Technology and Digital Media's Impact on Attention Span in Teenagers and Young Adults

AP Research

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Introduction

Social media has been prevalent around the globe in teens and adults alike leading to social media usage developing over the years. Attention span has become more and more researched to see the developing relationship between social media and attention span. Although there have been thoughts as if social media truly has an impact on attention span, this is only speculative as no official research confirms a causational relationship between the two variables. Attention span is defined by the Oxford Dictionary, as "The amount of information that the mind can be conscious of at a given moment, or the number of items it can reproduce." Additionally, social media is defined as by the Oxford Dictionary, "Websites and software programs used for social networking and entertainment." Surveys suggest that more than 90% of teenagers in the United States use some sort of social media from TikTok to Instagram which could cause changes in their attention span. With the addition of newer technology, social media usage has grown a profound amount. As more people are spending time with their technology using social media and digital media applications. There could be effects shown in many aspects of society such as school and quality of life in general. This leads to the research question: How does the heightened utilization of social media lead to decreased attention spans in both children and adults?

Literature Review

First when addressing "Social Media Impact on Attention Span". Social media affects adolescents and children in many different ways. Social media platforms such as Facebook,

Instagram, and TikTok are a constant part of adolescents' lives. Constant usage of these platforms creates an inverse relationship that as social media usage increases attention decreases, this helps to show the many implications and causes for concern involving children using social media. (Carstens, 2018). Kenneth E. Moyer's work on "The Concept of Attention Spans in Children " shows how understanding attention spans can help us better know what children's development will look like. Moyer shows the nature of attention spans and how technology can inhibit or change development in children professing a claim very similar to that in Carstens research. With Moyers's research, we can get a strong basis of what technology's impact on children is and how educators, parents, policymakers, and mental health professionals are all people in society that can help fix the problem (Moyer 2001.) "Adolescents and Digital Media" by Yolanda (Linda) Reid Chassiakos is a research paper that dives into how digital media consumption in this day and time is very high for children of various ages. Examining how different forms of digital media, including TV, video games, and mobile devices, may contribute to changes in attention span. This information shows how children use a variety of different types of digital media every day and that even with the increased usage of digital media, Chasakos claims that there is no significant effect on attention but rather on the children's outside lives as digital media is hurting their lives in the real world, causing them to not develop to be independent and fostering unhealthy habits that revolve on using their digital devices constantly.(Chassiakos, 2008). Carly A. Haxel's research on "Technology Screens and Effects on Attention" disregards this claim using quantitative data from existing studies investigating the relationship between screen time in all types of technology and attention span. By using different types of technology Haxel concludes children's attention span for many different digital devices such as smartphones,

tablets, computers, etc. Her conclusions from these different devices being tested on many students show a correlation between increased usage of technology and the decrease in attention span over time in most devices, but she still highlights the need for more research on devices and applications that are reliably new and similar to that of Chassiakos (Haxel, 2015). Nitesh Tripath's research focuses on the broader psychological effects of screen-based media technologies. He goes into how children's brains are changing due to the presence of screen-based technologies as he could monitor changes in their brain structure due to prolonged usage of digital devices. He noticed that people who are addicted to short-form videos seek immediate gratification and this could be seen in their brain as parts of the occipital lobe that control vision would light up brighter in those addicted to social media compared to those who aren't addicted. These results were collected while they watched short-term videos. He also notices how on social media platforms desensitizing content is very prominent. Tripath realizes that those who have been watching short-term videos and are used to this desensitizing content are not affected by things that are shown such as death and injury compared to those who don't use social media. He then uses psychological descriptions to help show the problems associated with screen-based technology over some time and prove that social media can cause less emotion when being shown disturbing or hurtful images to those who use it regularly(Tripath 2019) There was also research that focuses on the broader psychological effects of screen-based media technologies that show children's brains are changing due to the presence of screen-based technologies. The "Adverse effects of screen time in children and adolescents" by Gadi Lissak explains the psychological and physiological consequences of technology use on children involved. It states that " In 2011, 52% of 0 to 8-year-old children had access to a mobile device ".

