

# My Smartphone and I

What is the relationship between social media use and the level of self-esteem and loneliness?

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## Abstract

Social media platforms continue to play a growing and important role in the day to day life, therefore understanding how these platforms influence and shape the individual is vital. In this current study, the focus was placed on the social media platform Instagram. The aim of this study was to investigate the mediating effect of self-esteem on the relationship between social media usage and loneliness. A cross-sectional design and questionnaire was implemented on a sample of 109 participants aged 17-30. The collaborative questionnaire included Social Media Use items, the Rosenberg Self-Esteem Scale and the De Jong Gierveld Loneliness Scale. To test the relationships between social media use, self-esteem and loneliness, the Pearson correlation was calculated. To assess the mediating role of self-esteem on the relationship between social media use and loneliness, the PROCESS was implemented. The results yielded in this study showed that there were no statistically significant relationships between social media use and loneliness or social media use and self-esteem. Interestingly, a significant negative relationship was found between self-esteem and loneliness where higher levels of self-esteem were related to lower levels of loneliness. Additionally, self-esteem did not play a significant mediating role between social media use and loneliness. The results highlighted that the varying forms of social media usage influences self-esteem and loneliness in different ways. The current study allows for further research into the different forms of social media usage and how their varying forms have different relationships with self-esteem and loneliness.

*Keywords:* self-esteem, loneliness, social media use, active social media use, interactive social media use, passive social media use, social comparison, self-presentation

## Introduction

I sometimes find myself comparing the number of likes I have on Instagram or the number of notifications I have on my lock screen with those in my close friend circles. Sometimes these comparisons are done unconsciously, and awareness of them is not present. Other times, awareness of the comparison being made is present and comments such as “Oh you’re popular” or “You’re a very important person” are heard. I noticed in that when such comments are given, I often feel good about it and good about myself. Additionally, receiving notifications from WhatsApp, Snapchat or Instagram, gave a sense of importance, that people want to interact with me. Noticing these habits and having this curiosity, it prompted the topic for this thesis, *My Smartphone and I: What is the relationship between social media use and the level of self-esteem and loneliness?*

Smartphones play a key part in the day to day life of many others. A smartphone is a device that is capable of performing similar functions to a computer. These functions include short message service (SMS) to users, taking photos, playing games, using the Internet, connecting to social networks and providing navigation services, just to name a few (Bhardwaj & Ashok, 2015). The growing popularity of smartphones, while it improves intercommunications amongst those who are challenged by geographical distance, there are some negative effects (Beale, 2005; Cotten, 2008; Lane et al., 2011). The negative effects experienced by the increasing popularity of smartphones have an influence on depression, self-esteem, loneliness and poor well-being (Cotten, 2008; Kraut et al., 2002; Lane et al., 2011). With these smartphones, individuals have easy access to their social media platforms. Carr and Hayes (2015) stated that social media are internet-based platforms that accommodate interaction amongst users in real-time through means of selective self-presentation. These social media platforms allow users to create private or public profiles that can be shared with a wide audience. Instagram is such a platform where users are free to share

images or videos of themselves or their interests with a wide audience. These shared media, often referred to as posts, can then be liked and viewed by anyone who has access to the social media platform and the user's profile. Value is derived from social media when a person receives contributions of interactions from and with their audience (Carr & Hayes, 2015).

In this report, social media usage on the media platform Instagram will be explored. Previous research showed that there is a relationship between social media usage and psychosocial well-being (Verduyn, Ybarra, Résibois, Jonides, & Kross, 2017). The constructs of psychosocial well-being that will be investigated in this study are self-esteem and loneliness. Instagram is a social media platform that is used by a high percentage of the population. According to Iqbal (2020), Instagram has 1 billion active users worldwide. From that billion, 31% of the users are aged 18-24 and 34% are aged 25-34 years. Instagram is chosen as the social networking site of focus in this study as it implements the use of numbers for likes, comments or views a post receives. Considering more than half of its users being between the ages of 18-34, this age group serves as the target group of this study.

Before going further, it is important to understand what social media usage is. Social media usage can be divided into three categories: passive, active and interactive. Interactive usage describes the utilization of social media as a means to interact and socialize with others, such as commenting or liking a post. Active usage includes creating content to share on social media, though it is not directed to one specific person. Examples of this form of social media usage would be, posting videos or photos onto Instagram. Lastly, passive usage of social media entails browsing through social media and consuming the content displayed by other users without interaction, such as commenting or liking the post (Chang, 2016; Verduyn et al., 2017).

Looking at the desire to compare likes and the amount of notifications on the smartphone is best explained by the phenomenon known as social comparison. According to Myers and Crowther (2009), the social comparison theory states that people assess their level of achievement or progress by comparing themselves to someone else with the perceived 'standard' they aim to achieve. Given that 73.5% of the content dominating Instagram are images, it is a space where social comparison could occur (Iqbal, 2020). Social comparison could be considered a consequence of passive social media usage (Wang, Wang, Gaskin, & Hawk, 2017). This is because passive usage is described as no interaction or posting content on social media but observing and looking at content other users have uploaded. Just observing the content uploaded by other users may increase the chances for social comparison to occur. Comparing oneself to another can be both beneficial and detrimental. Benefits are attained when the comparison yields in ones' favour, that is, the comparison is similar or downward. One specific benefit of this form of social comparison is a boost in self-esteem (Meltzer & Rourke, 2005; Tibber & Butler, 2020). Detriments, or negative consequences, follow when the comparison highlights ones' shortcomings, therefore the comparison is dissimilar or upward. The first construct that will be addressed is self-esteem.

Self-esteem can be defined as the degree to which people value themselves (Blascovich & Tomaka, 1991; Brown & Marshall, 2006). Self-esteem is therefore a form of appraisal of oneself and these appraisals can be made based on one's appearance, personality or skill. James (1890) as cited by Crocker (2002), suggested that self-esteem is both stable and unstable, meaning that ones' level of self-esteem is usually consistent, but events can occur, good or bad, that impacts ones' level of self-esteem. Interestingly, individuals are selective about which events affect their self-

esteem (Crocker & Knight, 2005). These events include situations where the individual holds value or meaning in the social feedback that is received from others during that event.

According to Gentile, Twenge, Freeman, and Campbell (2012), social media platforms may increase self-esteem through positive self-presentation. Self-presentations are the conscious ways in which people present themselves on social media, which tend to be carefully managed (Gentile, Twenge, Freeman, & Campbell, 2012). Additionally, a study conducted by Widjajanta, Senen, Masharyono, Lísnowatí, and Anggraeni (2018) stated that self-esteem had an association with social media usage. Other studies, however, have a contradicting view on how social media usage relates to self-esteem. In a study conducted by Mehdizadeh (2010), it was found that self-esteem was negatively related to self-presentation. Therefore, there is no clear answer to whether individuals using social media platforms experience an increase or decrease in self-esteem.

Loneliness, the second construct that will be discussed, is an emotional feeling that can be described as sadness or pain which is a result of a perceived sense of an absence in emotional connection with peers (Nishimura, Murakami, & Sakurai, 2018; Yang, 2016). Concerning the relationship between social media networks, such as Instagram, and loneliness, the research on their relationship has been conflicting. The research shows that between social media use and loneliness there exists a relationship, however, the nature of the relationship is conflicting. Studies conducted found that social media usage can be related to lowered levels of loneliness (Bruke, Marlow, & Lento, 2010; Lou, Yan, Nickerson, & McMorris, 2012). Adversely, there are studies that showed that social media users are lonelier than nonusers (Yang & Brown, 2013; Yang, 2016). It is thought that interactive social media usage is connected to lower loneliness levels, whereas, passive social media usage is related to higher loneliness levels (Vally & D'Souza, 2019).

Studies have shown that the presence of loneliness precipitated by social deficits predicts other social risks. These risks include low self-esteem, low peer experience, high depression, externalizing behaviours and suicidal tendencies (Jones, Schinka, van Dulmen, Bossarte, & Swahn, 2011; Schinka, VanDulmen, Bossarte, & Swahn, 2012; Witvliet, Brendgen, van Lier, Koot, & Vitaro, 2010). Studies have also shown that low self-esteem can result in a feeling of loneliness (Al Khatib, 2012; Çivitci & Çivitci, 2009). Furthermore, while upward social comparison has a positive influence on self-esteem, loneliness was found to be a detriment that can occur from this form of social comparison (Meltzer & Rourke, 2005). It is implied that self-esteem is inversely related to loneliness where low self-esteem results in increased levels of loneliness and high self-esteem results in reduced feelings of loneliness. Therefore, a relationship exists between self-esteem and loneliness.

