To What Extent Does Mobile Phone Use Influence the Subjective Well-Being of British Adolescents?

Jiawen Yang

Residential Building of the Acoustics Institute, Beijing, China
Email: carmen.yang1027@gmail.com
Manuscript received November 29, 2024; revised December 29, 2024; accepted January 6, 2025; published March 25, 2025.

***Abstract*—Over the past decade, mobile phones have become an essential aspect of nearly every adolescent's lifestyle. Excessive use of mobile phones may have an adverse impact on teenagers' health. The statistics address the problem that British adolescents are getting less sleep and spending more time watching mobile phones. Subjective well-being refers to the way people evaluate their lives. High levels of subjective well-being are thought to be more essential in judging quality of life than either moral goodness or wealth throughout individuals' lives. The study aims to investigate a possible correlation between different types of MPU and various aspects of the subjective well-being of British adolescents, including academic performance, sleep outcomes, and mental health. A questionnaire with sixth-form students is used, and numerical data is compared to test the correlations. Key results show a negative correlation between multitasking with MPU and academic performance, a negative correlation between MPU and sleep outcomes, and a positive correlation between Passive Social Media Use (PSMU) and mental health. However, a content appraisal is found to influence the relationship between PSMU and mental health. The results also suggest that adolescents are not following the guidelines for screen time and sleep. The key findings in this study suggest that British adolescents need to increase awareness of properly using mobile phones to improve their well-being.**

***Keywords*—academic performance, British adolescents, mental health, mobile phone, sleep, social media use, well-being**

I. Introduction

Mobile phones have become an indispensable part of almost every adolescent's lifestyle in the past decade. The primary reason is that it is currently the major form of communication, via applications such as WhatsApp and Snapchat. The youngsters are attracted to fresh and catchy short videos through TikTok and Instagram.

Excessive use of mobile phones may cause addiction and have an adverse impact on teenagers' health. Under the guidance of sleep, screen time, and moderate to vigorous physical activity, it is suggested that participants need more than 8 hours of sleep and no more than 2 hours of screen time every day. Only 9.7% of British adolescents meet recommendations for sleep, ST, and moderate to vigorous physical activity, and only 21.6% meet guidelines for both sleep and ST [1]. The statistics address the problem that adolescents are getting less sleep and spending more time on screens.

Subjective well-being refers to the way people evaluate their lives. High levels of subjective well-being are thought to be more essential in judging quality of life than either moral goodness or wealth throughout individuals' lives. Not only does it lead to improved health and longevity, but it also improves social relationships and sociability. In addition, it also has effects on productivity and success. Significantly, intentional activities account for 40% of the variation among people in subjective well-being, despite the fact that it has a genetic basis [2]. In this study, the activities involved in Mobile Phone Use (MPU) are focused on examining subjective well-being.

This report will discuss to what extent MPU influences the subjective well-being of British adolescents. The aspects of well-being to be focused on include academic performance, productivity and success (since it is part of the lives of secondary students), sleep patterns, and mental health. Several factors of mobile phone usage affect their well-being. Firstly, screen time and frequency on mobile phones; second, multitasking when using mobile phones; thirdly, sleep outcomes; and lastly, the amount of time spent on active (e.g., posting) and passive (e.g., browsing) forms of screen usage, each called Active Social Media Use (ASMU) and Passive Social Media Use (PSMU) [3].

This project conducts a self-report questionnaire for secondary school students, where participants are sixth-form students from Years 12–13 at King's School Ely in the UK. The students will be sent an online questionnaire on Microsoft Forms.

There are five sections included in this investigation report. In terms of the literature review, referenced studies and hypotheses in each subsection are shown. A vast majority of the literature uses self-reporting as a method of measurement. Following that, data collection and analysis are displayed. Next, the results drawn from the data analysis will be in the conclusion section. Finally, limitations during the investigation and further studies, as well as comments on the EPQ, will be written in the evaluation section.

II. Literature Review

A. Academic Performance

There are different factors in MPU, such as time spent using smartphones and multitasking, that can affect students' health, which will have an extra indirect effect on academic performance [4] and satisfaction with life as a measure of subjective well-being.

Supportive research indicates a substantial negative correlation between the amount of time spent on smartphones and academic achievement. Data was gathered from 43 Brazilian business school students, and notably, applications including "App Usage Tracker" were used to effectively measure actual usage instead of traditional self-reporting methods. What is more, the results also implied the fact that every 100 minutes spent using the device on average per day corresponded to a decline in a student's position at the school's ranking of 6.3 points, on a scale from 0 to almost 100. Additionally, regarding class time only (as opposed to

during spare time and weekends), the effect was nearly two times as high [4].

