

Objective Social Media Use and Well-Being: An Actual Behavior Study

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Abstract

A myriad of research has examined how time spent on social networking sites (SNSs) impacts users' well-being; however, the results are inconsistent. Recent criticism has been that measuring time spent on SNSs with self-reported assessments is prone to errors. In the present study, we address this limitation by assessing participants' actual SNS use via the screen time feature on their smartphones. This way, we can relate the objectively measured SNS use of 383 respondents to several markers of well-being. Findings reveal that objective overall SNS use on smartphone apps is not a good predictor of well-being. A deeper look at the nine examined apps suggests that only time spent on TikTok and Snapchat is negatively linked to well-being as manifested via increased negative affect, anxiety, and depression. The pitfalls and benefits of using screenshots of the screen time feature as an objective measure for SNS use are discussed and future steps are outlined.

Keywords: Social Networking Sites, Well-Being, TikTok, Data Donations, Objective SNS Use

1. Introduction

While individuals spend substantial time on social networking sites (SNSs), how this affects their well-being is an open and much-debated research question (e.g., Kross et al. 2021). While some studies provide evidence for the presence of negative effects (Liu et al. 2019), other studies find no association (Orben et al. 2019), and yet others report a positive relationship (Yin et al. 2019). Importantly, until now, the extant research on the effects of SNS use on users' well-being has largely relied on self-reports (Parry, Fisher, et al. 2021). Recently, however, several studies have called into question the validity of this approach, pointing toward a discrepancy between people's reported and

their actual SNS usage times (Parry, Davidson, et al. 2021). Specifically, large-scale analyses that related self-reports of SNS use with logged data found either no or only moderate correlations between these measures (Parry, Davidson, et al. 2021). Against this backdrop, there is a growing pressure to obtain insights into the effects of SNS use using objective sources of data. This is because when it comes to self-report data, "clear conclusions regarding [these] relationships remain elusive." (Parry, Fisher, et al. 2021).

Hence, using objective data sources of people's SNS use yields untapped potential for researchers who seek to shed light on the consequences of these platforms on people's well-being. A deeper understanding of the relationship between SNS use and people's mental health can be generated by linking objectively captured SNS use to measures of people's well-being as measured with survey instruments. While studies that test the relationship between SNS use and well-being using objective data start to emerge (Faelens et al. 2021; Parry, Fisher, et al. 2021), research findings remain limited. Responding to the calls for measurement approaches that embrace recent methodological developments, we explore the use of screen time capturing features of mobile devices as a source of objectively measured SNS use. By asking participants to provide screenshots of their screen time feature on their mobile phones, we access the actual time participants spend on various SNS apps on their mobile phones. As opposed to data donations from social media archives or third-party apps that record SNS use behavior, which have been used by other researchers (van Driel et al. 2021), screenshots of people's SNS use offer an easily implementable and low-resource option for measuring objective SNS use. We collect and link this data to various measures of participants' well-being as reported in a survey. Our results provide new evidence on how participation in different SNSs relates to users' well-being. First, we find no association between the overall SNS screen

time and well-being measures included in our study. At the same, taking a more granular perspective, our analysis shows that the time users spend on TikTok is associated with a number of negative effects, including a loss in hedonic well-being, lower life satisfaction, as well as a rise in negative affect, anxiety, depression and feelings of envy. In a similar vein, the use of Snapchat is associated with loneliness, negative affect, anxiety, and depression among study participants.