As mentioned earlier, with the use of social media platforms, such as Instagram, rewards or deficits could be a consequence. Such deficits that can occur can be feelings of loneliness and loss of self-esteem. Studies have shown that there exists a statistically significant relationship between social media use and self-esteem and loneliness (Bruke, Marlow, & Lento, 2010; Gentile, Twenge, Freeman, & Campbell, 2012; Lou, Yan, Nickerson, & McMorris, 2012; Widjajanta et al., 2018). Moreover, self-esteem is inversely related to loneliness, where a high level of self-esteem is associated with low levels of loneliness and low self-esteem is associated with a high level of loneliness (Al Khatib, 2012; Çivitci & Çivitci, 2009). A study conducted by Lin, Liu, Niu, & Longobardi (2020) also hypothesized that self-esteem had a mediating effect on the relationship between social media usage and loneliness. Due to the previous literature review the current study, will explore the possible mediating effect self-esteem could have on the relationship between social media use and level of loneliness. There has been little research regarding self-esteem and

loneliness in relation to social media usage and the existing results are mixed. Therefore, the research question and sub-questions are:

What is the relationship between social media usage and the level of self-esteem and loneliness?

- a. What is the relationship between social media usage and self-esteem?
- b. What is the relationship between social media usage and loneliness?
- c. What is the relationship between self-esteem and loneliness?

Based on the information above, the hypothesis of this research is:

H1: The relationship between social media usage and the level of loneliness is mediated by the level of self-esteem.

## Methods

### 1.1 Design

The study implemented a cross-sectional design with the use of a questionnaire (Appendix A) that contained questions from each topic each researcher explored. This study involved a collaborative questionnaire which included items from fellow researchers, with their own research questions and instruments. The questionnaire was compiled not only using collaborative questions but pre-existing questionnaires as well.

### 1.2 Participants

The participants in this study were selected using a selection criterion. The inclusion criteria used to select the participants were: age (17-30), ownership of a smartphone, ownership of social media account(s) and usage of Instagram. The study had a sample of 109 participants ( $M = 21.7$ ,  $SD = 2.1$ , Female = 67.9%, Male = 32.1%). Of the 109 participants, the mean age was 21.7 with a standard deviation of 2.1. The nationalities of the participants in this study were German (69.7%),



Dutch (14.7%), Turkish (5.5%), French (2.8%), Australian (1.8%) and remaining percentages (0.9%) were distributed among different nationalities: Argentinian, Bulgarian, Dominican, Italian, Norwegian and Romanian. 90.8% of the participants were students, 5.5% were employed and 3.7% of the participants selected “other”. Before beginning the data analysis, the study sample was 181 participants, though 72 participants were removed from the data set. The reasons for removal included: disagreement with the consent, failure to complete the questionnaire, not owning a smartphone or social media account and not owning an Instagram account.

## **1.2 Materials**

The questionnaires used in this study are, Social Media Use items, Rosenberg Self-Esteem Scale and the De Jong Gierveld Loneliness Scale.

To measure social media use, a questionnaire was created by the current researchers that consisted of 10 questions. The items asked about their user behaviour within these three mentioned platforms. User behaviour includes the frequency of likes and comments made and receive, frequency of posting content and time spent on social media platforms. Sample items include: “How often do you post a picture on your most used platform?” “How often do you comment on others post?” and “How many times a day do you check your most used platform?”. The items were coded where the value “1” represented average to high usage and “0” represented low usage (Appendix C). This method was chosen as the items in the social media use section of the questionnaire were heavily collaborative and thus, were not independent and difficult to code. For this reason, it is also difficult to give examples of the responses and what was considered average as this changed depending on the question. For example, some questions had a six-point Likert scale or seven-point Likert scale. In Appendix C is a table showing which responses were

considered high (1) and low (0) for each question. After the recoding of the items, a total score for each participant was calculated by taking the sum of each item.

Rosenberg Self-Esteem Scale is a questionnaire that was developed to assess the level of self-esteem a person possessed (Jamil, 2006). This scale consists of 10 items and is a unidimensional measure of self-esteem (Rosenberg, 1965). Participants indicated their responses using a four-point Likert scale (strongly agree – strongly disagree). Sample items include “I feel that I have a number of good qualities.” and “I feel I do not have much to be proud of.”. There are two constructs within the scale of positively worded items and negatively worded items. Items 1, 2, 4, 6 and 7 are positively scored and items 3, 5, 8, 9 and 10 were negatively scored. The scale ranges from 0-30, with scores between 15-25 within the normal range; scores below 15 indicates low self-esteem; scores above 25 indicates high self-esteem (Jamil, 2006).

The KMO had value of 0.90, thus the validity was found to be marvellous. This indicates that the data is suitable for factor analysis. A principle component factor analysis was conducted. 10 questions were analysed with a Varimax rotation. One factor was extracted from the analysis, which explained 47.991% of the variance. Factor 1 is labelled self-esteem as all the items had high factor loadings, between 0.60 and 0.80. The communalities of the items were high overall, further confirming that each item is related to the factor. The reliability of this test, using the data collected from the participants, is high as the Cronbach’s alpha is 0.87. This high Cronbach’s alpha indicates that no item needed to be removed from the questionnaire.

De Jong Gierveld Loneliness Scale is a six-point Likert scale that assesses the level of loneliness a person experiences and is a unidimensional scale (De Jong-Gierveld & Kamphuls 1985; Thomás, Pinazo-Hernandis, Donio-Bellegarde, & Hontangas, 2017). Participants were asked to indicate their responses ranging from “none of the time” and “all of the time”. Sample

items include “I miss having a really close friend” and “There are enough people I feel close to”. Two constructs are measured within this the scale of emotional loneliness and social loneliness. For items 2, 3, 5, 6, 9 and 10, the neutral and positive responses are summed (“some of the time”, “often” and “all of the time”), which compute the emotional loneliness score. For items 1, 4, 7, 8 and 11, the neutral and negative responses are summed (“none of the time”, “rarely” and “some of the time”), which compute the social loneliness score. The total loneliness score is attained by the sum of the social and emotional loneliness scores. The total loneliness scale has four categories: not lonely (0-2), moderately lonely (3-8), severely lonely (9 or 10) and very severely lonely (11).

The KMO was found to be 0.85, which is meritorious. Therefore, the data is suitable for analysis. 11 questions relating to loneliness were analysed using a principle component factor analysis with a Varimax rotation. One factor was extracted from the analysis, which explained 43.146% of the variance. Factor 1 was labelled loneliness due to high factor loadings for all the item analysed. The factor loadings were found to be between 0.40 and 0.80. The communalities were relatively high (above 0.40), which indicates that the items are strongly related to the factor. The reliability of this test, using the data collected from the participants, is high, with a Cronbach’s alpha of 0.81. This indicates that no item needed to be removed from the questionnaire.

### **1.3 Procedure**

After the ethics committee of the Faculty of Behavioural Sciences approved the research with the file number (200335), the questionnaire made using Qualtrics was uploaded onto SONA which is a research platform provided by the University of Twente, where students could participate in the research of their fellow students. Upon completing the questionnaire, the participants received 0.25 SONA credits. Participants for this study were also recruited using varying forms of social media, WhatsApp, Instagram and Facebook, as a method of distributing the questionnaire. Participants

recruited in this manner did not receive 0.25 SONA credits. Prior to completing the questionnaire, the participants received a consent form to which they could agree or disagree to (Appendix B).

#### **1.4 Data Analysis**

The distribution of each variable was then tested using the Kolmogorov-Smirnov test. The null hypothesis of this test is that the data set is not normally distributed. The data was tested for outliers, using a boxplot analysis. This was done using the interquartile range rule 3. When a data point found itself outside the boxplot, represented as a dot, there is an outlier. There were no outliers were found. Following the normal distribution test, three tests were conducted on the demographics against social media use, self-esteem, and loneliness, to ensure that there was no significant association present between the demographic data and the variables of the research. These tests are: T-test for the variable gender, One-way Anova for the variables nationality and occupation and Pearson correlations test for the variable age.

