

## THE INTERNET AND ITS IMPACT ON OUR COGNITIVE ABILITIES

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### ABSTRACT

Throughout the course of human history, the Internet has been the technology that has gained the most extensive and rapid adoption. How we find information, enjoy media, and keep track of our social networks and connections have all been revolutionized by the widespread usage of the Internet. This revolutionary change has occurred in just a few decades. Internet connection has become portable and widespread, to the point where the population of the industrialized world can be said to be "online." This is a result of the even more recent arrival of smartphones. It is abundantly obvious that the Internet has had an impact on a variety of facets of contemporary society. On the other hand, the influence that it might have on the structure and functioning of our brains continues to be a primary focus of research. This paper will try to shed light to this complex topic and bring forward the most important issues that we should keep in mind when dealing with such a phenomenon.

**Keywords:** *Internet, cognitive, ability, technology, society.*

### INTRODUCTION

Here, using data from neuroscience, psychiatry, and psychology, we take a look at some basic theories on how the Internet might be influencing human cognition. We zero in on the following areas to see whether the unique features of the internet are impacting them: a) our ability to focus, since the constant flow of information on the Internet makes it hard to maintain attention on a single task for very long; b) our memory and how we store and retrieve information; and c) our social cognition, because the Internet is influencing our social lives in new ways, including how we view ourselves and our self-esteem, due to the fact that online social settings can mimic and even mimic real-life social processes. The Internet seems to have the ability to bring about both short-term and long-term changes in all of these areas of cognition, which could be reflected in corresponding changes in the brain. Given the existing state of knowledge, this is the overarching conclusion that can be reached (Anderson M, Jiang J., 2018). But, comparing the cognitive effects and brain effects of Internet use in older adults with that of young individuals whose brains are still developing is one of the most pressing issues in the field and a top priority for future studies. We conclude by proposing a method for Internet research to be integrated into broader research frameworks, with the aim of studying the long-term effects of this hitherto unstudied social phenomenon on human cognition and the brain..

It is unclear, however, how much time spent in front of screens and this new medium for connection, information, and communication are influencing our brains and cognitive functioning. Even before the rise of the Internet, a large amount of research had proven that the brain can adapt to certain stimuli and demands, especially when it comes to learning new processes, thanks to its neuroplasticity (Draganski B, Gaser C, Kempermann G et al., 2006). This was especially the case when it came to picking up new procedures. Research has shown that the human brain's neuronal circuitry can undergo permanent modifications in response to a variety of stimuli. Some examples of such situations include learning a new language, picking up a new skill (like juggling), or even just getting ready for a test. There may be changes to neural pathways in the brain as a result of the possibility and need to learn a broad array of new skills and ways to connect with society brought about by the global proliferation of Internet use. Research has shown that even short periods of time spent using a smartphone's touchscreen to access the Internet can cause long-term changes in brain function. Cortical areas involved in sensory and motor processing of the thumb and hand undergo neurological modifications, leading to these abnormalities. Furthermore, the Internet offers a unique platform for the almost

unlimited acquisition of new knowledge and intricate procedures that may be utilized in both the virtual and physical realms (Draganski B, Gaser C, Kempermann G et al., 2006)..

## **REPERCUSSIONS ON THE COGNITIVE CAPABILITIES**

Based on the review, Firth et al. al (2019) discovered three primary effects that excessive usage of the internet has on cognitive functioning. To begin, prolonged use of the internet does, in fact, result in physical changes in the brain. When researchers looked at people who used the internet frequently, they discovered that these people had a higher level of activity in the right prefrontal cortex and performed badly on activities that required them to pay attention to distractions. Because the right prefrontal cortex is essential for maintaining attention, researchers have come to the conclusion that individuals who spend a significant amount of time on the internet make higher use of their cognitive resources in order to avoid distractions when they are working on projects. The brain may be taking resources from other regions of the brain that should be utilized to promote achievement, which leads to poor performance. This increased effort to avoid distractions leads to poor performance (Gindrat A-D, Chytiris M, Balerna M et al., 2015). There is a need for additional research to identify and define the physical changes that occur in the brain as a result of technology and internet use; nonetheless, researchers have discovered that excessive internet use has negative impacts on brain function.

