Does the way we use software affect the way we think? I think the answer is Yes. We become used to doing things certain way and in a certain order. This has impacts upon the way our thoughts flow; With the procedural requirements of the software sometimes coming ahead of where our thoughts may lead. The fact that I am writing this on a piece of word processing software means that I've had to learn and adhere to a certain range of procedural rules created by somebody else. This has a significant impact on the way I think and on the way that I interact with it. My thoughts become constrained by the limitations of the software and by the fact that I have to adhere to a specific routine in order for it to be successful.

Procedures and structures are not a new thing for us, however. The fact that we use common language, shared ideals, et cetera show that we have structure thrust upon us from a very early age, it is the backbone of what we will consider civilization, culture and society.

(Joseph Firth, 2019) work suggests that individuals are already showing the influence that technology house on brain structure and functioning. He drew upon a range of psychological, psychiatric, and neuroimaging findings to examine how the Internet may be changing our cognition. He suggested that not only were new motor skills being developed, but the very way that we thought and process information was undergoing a radical and significant change. He suggested that neuroplasticity is reduced and that cognitive decline can be measured. Ironically, in older individuals the process of learning to use software and the Internet actually increases neuroplasticity and increases what he calls the cognitive reserve. Firth uses an interesting phrase: he called it “super-normal stimulus”. in an experiment using MRI, there was an investigation into the dorsal and ventral streams, with the ventral stream storing specific content, and the dorsal stream controlled external location of incoming information. It was discovered that there is no difference in the activation of the dorsal stream, but the ventral stream the water stream was vastly reduced. The findings support the possibility that online information gathered was faster, was insufficient to trigger brain regions for storing the information on the long term basis. If this is the case for the Internet, then software almost certainly does something similar.

There are different ways more recently developed that allow us to be far freer in the way that we interact and use the software; In particular the dictation function frees me from the constraints of a keyboard and allow me to think, and speak in a less constrained manner. This particular piece of work has been written using dictation, and at no point was a keyboard actually used. Despite this freeing effect, there were still rules that I have to follow in order to use this adaptation. I need to define my punctuation and grammar, telling the software why I wish to have commas, full stops etc.

I think that the suggestion the software is political can be slightly misleading. I would prefer to think of it as the fact that even the creators have an agenda and it is impossible for them to not use personal preferences and work flows within a product. At the end of the day, we're only human and we always bring ourselves to the table. Is there a solution? Possibly. The article suggests that open-source software can be if not a remedy, then it may give us an alternative way of working. The true alternative will be for us to write our own software and interact with it in a way that we would prefer. Unfortunately, how many of us have time to write a word processing application?

In an ideal world, open source software would be flexible enough for the user to work in any way that they felt was appropriate. Unfortunately, the reality is that we are still forced into using and interacting with technology in a very specific way. Despite improvements and changes in the interface and the points of physical contact with our hardware, we are still locked into using a workflow that may not necessarily be the right one for us.

The fact that I personally do not consider the impact of learning new software on cognitive function is something that initially I was unconcerned about, but the more I have considered the matter I do believe it is an area of alarm, although alarm is probably the wrong word. Let's say instead that I am suddenly sharply aware of the changes in my thought process is when I am using technology to help me. This may have an impact on my creative process too as I am similarly constrained by the limitations of the software and the structures that are enforced upon me by the creators. The only logical solution would be to create the tools that I need myself. Unfortunately, I'm going to have to learn how to programme very quickly to make my own tools!

Humanity are obligate tool makers, and we have done so for the past three million years. In the 21st century we still make tools, only now they are made of code and binary and our connection to the physical world is diminishing as technology invades every aspect of our lives.

# Bibliography

Joseph Firth, e. a., 2019. The “online brain”: how the Internet may be changing our cognition. *World Psychiatry,* 18(2), pp. 119-129.