The abovementioned tests were conducted in preparation for the following tests: Pearson correlation test and PROCESS. The correlation test was conducted to answer the research questions and the PROCESS was conducted to evaluate the hypothesis. For the correlation test, the sum score of the user behaviour questions expressed social media usage of the participants, which is the independent variable within this study. Total self-esteem score and total loneliness score were the dependent variables. These were the variables used in the correlation test. The variables used within the abovementioned tests are social media usage, total self-esteem, and total loneliness. For the mediation analysis, the independent variable was social media usage (X), the dependent variable was loneliness (Y) and total self-esteem was the mediating variable (M). A

mediation effect is achieved when comparing the direct relationship (c) and indirect relationship ( $c^1$ ) between X and Y and there is an increase in the indirect relationship.

## Results

The mean score for social media usage was found to be 3.64, which is on the lower half of the scoring out of 10. The standard deviation was found to be 2.044 which indicates that the data points are far from the mean. In the case of Loneliness, the mean was found to be 4.24, out of 11, with a standard deviation of 3.067. This implies that the data points are far away from the mean. Using the categorization mentioned earlier, the mean score of 4.24 is considered moderately lonely. Lastly, the mean of the self-esteem scores was found to be 20.53, from 30, with a standard deviation of 4.683. With a mean score of 20.53, the categorization was normal.

The data was normally distributed, according to the Kolmogorov-Smirnov test which had p-values greater than 0.05. The t-test, Anova and Pearson correlation revealed that there was no statistically significant association of the demographics: age, gender, nationality, and occupation, and the variables, loneliness and self-esteem. When checking the association between age and loneliness and self-esteem the Pearson correlation results showed that there was no significant association ( $r = 0.07$ ,  $n = 109$ ,  $p = 0.48$  and  $r = -0.06$ ,  $n = 109$ ,  $p = 0.54$ , respectively). The T-test showed that the association between gender and loneliness and self-esteem were not significant ( $t(35) = -0.56$ ,  $p = 0.58$  and  $t(35) = -0.10$ ,  $p = 0.92$ , respectively). The Anova results showed that the association between nationality and loneliness and self-esteem was not significant ( $F(2,106) = 0.691$ ,  $p = 0.51$  and  $F(2,106) = 1.157$ ,  $p = 0.32$ , respectively). Lastly, the association between occupation and loneliness and self-esteem was not significant ( $F(2,106) = 1.134$ ,  $p = 0.33$  and  $F(2,106) = 2.548$ ,  $p = 0.08$ , respectively).

The results yielded from the Pearson Correlation test answered the research questions earlier mentioned. Table 1 shows that there were low correlations between the constructs and each correlation has no statistical significance, with the exception of the negative correlation between self-esteem and loneliness. The relationship between user behaviour and self-esteem was not statistically significant ( $r = 0.07$ ,  $n = 109$ ,  $p = 0.35$ ). The relationship between user behaviour and loneliness was not statistically significant ( $r = -0.03$ ,  $n = 109$ ,  $p = 0.82$ ). There was a negative relationship between self-esteem and loneliness, which was statistically significant ( $r = -0.54$ ,  $n = 109$ ,  $p = 0.00$ ). The relationship was such that higher levels of self-esteem were related to lower levels of loneliness.

Table 1

*Summary of Intercorrelations, Means and Standard Deviations for Scores on Loneliness and Self-Esteem and Social Media Usage.*

Measure	Mean	SD	Social Media Usage	Loneliness	Self-Esteem
Social Media Usage	3.64	2.044	-		
Loneliness	4.24	3.067	-0.02	-	
Self-Esteem	20.53	4.683	0.09	-0.54	-

Figure 1 and 2 illustrates the results obtained from the PROCESS macro. Social media usage predicting self-esteem results showed that path a was non-significant ( $F(1,107) = 0.87$ ,  $p = 0.35$ ,  $R^2 = 0.01$ ,  $b = 0.20$ ,  $t(107) = 0.93$ ). Social media usage and self-esteem together predicts loneliness showed significant results. Self-esteem predicting loneliness results showed that path b was significant ( $F(1,107) = 21.55$ ,  $p = 0.00$ ,  $R^2 = 0.54$ ,  $b = -0.35$ ,  $t(107) = -6.56$ ). Regarding social media usage predicting loneliness the results found were not significant ( $F(1,107) = 0.05$ ,  $p = 0.82$ ,  $R^2 = 0.00$ ,  $b = -0.03$ ,  $t(107) = 0.22$ ). Path c<sup>1</sup>, social media usage predicting loneliness remains not

significant ( $b = 0.04$ ,  $t(107) = 0.32$ ,  $p = 0.75$ ). The confidence intervals of the bootstraps contained 0, therefore there was no mediation in the model. The hypothesis was, thus, not confirmed.

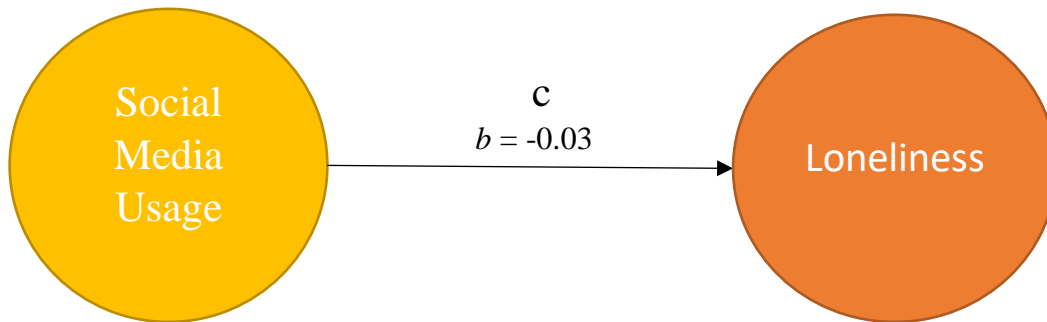


Figure 1: Social Media Usage predicting Loneliness

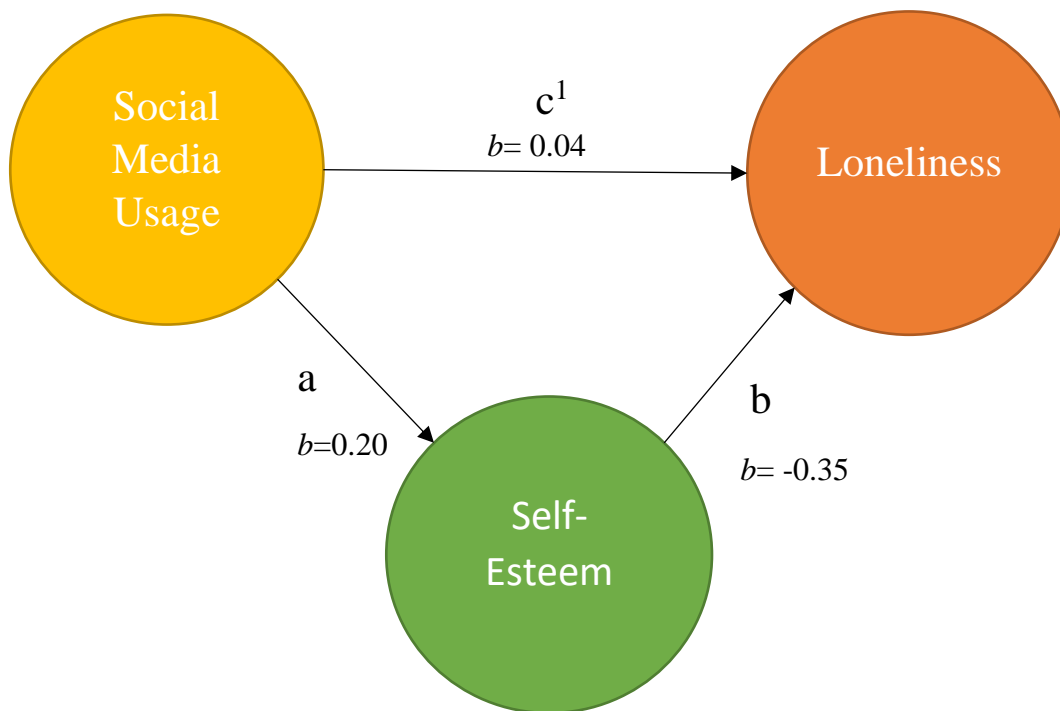


Figure 2: Mediation pathways of Social Media Usage, Self-Esteem and Loneliness

## Discussion

The purpose of this study was to explore the relationship between social media usage and loneliness and self-esteem. The results obtained from the data analysis in this study disproves the hypothesis that self-esteem is a mediator of the relationship between social media use and loneliness. While there is a statistically significant relationship between self-esteem and loneliness, where self-esteem and loneliness were inversely related, there is no statistically significant relationship between social media usage and loneliness or social media use and self-esteem. Therefore, the level of self-esteem did not act as a mediating factor within the relationship between social media usage and level of loneliness.