The second finding is that researchers have discovered that internet searches have an effect on the acquisition and retention of information. During the process of information acquisition that took place online, it was discovered that the ventral stream, also known as the "what" stream of information processing, was reduced in strength. Additionally, it was discovered that individuals who use the internet to seek for various tasks could not remember the information that they obtained from their internet searches. Researchers have a strong suspicion that the essential neurological processes that are crucial for the retention of information are either being disturbed or not occurring at all when they rely on internet searches to acquire and access information. It has been established by other research that individuals may rely on the internet for the acquisition and access to information, which in turn causes individuals to become dependent on the internet for the storage and utilization of information when it is required.

## **INTERNET AND PEOPLE'S MENTAL HEALTH**

In conclusion, excessive usage of the internet has been linked to issues related to mental health. According to the concept of social cognition, individuals interact with one another on the internet by following social media accounts, enjoying and sharing postings, and commenting on the information that is created by other individuals. The use of these measurements has made it possible for individuals to systematically evaluate themselves in comparison to other people, which might result in the development of issues related to self-esteem. For instance, a person who uses social media may suffer poor self-esteem if they believe that a post or comment they made online ought to have received a significantly greater amount of attention than it actually did. The pressure to reach unreasonable standards is a typical source of stress for young people who use the internet. Body dysmorphia is another common experience among internet users. It is possible for young people to have feelings of uncertainty and despair as a result of seeing and consuming different media trends across numerous platforms (Osterhout L, Poliakov A, Inoue K et al, 2008). It is difficult to establish a causal relationship between the use of the internet and mental health problems because there are a variety of other factors that have an effect on mental health. However, researchers are attempting to better discern the contributions of internet use on mental health in order to make recommendations on how to use the internet in a healthy manner.

When the Internet is considered to be a cognitive augmentation, this is understood to indicate that it assists individuals in enhancing their present cognitive capacities, such as those of acquiring, processing, and organizing information. This is because the Internet provides rapid access to a massive amount of information that is diverse in nature. The relation between information and knowledge is frequently and unproblematically equated. From the perspective of Persson and Savulescu, knowledge and its expansion are considered to be upgrades since they "provide [individuals] with means of improving their standard of living". This is because they enable individuals to pursue their goals in a manner that is both more effective and more efficient. Furthermore, they assert that "connection of minds and

information through the Internet seem the most realistic means of substantial cognitive enhancement" (Perrin A, Jiang J., 2018). This is a claim that they make. The relationship between extensive social collaboration and access to knowledge is the characteristic that distinguishes the Internet as a unique technology, one that has the potential to significantly improve human intellect. When information is already accessible and can be processed, collaborative information sharing and structuring can be cognitively beneficial; however, this is only the case when the information is already available.

The Internet has become the most extensive and widely available source of knowledge in recent years. Not only does it make it possible to access information, but it also makes it possible to generate information at a rate that has never been seen before. This is made possible by the ever-increasing computer and processing capacities within it, as well as the opportunities it affords for both human and non-human expression.

According to the Global Digital Report 2019, which was entitled "We Are Social," about three and a half billion people access the Internet through various social media platforms. It is true that all of the major digital platforms, such as Google, Facebook, and Twitter, serve as gatekeepers, which means that they organize and organize the content that is available online. Most of the time, algorithms are the ones that are responsible for the process of organizing information (Perrin A, Jiang J., 2018). Neither the prioritization of honest information nor the enhancement of its visibility and accessibility are among the goals that these algorithms are designed to achieve. They are designed to maintain engagement by disseminating content that either incites indignation or generates the greatest amount of advertising revenue (Perrin A, Jiang J., 2018). As a result, the information is shaped for the goal of advertising optimization or for user interaction; nevertheless, the public is not privy to the process of structuring the information because the algorithms that underlie it are considered to be protected intellectual property (Perrin A, Jiang J., 2018). As a consequence of this, the more the network expands, the more information is produced, transferred, and accessed, the more challenging it becomes to track down information that is actually true or helpful and that could lead to the acquisition of knowledge. We will continue our investigation into the ways in which the algorithmic organization of information leads to the spread of false information on the internet, as well as the ways in which it affects the cognitive capabilities of users in the following section.

Internet use can cause temporary and permanent alterations in specific parts of the brain, according to a multinational team of researchers from Western Sydney University, Harvard, Kings College, Oxford, and the University of Manchester. These alterations may mirror neurological shifts that influence our ability to focus, remember, and engage with others.

