Literature Review: Social Media Usage and it's Mental Impact on Adolescents

Problem Space

Adolescents are among the most endemic users of social media sites. Rising research and studies are finding that teenagers spend a significant percentage of their time using social media, and debates have emerged about the mental impacts social media have on adolescents. Based on this concern, we would like to define our domain space as the mental impacts of social media sites on young adolescents. Disparate fields come together, however, we will mainly focus on psychological well-being. Moreover, since Facebook is one of the most prevalent social media sites nowadays, we take Facebook depression as a case to focus on and pay particular attention to studies relevant to this.

Annotated Bibliography

1. Sohn, D. (2014). **Coping with information in social media: The effects of network structure and knowledge on perception of information value**. *Computers in Human Behavior*, *32*, 145–151. https://doi.org/10.1016/j.chb.2013.12.006

In modern society, people have a large number of approaches towards acquiring information, and mass media is obviously one of these. Once information is obtained, it often bounces around social networks from person to person through various media, including social networking sites like Facebook and Instagram. This study performed an online experiment to examine how people determine which information they choose to share in network environments, and the results shows that in spite of their level of knowledge, the network density and information valence also matters.

In the process of the study, Dongyoung has highlighted that people normally try to evaluate the consequences before sharing a piece of information, and judge whether it may be beneficial or harmful. Here, we note that the sharer's ability to judge is an important factor since the criteria for analyzing information and predict potential consequences is complicated. This is a joint product of the attributes of the information, the sharer's domain knowledge and the social relationships given. Relating to our domain space, since our target audience is adolescents, we all know that they have an immature and incomplete judgement system based on abundant study and research. It is likely that they may misjudge the potential information and share valueless or even harmful information to peers. The network system is vast and the influence becomes far-ranging. Negative information shared reaches across the network.

It was also discussed how the way each person thinks may be influenced by their local environment. For people designing for this domain, it may be helpful to consider the environments that teenagers may browse social media in, and how they may be changed to prevent negative and harmful information from being shared.

2. Argo, T., & Lowery, L. (2017). **The Effects of Social Media on Adolescent Health and Well-Being**. *Journal of Adolescent Health*, *60*(2, Supplement 1), S75–S76. https://doi.org/10.1016/j.jadohealth.2016.10.331

This article analyses the relationship between social media and adolescents' health, and conducts a survey by using questionnaires distributed to patients with teeth health issues. The result showed that there was no significant correlation between increased social media usage and PHQ-9 scores(a multipurpose instrument for screening, diagnosing, monitoring and measuring the severity of depression), but when linking social media use to bullying, a correlation was fairly obvious. We can conclude that some certain populations might be more susceptible to depression of social media. Note that the target group of this survey was limited within a clinic, which is restricted. So that I believe this result can not fully reveal the whole adolescents group but can definitely indicate that there exists some potential effects of social media use on their health.

This article dissected the impact of adolescents' health with increased use of social media, which is catered to our domain space. Note that since the conclusive data retrieved in this survey was limited, then the result cannot fully reveal our domain problem. The survey clearly showed that increased use of social media does have negative impact to adolescents' mental health in some extent. It stated that there are plenty of reports saying that social media can lead to depression, envy, decreased self-esteem and risky behavior. Moreover, the two factors mentioned in the survey, which were PHQ-9 scores and bullying, were all related to mental health since people with higher PHQ-9 scores have significantly increased feelings of depression and anxiety after social media use.

The main finding of this survey is that there exists a certain group of adolescents who are more likely to be influenced by the negative effects of social media. From here, if we could work out the typical characteristics of this group of people, then we could identify the correlation between those typical features and the impact of social media. Finally, we can give possible solutions regarding to that correlation.

3. Kaya, T., & Bicen, H. (2016). **The effects of social media on students' behaviors; Facebook as a case study**. *Computers in Human Behavior*, *59*, 374–379. https://doi.org/10.1016/j.chb.2016.02.036

The study used Facebook as a representative of social media to examine its effects on students' behaviors, and also assessed the relationship between confidence, social media usage and social media related actions. It was found that students are well-behaved after using Facebook, and that they were aware of protecting their social identity and respect privacy. Also, it showed that social media use and self-confidence would influence each other, where extensively using social media would increase their confidence and confidence would decrease social media fatigue.