Considering the findings from previous studies, the findings of the current study both contradict and confirm them. In this study, it showed that social media usage had no significant relationship with self-esteem. A study conducted by Lin et al. (2020), corroborates this finding while studies conducted by Tibber et al, (2020) and Shaw and Grant (2002), invalidate this finding. The differences of these studies could possibly account for the variance in the findings.

The study conducted by Lin et al. (2020), focused more on active social media use and its relationship with self-esteem. What was found in that study was there is no relationship between active social media use and self-esteem. The study carried out by Shaw and Grant (2002), focused on interactive social media usage, as the focus was placed on the effect chatting on the Internet had on constructs such as loneliness and self-esteem. The study conducted by Tibber et al. (2020), focused primarily on the frequency and interactive and passive forms of social media use and the relationship it had with self-esteem. The studies that focused on interactive and passive forms of social media showed a significant relationship with self-esteem, whereas the study that focused on



active social media use yielded no significant relationship with self-esteem. Active social media usage is not related to social media because no feedback is being received in active social media usage. Active social media usage entails posting content, such as, posts, comments, or stories (Chang, 2016; Verduyn et al., 2017). There is no social interaction that occurs for there to be feedback, which is needed in the appraisal to influence self-esteem (Schröder-Abé, Rudolph, Wiesner, & Schütz, 2007; Yang, Xu, Chen, Shi, & Han, (2016). The moment social media usage involves interacting or passive usage, the interaction begins, and social feedback can occur. This in turn influences self-esteem.

When comparing this to the current study, the relationship between social media use and loneliness was also found to be insignificant. According to Lin et al. (2020) and Shaw and Grant (2002), social media usage has a negative relationship with the level of loneliness, which contradicts the finding in this study which found that there was no relationship between social media use and loneliness. In the study conducted by Lin et al. (2020), the relationship between loneliness and active social media use was tested. A negative relationship was found between active social media use and loneliness. Shaw and Grant (2002), studied the effect of interactive social media use and loneliness, which is known to have a negative relationship as well. In this study however, the forms of social media use were not differentiated when testing its relationship with loneliness. This grouping of the different forms of social media use might have influenced the difference in the results.

The relationship between self-esteem and loneliness in the current study was found to be statistically significant which supports the findings of the study conducted by Lin et al. (2020). Since the results in both studies were similar it can be said that the difference in scale use had no effect on the results and can therefore be ruled out. A similarity between this study and that of Lin

et al. (2020), is the implementation and use of the Rosenberg Self-Esteem Scale (RSES), whereas differing scales were used to assess loneliness. In this study the De Jong Gierveld Loneliness Scale was used while Lin et al. (2002) implemented The Emotional and Social Loneliness Scale by Wittenberg. This shows that even when differing questionnaires are used, a statistically significant relationship between self-esteem and loneliness exists. This supports the finding that a relationship exists between the two phenomena.

The findings of the current study showed that self-esteem did not have a significant mediating effect between social media use and level of loneliness. This finding contradicts that of Lin et al. (2020), who argued that self-esteem has a mediating effect when combined with social support. The obvious difference is the additional assessment of social support which is thought to have a significant mediating role within the relationship between social media use and loneliness. In the study conducted by Lin et al. (2020), the mediating effect of self-esteem on social media use and loneliness had no statistical significance, however, self-esteem did improve the mediating effect found between social support and the relationship between social media usage and loneliness.

Evaluating the questionnaires used in this study, the questionnaire that assessed social media use served as a limitation. A collaborative social media usage questionnaire was used because it allowed each researcher to include questions specific to their topic of research. When reflecting on previous studies that researched similar concepts, as the current study, pre-existing social media usage questionnaires were implemented. This was not the case for this study. Items within the social media usage questionnaire used in the current study were improperly formulated due to the collaborative nature of the questionnaire. An example of such question is: How often

do you like other's postings (text, pictures, shared contributions) within your most used social media platform. The responses were not independent of each other (Appendix C).

Additional to this, not differentiating between the three different forms of social media use proved to be a limitation. In a study by Lin et al. (2020), only the form of active social media use was taken into account, Tibber et al. (2020) focused on interactive social media use and Shaw and Grant (2002) focused on interactive and passive social media use. It is evident that the different forms of social media use have varying relationships with self-esteem and loneliness because these different forms were further researched. A study conducted by Chen, Fan, Liu, Zhou, & Xie (2016) explored the relationship between passive social media usage and self-esteem and revealed that passive social media use was negatively associated with self-esteem.

Another limitation which might have influenced the study is that the data was collected during the COVID-19 pandemic at the stage where populations were initially being quarantined at home, with limited social interaction. Where it was expected to see an increase in social media use, the mean social media use in this study was low. A path for possible research would be to explore how the pandemic affected the relationship tested in this study by duplicating this study when there is no pandemic. The results obtained can then be compared to this study to observe if the pandemic influenced the results.

By testing the mediating role of self-esteem between social media use and loneliness, as well as the relationships, this current research adds to the knowledge of understanding how social media networks interact with self-constructs, such as, loneliness and self-esteem and points for further research. One such piece of knowledge is that combining the different forms of social media reduces the relationship it may have on self-esteem and loneliness. It is evident that the different forms of social media have varying effects on self-esteem and loneliness. A possible path for

further research is exploring how the different forms of social media usage can be used to attain certain results. For example, engaging in passive social media use is associated with low self-esteem (Chen, Fan, Liu, Zhou, & Xie, 2016). Investigating if there would be an opposite effect if people who previously engaged in passive social media use, stopped engaging in passive social media usage but rather interactive and/or active social media usage.

It is clear that the different forms of social media use have varying effects on self-esteem and loneliness. Understanding the relationship these varying forms of social media use have on self-esteem and loneliness creates the opportunity to use those relationships to attain certain results. For example, creating an intervention plan that can be used to improve psychological well-being, such as self-esteem and loneliness. The findings of such research can be used to advise and/or restrict appropriate forms of social media usage to influence an individual's psychological well-being.

To conclude, the aim of the study was to explore the relationship between social media usage, loneliness, and self-esteem. The hypothesis stated that self-esteem had a mediating effect on the relationship between social media usage and level of loneliness. Although the hypothesis of this study was rejected, the current study allows for further research into the different forms of social media usage and how their varying forms have different relationships with self-esteem and loneliness.

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## Appendix A

# My Smartphone and I - Bachelor Thesis

### Q165 The effects of smartphone use

This research aims to examine several topics related to the use of Smartphones among young adults. It will be focused on the influences of Smartphones, and in particular social media use on mental health, as well as on smartphone/social media use in relation to personality and productivity factors.

It is part of the Bachelor's Theses of four psychology students from the University of Twente. All the data collected during this study will be anonymised and nothing can be traced back to you. You can quit the survey at any point without giving reasons why or facing consequences. Please answer each question honestly as there are no right or wrong answers.

Inclusion criteria for this research are that you are between 18 and 30 years old and have sufficient English skills.

#### informed consent **Consent form to participate in a research project from students of the University of Twente**

I understand and consent that:

I am 18 years old or older

The procedure will approximately take 30 minutes

I understood the content and agree to contribute my data for the use of this research

I can withdraw from this research at any time by closing the questionnaire and without having to give a reason. In this case, my responses will be deleted within 24 hours.

My personal information will be anonymised to protect my privacy.

With my permission, I agree that all my data can be evaluated and used for the research.