A meta-analysis from Chen and Yan [5] investigates whether multitasking with mobile phones affects academic performance. Multitasking is defined by the researchers as "divided attention and rapid task switching between learning and off-task (not related to learning) MPU". 132 published studies during 1999–2014 were identified. One of the questions that the researchers aim to solve is how mobile phone multitasking impairs learning. In response to the question, it was suggested that distraction sources (i.e., the ring of mobile phones, texting, and Facebook), distraction targets (i.e., reading and attention), and distraction subjects (i.e., personality, gender, culture, and information motives) are three major ways of mobile phone multitasking that impair learning.

In particular, Hwang *et al.* [6] examine information motives through online surveying, based on general multitasking behaviors (i.e., frequency of multitasking) and content-specific multitasking behaviors (i.e., news or entertainment). The results suggest that mobile phone multitasking is more likely to be involved if their motives for multitasking are information seeking and exchanging. It demonstrates that smartphone use promotes constant searching for information while doing other things. However, the link between information motives and learning is not clearly understood.

According to Lepp *et al.* [7], if cell phone use is positively correlated with anxiety and negatively correlated with academic performance, then there may be an indirect negative influence on life satisfaction. The definition of life satisfaction, as suggested by Shin and Johnson [8], "refers to a judgmental process in which individuals assess the quality of their lives based on their own unique set of criteria." [9]. In addition, their literature review also suggests that success or failure in an important domain of life, which is academic performance for students, is influential on perceived life satisfaction. Participants, who are from a US public university, record their demographic information, the Satisfaction with Life Scale [10], the Beck Anxiety Inventory, and queries on texting and using a cell phone. Academic performance was measured using each participant's actual, cumulative grade point average through official records from the university. Results show that there is a negative relationship between cell phone use and satisfaction with life, and students who use phones more frequently tend to have lower grade point averages, higher anxiety, and lower satisfaction with life compared with their peers who use phones less often.

B. Sleep Outcomes

MPU, including screen time, is also related to sleep outcomes. Sleep outcomes include total sleep time, sleep quality, sleep onset latency (i.e., the amount of time it takes for a person to fall asleep after getting into bed), subjective assessment of daytime tiredness, and so forth [11].

A statistically significant association between total sleep time and screen time was found between either shortened total sleep time or delayed bedtime by 10 of the 12 who looked at it, according to a literature review of 67 studies published from 1999 to 2014 [11].

Regarding sleep duration, a study of adolescents from the UK using the School Sleep Habits Survey and Technology used a questionnaire to investigate screen time on mobile phones and sleep duration. The participants are secondary students aged between 11 and 18 years. All measures are self-reported. The researchers used the School Sleep Habits Survey to gather information on weekday sleep duration, indicating that sleep restriction is more likely during the weekdays. Participants are also asked not to include time spent awake in bed. As a result, adolescents aged 15–18 have a considerably shorter sleep duration of 7.79 hours on average than those aged 11–14 (8.76 hours) on average. The researchers also find that mobile telephone use has a significant negative direct effect on sleep duration, which shortens sleep by 21 minutes [12].

Every hour children watched screens at night was associated with 3–8 minutes of less sleep and irregular bedtimes, according to parent-reported data from the 2016 National Survey of Children's Health [13]. Another experimental study by Bartel *et al.* [14] exhibited that teenagers who put their phones down 1 hour before average bedtime during the weekdays turned off their lights earlier and had a longer sleep duration. Nevertheless, since only 26% of students participated in the experiment, it displays a lack of motivation to reach the phone usage limit.

In terms of sleep quality, an investigation examines different pre-sleep phone use patterns and sleep quality. The researchers aim to examine the difference between phone use in pre-bedtime (before getting into bed) and while in bed (bedtime). The sample consisted of 400 students at the University of Notre Dame in 2015, with an average age of 17 years and 11 months. The students are asked to wear a specific type of watch that records sleeping data for a full day. Surveys are also filled out by the students. Measures of sleep quality (i.e., awake count, awake duration, and restless count) when using and not using phones during pre-bedtime and bedtime are compared during the analysis. Results suggest that phone use during pre-bedtime and bedtime may have an adverse effect on sleep quality. In particular, using a phone right before bed may improve sleep quality more than using one right before bed [15].

