Social media use and its relationship to mental health/well-being: An Experience Sampling Study

Kai Gehrmann, s2332663

k.c.gehrmann@student.utwente.nl

Department of Psychology, Health and Technology

University of Twente

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First supervisor: Kim Tönis

Second supervisor: Dr. Alex van der Zeeuw

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Abstract

The technical revolution progresses continuously as sales of smartphones, and other technical devices and the registration numbers on social media platforms rise. Moreover, the cases of people who experience mental health issues increased as well. Previous research focused already on the influence of social media use on mental well-being, but both positive and negative results were documented. That is why this research aimed to observe the effect of social media use on mental well-being as well. Furthermore, this study was applied to reveal whether the reason for social media use could have a moderating influence on mental well-being. It is hypothesized, regarding the chosen target group (18-29), that social media use could have a positive effect on mental well-being, as this was observed in previous studies. Furthermore, it was theorized that "social interaction", "entertainment" and "beating boredom" are the most prevalent purposes of use. Lastly, the researcher assumed that the purpose of use would moderate the effect of social media use on mental well-being. The study was conducted using the experience sampling method which included one baseline questionnaire and 24 daily questionnaires (3 times a day, for eight days). To test the mental health of each participant over time the Mental Health Continuum-Short Form was filled out in the baseline questionnaire and the Short Warwick-Edinburgh Mental well-being scale was answered every day (Lamers et al., 2011; Warwick Medical School, n.d.). Moreover, participants had to answer several questions concerning their quantity of social media use and purpose of use. The results revealed that there is a significant negative effect of social media use on mental well-being and that the purposes of "entertainment", "beating boredom" and "social interaction" were indeed the most selected purposes of use. Furthermore, it showed that there was no moderating effect from the purpose of use on the relationship between social media use and mental well-being. Nevertheless, there was a significant positive effect from the purpose of use, "information seeking", on mental well-being. Although the study design showed to have some limitations, such as being limited to a western, educated, industrialized, rich and from a democratic country (WEIRD) sample and a language barrier, the results revealed several building blocks for future research.

Keywords: Social Networking Sites (SNS), Mental Well-Being, Purpose of Social Media Use

Introduction

Technical devices like smartphones or computers cannot be disregarded in today's society. In 2021 alone, 6.3 billion smartphones were active all over the world (O'Dea, 2022). In 2016 this number was still at 3.7 billion (O'Dea, 2022). This results in an increase of 2.6 billion used smartphones in just four years, and it is expected that this number will further increase in upcoming years (O'Dea, 2022). Additionally, the number of teenagers who obtain a smartphone increased substantially. Now, 89 percent of teenagers own a smartphone in the USA (Rideout & Robb, 2018), an amount that doubled in just six years (Abi-Jaoude et al., 2020). Furthermore, people have access to Social Networking Sites (SNS) through smartphones or computers and users of it spent more time on them every year. In 2021 4.2 billion SNS users were documented worldwide (Johnsen, 2021). Most of them are in western Europe, with 79 percent of the whole population using at least one SNS (Statista Research Department, 2022). Instagram, one of the biggest SNS, was the most downloaded application in the Google Play Store with nearly 25 million downloads just in one month (Ceci, 2022). Four more SNS providers were in the top ten of most downloaded applications, namely Telegram, Snapchat, WhatsApp Messenger and TikTok (Ceci, 2022).

There are several reasons for the established rise in SNS downloads. Besides the increase in smartphones and their use, another reason for the rise in social media users in recent years is the current Covid-19 pandemic. It forced people to spend a vast amount of time isolated at home (Valdez et al., 2020). An explanation for this could be "FOMO", the fear of missing out, which has been defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent," (Przybylski, 2013, p. 1).

Next to the reasons for the increasing use of SNS, the consequences of it also have to be established. Important to notice is that the increase in the usage of SNS has been associated with the increase in mental health issues in past years (Stewart, 2021). According to Stewart (2021) 41 percent of adults complained about feelings of depression, which is a seven percent increase in the last four years. Several studies argue that social media has a negative impact on mental well-being and is often the reason why mental health issues arise (Abi-Jaoude et al., 2020; Burnette et al., 2017; Hardy & Castonguay, 2018). Moreover, SNS provides plenty of possibilities to connect with others compared to the past, while it has also been argued that the cases of clinical loneliness are higher than ever before (Pittman & Reich, 2016). Furthermore, SNS seems to be the cause of increasing body image concerns in users (Burnette et al., 2017) and is connected to increased anxiety (Hardy & Castonguay, 2018).

Another concern is that all social networks follow different intents and adhering to all of them is connected to decreased mental well-being (Hardy & Castonguay, 2018).

Nevertheless, several studies suggest that social media can have a positive effect on its users and that it can indeed support users with mental health complaints (Rideout & Fox, 2018; Hardy & Castonguay, 2018). Rideout and Fox (2018) show that 90 percent of young adults researched on the internet about their mental health problems. Moreover, about 70 percent follow the stories from users of SNS that have already dealt with well-being issues in the past (Rideout & Fox, 2018). On one side, it is acknowledged that social media often puts young adults in challenging situations, while on the other side, social media offers many channels for this group of people to have a dialogue about what is bothering them (Pittman & Reich, 2016; Rideout & Fox, 2018). Furthermore, it is documented that support from other social media users has increased and that it can have a positive outcome on one's mental well-being (Stawarz et al., 2019). Especially for minorities, for instance, members of the LGBTQ+ community, SNS has been found to provide a platform in which they can openly express themselves and connect with others in their community (Best et al., 2014). That is specifically important in countries where their rights to openly express themselves are limited. In addition, social media can help to decrease the stigma around mental health problems (Stawarz et al., 2019). Decreasing this stigma and the stigma of requesting the help of professionals is needed, as a study by Stewart (2021) shows that 74 percent of Europeans never seek the help of a professional regarding their mental health. Users can interact in open discussions at SNS while maintaining a certain level of anonymity (Stawarz et al., 2019).