Based on the ranked statements table provided in the study, it was seen that social media had mental impacts on adolescents both positively and negatively. A positive example would be how many respondents said that they used social media to catch their friends' attention. The effectiveness of this would clearly have a strong effect on the self-esteem of students and thus, social media may be used to boost self esteem.

Conversely however, many respondents made comments similar to, "I become upset if I do not receive any likes on content that I share" and "Negative picture comments depress me". These responses show that social media could negatively impact adolescent confidence. They might lose faith in themselves, or in what other people think of them.

Regarding to the insight that I have gained, the article mentioned that people high in narcissism usually show higher Facebook participation, while students with more humility show opposite behaviors. Note that confidence is a core factor to determine whether a person is narcissistic or self-contemptuous. As mentioned in the above paragraph, designers could possibly make use of the relation between social media and users' confidence to help some adolescents to eliminate their inferiority complex in order to decrease the negative impact of social media.

4. Lau, W. W. F. (2017). **Effects of social media usage and social media multitasking on the academic performance of university students**. *Computers in Human Behavior*, *68*, 286–291. https://doi.org/10.1016/j.chb.2016.11.043

Since social media activities penetrate the people's daily life, there exists growing concerns about its potential negative effects on social well-being. This study examined whether and how social media usage (SMUL) and social media multitasking (SMM) predict academic performance among university students. Based on the statistics and analysis, the study found that SMUL did not significantly predict academic performance, while SMM significantly negatively predicted academic performance.

One essential idea the study addressed was that regarding cognition, social media multitasking was found to be adversely related to cognitive and control ability in adolescents. As mentioned in the article, multitasking may take three forms including dual-tasking, rapid attention switching and continuous partial attention. These attributes could all possibly lead to concentration reduction and attention delivery, which would exert an adverse effect on adolescents' mental development. As multiple tasks are performed simultaneously, a cognitive bottleneck develops since the cognitive capabilities and working memory capacity are limited. This could lead to a disruption in the process of decision-making. Moreover, based on the theory of cognitive load, there might appear a grow in intrinsic or extraneous load which would lead to memory overload that could obstruct learning when they are multitasking. Also, SMM was found to have a negative effect on study related attitudes. This could indicate adolescents' psychological situation in some extent. In summarize, SMM should be a valuable factor to examine within our domain space as cognitive and control ability are indicators of mental health.

Designers could focus on the potential effects of social media on adolescents' attention-deficit hyperactivity disorder, and develop a series of functions to achieve the minimization of adverse impacts.

5. O'Keeffe, G. S., Clarke-Pearson, K., & Media, C. on C. and. (2011). **The Impact of Social Media on Children, Adolescents, and Families**. *Pediatrics*, *127*(4), 800–804. https://doi.org/10.1542/peds.2011-0054

This report shed lights on both the positive and negative effects of social media use by teens and tweens. It concluded that social media benefits adolescents by enhancing communication, social connection and technical skills, however, negative impacts such as bullying, clique-forming, negative sexual experimentation, internet addiction and sleep deprivation also exist.

Regarding the benefits, the report highlighted that social media sites allow teens to build up online connections through shared interests to include others from more diverse backgrounds, which could afford the opportunity for respect and tolerance. This is important for them to establish a complete and healthy worldview in the process of their mental development. Moreover, teens can access health information more easily by using social media, and resources on a variety of topics such as stress reduction and signs of depression, which could positively help them to avoid such mental issues in some extent.

Adversely, in accordance to the negative effects, one point that worth attention is depression that social media could possibly bring us, which may cause preadolescents and adolescents at risk for social isolation, substance abuse, aggressive or destructive behaviors. Initially, people who are depressed are more likely to feel in a state of low-mood. More severely, depression could become a mental issue which could affect people's thoughts, feelings and tendencies.

 As mentioned in the paper about Facebook depression, the feeling of being left out was always a potential contributor to feelings of depression. In order to decrease the chance of being left, side functions for reminding users with newly updated messages such as their friends' new sharings should be useful. Then designers could pay attention to the functions of notifications and reminders to help teens to get more involved in social media sites.

6. Valkenburg, P. M. (2017). **Understanding Self-Effects in Social Media**. *Human Communication Research*, *43*(4), 477–490. https://doi.org/10.1111/hcre.12113

Understanding Self Effects of Social Media' is a literary review article, summarising research across multiple disciplines on the effects of communication on the self, and how these effects manifest in social media. Although the paper was largely uninformative on the specific problem space, it provided insight into the micro level 'events' occurring in the mind during communication on social media. It is believed that this would be valuable information for anyone designing in the problem space.