With regards to daytime sleepiness, there is a cross-sectional study on five Hong Kong secondary schools, which is based on self-administered questionnaires. MPU is measured by the Chinese version of the 10-item Mobile Phone Problem Use Scale (CMPPUS-10), and daytime sleepiness is measured using the Chinese version of the Epworth Sleepiness Scale (CESS) and socio-demographic questions. A higher CMPPUS-10 score indicates a higher likelihood of problems in MPU, and a CESS score larger than 10 is regarded as indicating excessive daytime sleepiness. The results indicate that the CMPPUS-10 score shows a positive correlation between the average daily duration of MPU and daytime sleepiness, with a mean CESS score of 8.53 (SD = 4.09). Furthermore, 29.74% of students identified as having excessive daytime sleepiness due to the CESS score being greater than 10 [16].

C. Social Media and Mental Health

The use of social media on mobile phones has become more prevalent in the present day. In 2015, 65% of all

American adults used Social Networking Sites (SNS), which has increased ten times from a decade ago, based on the Pew Internet and American Life Project. Popular SNS include Facebook, Twitter (i.e., former X), and Instagram. The aim of social media is to make social connections with other people in a digital society. However, the fact is actually the opposite and social media negatively affects our mental health [2]. Therefore, we need to consider how we use social media properly.

In terms of how much time is spent on social media, Stewart *et al.* [17] found that an average of 50 minutes among users around the world is spent on Facebook and Instagram every day. This is seven minutes longer than people spend interacting socially (e.g., visiting friends, attending or hosting activities), according to the Bureau of Labour Statistics in 2014.

As explained earlier, the idea of ASMU (e.g., posting) and PSMU (e.g., browsing) on social media is suggested to be a factor in mental health. PSMU is where users simply view posts from others, and ASMU is where users create and share their own posts, including comments, by stimulating social connectedness. The consequences of interacting with SNS for subjective well-being (i.e., how satisfied they feel with their real lives) are analyzed in a review by Verduyn *et al.* [2]. People spend abundant time on SNS to keep in touch with their friends and family. Facebook, the most popular SNS in the world, is an independent variable to be measured in most of the reviewed studies. The researchers found that passive Facebook use (PSMU) leads to rising social comparisons (i.e., "comparative judgments of social stimuli on particular content dimensions"), which reduces users' self-esteem, escalates feelings of jealousy, and makes users feel worse about themselves, therefore negatively impacting their well-being. Increased feelings of social connectedness are thought to be the reason for an increase in active usage of SNS for subjective well-being. The researchers conclude that whether SNS has an impact on subjective well-being depends on how one uses it.

Content appraisal is considered important in the research, as exposure to negative content such as cynical and confrontational messages have a negative effect on mood and well-being, whereas viewing optimistic and encouraging information increases well-being and improves mental health. The content of social media is a more important determinant than the type of use itself in the association between mental health and social media use [18].

A study by Evans *et al.* [3] hypothesises that PSMU is positively associated with mental illbeing, since the researchers suggest that well-being has received abundant attention while ill-being indicators such as anxiety and stress remain underexplored. The researchers take into account two potential moderators of the relationship between PSMU and mental illbeing, and one of them is subjective content appraisal. A 10–15-minute online survey is taken by participants about their social media and mental health. To measure participants' frequency of passive Facebook use, a 7-point Likert scale is used to respond to each of 18 items regarding the frequency with which participants engage in different Facebook behaviors (e.g., reading posts, viewing pictures, liking posts, etc.). A subjective content appraisal is measured using two scales, and 13 items reflecting common types of positive content (e.g., "friendly", "encouraging", "inspirational", etc.) and negative content (e.g., "controversial", "cynical", etc.) people might view on Facebook are developed for each scale. Each scale has a reference to whether the content is interacted with passively (i.e., viewed) or actively (i.e., posted, commented on, or reacted to). The results suggest that there is no direct relationship between PSMU and mental illbeing; nevertheless, there is a weaker relationship between PSMU and mental illbeing as there is an increase in subjective positive appraisal.

Among most of the studies above, there has been a geographical gap since there are insufficient studies on this subject conducted in the UK. Although one study by Arora *et al.* [12] was conducted in the UK, this study was published in January 2013, which is more than a decade ago, which indicates temporal validity. In addition, a large amount of the literature in this field takes samples of university students, which indicates a sample gap.

