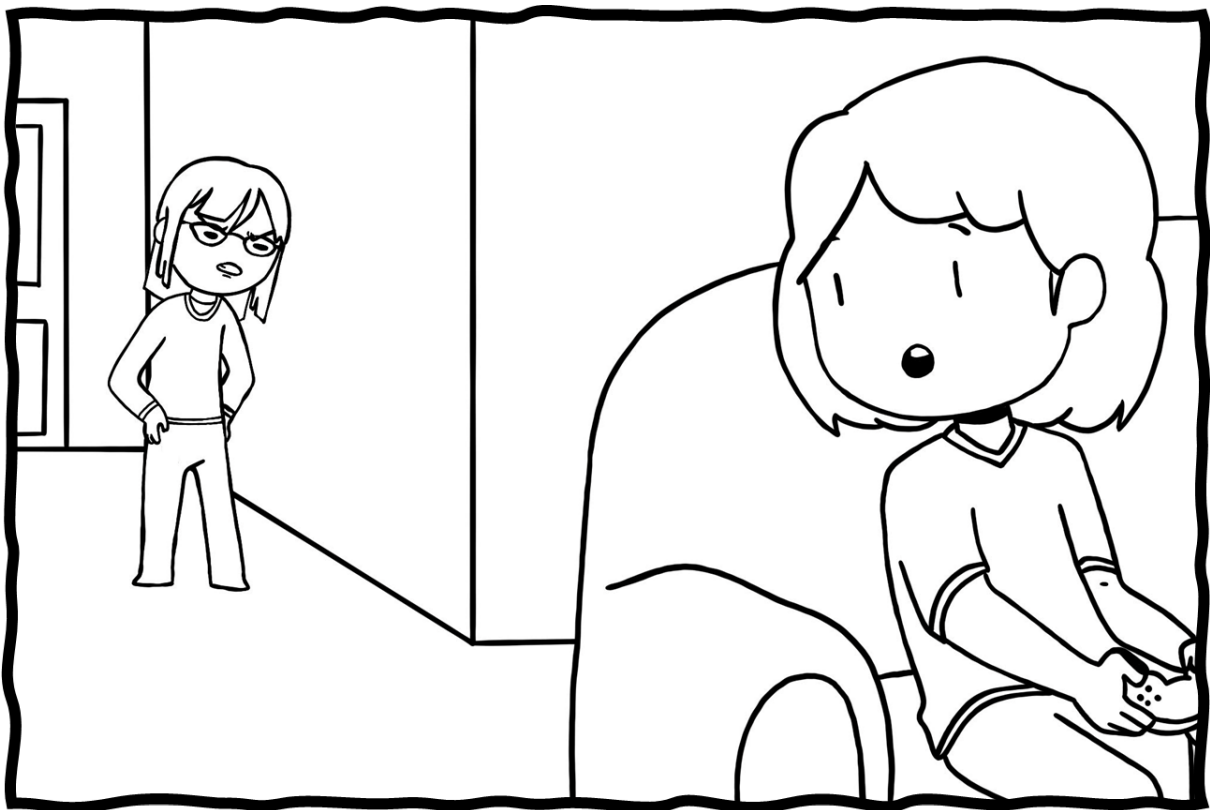


Play to learn, learn to play: short (not a) guide on how to become a professional video game player

Natalia Jakubowska

Have you ever heard that *video games are a waste of time and the only thing they will give you is a back injury*? If you were born in the 1980s, 1990s or 2000s, I bet such sentences remind you of your parents. While there is no doubt that improper sitting can affect your back, and the video games – which we often use for pure pleasure – should not obscure other responsibilities, more and more nowadays kids are thinking about linking their future with professional gaming, which does not seem as absurd as it seemed 20 years ago.



When I was a kid, my mom used to complain that I'm wasting my time playing video games. She didn't expect that my doctoral dissertation would focus on the positive influence of those. Checkmate mom!*

