# Can Playing Games Improve Tester Skills? Exploring the Science Behind Games

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Are gamers predisposed to careers in software testing? The prevalent perception seems to be that testers enjoy playing games more than the general population, and that playing games makes us better testers by honing cognitive skills, which especially important in our field. Can it be that people who enjoy games, riddles and puzzles are indeed better equipped to handle challenging software testing tasks?

Reading blogs and tweets, and listening to presentations and discussions at conferences, there is a hypothesis – often treated as a theory – that playing games is an important part of gaining and improving tester skills, but there is a disconcerting lack of empirical evidence accompanying such claims. Our job as testers is to question unsupported statements and to put hypotheses to the test, therefore I decided to go on a quest to discover if there is any scientific evidence that playing games can improve tester skills.

**Defining Games and Play**

"Play" and "games" mean very different things to different people, and "play" especially is an emotionally loaded word. Play is generally thought of as a voluntary activity that is fun and where the primary purpose is not to achieve a specific goal. Unfortunately, play is often contrasted against work, but play is important in the work environment too. Play encourages teamwork, helps us build relationships and promotes creativity and innovation. Play is a way to learn and grow, both as individuals and teams, and should in itself never be considered a waste of time[1]. When I use the phrase "playing games" in this article, my definition of "games" is very broad, including board games, puzzle games, riddles, video games, etc.

> "play is often contrasted against work"

Before trying to answer if there is any scientific evidence suggesting that playing certain games can improve tester skills, we need to break down the question and look at one part at the time:

1. Can cognitive skills be improved at all, regardless of method?
2. Can playing games improve cognitive skills?

**Neuroplasticity**

Historically, the brain has been seen as static, a hardwired computer whose circuits are finalized in our childhood, but it turns out that the brain is anything but static – the brain is plastic and can

be rewired. Neuroplasticity refers to changes in neural pathways and synapses due to changes in behavior, environment and neural processes. It is possible to change both the anatomy (the structure) and the physiology (the functional organization) of the brain. In other words, science indicates that at least the brain can change, which means that it is plausible that cognitive skills can be improved. But can playing games change the brain?

**Current Research**

As a layman, gaining insight in to today's research on the relationship between playing games and neural development is not easy. Most studies are published in journals that the public does not have access to, and what appears in public media and easily available literature tends to be skewed and sensational. There are also a lot of readily available studies done by the very companies that make a livelihood out of providing commercial brain-training games. It's hard to believe that these studies follow the scientific method and are not biased.

> "how do you design a control group"

To make matters even worse, a lot of studies do not use a control group, and how do you design a control group for, as an example, a study on the results of playing Mastermind? What do you have the control group do? There are also studies on children that are quite long, which makes it hard to know if the improvements seen are from playing the game, or just natural learning that could happen in six or twelve months. Finally, there is the problem of sample sizes. Many studies use groups of just a dozen or so people and, as a consequence, the statistic reliability of the results is very low.

**Reasoning Skills and Speed Training**

I found one study[2] on children's learning that looked at reasoning skills and processing speed. Reasoning skills account for our ability to plan and build new relations between elements, and processing speed measures rapidness of visual detection. Reasoning represents the capacity to think logically and solve problems in novel situations, which is a very important skill for testers that are constantly faced with new and challenging situations and software behaviours we have not seen before. Processing speed corresponds to our ability to quickly process inputs and, in particular, perform quick, visual searches, something tester are frequently doing while working with a GUI or checking log files.

In the study, a group of 7-9 year olds played games for two hours per week for eight weeks. One group played twelve different reasoning games, computerized and non-computerized, individual and collaborative. The second group played twelve speed of processing games.

The children's cognitive skills showed large improvements, and the group that played reasoning games only improved their reasoning skills, whereas the group that played speed of processing games only improved their processing speed, which shows that the processes are independent. The results of the study implies that reasoning and processing

speed can be improved, at least in children, and those skills are important to testers. But does it transfer to adults? A lot of the research turned out to be focused on children's learning, but I did find an interesting experiment that was focused on adults – Brain Test Britain.

**Brain Test Britain**

The Brain Test Britain experiment[3] was conducted through Lab UK[4], which is a BBC website that encourages citizen science and invites the public to participate in groundbreaking scientific experiments. The Brain Test Britain experiment was a full clinical study launched in 2009, designed by researchers at the University of Cambridge and Kings College in London.

13,000 people spent ten minutes three times a week for six weeks playing brain-training games. The participants were split into three groups:

1. One group playing reasoning games
2. One group playing non-reasoning games
3. One control group

This study only looked at computer-based games, and the control group did tasks that involved using the Internet but not any actual brain training.

The study found no evidence that playing brain training games transfers to other brain skills. "Practice makes perfect" – playing a specific game makes you better at…that particular game, but playing games doesn't make your smarter, or boost your brain power.

**Conclusions**

I looked at additional studies with completely different setups, using both computerized and non-computerized games, with people playing games both individually and collaboratively. There is definitely scientific support for the idea that playing games can improve cognitive skills such as:

1. Procedural skills
2. Debugging skills
3. Visual search skills
4. Attention skills
5. Reasoning skills
6. Processing speed

However, the transfer out of context appears to be limited or even non-existing, and the reliability of the studies can be questioned. Nonetheless, there seems to be no doubt that the brain can change. So, is there any point in playing games or should we stop playing? Whether playing games makes us better testers or not, there are other benefits to consider too:

1. It's FUN!
2. Games can be used to provide a safe environment in which people can learn to be skeptical and questioning.

I set out to decide if there was any empirical evidence that playing games makes us better testers, and even though I think the information I found was inconclusive, I will most certainly continue playing games.

[1] "Play: How it Shapes the Brain, Opens the Imagination, and Invigorates the Soul", Stuart Brown, Penguin Group, 2009

[2] Developmental Science 14:3 (2011), pp 582–590

[3] https://ssl.bbc.co.uk/labuk/experiments/braintestbritain/

[4] https://ssl.bbc.co.uk/labuk/

**About The Author**

After finishing her PhD in Physics at Stockholm University, Christin Wiedemann began working as a software developer. Christin soon discovered that software testing was more challenging and joined the Swedish testing company AddQ Consulting. There, she worked as a tester, test lead and trainer, giving courses on agile testing, test design and exploratory testing throughout Europe. Christin developed a course on exploratory testing and is a co-creator of the exploratory testing approach xBTM. In late 2011, Christin moved to Vancouver, where she joined Professional Quality Assurance (PQA) Ltd. In her roles as tester, test lead, trainer and speaker, Christin uses her scientific background and pedagogic abilities to continually develop her own skills and those of others.