Another aspect that could influence the type of effect that SNS has on mental health, is the reason for one's SNS use. In previous studies, several kinds of use were identified, namely social interaction, information seeking and entertainment (Whiting & Williams, 2013). Other prevalent reasons of use are beating boredom, escaping negative emotions and search for positive emotions (Brailovskaiaa et al., 2020). "Social interaction" is defined as using SNS for communicating and connecting with other people (Whiting & Williams, 2013). The study by Brailovskaia et al. (2020) showed that communication and interactions via SNS increase the development of relationships, can boost one's self-esteem and give users a sense of belonging. It also showed that social interaction seeking is correlated with a decrease in depressive symptoms. Furthermore, socializing with others was detected as one of the main reasons for visiting SNS (Hardy & Castonguay, 2018). Next, "information seeking" is explained by pursuing information and doing research via SNS (Whiting & Williams, 2013). Moreover, The purpose of use of "entertainment" is described as using SNS for amusement

purposes (Whiting & Williams, 2013). In general, SNS seems to fulfil the demand for self-promotion and self-expression (Brailovskaia et al., 2020). “Beating boredom” is explained by passing time in a certain situation, like waiting on the bus or waiting for a doctor’s appointment. “Escaping negative emotions” is interpreted through using SNS as a diversion to escape daily difficulties or negative events. Lastly, “search for positive emotions” can be explained by seeking positive emotions, an optimistic state of mind or relaxation (Brailovskaia et al., 2020).

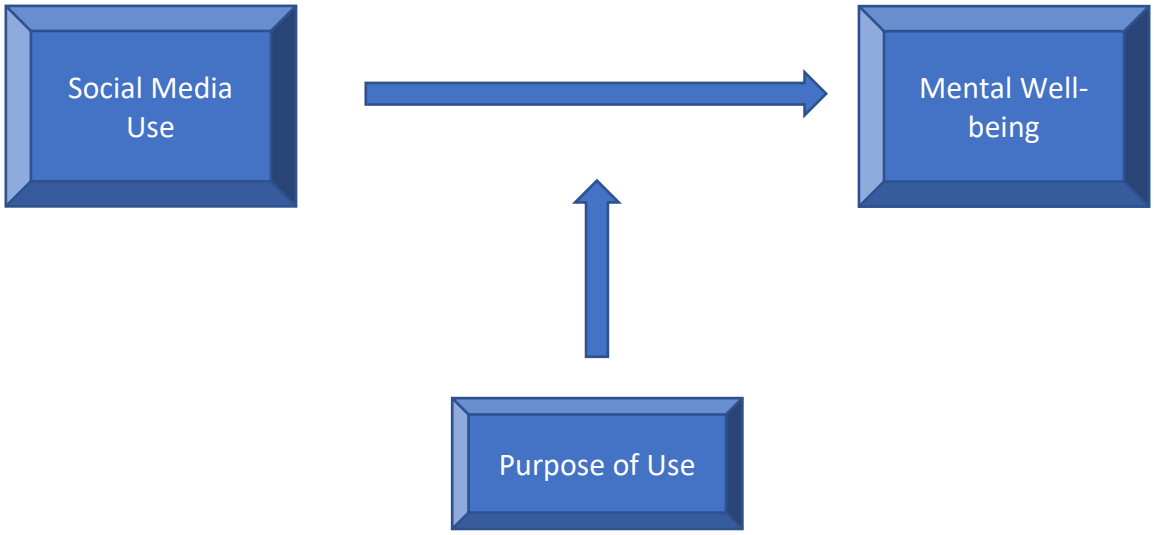
Especially for young adults, some of the types of use are more prevalent than others. In the age group of 18 to 29, approximately 91 percent own a smartphone and visited at least once a SNS during the study period (Pittman & Reich, 2016). Based on the data that was introduced before, it can be assumed that with an increase in smartphone sales, social media use will also further increase (O'Dea, 2022). Moreover, young adults are also more active in sharing content and staying in contact via social media or other technological devices as they want to reach out to peers as much as possible to avert social isolation (Hardy & Castonguay, 2018). This fact seems to be important in times of the COVID-19 pandemic. Furthermore, it is shown that young adults in the age group of 18-29 are better able to manage stressors that relate to social media, compared to older age groups (Hardy & Castonguay, 2018). This suggests that this group could have fewer mental health issues caused by SNS use, compared to older people. Nevertheless, it is shown that for example in the United States 74 percent of young adults between the age of 18 and 24, showed at least one mental health issue, such as depression or anxiety disorder, during Covid-19 (Elflein, 2020). Furthermore, it was revealed that 41 percent of people in the United Kingdom complained about feelings of depression at least one time just last year when asked in the study conducted by Stewart (2021). Hence, young adults could benefit from SNS regarding their mental health problems. Therefore, it was decided to target young adults between the age of 18 and 29 in this study.

In conclusion, the influence of SNS use on mental well-being is not been undoubtedly figured out yet. While some studies propose a positive effect of SNS on mental health, others suggest the opposite. Especially for young adults, the influence seems to be more positive, than for example people older than 30 years of age. Furthermore, it is discussed, that the different purposes of use of SNS could influence the mental well-being of young adults. Hence, this research study concentrates on the following two research questions: 1. "What are the reasons for social media use in young adults?" and 2. "How do the reasons for SNS use correlate to the user's mental well-being?". Due to the discussed literature, the selected variables for reasons of use are “social interaction”, “entertainment”, “beating boredom”,

"information seeking", "escaping negative emotions", "seeking positive emotions" and "other". Other variables like relaxation or pass time that were mentioned before were not chosen as they were seen as very similar to the variables of entertainment and beating boredom. Taking the discussed literature into account it is expected that "social interaction" is one of the most prevalent reasons for use. Regarding the target group, "beating boredom" and "entertainment" could be also prevalent purposes of use. Furthermore, it is expected that the effect of social media on mental well-being is moderated by the purpose of use.