This paper contributes to the theoretical literature in several ways. First, our results corroborate studies on the weak link between aggregate SNS use and well-being (Valkenburg 2022). While early, mostly cross-sectional studies reported diverging correlational relationships between social media use and well-being (Liu et al. 2019), recently, large-scale experience sampling studies have shown that aggregate social media use has no effect on the well-being of most users (Valkenburg 2022). At the same time, our results draw attention to the potential risks of using video-based social media applications like TikTok and Snapchat; both are platforms that have received significantly less academic attention. Second, our findings add to the research stream that calls for collecting objectively measured time spent on SNSs (Parry, Fisher, et al. 2021). Further, we discuss future research avenues for grasping people's activities on SNSs by using data donations from participants' social media archives. Lastly, this paper provides insights into the usability and practicality of utilizing screenshot data of participants' SNS use for research. Our study also yields several important practical implications. For platform providers, it is crucial to enhance understanding of how social media impacts users to establish sustainable platforms. Further, well-being variables like loneliness are getting increasingly more attention from policymakers who aim to protect the mental health of citizens. From a regulatory perspective, it is crucial to understand how social media use contributes to the well- or ill-being of people so that interventions such as media literacy training can be designed.

1.1. Implications of SNS Use for Well-Being

Well-being is an umbrella term for various markers of mental health, including both positive outcomes such as subjective well-being, affect, and life satisfaction, as well as negative states such as depression, anxiety, or loneliness (Meier and Reinecke 2021). Since the onset of SNSs, a large body of research examining how they impact users' emotional lives has been accumulated (Kross et al. 2021; Valkenburg et al. 2006; Verduyn et al. 2017). The first studies in this area mainly examined this relationship by correlating

aggregate time spent on SNSs to different well-being outcomes (Verduyn et al. 2017). These cross-sectional studies produced diverging findings, with some studies showing negative effects (Liu et al. 2019), other studies finding no association (Orben et al. 2019), and yet others reporting positive relationships or correlations that were moderated by participants' personalities (Yin et al. 2019). When looking at individual outcomes, a vast number of studies have reported both beneficial as well as detrimental implications of SNS use for well-being. For example, studies have reported that SNS use might decrease time spent with meaningful activities (Leung and Lee 2005), harm physical health by fostering sedentary behavior (Leung and Lee 2005), make users addicted (Andreassen 2015; Kwon et al. 2016), undermine self-esteem (Krause et al. 2021), or increase feelings of envy (Krasnova et al. 2015) and depression (Cunningham et al. 2021). Other researchers have documented that SNS use strengthens social support and offline relationships (Ellison et al. 2007) or increases self-esteem through self-affirmation and positive feedback from others (Krause et al. 2021).

In response to the scattered findings of earlier correlational studies, recent articles applied more sophisticated longitudinal or experimental designs (Kross et al. 2021). Using an experience sampling method, Faelens et al. (2021) for example show that Facebook and Instagram use results in exacerbated negative affect. At the same time, researchers found that for 46% of study participants, there was no change in well-being as a result of SNS use (Beyens et al. 2020). A number of experimental studies have established causal links between SNS use and well-being by administering abstinence, with the majority of results showing that abstinence leads to small improvements in overall well-being by increasing subjective well-being or decreasing stress, depression, and loneliness (Allcott et al. 2020; Hunt et al. 2018; Mosquera et al. 2020). One study, however, found that abstinence from Facebook caused lowered life satisfaction (Vanman et al. 2018)

In light of these conflicting results, more research is needed to uncover whether SNS use indeed has an impact on users' well-being. One important step in this regard is using more accurate measures of the time users spend on SNSs.

1.2. Objectively Measured SNS Use

So far, most of the studies that examine the effects of SNS use on well-being have based their analyses on self-reported SNS use (Parry, Davidson, et al. 2021). However, recently, these studies have been criticized due to a lack of correlation between self-reported and

objectively measured time spent on SNSs (Parry, Davidson, et al. 2021). When comparing the results of 44 research articles that captured both self-reported and behaviorally measured SNS use, Parry et al. (2021) demonstrate that these outcomes are only weakly correlated. The authors, therefore, conclude that self-reported SNS use as a measure of time spent on SNS should be approached with caution.

Objectively measured SNS use can be captured with different methods, for example, by using screen time features included in smartphones or SNS apps (Ohme et al. 2021). Furthermore, researchers can use custom-developed apps (Geyer et al. 2022), browser plugins (Haim and Nienierza 2019), APIs native to SNS platforms (Tsugawa et al. 2015) or ask participants to donate their social media archives (van Driel et al. 2021). Though these innovative measures warrant advances regarding the validity of findings, several new challenges arise. From a conceptual perspective, drawbacks remain regarding a lack of granularity and insight into people's activities while using SNSs when looking at aggregate time only. However, data donations from users' social media archives that include detailed accounts of their online behavior could open avenues for future research.