D. Hypotheses

Based on the literature review, this study hypothesizes:

H1. A high frequency of multitasking during Mobile Phone Use (MPU) is negatively associated with academic performance.

H2. Shorter intervals between mobile phone use and bedtime will negatively affect sleep quality.

H3. Passive Social Media Use (PSMU) on mobile phones is negatively associated with mental health.

III. Data Collection and Analysis

This study uses an online questionnaire to investigate the impact of MPU on subjective well-being. Due to time limitations, the questionnaire is deemed the most appropriate method for conducting the research. It allows for distribution to a large number of respondents, enabling the collection of a substantial amount of data quickly and cost-effectively. Additionally, respondents are more willing to disclose confidential information compared to interviews, thereby reducing social desirability bias.

A. Data Collection

The questionnaire is set on Microsoft Forms, a popular tool for setting up questionnaires and surveys. A teacher sends the questionnaire via email to the Year 12 and Year 13 groups in King's Ely. Before answering the questions, participants are informed that the information collected will be confidential and that they have the right to withdraw.

A pilot study refines the research question and creates a high-quality questionnaire for a larger group of participants. A smaller group, consisting primarily of individuals, is invited on WeChat to complete a pre-survey and provide feedback and suggestions. Nineteen responses were received in the pilot study. Initially, the range of year groups from Year 12–13 is increased, with 11 participants from Year 13 and 4 from Year 12. However, to standardize academic performance, it is deemed necessary to narrow down the range of the year group. Adjustments are made to the questions based on the responses received, resulting in an improved questionnaire for the formal study.

The formal questionnaire consists of 16 questions and is

designed to be completed within a 10-minute timeframe. From questions 1–3, some demographic information, such as year group, age, and gender, is gathered.

The investigation takes place from October 16th to October 20th, 2023, during weekdays and school hours. A total of 69 participants, who are sixth-form students ranging from Year 12 to Year 13, took part in the study. Responding to questions 1–3, the age distribution of the participants ranges from 16 to 18, with a mean age of 16.65. Among the respondents, 43.5% (N = 30) are male and 56.5% (N = 39) are female. In terms of year group, 58% of the participants are in Year 12, and 42% are in Year 13.

B. Pilot Study

Initially, it is decided to include a question in the survey regarding whether the respondents are day students or boarding students, as it is believed that this could potentially impact their mobile phone screen time. However, upon the realization that there is limited literature supporting this idea, the question is deleted. Additionally, in the feedback section, it is pointed out by a respondent that the limit for choices is not set in the multiple-choice questions. The question was originally set as a single-choice question, and it is suggested that in the future, the requirement should be added that every person can select a maximum of three options.

Regarding the two questions asking about ASMU and PSMU on social media, it is noted that the meaning of these terms is not explicitly stated, and the purpose of the question is not correctly suggested. One respondent expresses confusion about the comparison between these two questions. In future surveys, it is recommended to make the language of each question concise and straightforward.

The major issue identified during the pilot study is that not all of the questions are linked to the supportive literature review and hypotheses. Rather, many questions are added to the pre-survey when they are thought of. To improve accuracy, it is recommended to design more relevant questions to test hypotheses in future studies.

C. Data Analysis

The study examined to what extent MPU affects satisfaction with academic achievement, sleep outcomes, and mental health. The total sample size is 69. In this section, significant numbers and information are listed to test the hypotheses by using gathered data from the questionnaire. During the analysis of data, if a respondent gave invalid answers such as "I don't know", their responses were omitted. The results will be visualized in several forms, such as scatter diagrams, tables, and bar charts.

1) Mobile phone usage and pickups

Responding to questions 4–5, results show that on average, participants use their phones approximately 4 hours and 34 minutes a day. This exceeds the recommended daily ST of 2 hours by more than double, which addresses the problem that adolescents are spending more time using screens on their mobile phones. The average number of times they have picked up their phones recently is approximately 159.90 times. However, for this question, there are 67 out of 69 effective responses since some participants might misinterpret the questions.