Figure 1

Relationships of Variables



Hypothesis:

H1: Social interaction seeking, beating boredom and entertainment will be the most prevalent purposes of use.

H2: Social media use has a positive influence on well-being.

H3: The effect of social media use on well-being is moderated by the purpose of use.

Methods

Design

The following study will use the Experience Sampling Method (ESM). This will ensure momentary evaluations several times a day. Usually, in ESM, participants make use of a diary technique in which they get asked to fill out small questionnaires, several times a day, over a certain and fixed period to assess situational responses (Hektner et al., 2007). This technique of sampling reduces recall bias and therefore decreases the chance of retrospective report, which leads to heightened reliability and ecological validity (Hektner et al., 2007).

Ecological validity states whether it is possible to universalize the results of the study to the general population (Schmuckler, 2001). Using ESM makes it possible to account for temporal dynamics, specifically concerning the purposes of use of social media. It helps to detect momentary changes in purposes of use and the well-being of the participants (Hektner et al., 2007).

Participants

The participants who took part in this study were English-speaking and between the age of 18 to 29. The participants were collected with the help of convenience sampling via the Sona-System provided by the University of Twente. Students that are part of the Behavioural, Management and Social Sciences (BMS) faculty are obliged to obtain 15 Sona-System credits until they finished their studies. In taking part in this study, students that joined via the Sona-System were compensated with 0.5 points on the platform. Additionally, participants were invited via direct link on WhatsApp or Instagram, which was sent by the researchers.

Participants had to fulfil some inclusion criteria to participate in the study. Besides, the two criteria concerning language and age named in the beginning participants should possess a smartphone to download the 'Ethica' application and should be also active users of Instagram, Facebook or TikTok. Furthermore, the participants are compelled to fill out more than 50 percent to be included in the study sample in the end.

A total of 63 participants took part in the Study. Ten participants did not sign the informed consent or dropped out of the study and were excluded and 20 participants answered less than 50 percent of the questionnaires. Accounting for these points a number of 33 were included in the study. The age range of the participants was from 18 to 27, the mean was 21.7 and the standard Deviation was 1.81 (Table1). The study was completed by 21 females and 12 males (Table1). The participants originated from Germany (n=26), the Netherlands (n=1), Argentina (n=1), Turkey (n=2) and Switzerland (n=1) (Table1).

Table 1

Demographic Information

Demographic variable	*n (%)*	*M (SD)*
Gender		
Female	21 (63.6)	
Male	12 (36.4)	

Nationality		
German	26 (78.8)	
Dutch	1 (3)	
Turkish	2	
Argentinian	1	
Swiss	1	
Level of completed education		
High School	27 (81.8)	
Bachelor	5 (15.2)	
Master	1 (3)	
Finished Apprenticeship	2	
Spent screen time on phone		
90 to 120 minutes	3 (9.1)	
> 120 minutes	28 (84.8)	
60 to 90 minutes	2 (6.1)	
Age		21.66 (1.81)

Materials

This study was part of a bigger study. Hence items concerned with self-esteem and self-compassion were included in the questionnaires. Nevertheless, these measurements were not analyzed for this study and will therefore not be explained here. In the end, eight items were in the daily questionnaires and 14 items about mental well-being in the baseline questionnaire, these were distributed via the 'Ethica' application which had to be downloaded by the participants on their smartphones.

Mental Health Continuum-Short Form

The Mental Health Continuum-Short Form (MHC-SF) was used to assess a baseline measurement of well-being at the start of the study. The MHC-SF measured positive mental health with 14 items which consist of three different sub-scales, namely emotional well-being with three items, social well-being with five items and psychological well-being with six items (Lamers et al., 2011). The participants could score on a six-point Likert scale ranging from zero; "Never", to five; "Every Day". The total scores ranged between zero to 70. The internal reliability of the test was high, and the test-retest reliability was average. The

convergent validity of the MHC-SF was good in the study population of 18- to 87-year-olds (>.80). The Cronbach's Alpha of the scale in this study was also good (α= 0.934). It was tested again to observe if this study's scale was also reliable (Lamers et al. 2011).

Short Warwick-Edinburgh Mental Well-being Scale

For the daily assessments, the 'Short Warwick-Edinburgh Mental well-being scale' (SWEMWBS) was integrated to assess the daily mental well-being measurements of the participants. A shorter mental well-being questionnaire ensures that the daily surveys take less time to be filled out. It is derived from seven items that measure both emotional and psychological well-being (Haver et al., 2015). All Items of the scale were slightly changed to better suit the experience sampling method. The first item for example was changed from "I've been feeling optimistic about the future" to "At the moment I feel optimistic about the future". The participants were able to answer the items on a five-point Likert scale from one; "Strongly disagree", to five; "Strongly agree". The total scores ranged between seven to 35. The proposed cut-of points were (1) higher than 28 which equals high well-being, (2) 21 to 27 which equals average well-being, (3) 18 to 20 which equals possible depression and (4) less than 17 which equals probable depression (Warwick Medical School, n.d.). The Cronbach's alpha of the test has been good (>.80), the convergent validity was satisfactory and test-retest reliability showed to be good as well (Shah et al., 2021). The Cronbach's Alpha of the scale in this study was also good (α= 0.875).

Purpose of Use Items

To find supporting content for the items and variables that were used in this study, the seven categories of SNS use were based on a literature search. Additionally, one item was added to obtain an inquiry about the reasons why the participants used SNS. The participants were able to choose from six different reasons or select 'other'. First of all, "social interaction" was chosen and was defined as using SNS for communicating and connecting with other people (Whiting & Williams, 2013). Next, "information seeking" was selected and was explained through using social media to gather information and do research (Whiting & Williams, 2013). The purpose of use category of "entertainment" was described as using SNS for amusement purposes (Whiting & Williams, 2013). The fourth chosen purpose "beating boredom" is explained by visiting SNS to pass time (Brailovskaia et al., 2020). Moreover, "Escaping negative emotions" was selected and interpreted through using SNS as a diversion to escape daily difficulties or negative events. Lastly, "search for positive emotions" was chosen and can be explained by seeking positive emotions, an optimistic state of mind or

relaxation (Brailovskaia et al., 2020). The additional 'other' variable was chosen so that participants can write down reasons of use which deviated from the list of variables they are presented with.