The preeminent international publication for psychiatric research, *World Psychiatry*, published the first review of its type. The researchers looked into popular theories about potential changes to mental processes brought about by the Internet. More specifically, they looked at how much new evidence from neuroimaging, psychology, and psychiatry lent credence to these theories.

The evidence was compiled in order to produce revised models regarding the ways in which the Internet may influence the structure, function, and cognitive development of the brain. Dr. Joseph Firth, Senior Research Fellow at NICM Health Research Institute.

The most important takeaway from this research is that prolonged exposure to the Internet may have an effect on several brain processes. For instance, Professor Firth argues that our ability to concentrate on a single job may be diminished due to the endless flow of Internet-based reminders and notifications, which pushes us to constantly keep a divided attention.

On top of that, the internet has given us access to a mountain of information that is both constantly updated and extremely vast in scope. You can access this resource with just a few clicks or swipes at any time.

It seems like this could start altering how society and the brain store and even value facts and knowledge, considering that most of the world's factual information is now literally at our fingertips.

Some parents and educators are worried about the impact of these new digital tools, particularly social media, on their children's development and education. Children under the age of five should not spend more than one hour a day in front of screens, according to 2018 recommendations from the World Health Organization. More study is required to ascertain the pros and cons of Internet usage among youths, since the report also revealed that most studies investigating the impact of the Internet on the brain have been carried out in adults.

While more study is needed, Dr. Firth suggests that we can mitigate the risks by making sure kids aren't deprived of other important developmental opportunities, like physical activity and social interaction, due to their excessive screen time.

According to the researcher, there are now a plethora of apps and software programs that can help parents and carers limit their children's access to certain websites and content on their smartphones and computers. This can help establish "family-friendly" rules regarding the amount of time children spend on these devices and the content they access.

Additionally, it is crucial to have frequent conversations with children regarding the impact of their online life on them. This will help identify youngsters who may be vulnerable to cyberbullying, addictive behaviors, or even exploitation, and allow for prompt intervention to prevent negative consequences.

Among the individuals who have expressed concern about the possible consequences of excessive Internet use on the brain are Professor Jerome Sarris, Deputy Director and Director of Research at the NICM Health Research Institute at Western Sydney University, the other senior author of the article (Anderson M, Jiang J., 2018).

The university lecturer voiced several worries about the Internet's overwhelming amount of stimulus and the resulting difficulty focusing.

Along with the increasing #Instagramification of society, this could alter the social fabric of our society in addition to the brain's structure and function. As far as I'm concerned, this is correct.

"Internet hygiene" techniques, such as reducing online multitasking, ritualistic 'checking' behaviors, and evening online activity, while engaging in more in-person interactions, and mindfulness and focus practice can help mitigate the negative effects of heavy Internet use, suggests Professor Sarris.

The study's co-author and Oxford research fellow, Dr. Josh Firth, made the following comment: "It's evident the Internet has radically transformed the possibilities for social connections, and the situations within which social relationships might take place. Therefore, it is of the utmost importance to comprehend how the internet can potentially impact our social functioning and identify the areas of our social behavior that are likely to change and those that are unlikely.

Even though the internet and social media platforms can offer a wealth of knowledge and a sense of community, they also have the potential to have a negative impact on the relationships that people have with one another. The researchers at the University of British Columbia in Canada conducted a controlled study in which they discovered that when individuals bring electronic gadgets to the dinner table, it causes them to become engrossed in their attention and results in a loss of personal connection (Anderson M, Jiang J., 2018). It was established, using a scale with seven points, that individuals who were distracted by their phones or other electronic devices while they were seated at the table reported experiencing less enjoyment than those who did not have such distractions. On top of that, individuals who were having a face-to-face encounter at the table while using their electronic devices reported experiencing less satisfaction and involvement than those who were not using their gadgets. If this is the emotional experience that adults have when they are participating in a social engagement that is disrupted by diversions from social media, then it is reasonable to anticipate that it will have an even more significant influence on children and the connections that their minds create while they are still developing (Small GW, Moody TD, Siddarth P et al., 2009).

## **GOOD VS EVIL**

Do not be concerned about the effects that using the internet can have on the brain, even though they may appear to be rather severe. A tool that is getting increasingly utilized, whether at work, schools, or even out in businesses such as restaurants and retail stores, technology and social media is a necessary evil. This use of technology and social media is becoming increasingly prevalent. If you are a parent and you are attempting to restrict the access that your children have to social media, it may appear to be an intimidating task, but it is actually quite simple! Children's minds are still developing, and they require continual stimulation in order to function properly. This is one of the primary reasons why children are often drawn to the distractions that the internet and social media provide. Spending time together as a family is a great way to replace the excitement that comes from using the internet. It is possible that playing cards and board games could serve as a suitable substitute for video games and involvement on social media.