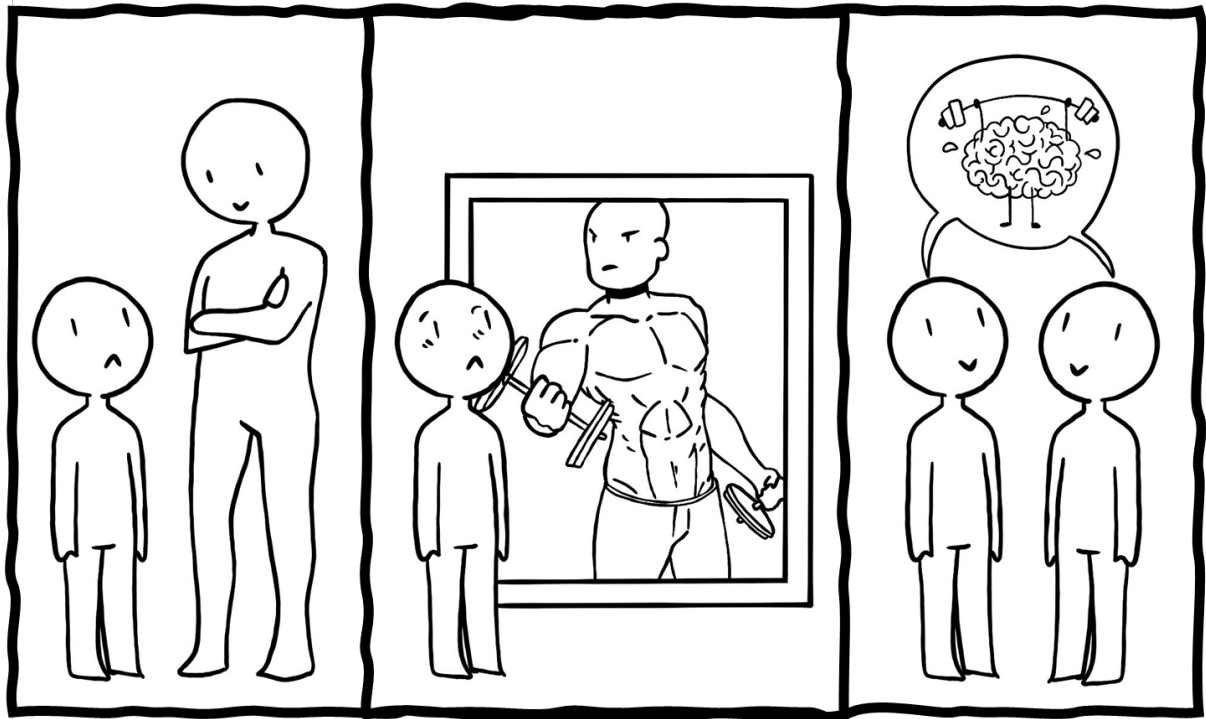
(* Obviously I'm joking. Love you mom.)

Youtube gameplay channels have enjoyed unflagging popularity for over 10 years. It turns out that we not only like to play video games, but – often in a situation where we cannot play ourselves – we like to watch other people struggling. RPGs (*role-playing games*) often give us a captivating story, comparable to a good book or movie. The ability to influence the decisions of the hero takes this experience to a whole new level.

But that's not the only option. RTS (real-time strategies), FPS (first-person shooters) and TPS (third-person shooters) players have the opportunity to prove

themselves in professional tournaments, the winning of which is not only associated with a diploma for participation, but also with huge cash prizes¹. That raises the question: **How to become a professional e-sport player?**

Similar questions may be asked by amateurs of football, basketball, volleyball and other classic sports, and in both: their case and in the case of e-sports, the answer is not simple. Video games players' results certainly do not depend on the players' height or strength. So what distinguishes professional e-sport players from average mortals? Recent research shows that it may be their **cognitive skills**.



Performance of e-sport players, unlike classic sports players, is not dependent on their physical attributes but on their cognitive functioning. In other words, whether you will be a good player does not depend on how tall or strong you are, but on how your brain works.