Considering the mixed evidence from prior research with its methodological diversity and the predominance of self-reports, we ask the following research question:

RQ: Is there a link between objectively measured time spent on different SNS apps and users' well-being?

2. Materials and Methods

2.1. Procedure

An online questionnaire was published on the Prolific Academic platform (Prolific.co 2021) in August 2021. Four pre-selection criteria were applied to the participant pool: 1) fluency in the English language, 2) being between 19 and 41 years of age, 3) being a UK resident, and 4) being an iPhone user. These screening criteria were applied to ensure that participants could follow the instructions, were in an age range of people who regularly use SNSs, reside in the same country, and use a device that offers the same functionalities to capture SNS screen time. The estimated duration of the survey was 15 minutes, and participation was compensated with £2.00. We collected responses in two rounds, always on Sunday evening. 285 participants took part in the first round of data collection, and 230 took part in the second round; hence, a total of 515 responses were collected. The

data was analyzed after the overall sample across both rounds had been collected.

First, participants were instructed to take a screenshot of the screen time feature on their phones, listing the time they had spent on different SNS apps over the past week. We gave participants detailed instructions on how to find the screen time feature and how to navigate to the right metrics. Instructions on how to take the screenshots have been slightly improved in the second round of data collection to improve the quality of the collected data. Uploading the screenshot was voluntary. Each screenshot displayed the time spent on the most frequently used SNS apps over the past week. Figure 1 shows a screenshot and how the data was converted. For the analysis, we decided to use only the metrics for the most frequently used apps: Instagram, Facebook, YouTube, Twitter, Snapchat, TikTok, WhatsApp, LinkedIn, (Facebook) Messenger, and Messages (the messenger app included in the iPhone).

In the next step, we asked participants for different well-being outcomes commonly tested in SNS research (see the Measures section for a detailed description). In the final part of the survey, participants stated how much time they spent interacting with people outside of SNSs and provided demographics. Overall, 485 out of 515 participants uploaded screenshots of which 387 were valid (screenshots were categorized as invalid if they were blurry, showed daily instead of weekly numbers, or depicted an unrelated image).

The numbers on the screenshots were transcribed and converted into tabular data using an automated script (the code is available upon request). The numbers were manually checked for errors in addition to the automatic transcription.

2.2. Sample Description

Out of the 515 original answers, 387 participants provided valid screenshots. Four additional observations were removed from the analyses due to missing well-being data. Overall, we obtained a sample of 383 usable observations. The mean age was 25.6 years (SD = 6.0). 45.2% of the sample held a college or university degree, 64.0% were employed or self-employed, and 25.9% were students. Females make up 82.2% of the sample. This misbalance in the sample can be attributed to the sudden increase in the representation of young females in the participant pool of Prolific, as a result of an unaffiliated video promoting Prolific going public on TikTok (Charalambides 2021) – an event that took place immediately prior to the data collection.

APP#	Instagram	Facebook	Snapchat	Messenger	Messages	...
1	289	218	177	90	41	...
...

Figure 1. Process of Data Conversion

Note: The screenshots contain the time spent on the mobile apps during the past 7 days. Upon data conversion from the screenshots to tabular form, the use times were entered in minutes. E.g., 4h 49m in the screenshot on the left turned into 289m in the dataset. Participants who spent below one minute on a given app were not included in the analysis.

2.3. Measures

SNS use implies deploying SNSs as a means of accomplishing or achieving something, e.g., watching or creating content, communicating with friends, browsing profiles, etc. Similar to self-disclosure, that has several dimensions and can be assessed in terms of depth (content) and breadth (amount) (Krasnova et al., 2010), SNS use can be operationalized by gauging (1) *what* SNSs were involved and *what* activity has been performed (interaction patterns) and (2) *how much time* was spent (duration). In this paper, we consciously focus only on the breadth dimension of SNS use, i.e., duration or time spent.