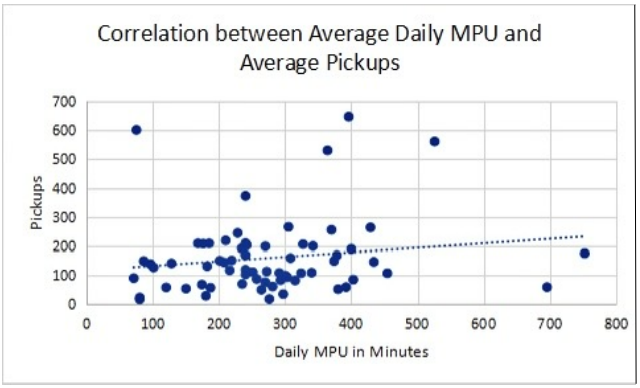

Fig. 1. Correlation between daily MPU and pickups.

The scatter graph in Fig. 1 shows a regression line with a positive correlation with a coefficient of 0.155 between average daily MPU (calculated in minutes) and average pickups of mobile phones. The positive relationship suggests that individuals who spend more time using their mobile phones in a single day are more likely to use their phones frequently throughout the day.

2) Academic performance

Table 1. Correlations between each reason for multitasking with MPU during homework and homework/test performance

Reasons for multitasking with MPU during homework	Homework Performance	Test Performance
To search for additional information on the internet	−0.147	−0.045
To make phone calls or texting	−0.186	−0.024
To use social media	−0.221	−0.153
To watch news	0.034	0.048
To listen to music	−0.049	0.008

The data in Table 1 is calculated using Excel generated by Microsoft Forms to compare questions 6–9 in the formal questionnaire. The aim of analyzing questions 6–9 in this section is to test whether the high frequency of multitasking during mobile phone use will negatively correlate with academic performance.

Question 6 is investigated, which explores whether participants turn on silent mode on their mobile phones to determine if it can be a contributing factor to multitasking with mobile phones and academic performance. Question 7 asks about multitasking with MPU due to various reasons, such as searching for additional information on the internet, making phone calls for texting, using social media, and watching news or listening to music. Participants rate these reasons on a Likert scale from 1 (not at all) to 5 (very much). The explanation of multitasking is mentioned in question 7. Questions 8 and 9 assess the participants' perceived improvement in academic performance, specifically homework performance and test performance, respectively, since the start of the term. Finally, we calculate the correlation between each reason for multitasking and aspects of academic performance.

Overall, the study found a negative correlation between multitasking with MPU and academic performance, as most of the data showed a negative correlation between different reasons for multitasking with MPU during homework. In particular, a weak negative correlation ($r = -0.221$) was observed between the reason for multitasking with MPU being social media and homework performance.

Table 2. Correlations between each reason of multitasking with MPU during homework and homework/test performance during silent mode

During silent mode: Reasons for multitasking with MPU during homework	Homework Performance	Test Performance
To search for additional information on the internet	−0.157	0.046
To make phone calls or texting	−0.260	0.031
To use social media	−0.240	0.142
To watch news	0.012	0.007
To listen to music	0.027	0.033

Whether having the silent mode on one's phone contributes to multitasking with an MPU and affects academic performance is also examined and displayed in Table 2. The study found that multitasking on mobile phones for phone calls or texting, while in silent mode, showed a negative correlation (r = −0.260) with homework performance. Similarly, multitasking on mobile phones for internet use also had a negative correlation (r = −0.157) with homework performance. Additionally, multitasking on social media had a weak negative correlation (r = −0.240) with homework performance. This implies that silent mode may not be helpful for improving academic performance when multitasking with MPU due to these reasons. Overall, Table 2 shows that when participants turn on silent mode on their phones, there is an increase in test performance but a decline in homework performance.

3) Sleep outcomes

Data gathered from Questions 10–13 is set to test whether shorter intervals between mobile phone use and bedtime will negatively affect sleep quality. The participants, on average, sleep approximately 446.65 minutes per day, which is approximately 7 hours and 27 minutes. This is less than the recommended sleep duration according to guidance from Pearson *et al.* [1], which addresses the problem that adolescents are getting less sleep. Fig. 2 below illustrates a negative correlation between daily MPU and sleep duration, with a correlation coefficient of −0.289. This suggests that a longer MPU may correlate with a shorter sleep duration.

