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fitness levels and determined if they qualified for the study (Raine et al., 2013). The data was then compiled and evaluated relative to the age and gender of participants (Raine et al., 2013). If participants scored above the 70th percentile for their respective age and gender then they were classified as HF – High Fit, and those below the 30th percentile were considered LF – Low fit (Raine et al., 2013). Participants scoring in between those two scores were excluded from the study (Raine et al., 2013).

On day 2 learning occurred (Raine et al., 2013). The participants were to remember the four letter names of 10 regions on two different fictitious maps (20 regions across both maps), using two different learning strategies – study only (SO) and test study (TS) (Raine et al., 2013). The participants were randomly placed in the four groups and explanations were provided regarding each learning strategy (Raine et al., 2013). The participants were allowed to practice on a separate sample map (using an iPad) and ask any questions (Raine et al., 2013).

The SO group began by looking at the names of the regions on the map for 3 seconds each, then trying to remember whatever they could (Raine et al., 2013). After this, the SO learning strategy occurred wherein participants had 6 seconds to tap on the region name located correctly on the map (Raine et al., 2013). This was done for all the regions 6 times (Raine et al., 2013). Each time, the participants were asked to remember the region names for the upcoming blocks and for the next day (Raine et al., 2013).

The TS group, were also exposed to the region names for 3 seconds and asked to remember what they could of the map (Raine et al., 2013). They

then went through the 10 regions 6 times, as the SO group did (Raine et al., 2013). Each time, the region names were displayed for 6 seconds, including a 4 second test phase and a 2 second study phase (Raine et al., 2013). In the test phase the participants were asked to tap on the map regions which corresponded to the region names, as the names were located outside of the regions (Raine et al., 2013). After this, the correct region name was displayed in the right location for 2 seconds—the study phase. Participants were asked to remember what they could regarding the region names for the next day (Raine et al., 2013).

On day 3 the participants attempted to recall the region names through either undergoing a free recall test or a cued recall test (Raine et al., 2013). A free recall test included the participants being shown a blank map, on an iPad, with textboxes on each region which they were to name (Raine et al., 2013). Cued recall consisted of participants being shown the same blank map, however, they had the region names listed, like a word bank (Raine et al., 2013). The participants then wrote the region name in the textboxes on the map (Raine et al., 2013).

7. DISCUSS THE RESULTS AND CONCLUSIONS OF THIS RESEARCH (5 MARKS):

The results showed that firstly, in the test study (TS) condition, with every block, high fit (HF) participants had an increased accuracy percentage, in terms of correct answers as opposed to the low fit (LF) participants (Raine et al., 2013). Also, the TS condition yielded the most correct answers when recalling regions on the map, as opposed to the SO condition (Raine et al.,

2013). In the TS condition, the HF group scored higher than the LF group (Raine et al., 2013). Also, HF and LF participants in the TS condition with cued recall proved to be the most efficient method which got the most percentage of answers correct on recall day (Raine et al., 2013).

Therefore, based on these results it can be concluded that physical exercise does improve learning abilities as the HF participants scored on average higher, in both SO and TS conditions, than LF participants (Raine et al., 2013). However, the learning strategy as well as the type of recall also heavily impacts whether the participants will score better (Raine et al., 2013). In this particular case the test study strategy with cued recall produced a higher percentage of accurate answers (Raine et al., 2013).

8. DESCRIBE YOUR OPINION OR REACTION TO THIS RESEARCH- BE CRITICAL IN AN OBJECTIVE AND SCIENTIFIC WAY (5 MARKS):

Overall, I think it is a sound research paper. Firstly, in terms of ethics, the researchers obtained consent from the legal guardians of the children as they were underage and seeing as they may not have understood many of the questionnaires, the researchers made sure that their guardians completed them. Also, the researchers implemented particular methods so that that harm is minimised to the participants and so participants are able to better understand the research. For example, the OMNI scale was implemented whilst the children completed the VO₂max test which allowed them to indicate to the researchers how tired they were based on pictures and participants were allowed to ask questions about anything they did not understand (Raine et al., 2013).

Although the research stands to simply prove yet again that aerobic exercise is beneficial for learning and memory, it

The only negatives are that in the sample size there is an uneven ratio of females to males and the age is restricted only to 9-10 year olds. This indicates that the results cannot be strictly generalised to the public because of the limited size and representation, however the basis of the results can be applied to those who are physically active.