I have been given the guarantee that this research project has been reviewed and approved by the BMS Ethics Committee. For research problems or any other questions regarding the research project, the Secretary of the Ethics Commission of the faculty Behavioural, Management and Social Sciences at the University of Twente can be contacted through the following mail address: [ethicscommittee-bms@utwente.nl](mailto:ethicscommittee-bms@utwente.nl) In case of questions or ambiguities, the researchers Pauline Kersebaum ([p.kersebaum@student.utwente.nl](mailto:p.kersebaum@student.utwente.nl)), Samuel Ditrlich ([s.m.ditrlich@student.utwente.nl](mailto:s.m.ditrlich@student.utwente.nl)), Dorvanique Cocks ([d.s.cocks@student.utwente.nl](mailto:d.s.cocks@student.utwente.nl)) and Robin Untiet ([r.untiet@student.utwente.nl](mailto:r.untiet@student.utwente.nl)) can be contacted in order to help.

I confirm that I read the informed consent form and agree with all listed conditions.

I agree (1)

I don't agree (2)

#### subheading1 **Background Characteristics**

age What is your age in years?

---

nationality What is your nationality?

---

gender What is your gender?

- Male (1)
- Female (2)
- Neutral (3)

student What is your occupation status?

- Student (3)
- Employed (4)
- Other (5)

ownsmartphone Do you own a smartphone?

- Yes (1)
- No (2)

description Think about how you perceive yourself. Please indicate to what extent you agree or disagree with the following statements.

equal I feel that I am a person of worth, at least on an equal plane with others.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

qualities I feel that I have a number of good qualities.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

failure All in all, I am inclined to feel that I am a failure.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

ability I am able to do things as well as most other people.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

pride I feel I do not have much to be proud of.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

attitude I take a positive attitude toward myself.

- Strongly agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

satisfied On the whole, I am satisfied with myself.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

respect I wish I could have more respect for myself.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

usefulness I certainly feel useless at times.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

worth At times I think I am no good at all.

- Strongly Agree (1)
- Agree (2)
- Disagree (3)
- Strongly Disagree (4)

Q169 This section of the questionnaire will measure the characteristics of your personality. Please mark the most appropriate answer option for each question.

lookpainting

I can look at a painting for a long time

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

rightspot I make sure that things are in the right spot

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

remainunfriendly I remain unfriendly to someone who was mean to me

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

nobodylikestalkingme Nobody likes talking to me

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

afraidofpain I am afraid of feeling pain

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

difficulttolie I find it difficult to lie

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

scienceisboring I think science is boring

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

postponetasks I postpone complicated tasks as long as possible

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

expresscriticism I often express criticism

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

approachstrangers I easily approach strangers

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

worrylessthanothers I worry less than others

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

makemoneydishonest I would like to know how to make lots of money in a dishonest manner

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

lotofimagination I have a lot of imagination

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)



workprecisely I work very precisely

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

agreewithothers I tend to quickly agree with others

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

liketalkingwithother I like to talk with others

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

overcomedifficulties I can easily overcome difficulties on my own

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

befamous I want to be famous

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

strangeideas I like people with strange ideas

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

withoutthinking I often do things without really thinking

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

treatedbadlyrem.calm Even when I am treated badly, I remain calm

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

seldomcheerful I am seldom cheerful

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

cryduringfilms I have to cry during sad or romantic movies

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

specialtreatment I am entitled to special treatment

- strongly disagree (1)
- disagree (2)
- neutral (3)
- agree (4)
- strongly agree (5)

Q174 Below is a collection of statements about your everyday experience. Please indicate to what extent the following statements generally apply to you.

Q7 I fear others have more rewarding experiences than me.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q5 I fear my friends have more rewarding experiences than me.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q6 I get worried when I find out my friends are having fun without me.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q8 I get anxious when I don't know what my friends are up to.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q9 It is important that I understand my friends "in jokes".

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q10 Sometimes, I wonder if I spend too much time keeping up with what is going on.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q11 It bothers me when I miss an opportunity to meet up with friends.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q12 When I have a good time it is important for me to share the details online (e.g. updating status).

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q13 When I miss out on a planned get-together it bothers me.

- Not at all true of me (1)
- Slightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

Q14 When I go on vacation, I continue to keep tabs on what my friends are doing.

- Not at all true of me (1)
- SLightly true of me (2)
- Moderately true of me (3)
- Very true of me (4)
- Extremely true of me (5)

description Please indicate how frequently you experience the following statements.

LS There is always someone I can talk to about my day-to-day problems

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q130 I miss having a really close friend.

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q131 I experience a general sense of emptiness.

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q132 There are plenty of people I can lean on when I have problems

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q157 I miss the pleasure of the company of others

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q158 I find my circle of friends and acquaintances too limited

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q159 There are many people I feel close to

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q160 There are enough people I feel close to

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q161 I miss having people around me

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q162 I often feel rejected

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q163 I can call my friends whenever I need them

- None of the time (1)
- Rarely (2)
- Some of the time (3)
- Often (4)
- All of the time (5)

Q170 Your general life satisfaction will be assessed with the aid of the following questions. Hereby, you can mark the most appropriate answer option for each question.



lifecloseideal In most ways my life is close to my ideal

- strongly disagree (1)
- disagree (2)
- slightly disagree (3)
- neither agree nor disagree (4)
- slightly agree (5)
- agree (6)
- strongly agree (7)

conditionsexcellent The conditions of my life are excellent

- strongly disagree (1)
- disagree (2)
- slightly disagree (3)
- neither agree nor disagree (4)
- slightly agree (5)
- agree (6)
- strongly agree (7)

satisfiedwithlife I am satisfied with my life

- strongly disagree (1)
- disagree (2)
- slightly disagree (3)
- neither agree nor disagree (4)
- slightly agree (5)
- agree (6)
- strongly agree (7)

havethingsIwant So far I have gotten the important things I want in life

- strongly disagree (1)
- disagree (2)
- slightly disagree (3)
- neither agree nor disagree (4)
- slightly agree (5)
- agree (6)
- strongly agree (7)

liveagainchangenoth If I could live my life over, I would change almost nothing

- strongly disagree (1)
- disagree (2)
- slightly disagree (3)
- neither agree nor disagree (4)
- slightly agree (5)
- agree (6)
- strongly agree (7)

Flow Introduction Please think of a domain of your life where you work most for (e.g. University, Job, ... ). How often does it happen that ...

Flow 1 ... you feel bored?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Flow 2 ... it feels as if your ability to perform what you do completely matches how difficult it is?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Flow 3 ... you have a clear picture of what you want to achieve, and what you need to do to get there?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Flow 4 ... you are conscious of how well or poorly you perform what you are doing?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Flow 5 ... you feel completely concentrated?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Flow 6 ...you have a sense of complete control?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Flow 7 ...what you do feels extremely enjoyable to do?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Everyday, or almost everyday (5)

Q168 The following section will ask you several questions regarding your social media use and your behaviour while you are online. You can mark the most appropriate answer option for each question.

usesocialmedia Do you use social media?

- Yes (1)
- No (2)

*Skip To: End of Block If Do you use social media? = No*

Q128 Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform) and continue with 2 (second most used platform) and so on. If you don't use more than one platform you can ignore the others.

- \_\_\_\_\_ Instagram (1)
- \_\_\_\_\_ Facebook (2)
- \_\_\_\_\_ Twitter (3)
- \_\_\_\_\_ LinkedIn (4)
- \_\_\_\_\_ Pinterest (5)
- \_\_\_\_\_ Snapchat (6)
- \_\_\_\_\_ Other options (7)

*Display This Question:*

*If Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Other options ] Is Not Empty*

Q133 Rank the 3 social media platforms you spend the most time on.

- Most used platform (1) \_\_\_\_\_
- Second most used platform (2) \_\_\_\_\_
- Third most used platform (3) \_\_\_\_\_

minutesonmostusedpl How much time on average do you spend daily on your most used social media platform?

- 5-15 minutes (1)
- 15-25 minutes (2)
- 25-35 minutes (3)
- 35-45 minutes (4)
- approximately 1 hour (5)
- 1-1:30 hours (6)
- 1:30-2:00 hours (7)
- more than 2 hours (8)

loginsmostused How many times a day do you check your most used social media platform on average?

- 5-15 times (1)
- 15-25 times (2)
- 25-35 times (3)
- 35-45 times (4)
- 45-55 times (5)
- 55-65 times (6)
- more than 65 times (7)

*Display This Question:*  
 If Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Instagram ] Is Not Empty  
 Or Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Facebook ] Is Not Empty  
 Or Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Twitter ] Is Not Empty

liketextmostused How often do you like other's postings (texts, pictures, shared contributions) within your most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*

*If Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Instagram ] Is Not Empty*

Q178 How many likes do you receive on average for your postings (texts, pictures, shared contributions) within your most used social media platform?