 Four major paradigms were outlined as the major effects of communication on the self. As these are largely 'good' effects, it may be beneficial in design to consider how habits around social media could be centered to optimise for these effects.

Self-Persuasion
It was highlighted that someone who tries to convince others of something are likely to convince themselves that what they are saying is true.

Self-Concept Change
In speaking or acting in particular ways, people are inclined to change their beliefs/attitudes/perceptions of who they are towards the way in which they're acting. This effect is usually stronger when in a public setting, in that people 'do not like to appear inconsistent in their public self-presentations'.

Expressive Writing
It is beneficial for people to write out their deepest thoughts and feelings. To quote, 'expressive writing may force individuals to re-evaluate their life circumstances, label and acknowledge their emotions, or change the representations of certain emotional events in their brain'.

Political Deliberation
This refers to a scenario where a democratic decision is made among a group of people through peaceful, logical and reasoned discussion. A person who speaks is subjected to 3 effects, felt in anticipation of communicating, during communication, and after communicating.

The article goes on to demonstrate that each of these effects are just as, if not more prevalent in social media communications. Social media takes the concept of 'mass communication' towards 'mass self-communication'.

With public posts being similar in nature to acts in public, posting in social media has similar effects in changing the self-perceptions of adolescents. As actions are also asynchronous, users have as much time as they want to express themselves, and in their minds experience the effects of expressive writing and political deliberation.

While this article provides great detail on the mental effects on posting in social media, a similar analysis on the effects of browsing social media would provide a more complete picture.

7.   Choi, M., & Toma, C. L. (2014). **Social sharing through interpersonal media: Patterns and effects on emotional well-being**. *Computers in Human Behavior*, *36*, 530–541. https://doi.org/10.1016/j.chb.2014.04.026

The article here examines the effects of social media on mental and emotional well being by focusing on 'social sharing', or the sharing of 'significant emotional experiences' by users of social media.

Following trends found in the traditional research of face-to-face communication, it was hypothesized that social sharing of positive events would boost positive effects felt by sharers while social sharing of negative events would lead to increased negative affect. The reasoning behind this was that the sharing of positive events lets sharers increase the memorability and significance of events while the social sharing of negative events tends to exacerbate anger or negative feelings all the while preventing distractors. This is definitely a useful insight for designing in the problem space.

Another interesting insight was the hypothesis that different forms of social media would be used for the sharing of positive and negative events, with users selecting based on 'media affordances', or 'features of the media that are perceived by users to impact their ability to fulfill their goals and needs'. The example given for this first looked at how a person who receives a job offer is likely to post the news onto Facebook, with affordance of the medium being reach to a large audience. This was put into contrast with a situation where a person had just failed an exam, where they would likely share the news to a trusted person face-to-face. Here, the medium allows for nonverbal feedback such as a hug or a pat, and interactivity is constrained to sharing the information to just a single person.

Experiments in the article confirmed these hypotheses, and effectively showed that social sharing in online social media environments have similar effects to social sharing in real life. People also tended to share positive events to larger audiences while seeking comfort and confidentiality when sharing negative events. These insights would likely be helpful in further exploration of the problem space. Interestingly, it was also found that the effects of sharing negative events were worse through online social media than through face-to-face, with a suspected explanation being that face-to-face interaction is more comforting.

The article essentially concludes that whether the emotional effects of using social media are positive or negative depend on the social sharing that is done. Overall in designing for the problem space, perhaps it could be beneficial to try and push users towards doing more of what's good for them, and less of what's not. To further this study, work could be done in finding out whether the affordances given by face-to-face contact may be successfully translated through digital means (e.g. emojis), and whether this may improve the emotional effects of social media use.

8.   Suphan, A., & Mierzejewska, B. (2015). **Happy Online and in Real Life Too?: How Social Media Interactions Affect Real Life Well-being of Students in the U.S. And Germany**. In *Proceedings of the 2015 International Conference on Social Media & Society* (pp. 8:1–8:8). New York, NY, USA: ACM. https://doi.org/10.1145/2789187.2789189

In this paper, Suphan and Mierzejewska identify how use of Social Networking Sites (SNS) may either directly affect general well-being, or indirectly affect it through a series of side effects. These are listed below, with each being a possible area that a solution to the problem space could be designed around.