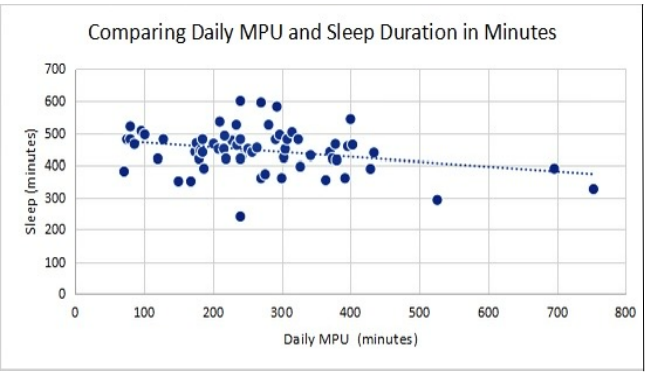

Fig. 2. A negative correlation with a correlation coefficient of −0.289 between daily MPU and sleep duration in minutes.

According to Fig. 3, in general, sleep duration tends to increase as phones are put down earlier before bed. Participants who put their phones down within 10 minutes had an average daily sleep duration of approximately 7 hours and 25 minutes. Those who put their phones down between 10 and 30 minutes had an average sleep duration of approximately 7 hours and 34 minutes. Participants who put their phones down between 30 minutes and 1 hour had an average sleep duration of approximately 7 hours and 41 minutes. However, participants who put their phones down more than 1 hour before bed had an average sleep duration of 6 hours and 46 minutes, which differs from a study's results by Bartel *et al.* [14] that showed teenagers who put their phones down 1 hour before bedtime tend to have longer sleep duration. This may be due to the small sample of participants choosing this option.

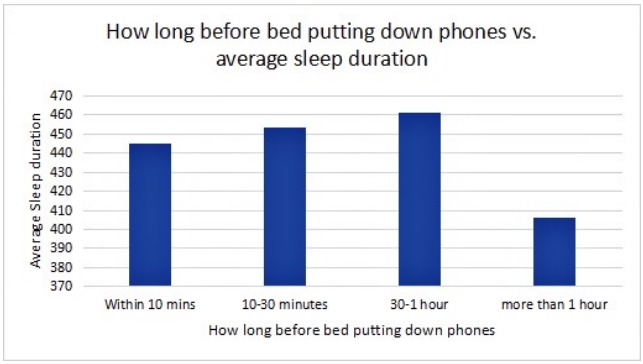

Fig. 3. How long before bed putting down phones vs. average sleep duration?

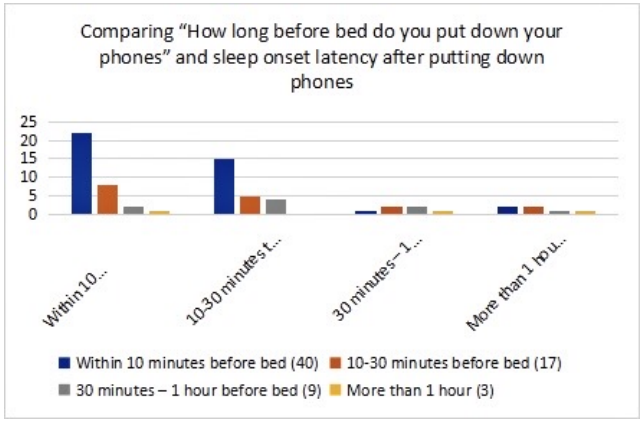

Fig. 4. Comparing "How long before bed do you put down your phones" and sleep onset latency after putting down phones.

Fig. 4 analyses the data gathered from questions 11 and 12, asking participants about how long before bed they put down their phones and how long they usually fell asleep after putting them down. It provides insights into the relationship between MPU and sleep onset latency. The data in the Table records how many people chose the answer of sleep onset latency from each horizontal option. The majority (55%) of participants who responded said that they put down their phones within 10 minutes before bedtime and fell asleep within 10 minutes. It has been discovered that participants who put their phones closer to bedtime tend to fall asleep more quickly, which implies improved sleep quality. This contradicts the previous assumption that shorter intervals between MPU and bedtime will negatively affect sleep quality.

Table 3. Correlations between each reason of multitasking with MPU during homework and homework/test performance during silent mode

MPU before bed	< 10 minutes	10–30 minutes	30 minutes – 1h	> 1h
Number of participants	40	17	19	3
Average sleepiness score	4.33	3.24	2.78	4.67

Table 3 compares the duration of MPU before going to bed from question 11 with the level of daytime sleepiness experienced by participants. The four sub-questions of

daytime sleepiness in the figure are referred to as CESS, and the related question is answered on the Likert scale [16]. The choices from "would never doze" to "high chance of dozing" are converted into an average sleepiness score, where "would never doze" = 0, "slight chance of dozing" = 1, "moderate chance of dozing" = 2, and "high chance of dozing" = 3. The score from four sub-questions is added together to determine sleepiness. The results range from 0–12. Scores below 5 are considered to be in the normal range for sleep propensity. There is a decreasing sleepiness score within 1 hour of putting down phones before bedtime, which implies that within 1 hour, as the participants stop using their phones sooner before bedtime, they tend to be more awake the next day. However, an average sleepiness score of 4.67 is displayed if participants put down their phones 1 hour before bedtime, so the score is higher. This may be due to the small sample of participants choosing this option.