We measured participants' well-being, their time spent on different SNSs via screenshots as well as social interactions that occurred outside of SNS use. Moreover, participants' demographics, days spent working from home and their overall number of working days were measured.

When assessing participants' well-being, we adopted a broad definition of the term that encompasses both markers of how well people are doing in their lives as well as the extent to which they are experiencing psychological distress (Meier and Reinecke 2021). We collected the following measures from participants:

Subjective well-being was measured using the Mental Health Continuum Short Form by Lamers et al. (2011). This 14-item scale has subscales for hedonic well-being, social well-being, and psychological well-being. All items were measured using a 5-point scale (never – several times per day).

Positive affect and negative affect were measured using the Positive and Negative Affect Schedule

(PANAS) (Watson et al. 1988). This scale measures how often participants have felt any of 10 positive and 10 negative emotions over the past week (not at all – very much) on a 5-point scale.

Life satisfaction was assessed using the Satisfaction with Life scale (Diener et al. 1985). Participants indicated their level of agreement to five items using a 7-point scale (strongly disagree – strongly agree)

Loneliness was measured using the 8-item version of the UCLA Loneliness scale (Hays and DiMatteo 1987). On a 4-point scale, participants stated how often they felt the way described in eight different statements (never - often).

Anxiety was evaluated with the Generalized Anxiety Disorder 7-item scale (GAD-7) (Spitzer et al. 2006). For this measure, participants indicated how often they felt each of seven emotional states on a 4-point scale (not at all – nearly every day).

Depression was rated by using a 5-item version of the Center for Epidemiologic Studies Depression Scale (CESD) (Radloff 1977). With this scale, participants state how often they experience each of five emotions on a 4-point scale (rarely or none of the time - most or all of the time).

Envy was measured according to the scale by Tandoc et al. (2015). Respondents marked their level of agreement to seven statements assessing their tendency to feel envious on a 5-item scale (strongly disagree – strongly agree).

Face-to-face time measured how many minutes participants spent interacting with other people face-to-face on the day of the study.

Social interactions assessed how many people participants had interacted with face-to-face over the past week.

As for controls, we included *gender* (female=1), *household size* (number of people living together), *homeoffice days* (number of days spend in homeoffice during last week) and *total workdays* (number of work days last week).

The complete wording of the scales can be found in the Online Appendix.

2.4. Convergent Validity

Table 1 demonstrates that all Cronbach's alphas are within the interval of 0.65-0.80, which is conventionally considered adequate (Vaske et al. 2017). Composite reliability values are above 0.7 and, therefore, satisfy the criteria suggested by Fornell and Larcker (1981). Since the constructs for all outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	AVE	CA
(1) Hedonic WB										0.75	0.87
(2) Social WB	0.60									0.59	0.78
(3) Psychological WB	0.68	0.65								0.54	0.85
(4) Loneliness	-0.50	-0.46	-0.56							0.67	0.87
(5) Life satisfaction	0.68	0.53	0.67	-0.57						0.57	0.89
(6) Positive affect	0.64	0.57	0.68	-0.48	0.52					0.60	0.91
(7) Negative affect	-0.46	-0.31	-0.53	0.48	-0.48	-0.32				0.65	0.90
(8) Anxiety	-0.48	-0.33	-0.49	0.47	-0.47	-0.34	0.78			0.73	0.90
(9) Depression	-0.70	-0.51	-0.69	0.64	-0.68	-0.64	0.66	0.68		0.62	0.85
(10) Envy	-0.51	-0.42	-0.55	0.57	-0.63	-0.43	0.48	0.49	0.59	0.58	0.83

Table 1. Correlations, AVE and Cronbach's Alpha (CA) of all Well-Being (WB) Outcomes.

evidenced good psychometric properties, we averaged the items for the statistical analysis.