1. Positive or negative changes in wellbeing related to emotional outcomes of using SNS
2. Positive changes in wellbeing related to participation in real life social activities, caused by use of SNS
3. Negative changes in wellbeing stemming from a perception of exclusion, from use of SNS

The paper makes a list of 8 hypotheses linking use of SNS with general well being, and each of the above side effects. This is shown in the diagram to the right. The experiment conducted then surveyed a total of 658 students in both the US and Germany, and attempted to statistically draw correlation between each of the hypothesised links. A ninth hypothesis was that cultural differences would lead to different results between german and american students. This was an excellent method for breaking down the consequences of social media use, and its impact across cultures.
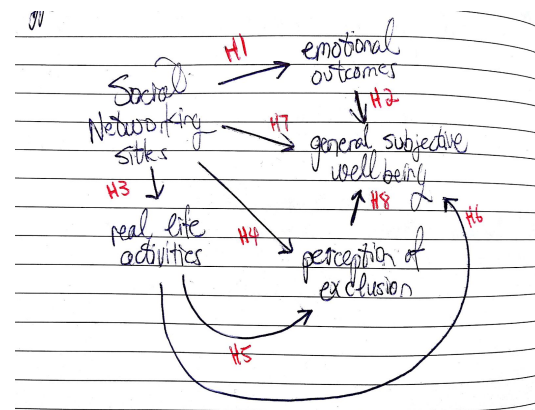
It was concluded that while use of social networking sites had a strong links to positive emotional outcomes and general well-being, the indirect negative effects of negative emotion and feelings of exclusion far outweighed them. The hypothesis that use of SNS would lead to increased participation in real life social activities was also not supported. An interesting final note however was that the observed effects were found to be much stronger in the US then in Germany. Each of these are points which could be taken advantage of when designing to help adolescents in using social media safely.

Overall, the paper provides great insight into the problem space, and breaks down the factors that lead to changes in well-being from social media. The fact that the results obtained varied across cultures suggests that changes in attitude in a society can make differences in how people are affected by use of SNS, and also suggests that some design which shifts cultural perceptions of social media could help those that suffer from it.

A flaw in the paper would be its equal treatment of all widespread social media platforms. It may be understood that the design and dynamics of a platform may lead to differences in how its use leads to changes in well-being.

9.   Qiu, L., Lin, H., & Leung, A. K. (2010). **How Does Facebook Browsing Affect Self-awareness and Social Well-being: The Role of Narcissism**. In *Proceedings of the 7th International Conference on Advances in Computer Entertainment Technology* (pp. 100–101). New York, NY, USA: ACM. https://doi.org/10.1145/1971630.1971661

To quote, the article in question here aims to "understand how Facebook browsing affects individuals' self-awareness and social well-being". This was done by conducting the two experiments explained below.

To examine the effects of Facebook browsing on self-awareness, 59 students were taken and split into control and experimental groups. For both groups, participants were first asked to complete a survey evaluating narcissism. The experimental group was then asked to browse Facebook while the control group was asked to browse the internet in general. Surveys were then conducted to evaluate the levels of self-awareness in both groups. Shown in Figure 1, it may be seen that those high in narcissism improved in their levels of self-awareness after browsing Facebook while those low in self-awareness did worse.
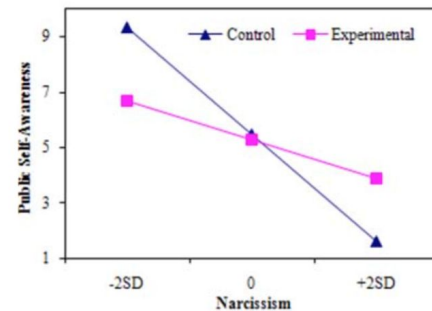

Figure 1: Public self-awareness as a function of narcissism (2SD above and below the mean) and condition.

Studying the effect of Facebook browsing on well-being, a similar experiment was conducted, but with a third group being added, and additional surveys given to participants to measure life satisfaction, loneliness as well as their perceptions of their own lives against their friends. The new group was asked to not only browse Facebook, but to browse the accounts of their most active friends on the social network. Here, strong links were found between browsing and lower levels of well-being. Users who perceived that their friends lived better lives than they did felt 'loneliness, lower life satisfaction and more negative emotion'. Interestingly, users high in narcissism were not affected.