Ethica

Ethica is a website and application available on Android and Apple devices to utilize the experience sampling method in questionnaires (Ethica Data, 2022). Ethica gives researchers the possibility to have an overview of the participant's responses on a daily basis. It was also possible to set up trigger schedules at what time the questionnaires should have been sent to the participants. At the same time, the app triggered a notification for the participant, that a new questionnaire was available. Furthermore, Ethica saves all the data that was gathered through the surveys for the analysis of the researchers, which is approved by the Ethics Review Board (Ethica Data, 2022).

Procedure

Ethical approval was obtained from the Ethics Committee of BMS at the University of Twente. The Sona-System, as well as WhatsApp and Instagram, were used for recruiting participants and the distribution of the questionnaires. Following the creation of the surveys both on Qualtrics and Ethica, the study was pilot tested by the two researchers. Meanwhile, participants were introduced to the study with an opening statement and were provided with the informed consent which they had to agree with in order to continue the study (Appendix B). After a successful pilot study, invitation links were sent to the participants, in which they were asked to download the Ethica application and to sign up with the provided survey ID. Furthermore, participants were asked to allow push notifications from Ethica to be regularly informed about when the daily questionnaires were available. One day after signing up, the participants were provided with the baseline questionnaire in which they had to enter demographic data and general information about their SNS use in the Ethica application (Appendix C). Afterwards, they filled in the MHC-SF.

The daily questionnaires were assessed three times a day and each questionnaire did not take longer than four minutes. According to Mikolajczyk et al. (2008) students deal with several daily stressors already, which is the reason that just three measures per day were chosen. Participants were informed via push notifications after one minute when a questionnaire was published. To ensure that participants were not able to change their behaviour in expectation of the questionnaire the publishing times varied to ensure better validity. The morning questionnaire was sent out at a random point between 8:30 am and one pm, the afternoon questionnaire was published between 2:45 pm and 6:30 pm and the

evening questionnaire between eight pm and 12 am. When participants did not fill in the questionnaire directly, they got another notification after one hour and then again after two hours. The intervals of the questionnaires were repeated for eight consecutive days. In these daily questionnaires, the participants were asked about their purpose of use of their latest SNS activity. Moreover, the questionnaires included questions about momentary mental well-being (Short Warwick-Edinburgh Mental well-being scale). After finishing the last questionnaire, the participants also received a thank you message for their participation from the researchers. The ones that participated via 'Sona-System' only got their 0.5 credits if they completed more than 50% of the questionnaires.

Data Analysis

The data of the ESM study were analyzed with the statistical program Statistical Package for the Social Sciences (SPSS) version 28. After downloading the data set of the study in .csv format, all participants were checked if they fulfilled the inclusion criteria. Mainly, it was observed whether participants agreed to the informed consent, filled out the baseline questionnaire, were in the age range of 18 to 29 and filled out more than 50 percent of the daily questionnaires. If one of these factors was not fulfilled, the participant was excluded from the study.

The study population was investigated by mean age, gender, and nationality to ensure that the whole target group was included. If the population was not inclusive the transferability of the data to the whole population would have needed consideration. Furthermore, a Cronbach's alpha check was done for the MHC-SF and the SWEMWBS to check for the scale's internal consistency. Furthermore, all important variables were labelled, and values were assigned. All scale items were recoded in numeric variables, to use them as such for the analysis.

Next, labels were assigned to the variables. The independent variable was SNS use and marked as an ordinal variable. The dependent variable was mental well-being and the variables concerning it were marked as ordinal as well. The moderating variable was labelled as "purpose of use" and was marked as categorical with seven groups.

Afterwards, the main assumptions for linear mixed models were checked, namely normality of residuals, linearity, and equal variance (Maas & Hox, 2004; Palmeri, 2016). In total two graphs were created. One in which the residuals were plotted to see if they were normally distributed and another in which the standardized residuals were plotted against the standardized predicted values to check for randomization. Moreover, the mean of every

measurement and then the mean of all daily measurements were calculated for each participant.

To check the first hypothesis, whether “social interaction”, “entertainment” and “entertainment” were selected most often, the purpose of use was recoded from a string variable to a nominal one as well. In accordance, every purpose of use got assigned a number from one to seven. Next, a frequencies analysis was performed to find out which purposes of use were selected most often.

To check the second hypothesis, that social media use has a positive influence on mental well-being, the data was analyzed using the Linear mixed model (LMM). As with using LMM, it was possible to perform an ANOVA analysis which accounted for both fixed and random effects. Furthermore, it also incorporated the nested structure of the dataset (Gueorguieva, 2001). First, the mean of the total score of all the numeric scale items of the SWEMWBS was calculated and then summed up in a new variable. In the LMM analysis “ID” was then selected as the subject, the variable “time” as repeated and Autoregressive (1) was selected as covariance type, as it was assumed that more time between observations means less correlation of these (Fidell & Tabachnick, 2003). Next, the variable with the mean total scores of the SWEMWBS items was selected as dependent and “social media use" as a covariate. Then, the variable “social media use” was set as the main effect and parameter estimates for fixed effects were selected in the Statistics Option. The table that was analyzed was the estimates of fixed effects table which showed the correlation between the two chosen variables. The estimates in the table were non-standardized which were difficult to interpret. Therefore, these were transformed through the descriptive command to create two new variables which then showed the standardized value to favour better interpretation. Afterwards, the same analysis was run again with the standardized variables.