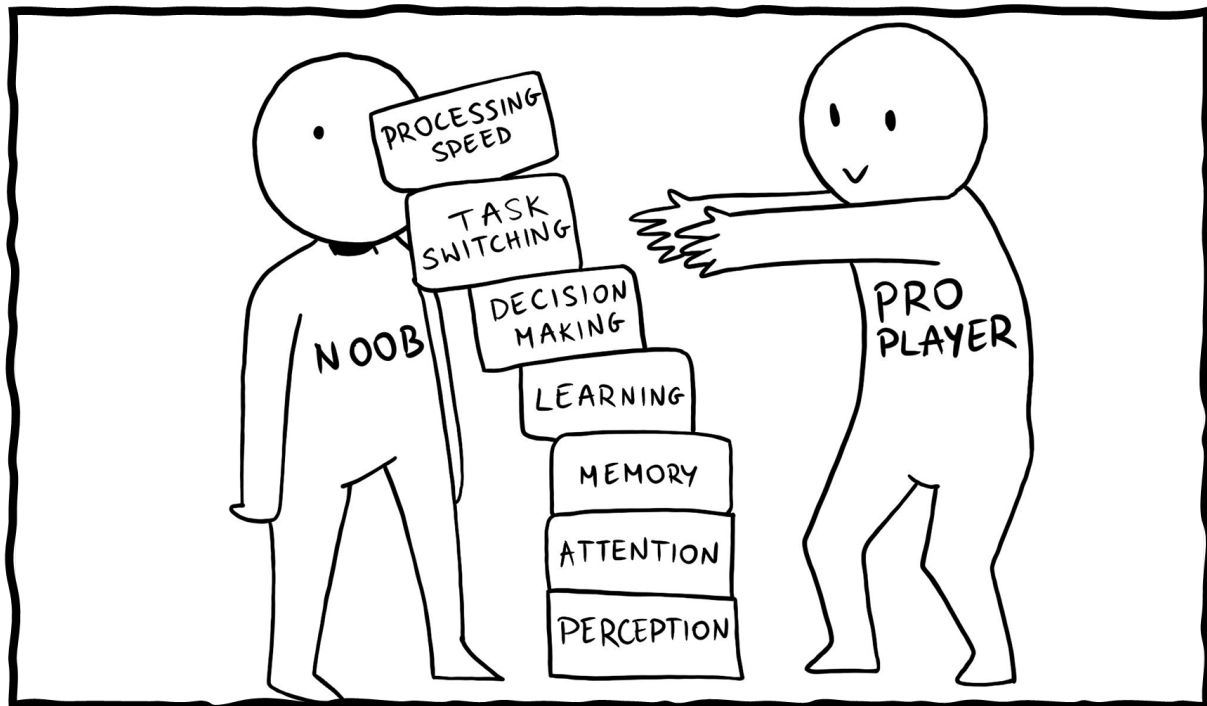
In the simplest explanation, cognitive skills are the core skills your brain uses to think, learn, remember, reason, and pay attention. Working together, they take incoming information and move it into the bank of knowledge you use every day at school, at work, and in life². Cognitive skills do not depend on the strength of our muscles (although good physical and health condition certainly affects their level), but on our brain: it's structure and the way it's working.

Research focusing on differences between the cognitive skills of video games players and non-players is nothing new in the science world. Recent studies show

¹ In 2019 the 16 years-old Kyle „Bugha” Giersdorf won 3 millions dollars in the e-sport “Fortnite” World Cup!

² <https://www.mindmattersjo.com/what-are-cognitive-skills.html>

that video game players display more efficient processing speed and task-switching ability³, attentional abilities⁴, working memory capacity⁵ and much more.



Cognitive skills are the core skills your brain uses to solve everyday activities, for example winning a RTS or TPS match. Recent studies have shown that advanced video game players have higher levels of several cognitive skills in comparison to non-players.

Knowing those facts, we can raise another question: how to train our cognitive skills to be on a good level? Sadly, this question is also not easy to answer. On one hand, studies show that playing video games can on its own improve our cognitive skills^{6,7,8}, on the other hand – the same studies show that not everyone is able to improve their skills equally effectively.

Improvement may depend on the way we are playing, on variation in training and difficulty level, but also on our natural predispositions. Some studies show that video game players' brains differ from non-video game players. For example, the grey matter of the entorhinal cortex, hippocampus and occipital areas (which are

³ Kowal M., Toth A.J., Exton C., Campell M.J. (2018) Different cognitive abilities displayed by action video gamers and non-gamers. *Computers in Human Behavior*, 88. <https://doi.org/10.1016/j.chb.2018.07.010>.

⁴ Green C.S., Bavelier D. (2012) Learning, attentional control and action video games. *Current Biology*, 22(6). <https://doi.org/10.1016/j.cub.2012.02.012>.