This research goes into the potential risks of technology on children what has been done to cause such a decrease in attention span over the decade and how the increased prevalence of mobile devices globally has given children more of a chance to be exposed to digital media at an early age. Lissak also looks into the importance of social norms as around the globe people are using social media to highlight the best part of their lives and showcase what they want to the world. This has led to many pursuing this usage of digital media as a form of expressing themselves which is not a promising endeavor for those who are young (Lissak, 2017).In addition, "The Effect of Daily Internet Usage on a Short Attention Span and Academic Performance" by Herr Andrew Fillmore goes into how increased digital media usage can cause changes in attention span and academic performance. He validates this by taking notes on students who are avid users of social media and students who don't use social media regularly and compares their grades. Although many different factors can influence academic performance. He makes sure that there are no conflicting variables by offering incentives to study for an exam that he created for all students. This way they would all be motivated to study and do well. With this Filmore realized that there is a correlation between increased social media usage resulting in decreased academic performance as those who were avid users of social media were addicted and did not put time into their studies for this exam (Filmore,2014). Similarly, "The Effects of Social Media Usage on Attention, motivation, and Academic Performance" by Bianca A Barton goes into detail on how social media affects multiple parts of people's lives, not just attention but aspects of people's personalities. Increased usage of social media in this study led to laziness and no productivity in people's lives. This created a lack of motivation which impacted their future on a large scale. Without changes to this, people's livelihoods are at risk due to social media addiction that

follows them wherever they go. Barton also goes into social media as a recurring cycle that continues for time on end, and when you finally realize to cut back on social media- you can't since it's all that takes up your mind and time every day.

Method

To answer the question of how does the heightened utilization of social media lead to decreased attention spans in both children and adults? A five-question survey was created in Google Forms for the current AP seminar students at Reedy High School in Frisco TX. This was created so that an accurate representation of teens could be pulled and the results found would correlate with that of others around the world. The survey was designed so that the correlation between attention span and usage of social media was reliable so that conclusions could be drawn. At first case studies as well as correlational research were options however after a more in-depth look at the methods that are feasible case studies looked less and less appealing due to the need for permission and other requirements that make this type of research ethically and normally feasible. So a correlational study using a survey would be the best option as it is easy to gather large amounts of data in a short time. The survey was also organized so that you would be able to see the correlations people feel between attention span and their level of social and digital media usage in their own opinion. Choosing a survey was also the best option because I needed a way to get information in large quantities without going into the personals of people participating as this was not an experiment. This also was beneficial as a survey I will be able to not put my personal bias into the study and can't interfere with the respondent's answers allowing for more accurate results as well. With a correlational study, I can compare the results from my survey to

those of other people around the world forming a correlation between the two and forming a reasonable conclusion. The link for the survey was provided to all AP seminar students so that they would be able to answer the questions on the survey as well as giving me reliable and correct data in the process. But this survey could be shared with more people who attend schools all around the world as social media is global and would be showing the same results or that similar to those of other students in the survey conducted. In the survey, we had participants first talk about how many hours they think they spend on social and digital media every day. With this information, we form graphs and other necessary ways to represent the information compared to how high they think their attention span is. The next question involves asking the participant how often they think social media interrupts their studying. This information also allowed me to conclude that participants are feeling disrupted and how this shows the usage of social media can affect people's attention spans. Most of the questions asked show how specific people who are answering high social media usage on one section answer high on all the sections regarding social media's impact on them, exemplifying that correlations can be made with the data provided and this data can be used to compare with other studies conducted on a wider scale. Additionally, just to make sure that my results were not by chance and would solve my research question, chi-square analysis was utilized as a means of checking the data. The Chi-squared test allows for an in-depth look into creating a causation relationship between social media and attention span as this allows for a direct relationship rather than correlation. If the chi-square analysis value happens to be bigger than the critical value that we will see from the chi-square table we can conclude that the relationship between social media and attention span leans towards causation rather than if it fails where there is correlation.

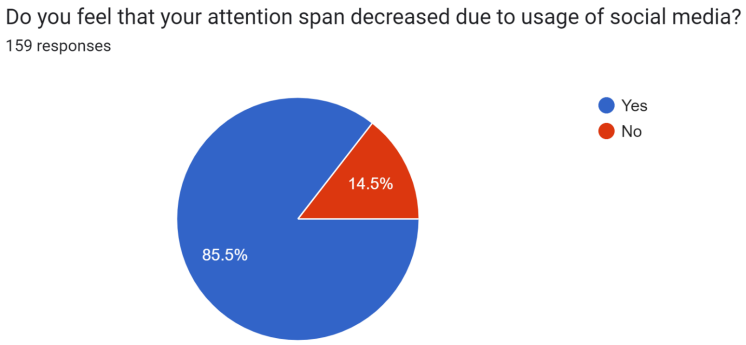
Materials and Procedure

There are many different tools I utilized during my research. First I used Google Forms to conduct surveys that give me some insight into what the population is thinking. I also used Google Sheets allowing me to organize my results creating efficient information management. There was also the need to use the tools of tables and graphs allowing for a better representation of my data in a way that people can understand and utilize. An additional tool that was utilized was already made chi-square analysis tables that allowed me to use values that correlate and solve my research question. Some other resources that were readily available and easy to use were databases of peer-reviewed journal articles. Websites such as Pubmed and SciHub allowed for the finding of reliable information.