To test the third hypothesis a LMM moderation analysis was run to see if “purpose of use” had a moderating effect on the relationship between "social media use” and the mean total scores of the SWEMWBS items. Therefore, "purpose of use" was selected as a factor, the mean total scores of the SWEMWBS items were selected as dependent and “social media use" as a covariate. Additionally, an interaction effect between social media use and purpose of use was chosen. In the derived table of estimates, it was then observable if a moderation effect existed or not.

Results

Descriptive Statistics

After all the participants that did not meet the inclusion criteria were excluded, a total of 33 participants were left. These participants filled out a total number of 729 responses. It was observed that the average total score of the SWEMWBS in the daily questionnaires was average in comparison to the cut-off score of 21 to 27 (Table 2; Warwick Medical School, n.d.). The mean score of the MHC-SF in the baseline questionnaire was moderate at 3.06 (Lamers, 2010; Table 2). The sample of 33 is seen as sufficient for an Experience Sampling study according to van Berkel et al. (2017), who stated that a sample of n=19 is already meaningful when working with Experience Sampling.

Table 2

Well-being scores

Baseline measurements	M	SD	Min.	Max.
Mental Health Continuum-Short Form	3.06	0.97	0.86	4.43
Daily measurements				
Short Warwick-Edinburgh Mental well-being scale	26.66	4.72	8	35

Assumptions Check

According to Maas and Hox (2004), three assumption tests need to be done for a LMM analysis, namely normality, equal variance and linearity. The graph that was used to check for normality showed a not perfect alignment and was slightly skewed but was evaluated as sufficient. Therefore, the normality criterion was still met (see Appendix C). The scatterplot that was created to check for equal variance and linearity showed no curve of the data points in the plot. This means that the linearity criterion was met. Furthermore, also the equal variance criterion was met, as the data points in the scatterplot were not aligned in a triangular shape (see Appendix D).

Analysis of Purposes of Use

To test the first hypothesis that “social interaction”, “beating boredom” and “entertainment” are the most prevalent used purposes of use, a frequencies analysis was performed. In the table, it was observed that “social interaction” was selected 112 times

(15.4%), “entertainment” 227 times (31.1%) and “beating boredom” 128 times (17.6%). Although in the hypothesis the purposes of use were formulated in a different order, the hypothesis showed to be expressive.

Table 3

Purpose of Use table

	Frequency	Percent	Valid percent	Cumulative percent
Social interaction	112	15.4	19.8	19.8
Information seeking	63	8.6	11.2	31.0
Entertainment	227	31.1	40.2	71.2
Beating Boredom	128	17.6	22.7	93.8
Escaping negative emotions	25	3.4	4.4	98.2
Searching for positive emotions	10	1.4	1.8	19.8
Missing	164	22.5		

Correlation Analysis

To test the second hypothesis that social media use has a positive influence on mental well-being, a LMM analysis was performed. The analysis showed that there was a significant weak negative effect of social media use on mental well-being with a standardized estimate of ß= -0.11, p= .000 (Table 4). Therefore, an increase in social media use was related to a decrease in mental well-being.

Table 4

Table of Estimates for Social media use on mental well-being

							95% CI	
Parameter	*b*	*ß*	*Std. error*	*df*	*t*	*Sig.*	*Lower bound*	*Higher bound*
Intercept	3.99		.07	233.15	52.39	<.001	3.84	4.14
Social Media Use	-.071	(-0.11)	.02	535.42	-3.52	<.001	-.11	-.031

Moderation Analysis

To test the third hypothesis, that the relationship between social media use and mental well-being is moderated by purpose of use, a moderation LMM analysis was conducted. The analysis showed that purpose of use had a significant effect on mental well-being with ß= -0.13, p= < .001 (Table 5). But only one of the purposes of use items had a significant effect namely, *information seeking* with b=1.22, p=.04 (see Appendix E). Moreover, the interaction effect of social media use and purpose of use was not significant with b= 0.03, p= .06. Therefore, purpose of use did not have a moderation effect on the relationship between social media use and mental well-being (Table 5). Worth mentioning is that none of the purpose of use variables showed a significant moderation effect. Despite that purpose of use having a significant effect on mental well-being, it did not have a significant moderation effect on the relationship between social media use and mental well-being.

Table 5

Table of Estimates Moderation Analysis

						95% CI	
Parameter	*b*	*ß*	*df*	*t*	*Sig.*	*Lower bound*	*Higher bound*
Intercept	4.35		560.7	29.91	<.001	4.06	4.64
Purpose of use	-0.14	(-0.13)	483.27	-3.29	<.001	-0.23	-0.06

Social Media use*Purpose of use	0.03	(0.05)	479.74	1.88	.061	-0.01	0.06

Discussion

This study aimed to explore the effect of social media use on mental well-being of 18- to 29-year-old people. Moreover, it was observed for which reasons people use SNS most often. Then, it was analyzed if the purpose of use influences the relationship described before. To test this, the experience sampling method was utilized.

The first hypothesis that "social interaction", "entertainment" and "beating boredom" are the most prevalent purposes of use was accepted, as all three were found to be selected most often. This is in line with Whiting and Williams (2013) and Brailovskaia et al. (2020) who proposed that social interaction seeking, entertainment and beating boredom are part of the main reasons to visit SNS. Another interesting observation is that participants selected the same purpose of use multiple times over the period of eight days. Based on the results of this study it could be assumed that the purpose to use SNS is overall the same over time. Nevertheless, these results have to be interpreted with caution as a sample of 33 participants might be representative for an ESM study but could be questioned concerning the item of purpose of use. Furthermore, it was observed that in 164 out of 729 responses to the daily questionnaire participants either selected "other" as purpose of use, or the daily questionnaire was not answered. The reasons, for the participants that selected "other", were often just mentioned once, which is why it was decided to not include them in the results.

Moreover, with the results of the first hypothesis the first research question, which asked for the reasons young adults use social media, can be answered as well. Most of the participants selected "entertainment" and second most "beating boredom" (Table 3). Therefore, entertainment and beating boredom are considered the most important reasons for this age group to use SNS.