- none (1)
- Less than 100 (2)
- 101-400 (3)
- 401-600 (4)
- 601-1000 (5)
- more than 1000 (6)

frequencytextcomment How often do you comment on other's postings (texts, pictures, shared contributions) within your most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*

*If Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Instagram ] Is Not Empty*

Q180 How many comments do you receive on average for your postings (texts, pictures, shared contributions) within your most used social media platform?

- Less than 100 (1)
- 101-300 (2)
- 301-500 (3)
- 501-700 (4)
- 701-1000 (5)
- More than 1000 (6)

posttextmostused How often do you post your own text within your most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*

*If How often do you post your own text within your most used social media platform? = about once a day  
Or How often do you post your own text within your most used social media platform? = multiple times a day  
Or How often do you post your own text within your most used social media platform? = about once per week  
Or How often do you post your own text within your most used social media platform? = multiple times per week  
Or How often do you post your own text within your most used social media platform? = about once per month  
Or How often do you post your own text within your most used social media platform? = multiple times per month*

contentoftextposting What kind of content do you describe inside your text postings within your most used social media platform? (you can mark multiple options)

- I don't post any text (1)
- study related information (2)
- about my friends (3)
- about my thoughts and opinions (4)
- about my leisure activities (5)
- about my political interests (6)
- about something else (7)

*Display This Question:*  
 If What kind of content do you describe inside your text postings within your most used social media... = about something else

alternat.contenttext What kind of content do you describe inside your text postings within your most used social media platform?

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postpicmostusedplat How often do you post a picture within your most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post a picture within your most used social media platform? = about once a day  
 Or How often do you post a picture within your most used social media platform? = multiple times a day  
 Or How often do you post a picture within your most used social media platform? = about once per week  
 Or How often do you post a picture within your most used social media platform? = multiple times per week  
 Or How often do you post a picture within your most used social media platform? = about once per month  
 Or How often do you post a picture within your most used social media platform? = multiple times per month



contentpicturepostin What are your picture postings within your most used social media platform about? (you can mark multiple options)

- selfies (1)
- groupies (you & your friends) (2)
- my thoughts, opinions & ideas (3)
- study related informaton (4)
- leisure activities (5)
- I don't post any pictures (6)
- something else (7)

*Display This Question:*  
 If What are your picture postings within your most used social media platform about? (you can mark m... = something else

altern.picpost What are your picture postings about?

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frequen.storymostuse How often do you post a story within your most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post a story within your most used social media platform? = about once a day  
 Or How often do you post a story within your most used social media platform? = multiple times a day  
 Or How often do you post a story within your most used social media platform? = about once per week  
 Or How often do you post a story within your most used social media platform? = multiple times per week  
 Or How often do you post a story within your most used social media platform? = about once per month  
 Or How often do you post a story within your most used social media platform? = multiple times per month

contmostusedstory What kind of content do you post inside your story within your most used social media platform?

- selfies (1)
- groupies (you & your friends) (2)
- my thoughts, opinions & ideas (3)
- study related information (4)
- leisure activities (5)
- I don't post any stories (6)
- something else (7)

*Display This Question:*  
 If What kind of content do you post inside your story within your most used social media platform? = something else

alternat.mostusestor What are your stories about?

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friends/followermost How many friends/followers do you have on your most used social media platform?

- 0 - 50 (1)
- 51 - 100 (2)
- 101 - 200 (3)
- 201 - 350 (4)
- 351 - 500 (5)
- 500 - 1000 (6)
- more than 1000 (7)

reasonsloginmost Because of which reasons do you check your most used social media platform? (you can mark multiple options)

- being bored (1)
- searching for entertainment (2)
- receiving news (3)
- study related topics (4)
- birthday wishes (5)
- stay in contact with friends (6)
- post leisure activities (7)
- something else (8)

*Display This Question:*  
*If Because of which reasons do you check your most used social media platform? (you can mark multipl... = something else*

altern.reasonloginmo Reasons for checking your most used social media platform

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havesecondfavplatfor The next questions are about your second most used social media platform. Do you have a second most used social media platform?

- yes (4)
- no (5)

*Skip To: End of Block If The next questions are about your second most used social media platform. Do you have a second mo... = no*

minonsecondmostusedp How much time do you spend on average daily on your second most used social media platform?

- 5-15 minutes (1)
- 15-25 minutes (2)
- 25-35 minutes (3)
- 35-45 minutes (4)
- approximately 1 hour (5)
- 1-1:30 hours (6)
- 1:30-2:00 hours (7)
- more than 2 hours (8)

loginsecondmosttime How many times a day do you check your second most used social media platform on average?

- 5-15 times (1)
- 15-25 times (2)
- 25-35 times (3)
- 35-45 times (4)
- 45-55 times (5)
- 55-65 times (6)
- more than 65 times (7)

*Display This Question:*

*If Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Instagram ] Is Not Empty*

*Or Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Facebook ] Is Not Empty*

*Or Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Twitter ] Is Not Empty*

liketextsecondused How often do you like other's postings (texts, pictures, shared contributions) within your second most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)

- about once per month (6)
- multiple times per month (7)

commentontextsecond How often do you comment on other's postings (texts, pictures, shared contributions) within your second most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

amount of likes2 How many likes do you receive on average for your postings (texts, pictures, shared contributions) within your second most used social media platform?

- none (1)
- Less than 100 (2)
- 101-400 (3)
- 401-600 (4)
- 601-1000 (5)
- more than 1000 (6)

amount of comments2 How many comments do you receive on average for your postings (texts, pictures, shared contributions) within your second most used social media platform?

- Less than 100 (1)
- 101-300 (2)
- 301-500 (3)
- 501-700 (4)
- 701-1000 (5)
- More than 1000 (6)

posttextsecondmost How often do you post your own text within your second most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post your own text within your second most used social media platform? = about once a day  
 Or How often do you post your own text within your second most used social media platform? = multiple times a day  
 Or How often do you post your own text within your second most used social media platform? = about once per week  
 Or How often do you post your own text within your second most used social media platform? = multiple times per week  
 Or How often do you post your own text within your second most used social media platform? = about once per month  
 Or How often do you post your own text within your second most used social media platform? = multiple times per month

contextpostsecond What kind of content do you describe inside your text postings within your second most used social media platform? (you can mark multiple options)

- I don't post any text (1)
- study related information (2)
- about my friends (3)
- about my thoughts and opinions (4)
- leisure activities (5)
- about my political interests (6)
- about something else (7)

*Display This Question:*  
 If What kind of content do you describe inside your text postings within your second most used socia... = about something else

altern.textpostsecon What kind of content do you describe inside your text postings within your second most used social media platform?

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postpicinsecondmost How often do you post a picture within your second most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post a picture within your second most used social media platform? = about once a day  
 Or How often do you post a picture within your second most used social media platform? = multiple times a day  
 Or How often do you post a picture within your second most used social media platform? = about once per week  
 Or How often do you post a picture within your second most used social media platform? = multiple times per week  
 Or How often do you post a picture within your second most used social media platform? = about once per month  
 Or How often do you post a picture within your second most used social media platform? = multiple times per month

contpicsecondmost What are your picture postings within your second most used social media platform about? (you can mark multiple options)

- selfies (1)
- groupies (you & your friends) (2)
- my thoughts, opinions & ideas (3)
- study related information (4)
- leisure activities (5)
- I don't post any pictures (6)
- something else (7)

*Display This Question:*  
 If What are your picture postings within your second most used social media platform about? (you can... = something else

alterpicpostsecond What are your picture postings about?

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frequ.storypostsecon How often do you post a story within your second most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post a story within your second most used social media platform? = about once a day  
 Or How often do you post a story within your second most used social media platform? = multiple times a day  
 Or How often do you post a story within your second most used social media platform? = about once per week  
 Or How often do you post a story within your second most used social media platform? = multiple times per week  
 Or How often do you post a story within your second most used social media platform? = about once per month  
 Or How often do you post a story within your second most used social media platform? = multiple times per month

contsecmostusedstory What kind of content do you post inside your story within your second most used social media platform?