Results

Upon analyzing the data collected from the survey administered to Reedy High School AP Seminar students, a significant correlation emerges between increased social media usage and decreased attention span. The findings reveal that individuals who report spending more time on social media platforms tend to exhibit lower levels of sustained attention and increased susceptibility to distractions. We can see this through the Google form questions asked in the survey on their personal feelings of how social media is a part of their life constantly, as well as the sample size of 159 people allowing for me to get valuable data on their social media usage.

These questions show the potential impact of frequent exposure to social media on cognitive processes, particularly attentional control. Furthermore, these results align with existing research studies, which have consistently demonstrated a link between heightened social media engagement and diminished attentional capacities across various age groups and populations. Thus, the evidence gathered from both the Reedy High School and comparisons with prior research findings supports the hypothesis that increased social media usage is associated with a decline in attention span specifically for adolescents.



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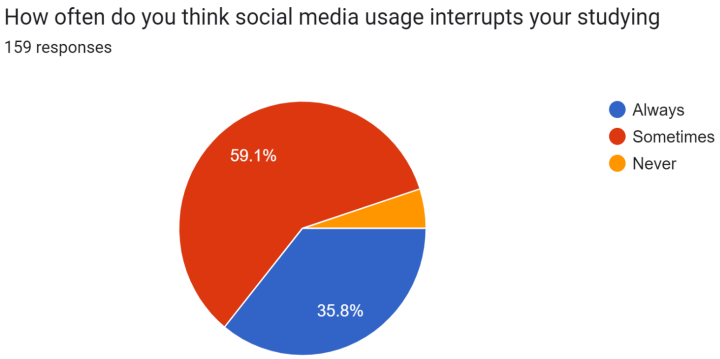

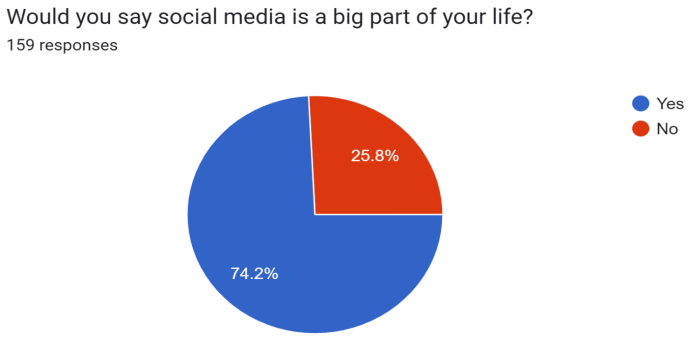

When examining the pie charts shown we can see that in all the questions asked there is a correlation for all students on the fact that social media is affecting them in some way over 50% of the time. Now we can go into whether this actually is true and if social media truly does have an effect on attention span. To do this I first calculated my N value which is my total number of respondents. In this case, it was 159 responders. I then for each question observed the frequency of yes towards social media and multiplied it by the N value. For Question 1: 54% of respondents was yes = 0.54 * 159 ≈ 85.86. Question 2 was 85.5% of respondents was yes = 0.855 * 159 ≈ 135.945. Question 3: 75.5% of respondents were yes= 0.755 * 159 ≈ 120.145. Given that the total number of respondents is 159 and each question has only two response options Yes or No, the expected frequency of Yes responses would be 50% of the total respondents: With this we get that the Expected frequency of "Yes" responses (E) = 159 * 0.5 = which gives 79.5. After these values are calculated we now have to do the chi-square statistic for all these question values. Using the chi-square formula which is the summation of the observed outcome minus the expected outcome which is all squared and then divided by the expected outcome. When doing this we get the values 4.375 for the first question, 52.64 for question number 2, and 50 for number 3. Adding all these values we get 106.915. Next, we need to

calculate the degrees of freedom which in this case was 2 as we do this by subtracting the number of questions minus one to get 2 degrees of freedom. We now have to compare our chi square value of 106.915 to our statistical significance value which is always .05 and our degrees of freedom which is 2. Using a chi-square table -