Next, the second hypothesis that social media has a positive influence on mental well-being was rejected. According to the results, social media use had a weak negative effect on well-being. Even though the mean score of mental well-being in the daily questionnaire was average in comparison to the cut-off score of 21 to 27 (Warwick Medical School, n.d.), the analysis showed that when participants indicated that SNS were visited often it negatively affected their mental well-being. This also refutes the assumption by Rideout and Fox (2018) who assumed that social media use has a positive influence on young adults. The results

rather supported the conclusion that social media use is one of the reasons for decreasing mental well-being of society (Abi-Jaoude et al., 2020). But the differentiation of the results compared to the study of Rideout and Fox (2018) could be reasoned through the purpose of use that was used most often in the studies, as the main purpose of use differed in the two studies. In this research, most participants selected *entertainment* as their main purpose of use, but in the study of Rideout and Fox (2018) they checked the outcomes mainly on "information seeking". Therefore, it could be hypothesized that the purpose of use of *entertainment* leads to a negative influence on mental well-being and *information seeking* leads to a more positive influence. Another limitation that could be evaluated for this hypothesis is that social media use is not the only source that influences well-being in a daily context. A lot of different things can alter the responses, as several responses are gathered at different times. Factors like the war of Russia on Ukraine and fears of an ongoing conflict, the continuing Covid-19 pandemic or daily life stressors can be things that could impact one's mental well-being. Particularly in times of Covid-19, it was shown that students' complaints of anxiety and depressive symptoms increased compared to the cases before the pandemic (Fruehwirth et al., 2021). Even though the restrictions are not that present anymore, the stress that derives because of it cannot be disregarded. Additionally, Østergaard et. al (2022) detected that also people that are not directly affected by the war in Ukraine, are however passively mentally affected. Although the study was conducted in Denmark, the results can be translated to countries like the Netherlands or Germany as well (Østergaard et al., 2022). Nevertheless, it can be stated that the experience sampling method is a favourable method to adjust to these outside influences, compared to common surveys (Napa Scollen, 2009).

Lastly, the third hypothesis, that purpose of use moderates the relationship between social media use and mental well-being, was rejected. No significant effect was detected. Based on this it can be said that the purpose of use did not impact this relationship in a positive or negative form, there is simply no impact. Nevertheless, the variable purpose of use had a significant negative effect on the dependent variable of mental well-being. Furthermore, it is important to mention that only *information seeking* showed a significant and even positive effect on mental well-being, as the fourth most often selected purpose of use. However, this demonstrates that when participants were actively seeking information on SNS it had a positive impact on their mental well-being, which supports the findings of Rideout and Fox (2018) as well. After interpreting the results, it can be assumed that despite not having a significant effect as a moderator, purpose of use cannot be fully disregarded in

the relationship. As there are no big studies that particularly investigate the reasons for use in connection to mental well-being, this should be further explored in the future. In accordance, studies like the one from Whiting and Williams (2013) about the importance of the reasons to use social media, could be used as a building block to broaden this research.

Furthermore, the results of the third hypothesis contribute to answering the second research question of how the reasons for SNS use correlate with the user's mental well-being. According to the results just one of the reasons had a significant relationship with mental well-being, namely *information seeking*. All other reasons and the moderating relationship were non-significant. Therefore, it can be said that *information seeking* has a positive relationship to mental well-being, but the other purposes investigated in this study did not (see Appendix E).

Strengths and Limitations

In this study, several strengths and limitations can be identified. One strength is that the study had a sufficient sample size with n=33. As mentioned in the results, a sample size of n=19 is already representative for ESM studies (van Berkel et. al., 2017). Furthermore, the scales used to measure mental well-being in this analysis had good internal reliability and consistency scores, which can be compared to other studies that worked with these scales as well (Luijten et al., 2019; Shah et al. ,2021). Another strength that this study has, is the utilization of the experience sampling method (Napa Scollen, 2009). The results that were gathered, were not only from one measurement but from several ones and provide therefore a broader picture of the participant's well-being and their social media usage. Furthermore, it revealed that the purpose of use stayed overall the same among the participant and due to the randomization of questionnaire trigger times, the participants were not able to prepare.

On the other side is the experience sampling method the reason for a few limitations of this study as well. With participating in this study participants agreed to be available for eight consecutive days and to fill in three small questionnaires a day. After finishing the data collection, it was observed that this seemed to be a problem, as just five participants of 33 who were included, responded to 100 percent of the questionnaires, which are an underwhelming 15 percent. Furthermore, 55 participants signed up on the 'Ethica' application, which is a very good sample for an experience sampling study compared to what van Berkel et. al. (2017) proposed. Nevertheless, 20 participants had to be excluded from the study as they failed to answer more than 50 percent of the questionnaires, which are 36 percent of the sample of participants in the beginning. And even though a sample of 33 participants is still satisfactory, it should be evaluated how participants can be further

motivated to fill out at least more than 50 percent. One thing that should be kept in mind is the recruiting of participants. Several participants were recruited via the 'Sona-System' Website and students that joined, received 0.5 credits for their full participation and therefore had a motivation to finish the study. However, most participants were recruited externally from the University of Twente, which implies that they did not receive a comparable gratuity and thus could have lacked the motivation to fully participate. Implementing a gratuity, for example in form of a lottery reward for participants outside the University environment should be thought of in future experience sampling studies (Hsieh & Kocielnik, 2016). This can be used to increase the motivation of participants, which consequently could lead to a higher response rate and therefore a bigger sample (Hsieh & Kocielnik, 2016).