The experiments conducted essentially show that for non-narcissists, Facebook browsing leads to reductions in self-awareness and well-being. Although this is a strong conclusion and builds up a case that we are looking at a valid problem space, the methodology of the second study is believed to be questionable. The study asked a third group of people to browse their most active friends on Facebook, and it is not surprising that this group felt less satisfaction about their own lives after doing this. What if, however, this third group looked at content on Facebook which made them feel better about their own lives? What if a group was instructed to only scroll down their feed? How does the social circle of a user, and the way that they've curated the content they receive impact their feelings? Finally, the paper also recognises that the measured effects were only in the very short term. A long-term experiment of a similar nature would also be informative.

Nonetheless, the role of narcissism in Facebook's usage effects is probably a statement which could be used in educating the public about the issues behind overuse of social media.

10.   Shakya, H. B., & Christakis, N. A. (2017). **Association of Facebook Use With Compromised Well-Being: A Longitudinal Study**. American Journal of Epidemiology, 185(3), 203–211. https://doi.org/10.1093/aje/kww189

In the experiment conducted, a social media component was developed to be added to a large American survey, representative of households in the US. Members in the survey eligible for its web portion were invited to answer questions about their online and offline social lives, and also optionally asked for permission for their Facebook account data. This was done consecutively for 3 years, and the trials received 35 256, 49 363, and 43 145 respondents respectively. The data retrieved was linked to measures of well-being indicated by respondents in other components of the survey.

For users which had opted into contributing their Facebook account information, measures of Facebook use including friend count, number of things liked, number of links clicked, and number of status updates were recorded.

Statistical analysis of the large sets of data collected showed definite links between Facebook usage and lower reported well-being. Especially insightful was that fact that respondents which were regular users of Facebook tended to be in worse physical and mental health, and also reported poorer life satisfaction and BMI. While respondents with higher friend counts on Facebook tended to do better with life satisfaction, those who reported active social lives offline were the ones which reported the best.

The paper concludes by saying that users of social media may as well just go and make some real friends.

At least for the United States, the fact that this paper represents such a large and diverse group of adults over multiple trials proves that Facebook is a problem for the well-being of people. A valid problem with the study would be that while a correlation was found, the data collected doesn't help with identifying cause or highlighting the parts of social media what are the most harmful. This doesn't help with designing a solution to the problem.

As Facebook was the only social network looked at in the survey, it cannot be said with certainty that the effects found in this study would carry through to other social networks such as Instagram, Snapchat, Twitter, YouTube, Reddit, Quora, WhatsApp, Viber, WeChat, Vine, Pinterest, LinkedIn, Flickr, Tumblr, Google+, Piazza and the DECO3500 Slack.

As the experiment conducted only surveyed adults in the US, it is also difficult say whether the same results apply to Australians.

Finally, it would be interesting to investigate whether Facebook usage impacts 'digital natives' differently to those from the older generation.

Overview of Papers

It is clear after the process of reading and critiquing the 10 above papers that social media and its impact on the mental health of adolescents is a real problem space which needs to be addressed.

From understanding the problem through each of the 'lenses' that the chosen papers have provided, it's evident that the effects of social media on mental health aren't straightforward, and that there is a large network of effects, side effects and variables which play a role into how social media impacts individuals, and society.

To give some examples, Paper 1 demonstrated how what adolescents share in the first-place changes how a social network is experienced by others. This ties in with Paper 9, which shows that browsing the profiles of those most active on Facebook drastically reduces well-being.

But then we see in Papers 3, 5, 7, 8 and 10 that while bad effects often result, social media can also contribute positively towards mental health. Usage of social media can boost self-esteem, build friendships, improve feelings of connectivity and also help build confidence and be a channel for learning about the world in a stage where adolescents are maturing. Between various types of social media, features like private messaging are in general better for mental health than simply browsing. Even among different cultures, it's also important to know how values and beliefs in society impact people's views on social media.

To continue, Papers 2 and 6 also show that social media impacts different people in different ways, and that in communicating with others, social media users are able to organise their own thoughts, develop in their understandings of themselves and label their own emotions.

Each of the examples above show that there are many positive aspects to use of social media that can be leveraged to help adolescents experience it in a positive way. Designing in this problem space, it can be understood that there are many impacts that we can try to maximise, while reducing the spread of harmful messages and the effects of comparison with others.