Degrees of freedom	Probability (alpha) that the tabulated value is exceeded			
	0.10	**0.05**	**0.01**	**0.001**
1	2.71	**3.84**	6.63	**10.83**
2	4.61	5.99	9.21	13.82
3	6.25	7.81	11.34	16.27
4	7.78	9.49	13.28	18.47
5	9.24	11.07	15.09	20.52
6	10.64	12.59	16.81	22.46
7	12.02	14.07	18.48	24.32
8	13.36	15.51	20.09	26.13
9	14.68	16.92	21.67	27.88
10	15.99	18.31	23.21	29.59
11	17.28	19.68	24.73	31.26
12	18.55	21.03	26.22	32.91
13	19.81	22.36	27.69	34.53
14	21.06	23.68	29.14	36.12
15	22.31	25.00	30.58	37.70
16	23.54	26.30	32.00	39.25
17	24.77	27.59	33.41	40.79
18	25.99	28.87	34.81	42.31
19	27.20	30.14	36.19	43.82
20	28.41	31.41	37.57	45.32

we get 5.99 which is our critical value. Since our chi-square value is so much greater than our value of 5.99 we can conclude that it is not by chance and that social media has an impact on attention span in adolescents.

Discussion

The results are significant and call for intervention to prevent the adverse effects of social media use on attention span among adolescents. The first line of intervention would be

institutionalizing digital literacy and mindfulness in the curriculum so that critical thinking skills and self-regulation strategies can be developed among students as they plunge into digital media. Parents and guardians can play a more assertive role in guiding their children in the online world, encouraging healthy digital habits, and inculcating the value of going offline. This won't just help steer academic performance in the right way it allows for overall improvement in well-being. The results also allow for better care of children when it comes to digital devices as the internet contains information that is not for children to experience. So policymakers might also consider instituting guidelines or legislation that will steer social media toward usage that is not detrimental to adolescents and protects them from harmful content. Despite the glaring correlation obtained in the study between increasing social media usage and a decreasing attention span among adolescents, the study presents some limitations. One of them is the reliance on self-reported data from a single group of AP Seminar students at Reedy High School, which limits the generalizability of the findings to other aged populations. Since it was just Reedy students in the study it may not be applicable as these are just teens who are taking the survey. So allowing for a bigger survey across different age groups would fix this problem and allow for a wider data spread allowing for more accurate information. Another limitation is that since the study was cross-sectional, causality may have been implied but it was not determined. This paper cannot directly pinpoint the direction of the relationship between social media usage and attention span. The survey instrument that measured the use of social media to capture attentional capacities is also subject to response bias and thus may impact the accuracy of the outcomes, as the survey method is not considered reliable. There could also be the problem of peer pressure as this was taken in their AP Seminar class under no restricted conditions which

could cause the manipulation of data in one way just due to a single person helping someone answer the questions. Moreover, the scope of the study did not take into consideration other potential confounding variables including personality traits, prior media exposure, and socio-cultural influences, which may result in variation in the attention span of adolescents. Social media can affect people in different ways while some may become lazy and change their ways of life to suit social media others may not and this could be a limitation. Notwithstanding those mentioned limitations, the evidence offers insights into social media and its relationship to cognitive functioning among adolescents, and that is why further research needs to be conducted in this regard to understand it better. Creating newer research on the topic can help create more targeted practices to stop the ongoing rise of social media usage in adolescents effectively ending the creation of attention-deficit children.

Conclusion and Future Research

The result of the study thus contributes to new knowledge on the relationship between social media use and attention span for adolescents. The finding of a significant relationship between increased social media activity and decreased capacity to focus raises attention to the fact that active measures for the promotion of digital well-being among young people are needed. The finding also underlines the importance of individual differences and contextual factors in the exploration of social media's effects on cognitive functions. These findings will contribute to further discussions on how technology shapes cognitive processes. Such findings will also make known that more effort is needed in the development of healthy habits that tend to mitigate the negative effects of excessive consumption of digital media. The insights thus formed here guide stakeholders such as educators, parents, policymakers, and mental health

professionals. Educators, for instance, may integrate digital literacy and mindfulness practices in the curriculum to prepare students with the skills needed to navigate the digital environment of today's world. Parents may tend to monitor and guide their children's online activities to generate healthy digital habits. Policymakers may be able to include guidelines or regulations that promote responsible social media use while saving young people from possible damaging effects of social media. Mental health professionals can include digital well-being strategies as part of therapeutic interventions toward their treatment in cognition and general well-being. This new understanding calls for a lot of actions to help protect the cognitive health of adolescents in a rapidly digitizing world.

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