Considering that most of the participants were from Germany another limitation is, that the sample of the study was WEIRD which implies that most of the participants were western, educated, industrialized, rich and from a democratic country (Muthukrishna, 2020). Furthermore, most of the participants were female, which is disproportionate compared to the general population (Table 1). Lastly, the mean age of the study population was 21.66 which is quite low for the target group of 18 to 29 (Table 1). When considering all these premises, it can be argued that the sample of this study was not representative, and the results should be interpreted regarding these limitations (Muthukrishna, 2020). In the future, the focus should be centred on gathering a broad sample which is fully representative of the population it concerns.

Last of all, the language barrier could have been another limitation, as all nationalities from this study do not have English as one of their mother tongues and the questionnaires were all phrased in English. On the one side, the participants that participated that are currently studying at the University of Twente have sufficient English skills to participate without any adversities. On the other side, as mentioned above, several participants were from Germany and were not studying at an university in the Netherlands. The researchers got feedback from some participants that they thought their knowledge of the English language was too limited to successfully participate in the study. If these were concerns that some participants had, it cannot be disregarded that more participants had similar concerns but did not contact the researchers about these. This could be the reason for the low response rate of some participants and gives rise to validity concerns of the study. Nevertheless, the items in the questionnaire were framed simple so that a distortion of the results cannot be expected. In the future, it should be evaluated if questionnaires should be translated to a native language to ensure a higher participation rate.

Implications for Future Research

Even though two of the three hypotheses were rejected this study provides important implications that should be considered in future research. First, it was revealed that "information seeking" has a significant positive effect on mental well-being, while all other purposes of use were not significant. One possibility, for future researchers, would be to explore which kind of "information seeking*"* has a beneficial outcome on well-being and then how this behaviour can be promoted. Furthermore, there was no moderation effect of purpose of use on the relationship between social media use and mental well-being detected. Importantly, future researchers could test whether this stays the same for other purposes of use. Lastly, the sample of this study was WEIRD, which means that it was not representative of the general population. In future research a more diverse sample should be aimed at to ensure that the sample is representing the broad population. This could be done by a translation of the questionnaire, different sampling methods as well as the provision of a gratitude for every participant,

Additionally, it should be considered to create a pre-study to adapt the purposes of use to the target population. In this study, the target group could be interviewed to find out what purposes of use they have for their SNS visits. This would be wise as the purposes of use that this research worked with were collected through researching different studies. Nonetheless, the studies did not have the same goal as well as target group as this study. Therefore, validity is again in question. Creating one's pool of purposes would improve the validity for the target population and would ensure a broader more differentiated pool of reasons that participants can identify with.

Conclusion

In conclusion, it can be stated that social media use had a negative effect on mental well-being and not a positive like hypothesized in the beginning. Furthermore, a moderation effect of purpose of use on the relationship between social media use and mental well-being could not be observed. Nevertheless, "entertainment", "beating boredom" and "social interaction" were confirmed to be the most chosen purposes of use in the surveys. Moreover, "information seeking" was found to have a positive significant effect on well-being and should be further explored in future research. Furthermore, in the future, it would be advisable to implement a pre-study, to better adapt the purposes of use to the target group. On a final note, researchers should focus on obtaining a representative sample for the target group in future and especially consider translating questionnaires for participants who do not have adequate English skills as well as providing gratitude to all participants.

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Appendix

Appendix A

Purposes of use

- Social interaction
- Entertainment
- Beating Boredom
- Information seeking
- Escaping negative Emotions
- Search for positive Emotions
- Other: with option to write it down

Appendix B
Informed consent form

Welcome!

Dear Participant,

You are being invited to participate in a research study titled “Social media use and its relationship to mental health/well-being: An Experience Sampling Study”. This study is being done by Sarah Schünke and Kai Gehrmann from the Faculty of Behavioural, Management and Social Sciences at the University of Twente.

The purpose of this research study is to find out how social media affects mental well-being and what relationship self-esteem and upward social comparison play in this relationship as a moderater. Moreover, we want to find out what the most prevalent reasons for social media use is in that group and how this influences mental well-being. For the present study, we would like to use an app called 'Ethica' in which you have to fill out three short questionnaires three times a day (morning, afternoon, and evening) for eight consecutive days. In these questionnaires, we will ask you about your mental well-being, social comparison, self-esteem, and social media use. The data will be used for research purposes only.

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential and no personal data of you will be stored.

Study contact details for further information:
Sarah Schünke (s.schunke@student.utwente.nl)
Kai Gehrmann (k.c.gehrmann@student.utwente.nl)

Appendix C

Introduction to daily questionnaires

Dear participant,

Thank you again for signing up for this study! We hope you will have an interesting and insightful week!:)

Today you will start by filling in some demographics about yourself and complete three brief questionnaires.

Today's questionnaires will only be filled out once.

As of tomorrow, you will start to fill out the questionnaires three times a day for the next eight days.

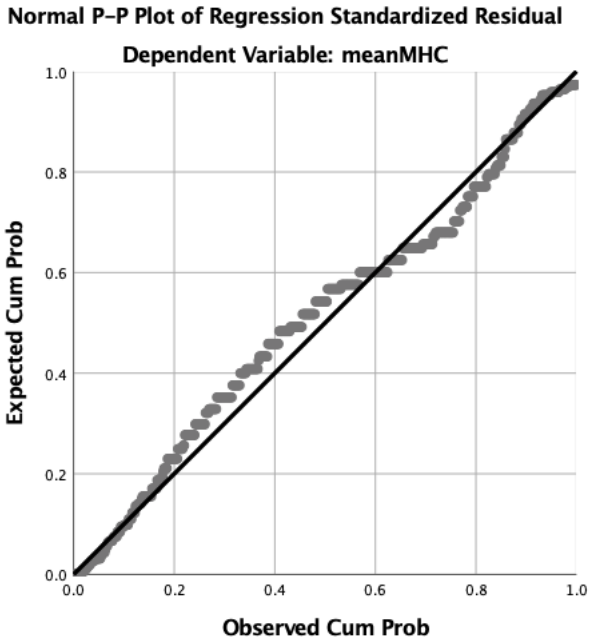
Therefore, we would kindly ask you again to allow push notifications from the Ethica app in order to not miss the questionnaires and minimize data loss.