- selfies (1)
- groupies (you & your friends) (2)
- my thoughts, opinions & ideas (3)
- study related information (4)
- leisure activities (5)
- I don't post any stories (6)
- something else (7)

*Display This Question:*  
 If What kind of content do you post inside your story within your second most used social media plat... = something else

altern.secstoryabout What are your stories about?

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friends/followsec How many friends/followers do you have on your second most used social media platform?

- 0 - 50 (1)
- 51 - 100 (2)
- 101 - 200 (3)
- 201 - 350 (4)
- 351 - 500 (5)
- 500 - 1000 (6)
- more than 1000 (7)

reasonsloginsec Because of which reasons do you check your second most used social media platform? (you can mark multiple options)

- being bored (1)
- searching for entertainment (2)
- receiving news (3)
- study related topics (4)
- birthday wishes (5)
- stay in contact with friends (6)
- to post leisure activities (7)
- something else (8)

*Display This Question:*  
*If Because of which reasons do you check your second most used social media platform? (you can mark... = something else*

altern.reasonlogsec Reasons for checking your second most used social media platform

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Q164 The next questions are about your third most used social media platform. Do you have a third most used social media platform?

- yes (4)
- no (5)

*Skip To: End of Block If The next questions are about your third most used social media platform. Do you have a third most... = no*

minonthirdmostusedpl How much time do you spend on average daily on your third most used social media platform?

- 5-15 minutes (1)
- 15-25 minutes (2)
- 25-35 minutes (3)
- 35-45 minutes (4)
- approximately 1 hour (5)
- 1-1:30 hours (6)
- 1:30-2:00 hours (7)
- more than 2 hours (8)

loginthirdmosttime How many times a day do you check your third most used social media platform on average?

- 5-15 times (1)
- 15-25 times (2)
- 25-35 times (3)
- 35-45 times (4)
- 45-55 times (5)
- 55-65 times (6)
- more than 65 times (7)

*Display This Question:*

*If Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Instagram ] Is Not Empty*

*Or Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Facebook ] Is Not Empty*

*Or Please rank the platforms you spend the most time on. Rank them starting by 1 (most used platform... [ Twitter ] Is Not Empty*

liketextthirdused How often do you like other's postings (texts, pictures, shared contributions) within your third most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

amount of likes3 How many likes do you receive on average for your postings (texts, pictures, shared contributions) within your third most used social media platform?

- none (1)
- Less than 100 (2)
- 101-400 (3)
- 401-600 (4)
- 601-1000 (5)
- more than 1000 (6)

commentontextthird How often do you comment on other's postings (texts, pictures, shared contributions) within your third most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

amount of comments3 How many comments do you receive on average for your postings (texts, pictures, shared contributions) within your third most used social media platform?

- Less than 100 (1)
- 101-300 (2)
- 301-500 (3)
- 501-700 (4)
- 701-1000 (5)
- More than 1000 (6)

posttextthirdmost How often do you post your own text within your third most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*

*If How often do you post your own text within your third most used social media platform? = about once a day  
Or How often do you post your own text within your third most used social media platform? = multiple times a day  
Or How often do you post your own text within your third most used social media platform? = about once per week  
Or How often do you post your own text within your third most used social media platform? = multiple times per week  
Or How often do you post your own text within your third most used social media platform? = about once per month  
Or How often do you post your own text within your third most used social media platform? = multiple times per month*

contextpostthird What kind of content do you describe inside your text postings within your third most used social media platform? (you can mark multiple options)

- I don't post any text (1)
- study related information (2)
- about my friends (3)
- about my thoughts and opinions (4)
- leisure activities (5)
- about my political interests (6)
- about something else (7)

*Display This Question:*  
 If What kind of content do you describe inside your text postings within your third most used social... = about something else

altern.textpostthird What kind of content do you describe inside your text postings within your third most used social media platform?

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postpicinthirdmost How often do you post a picture within your third most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post a picture within your third most used social media platform? = about once a day  
 Or How often do you post a picture within your third most used social media platform? = multiple times a day  
 Or How often do you post a picture within your third most used social media platform? = about once per week  
 Or How often do you post a picture within your third most used social media platform? = multiple times per week  
 Or How often do you post a picture within your third most used social media platform? = about once per month  
 Or How often do you post a picture within your third most used social media platform? = multiple times per month

contpicpostthird What are your picture postings within your third most used social media platform about? (you can mark multiple options)

- selfies (1)
- groupies (you & your friends) (2)
- my thoughts, opinions & ideas (3)
- study related information (4)
- leisure activities (5)
- I don't post any pictures (6)
- something else (7)

*Display This Question:*  
 If What are your picture postings within your third most used social media platform about? (you can... = something else

alternatpicpostthird What are your picture postings about?

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frequ.storypostthird How often do you post a story within your third most used social media platform?

- never (1)
- about once a day (2)
- multiple times a day (3)
- about once per week (4)
- multiple times per week (5)
- about once per month (6)
- multiple times per month (7)

*Display This Question:*  
 If How often do you post a story within your third most used social media platform? = about once a day  
 Or How often do you post a story within your third most used social media platform? = multiple times a day  
 Or How often do you post a story within your third most used social media platform? = about once per week  
 Or How often do you post a story within your third most used social media platform? = multiple times per week  
 Or How often do you post a story within your third most used social media platform? = about once per month  
 Or How often do you post a story within your third most used social media platform? = multiple times per month

contthirdmostusedsto What kind of content do you post inside your story within your third most used social media platform?

- selfies (1)
- groupies (you & your friends) (2)
- my thoughts, opinions & ideas (3)
- study related information (4)
- leisure activites (5)
- I don't post any stories (6)
- something else (7)

*Display This Question:*  
*If What kind of content do you post inside your story within your third most used social media platf... = something else*

altern.thirdstoryabo What are your stories about?

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friends/follothird How many friends/followers do you have on your third most used social media platform?

- 0 - 50 (1)
- 51 - 100 (2)
- 101 - 200 (3)
- 201 - 350 (4)
- 351 - 500 (5)
- 500 - 1000 (6)
- more than 1000 (7)

reasonsloginthird Because of which reasons do you check your third most used social media platform? (you can mark multiple options)

- being bored (1)
- searching for entertainment (2)
- receiving news (3)
- study related topics (4)
- birthday wishes (5)
- stay in contact with friends (6)
- to post leisure activities (7)
- something else (8)

*Display This Question:*  
*If Because of which reasons do you check your third most used social media platform? (you can mark m... = something else*

altern.reasonlogthir Reasons for checking your third most used social media platform

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SAS-SV Introduction Please indicate to what extent you agree with the following ten statements concerning your smartphone use.

SAS-SV 1 I miss planned work due to smartphone use.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 2 I have a hard time concentrating in class, while doing assignments, or while working due to smartphone use.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 3 I feel pain in the wrists or at the back of the neck while using a smartphone.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 4 I won't be able to stand not having a smartphone.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)

- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 5 I feel impatient and fretful when I am not holding my smartphone.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 6 I have my smartphone in my mind even when I am not using it.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 7 I will never give up using my smartphone even when my daily life is already greatly affected by it.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 8 I constantly check my smartphone so as not to miss conversations between other people on WhatsApp, Instagram or Facebook.

- Strongly Disagree (1)

- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 9 I use my smartphone longer than I had intended.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

SAS-SV 10 The people around me tell me that I use my smartphone too much.

- Strongly Disagree (1)
- Disagree (2)
- Weakly Disagree (3)
- Weakly Agree (4)
- Agree (5)
- Strongly Agree (6)

how much did your smartphone use affect your productivity while you were studying and/or working?

- Not at all** 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)

- 7 (8)
- 8 (9)
- 9 (10)
- A great deal** 10 (11)

Productivity 2 During the past 7 days how much did your smartphone use affect your ability to do regular daily activities, e.g. housework?

- Not at all** 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)
- 8 (9)
- 9 (10)
- A great deal** 10 (11)

Productivity 3 During the past 7 days how much did your smartphone use affect your ability to engage in leisure activities, e.g. doing sports or meeting friends?

- Not at all** 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 (7)
- 7 (8)
- 8 (9)

9 (10)

**A great deal** 10 (11)

Q156 Thank you for your participation. Your responses have been collected.

## Appendix B

### Consent form to participate in a research project from students of the University of Twente

I understand and consent that:

I am 18 years old or older

The procedure will approximately take 30 minutes

I understood the content and agree to contribute my data for the use of this research

I can withdraw from this research at any time by closing the questionnaire and without having to give a reason. In this case, my responses will be deleted within 24 hours.