3. Results

3.1. Objective SNS Use (Screenshot Data)

Table 1 gives an overview of the times participants spent on different SNS apps over the week before taking part in the study. Participants on average spent the most time on TikTok ($\mu = 485.48$, $SD = 385.87$). On average, the least amount of time was spent on LinkedIn ($\mu = 22.62$, $SD = 30.86$). User counts of Instagram ($N = 345$) and Messages ($N = 356$) were the largest in the sample.

3.2. The Relationship between Objective SNS Use and Well-Being

The association between objective SNS use and well-being was measured in two steps. In the first step, we regressed the overall screen time on all well-being outcomes (see Table 3). In the second step, we looked at each SNS individually (see Table 4).

Overall SNS screen time was computed as the sum of minutes spent on TikTok, Instagram, Facebook, WhatsApp, Twitter, LinkedIn, Snapchat, Messenger,

and Messages. Table 3 shows that the overall SNS screen time is not a valid predictor of participants' well-being. Instead, the control variables predict the outcomes better. As such, the higher the household size, the lower are hedonic well-being ($\beta = -0.15$, $p < 0.001$), psychological well-being ($\beta = -0.09$, $p < 0.05$), life satisfaction ($\beta = -0.20$, $p < 0.05$) and the higher are loneliness ($\beta = 0.12$, $p < 0.001$), negative affect ($\beta = 0.16$, $p < 0.001$), anxiety ($\beta = 0.14$, $p < 0.001$), and depression ($\beta = 0.11$, $p < 0.001$). Total workdays negatively correlate with hedonic well-being ($\beta = -0.24$, $p < 0.001$), life satisfaction ($\beta = 0.35$, $p < 0.001$), and positively with depression ($\beta = 0.14$, $p < 0.001$) and envy ($\beta = 0.11$, $p < 0.001$). Days spent working from home contribute to higher hedonic well-being ($\beta = 0.12$, $p < 0.001$) and life satisfaction ($\beta = 0.27$, $p < 0.001$) as well as lower depression ($\beta = 0.10$, $p < 0.001$) and envy ($\beta = -0.14$, $p < 0.001$). Finally, social interactions are consistently positively linked to variables that measure positive emotional states and negatively linked to variables that measure negative states.

In the next step, we took a more granular look at each SNS and its association with the well-being outcomes (Table 4). For example, to explore the effects for TikTok users, the following model was estimated, where the variable "OtherSNSs" controls for the time spent on other SNSs, except for TikTok:

Variable	N	Mean	Std. Dev.	Median	Min	Max
TikTok	216	485.48	385.87	451.50	1	2384.00
Instagram	345	314.9	254.09	258.00	1	1587.00
Facebook	281	223.06	206.09	155.00	1	926.00
WhatsApp	337	117.99	156.09	57.00	1	1124.00
Twitter	191	122.22	170.4	59.00	1	1105.00
LinkedIn	76	22.62	30.86	12.50	1	164.00
Snapchat	232	169.88	212.87	99.00	1	1403.00

Messenger	250	57.95	76.82	25.50	1	527.00
Messages	356	42.7	75.19	17.00	1	858.00

Table 2. Weekly SNS Usage Times

Note: Times measured in minutes per week. Varying N due to not all participants using all apps. Participants who spent below one minute on a given app were not included in the analysis.

Hedonic WB

$$= \beta_0 + \beta_1 \text{Log TikTok} + \beta_2 \text{Log OtherSNSs} + \beta_3 \text{Log ftf time} + \beta_4 \text{female} + \beta_5 \text{hhsz} + \beta_6 \text{homeoffice_days} + \beta_7 \text{total_work_days} + \beta_8 \text{social_interactions} + \epsilon$$

Results of this analysis show that TikTok is a significant predictor of most of our well-being measures, with more time spent on TikTok being linked to lower hedonic well-being ($\beta=-0.11, p<0.1$) as

well as lower life satisfaction ($\beta=-0.24, p<0.05$), and increases in negative affect ($\beta=0.12, p<0.05$), anxiety ($\beta=0.12, p<0.05$), depression ($\beta=0.12, p<0.05$), and envy ($\beta=0.11, p<0.05$). Further, Snapchat positively predicts loneliness ($\beta=0.10, p<0.05$), negative affect ($\beta=0.15, p<0.05$), anxiety ($\beta=0.17, p<0.001$), and depression ($\beta=0.15, p<0.001$). Using Facebook was related to higher positive affect ($\beta=0.10, p<0.05$), while using its messenger was associated with increased feelings of envy ($\beta=0.12, \text{not significant}$).