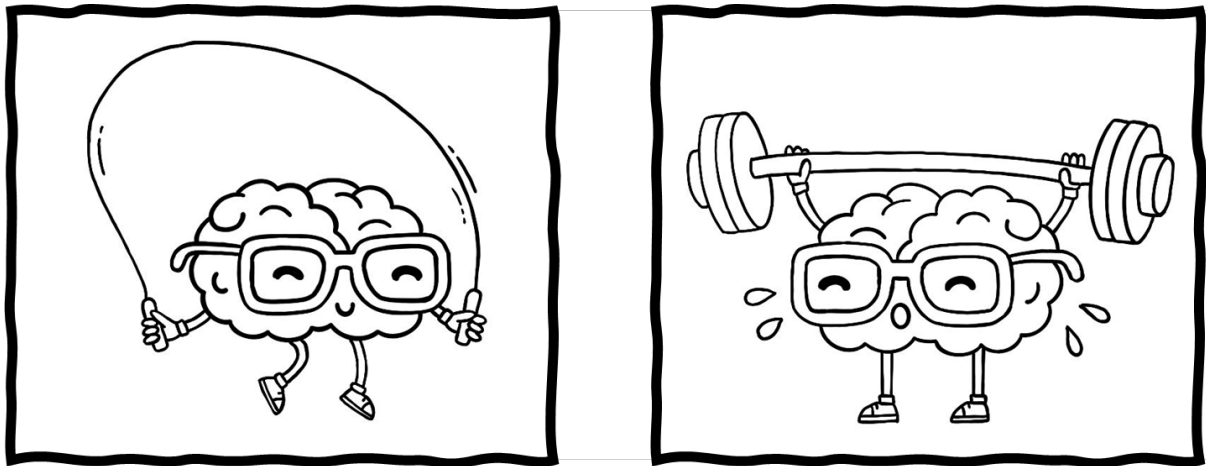
⁵ Green C.S., Bavelier D. (2006) Enumeration versus multiple object tracking: The case of action video game players. *Cognition*, 101. <https://doi.org/10.1016/j.cognition.2005.10.004>.

⁶ Jakubowska N., Dobrowolski P., Rutkowska N., Skorko M., Myśliwiec M., Michalak J., Brzezicka A. (2021) The role of individual differences in attentional blink phenomenon and real-time-strategy game proficiency. *Heliyon*, 7(4). <https://doi.org/10.1016/j.heliyon.2021.e06724>.

⁷ Jakubowska N., Dobrowolski P., Binkowska A.A., Arslan I.V., Myśliwiec M., Brzezicka A. (2021) Psychophysiological, but Not Behavioral, Indicator of Working Memory Capacity Predicts Video Game Proficiency. *Frontiers in Human Neuroscience*, 15. <https://doi.org/10.3389/fnhum.2021.763821>.

⁸ <https://www.apa.org/monitor/2014/02/video-game>

related to navigation and memory⁹ and visual attention¹⁰) was found to be correlated with the total amount of time spent playing video games. While in those cases it was not clear if the differences in those structures were a result of playing video games or an individual characteristic, different, experimental studies show that non-players' video game performance may be predicted by the size of a specific brain regions¹¹ or brain activity^{6,7}.



Structure and functioning of our brain can predict video-game players' performance. Video game players may vary depending on their innate predispositions, but the key factor seems to be the experiences and training that influence the development of the brain.

Does it mean that your potential predispositions to be a professional gamer were defined at the moment of your birth (or even earlier)? Yes and no. Remember that cognitive skills are not only trained by playing video games! There are a bunch of everyday activities which influence how your brain is developing, changing and working (so it's not the best idea to quit school and throw yourself into playing video games only). Apart from that, natural predispositions are not enough to become a professional player in any sport. After all, being tall is not enough to become a professional volleyball or basketball player. Similarly, even if you learn all the soccer tricks, you won't necessarily become a professional soccer player.

Let's go back to our original question and ask ourselves if we learned the answer. After all of our considerations, we can certainly answer that **there is no certain answer**. We managed, however, to discover another important thing: while playing video games doesn't guarantee us a career as a professional gamer, in most cases (and under certain conditions) **it can be beneficial for our brains**. Of course, we must not forget about keeping the balance between playing and all other everyday activities. Moreover, science appears to be on the good track to actually identifying potential professional players and measuring their progress. Who knows? Maybe in a few years, e-sport clubs will be equipped with a professional apparatus that allows us to observe the activity and structure of players' brains. Maybe specific

⁹ Eichenbaum H., Yonelinas, A.P., Ranganath C. (2007). The Medial Temporal Lobe and Recognition Memory. *Annual Review of Neuroscience*, 30. <https://doi.org/10.1146/annurev.neuro.30.051606.094328>.

¹⁰ Corbetta M., Shulman G.L. (2002) Control of goal-directed and stimulus-driven attention in the brain. *Nature Reviews Neuroscience*, 3. <https://doi.org/10.1038/nrn755>.

¹¹ Ericson K.I. and colleagues. (2010) Striatal Volume Predicts Level of Video Game Skill Acquisition. *Cerebral Cortex*, 20(11). <https://doi.org/10.1093/cercor/bhp293>.

e-sports players will be treated similarly to professional chess players (let's be honest – no one says that playing chess is unhealthy or it is a waste of time).

The next time you see someone playing video games, or when you decide to play video games yourself, take a moment to think about its possible influence on cognitive skills. Even if you find that this specific game is not necessarily developmental, don't worry! As long as you keep the balance between gaming and living in the real world, there is nothing wrong with having a little fun.



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