4) Mental health

Data gathered from Questions 14–16 are set to test whether PSMU on mobile phones will negatively associate with mental health, especially negatively affecting mental well-being and positively affecting mental ill-being. PSMU is identified through passive actions such as reading posts, reading comments on posts, and watching videos or pictures. On the other hand, ASMU is identified through active actions such as sending posts, commenting on posts, and reacting to posts and comments. The choices from "disagree" to "agree" are converted into numerical scores from 1–5. The scores for each variable are calculated as averages and then compared. Sub-questions 1–5 from question 16 focus on anxiety and stress levels, which are measured using the 21-item Depression Anxiety and Stress Scale (DASS-21). Symptoms of stress include difficulty winding down, inability to relax, and feeling agitated. Symptoms of anxiety include feeling close to panic and being generally anxious. On the other hand, sub-questions 6–9 assess mental well-being by measuring satisfaction with life using the Satisfaction with Life Scale [19]. To investigate if content appraisal affects the relationship between PSMU and mental illbeing, question 15 is answered by how much they agree that they watch positive or negative content on social media using a Likert scale.

Table 4 displays that while there is a positive correlation (r = 0.0828) between PSMU and stress, anxiety, and mental ill-being in general, a stronger positive correlation (r = 0.1918) between PSMU and mental well-being is discovered. However, according to Table 4, when participants watch more positive content, PSMU is negatively associated with mental illbeing (r = −0.180) and positively associated with mental well-being (r = 0.121). On the other hand, according to Table 5, when the participants are watching more passive and controversial content, PSMU is positively associated with mental illbeing (r = 0.240) and negatively associated with mental well-being (r = −0.046). The findings demonstrate that the relationship between PSMU and mental health is influenced by the type of content viewed.

Table 4. Correlation between social media use and mental health

Patterns	Stress	Anxiety	Mental ill-being	Mental well-being
PSMU	0.0404	0.1090	0.0828	0.1918
ASMU	0.0070	0.0451	0.0223	0.1256

Table 5. Correlation between PSMU and mental health depending on content appraisal

Content appraisal/ mental health	Mental ill-being	Mental well-being
Positive contents	−0.180	0.121
Negative contents	0.240	−0.046

IV. Conclusion

The data analysis has shown that mobile phones influence some aspects of adolescents' subjective well-being, especially academic performance, sleep outcomes, and mental health.

It has been discovered that adolescents are not meeting screen time and sleep guidelines, which suggests that there needs to be greater awareness of controlling mobile phone use and sleep.

There is a negative association between multitasking at MPU and academic performance. When switching the phones to silent mode when doing homework, multitasking with MPU is positively associated with test performance but negatively associated with homework performance. This implies that reducing multitasking behavior with mobile phone use can avoid a regression in academic performance. For instance, putting phones far away from the desk to reduce the frequency of mobile phone use can be suggested, since it is also found that the longer people use mobile phones, the more frequently they tend to pick up their phones. Furthermore, it is advised that adolescents should also use their phones less, especially for phone calls, texting, or social media during homework.

There are different results in terms of MPU affecting sleep outcomes. Shorter sleep duration is associated with longer MPU. In particular, sleep duration tends to increase, and sleepiness tends to decrease as phones are put down earlier before bed. Participants who put their phones closer to bedtime tend to fall asleep more quickly but tend to be sleepier the next day. However, because there is an uneven distribution between participants choosing different options, a larger sample for future work needs to be gathered if there is a chance to conduct further investigation. It may also be because the two related questions are set in range rather than recording the actual time duration. The results still imply that adolescents can sleep longer and reduce daytime sleepiness by using mobile phones for a shorter duration and putting down their phones earlier before bed (e.g., 30 minutes).