Dependent Variable →	Hedonic WB	Social WB	Psychological WB	Loneliness	Life satisfaction	Positive affect	Negative affect	Anxiety	Depression	Envy
(Intercept)	3.62*** (0.04)	2.66*** (0.04)	3.30*** (0.04)	2.18*** (0.04)	4.47*** (0.07)	3.09*** (0.04)	2.22*** (0.04)	2.08*** (0.04)	2.08*** (0.04)	3.18*** (0.04)
Log total SNS time	0.02 (0.04)	0.00 (0.04)	-0.02 (0.04)	-0.01 (0.04)	-0.06 (0.07)	0.03 (0.04)	0.07 [†] (0.04)	0.08 [†] (0.04)	0.05 (0.04)	0.07 [†] (0.04)
Log face-to-face time	0.07 [†] (0.04)	0.07 [†] (0.04)	0.10* (0.04)	-0.13*** (0.04)	0.21 (0.07)	0.10* (0.04)	0.02 (0.04)	-0.01 (0.04)	-0.05 (0.04)	-0.02 (0.04)
Female	0.00 (0.04)	-0.01 (0.04)	-0.01 (0.04)	-0.05 (0.04)	-0.07*** (0.07)	-0.01 (0.04)	-0.03 (0.04)	-0.03 (0.04)	-0.01 (0.04)	0.00 (0.04)
Household size	-0.15*** (0.04)	-0.07 [†] (0.04)	-0.09* (0.04)	0.12*** (0.04)	-0.20* (0.07)	-0.04 (0.04)	0.16*** (0.04)	0.14*** (0.04)	0.11*** (0.04)	0.08 [†] (0.04)
Homeoffice days	0.12* (0.05)	0.06 (0.05)	0.07 (0.05)	-0.07 (0.04)	0.27*** (0.08)	0.10 [†] (0.05)	-0.01 (0.05)	-0.03 (0.05)	-0.10* (0.04)	-0.14*** (0.05)
Total workdays	-0.24*** (0.05)	-0.06 (0.05)	-0.09 (0.05)	0.07 (0.05)	-0.35*** (0.09)	-0.08 (0.05)	0.09 [†] (0.05)	0.10 [†] (0.05)	0.14*** (0.04)	0.11* (0.05)
Social interactions	0.17*** (0.05)	0.16*** (0.04)	0.15*** (0.05)	-0.13*** (0.04)	0.25*** (0.08)	0.16*** (0.05)	-0.08 (0.05)	-0.07 (0.05)	-0.16*** (0.04)	-0.11* (0.04)
Model fit:										
N	382	382	382	382	382	382	382	382	382	382
R ²	0.10	0.06	0.06	0.1	0.11	0.06	0.06	0.05	0.08	0.05
Adj. R ²	0.08	0.04	0.05	0.08	0.09	0.05	0.04	0.04	0.06	0.03
F(7,374)	5.91	3.27	3.61	5.73	6.49	3.62	3.12	2.99	4.78	2.91

Table 3. Overview of Regression Results for the overall time spent on SNSs and all Well-Being (WB) Outcomes.

Note: Statistical significance is denoted with [†]p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001. The values in cells are standardized coefficients for an OLS regression. Standard errors are in parentheses. Total SNS time is the sum of use times across all SNSs over the past week. "Log" refers to the natural logarithm of a given variable: log-transformation was applied to meet OLS assumptions.