My personal information will be anonymised to protect my privacy.

With my permission, I agree that all my data can be evaluated and used for the research.

I have been given the guarantee that this research project has been reviewed and approved by the BMS Ethics Committee. For research problems or any other questions regarding the research project, the Secretary of the Ethics Commission of the faculty Behavioural, Management and Social Sciences at the University of Twente can be contacted through the following mail address: [ethicscommittee-bms@utwente.nl](mailto:ethicscommittee-bms@utwente.nl) In case of questions or ambiguities, the researchers Pauline Kersebaum ([p.kersebaum@student.utwente.nl](mailto:p.kersebaum@student.utwente.nl)), Samuel Dittrich ([s.m.dittrich@student.utwente.nl](mailto:s.m.dittrich@student.utwente.nl)), Dorvanique Cocks ([d.s.cocks@student.utwente.nl](mailto:d.s.cocks@student.utwente.nl)) and Robin Untiet ([r.untiet@student.utwente.nl](mailto:r.untiet@student.utwente.nl)) can be contacted in order to help.

I confirm that I read the informed consent form and agree with all listed conditions.

I agree (1)

I don't agree (2)

## Appendix C

*Table 2: Coding information on Social media use questions*

Question	Repose options	0	1
How much time on average do you spend daily on your most used social media platform?	(5-15 minutes, 15-25 minutes, 25-35 minutes, 35-45 minutes, approximately 1 hour, 1-1.30 hours, 1.30-2 hours, more than two hours)	1(5-15 minutes), 2(15-25 minutes), 3(25-35 minutes), 4(35-45 minutes)  “Average Time Spent Daily on Social Media (Latest 2020 Data)”, 2020. Retrieved from: <a href="https://www.broadbandsearch.net/blog/average-daily-time-on-social-media#:~:text=Coming%20in%20the%20future,day%20on%20Instagram%20in%202018">https://www.broadbandsearch.net/blog/average-daily-time-on-social-media#:~:text=Coming%20in%20the%20future,day%20on%20Instagram%20in%202018</a> .	5(approxiamately 1 hour), 6(1-1.30 hours), 7(1.30-2 hours), 8(more than two hours)
How many times a day do you check your most used social media platform on average?	(5-15 times, 15-25 times, 25-35 times, 35-45 times, 45-55 times, 55-65 times, more than 65 times)	1(5-15 times)	2(15-25 times), 3(25-35 times), 4(35-45 times), 5(45-55 times), 6(55-65 times), 7(more than 65 times)
How often do you like other's postings (texts, pictures, shared contributions) within your most used social media platform?	(never, once a day, multiple times a day, once per week, multiple times per week, once per month, multiple times per month)	1(never), 4(once per week), 6(once per month)	2(once a day), 3(multiple times a day), 5(multiple times per week), 7(multiple times per month)

<p>How many likes do you receive on average for your postings (texts, pictures, shared contributions) within your most used social media platform?</p>	<p>(none, less than 100, 101-400, 401-600, 601-1000, more than 1000)</p>	<p>1(none), In2(less than 100), 3(101-400)  Whatman, P. (2018, 21 March) Instagram Statistics: The Big Lessons from our Study of 115 Million Posts. Retrieved from: <a href="https://mention.com/en/blog/instagram-statistics-report/#:~:text=Instagram%20posts%20get%20an%20average%20of%201%2C261%20likes&amp;text=1%2C200%20likes%20is%20out%20of,Now%20remember%2C%20that's%20the%20average.">https://mention.com/en/blog/instagram-statistics-report/#:~:text=Instagram%20posts%20get%20an%20average%20of%201%2C261%20likes&amp;text=1%2C200%20likes%20is%20out%20of,Now%20remember%2C%20that's%20the%20average.</a></p>	<p>4(401-600), 5(601-1000), 6(more than 1000)</p>
<p>How often do you comment on other's postings (texts, pictures, shared contributions) within your most used social media platform?</p>	<p>(never, once a day, multiple times a day, once per week, multiple times per week, once per month, multiple times per month)</p>	<p>1(never), 4(once per week), 6(once per month)</p>	<p>2(once a day), 3(multiple times a day), 5(multiple times per week), 7(multiple times per month)</p>
<p>How many comments do you receive on average for your postings (texts, pictures, shared contributions) within your most used social media platform?</p>	<p>(none, less than 100, 101-400, 401-600, 601-1000, more than 1000)</p>	<p>1(less than 100),  Whatman, P. (2018, 21 March). Instagram Statistics: The Big Lessons from our Study of 115 Million Posts. Retrieved from: <a href="https://mention.com/en/blog/instagram-statistics-report/#:~:text=The%20average%20number%20of%20Instagram%20comments%20is%2024.5">https://mention.com/en/blog/instagram-statistics-report/#:~:text=The%20average%20number%20of%20Instagram%20comments%20is%2024.5</a></p>	<p>2(101-300), 3(301-500), 4(501-700), 5(701-1000), 6(more than 1000)</p>



<p>How often do you post your own text within your most used social media platform?</p>	<p>(never, once a day, multiple times a day, once per week, multiple times per week, once per month, multiple times per month)</p>	<p>1(never), 4(once per week), 6(once per month)  Anthony, E. (n.d). How Often Should Your Business Post on Social Media? Retrieved from: <a href="https://www.revlocal.com/blog/social-media-marketing/how-often-should-your-business-post-on-social-media#:~:text=In%20reality%2C%20though%2C%20even%20the,1%2D2%20photos%20a%20day.">https://www.revlocal.com/blog/social-media-marketing/how-often-should-your-business-post-on-social-media#:~:text=In%20reality%2C%20though%2C%20even%20the,1%2D2%20photos%20a%20day.</a></p>	<p>2(once a day), 3(multiple times a day), 5(multiple times per week), 7(multiple times per month)</p>
<p>How often do you post a picture within your most used social media platform?</p>	<p>(never, once a day, multiple times a day, once per week, multiple times per week, once per month, multiple times per month)</p>	<p>1(never), 4(once per week), 6(once per month)  Anthony, E. (n.d). How Often Should Your Business Post on Social Media? Retrieved from: <a href="https://www.revlocal.com/blog/social-media-marketing/how-often-should-your-business-post-on-social-media#:~:text=In%20reality%2C%20though%2C%20even%20the,1%2D2%20photos%20a%20day.">https://www.revlocal.com/blog/social-media-marketing/how-often-should-your-business-post-on-social-media#:~:text=In%20reality%2C%20though%2C%20even%20the,1%2D2%20photos%20a%20day.</a></p>	<p>2(once a day),3(multiple times a day), 5(multiple times per week), 7(multiple times per month)</p>
<p>How often do you post a story within your most used social media platform?</p>	<p>(never, once a day, multiple times a day, once per week, multiple times per week, once per month, multiple times per month)</p>	<p>1(never), 4(once per week), 6(once per month)  Everett, C. (2020, January 6). The 2020 Instagram Stories Benchmark Report. Retrieved from: <a href="https://www.rivaliq.com/blog/instagram-stories-benchmark-report/#:~:text=The%20average%20brand%20is%20posting,over%20one%20Story%20per%20week.">https://www.rivaliq.com/blog/instagram-stories-benchmark-report/#:~:text=The%20average%20brand%20is%20posting,over%20one%20Story%20per%20week.</a></p>	<p>2(once a day), 3(multiple times a day), 5(multiple times per week), 7(multiple times per month)</p>

<p>How many friends/followers do you have on your most used social media platform?</p>	<p>(0-50, 51-100, 101-200, 201-350, 351-500, 500-1000, more than 1000)</p>	<p>1(0-50), 2(51-100), 3(101-200)                  Erin. (202, January 16). Instagram Followers: How Many Does the Average Person Have? Retrieved from:  <a href="https://www.hashtagsforlikes.co/blog/instagram-followers-how-many-does-the-average-person-have/#:~:text=For%20a%20person%20Instagram%20account,you%20because%20they%20know%20you">https://www.hashtagsforlikes.co/blog/instagram-followers-how-many-does-the-average-person-have/#:~:text=For%20a%20person%20Instagram%20account,you%20because%20they%20know%20you</a>                  u.</p>	<p>4(201-350), 5( 351-500), 6(500-1000), 7(more than 1000)</p>
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