According to research conducted by the Harvard School of Medicine, spending time outside can bring a number of benefits, including increased healing, improved mood, and enhanced attention, as well as the benefits of adequate exercise and vitamin D. In addition, the establishment of "tech-free zones" within the home, such as bedrooms and the dinner table, can be of assistance in managing the amount of time that is spent on social media. Although these actions may appear to be insignificant, they have the potential to have a significant influence on children as they develop into adolescents and adults. According to a number of studies, having family dinners without the interruption or distraction of electronic devices and social media can lead to a reduction in the incidence of substance addiction, sexual activity, suicide, violence, and academic difficulties in later life.

It is essential for parents to restrict the amount of time their children spend on the internet, despite the fact that this is a challenging endeavor. Additionally, we must be aware of the social media interactions that our children are participating in. An excessive amount of time spent on social media has been shown to increase the likelihood of mental health issues such as depression and anxiety, as well as attention and physical health issues, in children and teenagers.

The use of social media during school hours is detrimental to academic performance, and research has shown that individuals who spend more than two hours per day online are more likely to suffer from depression and suicidal ideation than those who spend less than two hours online. In addition, the persistent pursuit of acceptance through likes and open comment boards puts young people at a greater risk of being bullied, shamed, and subjected to peer pressure (Perrin A, Jiang J., 2018). These behaviors can result in issues related to mental health, inaccurate views of other people, and even long-term damage to personal relationships. In point of fact, females between the ages of 8 and 12 have been found to have a negative link with their social well-being, and those who have a significant presence on Facebook have been found to have a higher correlation with antisocial conduct, mania, and aggressive tendencies. Despite the fact that all of this may appear to be overwhelming and a little bit gloomy, there are also wonderful benefits to allowing children to use social media, provided that they are watched properly.

People who have access to social media can connect with their friends and family all around the world and can also provide opportunities for them to meet other people who share their interests. In addition to being a creative way of expressing oneself, it can also function as a platform that assists introverted adolescents in reaping the benefits of social networking (Perrin A, Jiang J., 2018). The internet has the potential to be entertaining, which can lead to a favorable reception inside the brain. Additionally, it has the ability to provide possibilities for real-time interactive learning due to the ease of access and abundance of new knowledge.

There is no way to stop the proliferation of social media, which is expanding into every aspect of everyday life. Because of this, it is essential to recognize the benefits that the internet offers, and it is also essential to remember to take breaks from social media and investigate the connections, interactions, and events that are occurring in your immediate environment.

Prior to the advent of search engines like Yahoo and Google, the process of looking for information required more effort. It required a lot of work to carefully develop a precise query, as well as understanding the different kinds of sources that could be used. Transportation to a library was required on a regular basis. When people had exhausted all of their efforts to locate a certain fact, they made sure to record it in some way, whether it was on paper, in their computer, or in their memories (Perrin A, Jiang J., 2018). They were aware of how difficult it would be to locate that knowledge once more. Searching for knowledge in the modern era is an entirely different experience. You make your way to the nearest technological gadget and search for the answer to your inquiry on Google. In a matter of seconds, an answer to your inquiry will be presented to you, and it will come from a wide variety of sources. There is a disagreement among cognitive scientists and psychologists over whether or not the ease with which information can be found has an effect on the way in which and the type of knowledge that is stored in the brain.

## CONCLUSION

We are now doing a massive experiment that includes widespread Internet usage among the whole global population, and the results could be beneficial or bad. It is critical to undertake a more thorough investigation in order to have a more complete comprehension of the societal impacts of this usage in the long run. Standard components of national

data projects may include measuring the frequency, duration, and types of Internet usage. Internet data collection in "biobank" evaluation protocols, for example, could help with this. This data could come from devices or self-report measurements. Researchers may be able to determine the effect of Internet use on mental health and brain function across whole populations (instead of just the small study samples used now) and account for all the potential confounding variables by integrating this with the large amounts of socio-demographic, genetic, lifestyle, and neuroimaging data collected by certain ongoing projects.

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