4. Future Research and Discussion

With this study, we set out to investigate the relationships between objectively measured SNS use

and people's subjective well-being, understood broadly and including both markers of how well people are doing in their lives as well as the extent to which they are experiencing psychological distress (Meier and Reinecke 2021). Our results demonstrate that the relationship between objectively measured SNS use on various apps (as logged by the device) and different well-being outcomes was statistically insignificant for most SNSs. TikTok and Snapchat were the only exceptions, with time spent on these apps being related to multiple well-being outcomes.

In comparison to other social media platforms, TikTok and Snapchat have received significantly less scholarly attention thus far. In our sample, TikTok was the most widely used platform while at the same time having the most negative effect on well-being. So far, limited evidence shows that aggregate TikTok use is associated with depression (Roberts et al., 2023), and using the platform for

depression, anxiety, and negative affect. However, these findings are not necessarily at odds with each other. More lonely and anxious people could turn to Snapchat to fulfill their relationship needs, perceiving those interactions as more enjoyable than offline interactions. Overall, our results show that the effects of social media use on well-being are platform-dependent, which is in line with previous findings (Masciantonio et al., 2021).

Our results further suggest that variables capturing the time spent interacting with people outside of SNSs appear to be better predictors of well-being than SNS use. Next, the merits of working from home are illuminated: the number of days working from home is positively associated with hedonic well-being and life satisfaction and decreases depression and envy. Household size is negatively related to well-being and life satisfaction, simultaneously being positively

Dependent Variable →	Hedonic WB	Social WB	Psychological WB	Loneliness	Life satisfaction	Positive affect	Negative affect	Anxiety	Depression	Envy
Log TikTok (N=216)	-0.11[†] (0.05)	-0.05 (0.05)	-0.11 [†] (0.06)	0.07 (0.05)	-0.24[*] (0.09)	-0.08 (0.06)	0.12[*] (0.06)	0.12[*] (0.06)	0.12[*] (0.05)	0.11[*] (0.05)
Log Instagram (N=345)	-0.04 (0.04)	-0.03 (0.04)	-0.03 (0.04)	0.04 (0.04)	-0.07 (0.07)	-0.05 (0.04)	0.05 (0.04)	0.04 (0.04)	0.05 (0.04)	0.01 (0.04)
Log Facebook (N=281)	0.09 [†] (0.05)	0.08 (0.05)	0.06 (0.05)	-0.02 (0.04)	0.03 (0.08)	0.10[*] (0.05)	-0.08 (0.05)	-0.04 (0.05)	-0.07 [†] (0.04)	-0.01 (0.05)
Log WhatsApp (N=337)	0.05 (0.04)	0.01 (0.04)	0.06 (0.04)	-0.07 [†] (0.04)	0.03 (0.07)	0.07 [†] (0.04)	-0.04 (0.04)	-0.05 (0.04)	-0.06 (0.04)	-0.03 (0.04)
Log Twitter (N=191)	0.04 (0.06)	-0.02 (0.05)	0.00 (0.06)	0.01 (0.05)	-0.00 (0.10)	-0.03 (0.06)	0.03 (0.06)	0.03 (0.06)	0.01 (0.05)	0.00 (0.06)
Log LinkedIn (N=76)	-0.16 (0.10)	-0.12 (0.10)	-0.09 (0.10)	-0.00 (0.09)	-0.13 (0.15)	-0.07 (0.09)	0.05 (0.10)	0.03 (0.10)	0.07 (0.09)	0.05 (0.10)
Log Snapchat (N=232)	-0.10[†] (0.06)	-0.04 (0.05)	-0.10[†] (0.05)	0.10[*] (0.05)	-0.05 (0.09)	-0.08 (0.05)	0.15[*] (0.06)	0.17^{***} (0.05)	0.15^{***} (0.05)	0.01 (0.05)
Log Messenger (N=250)	-0.04 (0.05)	-0.05 (0.05)	-0.01 (0.05)	0.00 (0.04)	-0.13 (0.09)	0.05 (0.05)	0.06 (0.05)	0.07 (0.05)	0.05 (0.04)	0.12[*] (0.05)
Log Messages (N=356)	0.02 (0.04)	0.01 (0.04)	0.01 (0.04)	-0.01 (0.04)	-0.07 (0.07)	0.01 (0.04)	0.07 (0.04)	0.09 [*] (0.04)	0.02 (0.04)	0.00 (0.04)

Table 4. Overview of Regression Results for each SNS and all Well-Being Outcomes.