Have fun and enjoy! :)

Appendix D

Figure 1

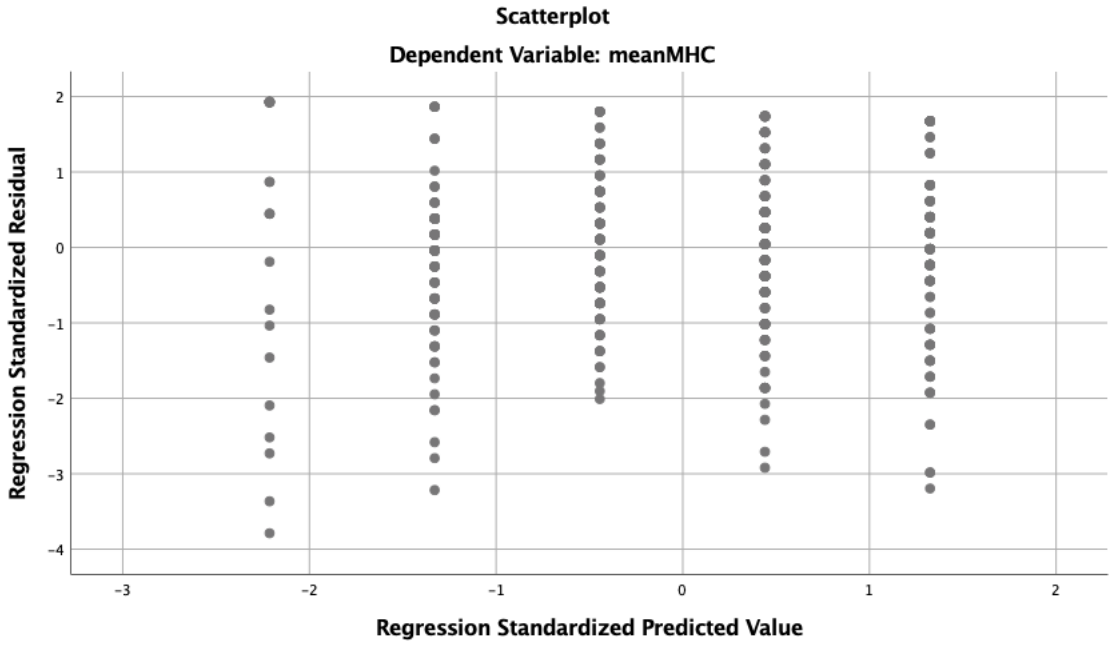
Distribution of Residuals



Appendix E

Figure 2

Scatterplot for Equal Variance and Linearity



Appendix F

Table 6

Table of estimates moderation analysis (non-standardized)

						95% CI	
Parameter	*Estimate*	*Std. Error*	*df*	*t*	*Sig.*	*Lower Bound*	*Upper Bound*
Intercept	3.08	0.58	485.23	5.33	.000	1.94	4.22
[purposedum=1.00]	1.07	0.59	476.99	1.82	.070	-0.09	2.22
[purposedum=2.00]	1.22	0.59	476.55	2.07	.039	0.06	2.38
[purposedum=3.00]	0.83	0.58	478.98	1.42	.155	-0.32	1.98
[purposedum=4.00]	0.50	0.58	475.29	0.87	.387	-0.64	1.65
[purposedum=5.00]	0.79	0.60	470.998	1.31	.191	-0.4	1.98
[purposedum=6.00]	0[b]	0	.	.	.	.	.
Social_Media_Use	0.099	0.17	467.17	0.57	.569	-0.24	0.44
[purposedum=1.00] * Social_Media_Use	-0.21	0.18	459.47	-1.2	.232	-0.56	0.14
[purposedum=2.00] * Social_Media_Use	-0.26	0.18	465.43	-1.41	.160	-0.62	0.10
[purposedum=3.00] * Social_Media_Use	-0.11	0.18	468.93	-0.61	.541	-0.46	0.24

[purposedum=4.00] * Social_Media_ Use	-0.04	0.18	463.47	-0.24	.808	-0.39	0.30
[purposedum=5.00] * Social_Media_ Use	-0.22	0.18	462.82	-1.21	.225	-0.58	0.14
[purposedum=6.00] * Social_Media_ Use	0[b]	0	.	.	.	.	.

Appendix G

Table 7

Table of estimates moderation analysis (standardized)

					95% CI	
Parameter	*ß*	*df*	*t*	*Sig.*	*Lower bound*	*Higher bound*
Intercept	-.277877	505.029	-1.296	.195	-.698998	.143244
[ZSocial_Media_Use=-1.32599]	.355588	554.559	1.635	.103	-.071541	.782716
[ZSocial_Media_Use=-.44200]	.379501	554.753	1.778	.076	-.039853	.798855
[ZSocial_Media_Use=.44200]	.336021	554.693	1.560	.119	-.087143	.759185
[ZSocial_Media_Use=1.32599]	.162020	549.772	.769	.443	-.252092	.576132
[ZSocial_Media_Use=2.20998]	0[b]	.	.	.	.	.
ZPurposeOfUse2	-.125042	527.280	-.702	.483	-.475090	.225007
[ZSocial_Media_Use=-1.32599] * ZPurposeOfUse2	-.159055	504.341	-.869	.385	-.518762	.200653
[ZSocial_Media_Use=-.44200] * ZPurposeOfUse2	-.003372	515.613	-.018	.985	-.364773	.358030
[ZSocial_Media_Use=.44200] * ZPurposeOfUse2	.019028	518.228	.102	.919	-.347293	.385349
[ZSocial_Media_Use=1.32599] * ZPurposeOfUse2	.067644	502.208	.381	.703	-.281210	.416498
[ZSocial_Media_Use=2.20998] * ZPurposeOfUse2	0[b]	0	.	.	.	.