The findings of the study indicate that there is a positive correlation between PSMU and mobile phones and mental health, which is in contrast to the hypothesis that suggests a negative correlation. However, it was later discovered that the relationship between PSMU and mental health is influenced by the type of content viewed. It is therefore suggested that British adolescents should watch more positive content on social media to maintain good mental health.

Conflict of Interest

The author has claimed that no conflict of interest exists.

REFERENCES

[1] N. Pearson, L. B. Sherar, and M. Hamer, "Prevalence and correlates of meeting sleep, screen-time, and physical activity guidelines among adolescents in the United Kingdom," *JAMA Pediatrics*, vol. 173, no. 10, p. 993, Oct. 2019.

[2] P. Verduyn, O. Ybarra, M. Résibois, J. Jonides, and E. Kross, "Do social network sites enhance or undermine subjective well-being? A critical review," *Social Issues and Policy Review*, vol. 11, no. 1, pp. 274–302, Jan. 2017.

[3] O. Evans, S. Hardacre, M. Rubin, and M. Tran, "Content appraisal and age moderate the relationship between passive social media use and mental ill-being," *Frontiers in Psychology*, vol. 14, Jul. 2023.

[4] D. D. Felisoni and A. S. Godoi, "Cell phone usage and academic performance: An experiment," *Computers and Education*, vol. 117, pp. 175–187, Feb. 2018.

[5] Q. Chen and Z. Yan, "Does multitasking with mobile phones affect learning? A review," *Computers in Human Behavior*, vol. 54, pp. 34–42, Jan. 2016.

[6] Y. Hwang, H. Kim, and S.-H. Jeong, "Why do media users multitask? Motives for general, medium-specific, and content-specific types of multitasking," *Computers in Human Behavior*, vol. 36, pp. 542–548, Jul. 2014.

[7] A. Lepp, J. E. Barkley, and A. C. Karpinski, "The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students," *Computers in Human Behavior*, vol. 31, pp. 343–350, Feb. 2014.

[8] D. C. Shin and D. M. Johnson, "Avowed happiness as an overall assessment of the quality of life," *Social Indicators Research*, vol. 5, no. 1–4, pp. 475–492, 1978.

[9] W. Pavot and E. Diener, "Review of the satisfaction with life scale," *Psychological Assessment*, vol. 5, no. 2, pp. 164–172, Jun. 1993.

[10] E. Diener, R. A. Emmons, R. J. Larsen, and S. Griffin, "The satisfaction with life scale," *Journal of Personality Assessment*, vol. 49, no. 1, pp. 71–75, Feb. 1985.

[11] L. Hale and S. Guan, "Screen time and sleep among school-aged children and adolescents: A systematic literature review," *Sleep Medicine Reviews*, vol. 21, pp. 50–58, Jun. 2015.

[12] T. Arora, S. Hussain, K.-B. H. Lam, G. L. Yao, G. N. Thomas, and S. Taheri, "Exploring the complex pathways among specific types of technology, self-reported sleep duration and body mass index in UK adolescents," *International Journal of Obesity*, vol. 37, no. 9, pp. 1254–1260, Jan. 2013.

[13] A. K. Przybylski, "Digital screen time and pediatric sleep: Evidence from a preregistered cohort study," *The Journal of Pediatrics*, vol. 205, pp. 218–223, Feb. 2019.

[14] K. Bartel, R. Scheeren, and M. Gradisar, "Altering adolescents' pre-bedtime phone use to achieve better sleep health," *Health Communication*, vol. 34, no. 4, pp. 456–462, Jan. 2018.

[15] S. Vhaduri and C. Poellabauer, "Impact of different pre-sleep phone use patterns on sleep quality," presented at 2018 IEEE 15th International Conference on Wearable and Implantable Body Sensor Networks (BSN), Las Vegas, NV, Mar. 4–7, 2018.

[16] K. C. Ng, *et al.*, "The relationships between mobile phone use and depressive symptoms, bodily pain, and daytime sleepiness in Hong Kong secondary school students," *Addictive Behaviors*, vol. 101, 105975, Feb. 2020.

[17] J. B. Stewart, "Facebook has 50 minutes of your time each day. It wants more," *The New York Times*, May 2016.

[18] P. M. Valkenburg, I. I. V. Driel, and I. Beyens, "The associations of active and passive social media use with well-being: A critical scoping review," *New Media & Society*, vol. 24, no. 2, pp. 530–549, Dec. 2021.

[19] B. Buchanan, "Satisfaction with Life Scale (SWLS)," *NovoPsych*, Feb. 2023.