Note: Statistical significance is denoted with [†]p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001. The values in cells report standardized coefficients for an OLS regression. Standard errors in parentheses. Each cell represents one regression. "Log" refers to the natural logarithm of a given variable: log-transformation was applied to meet OLS assumptions. All regressions include the following controls: Log Face-to-face time, female, household size, home office days, total workdays, social interactions. SNS times measured in minutes per week. For each regression, all users of the SNS were included and the remaining SNSs served as a combined control variable.

escapist behavior is related to negative affect, while using it for maintaining relationships is linked to higher life satisfaction (Dong & Xie. 2022). Studies on Snapchat use and well-being are even more rare. One study reports that participants regard Snapchat as a platform for sharing lightweight, non-staged content with friends and that Snapchat interactions were perceived as more enjoyable than interactions on other channels (Bayer et al., 2015). In contrast, our results show that Snapchat use is linked to higher loneliness,

related to loneliness, negative affect, anxiety, and depression.

We have relied on a novel method of collecting logged data on the time of SNS use and demonstrated the potential of the recently introduced features like iOS screen time for research purposes. Namely, 94% of all people who participated in the study shared screenshots with the information required by the researchers, and almost 80% of those who uploaded

the screenshots submitted usable images (correct information was depicted and was not blurred). Thus, mobile data donations in the form of screenshots are a

4.1. Implications for Research

Our findings underline the calls for being cautious when working with self-reported SNS use data (Parry, Fisher, et al. 2021). The associations between objectively measured SNS use and well-being metrics turned out trivial for most SNSs. That said, the results are aligned with prior findings from smartphone use studies, indicating that objective logs of technology use are not significant predictors of mental health, whereas self-reports and problematic use scales are significantly related to mental health outcomes (Shaw et al. 2020). Hence, a new need for a more profound understanding of the discrepancies between the effects obtained within subjective self-reports and objective measures of media exposure arises.

On the one hand, the discrepancy might stem from the priming effect of such scales as use intensity, addiction, and problematic SNS use (Mieczkowski et al. 2020). Mieczkowski et al. (2020) demonstrate the priming effects of media use scales on depression and conclude that well-being questions should precede the questions about SNS use. The use of objective logged data protects against such priming, which might explain insignificant media effects on well-being. In a recent meta-review (Parry et al. 2021), self-reports were only moderately correlated with the objective use data, and problematic SNS use showed even weaker correlations.

On the other hand, there could be alternative explanations for the absence of SNSs' effects on well-being: it could be that the overall time spent on a given platform is too broad of a metric to meaningfully describe what a person is doing. Besides, SNS platforms offer an array of affordances to their users (Karahanna et al. 2018). That said, due to the actual use practices differing from person to person and from sample to sample, the media effects might differ as well. Hence, the reliance on objective data should go hand in hand with investigating more granular use practices.

Overall, our results contribute to the accumulation of more accurate knowledge about the effects of SNS use on a range of well-being outcomes. Moreover, our approach to data collection can serve future research by offering a reproducible description of procedures. Relying on screenshots, compared to the donation of

feasible data source for studies investigating the effects of media exposure.

complete SNSs use archives, is less privacy-invasive and therefore may reduce self-selection bias and drop-out rates.

4.2. Limitations and Future Steps

This study design comes with the limitation of only measuring SNS use on one device. Since we solely measured the time participants spent on the different SNS apps on their primary smartphones, we do not know how much time they spent on these platforms on other devices. Future research should employ a more granular design to be able to capture use over all devices. Further, the measurement of objective SNS use relied upon the screen time feature provided by Apple, which is less accurate than measuring screen time directly via log data of participants' phones. In future studies, the screen time data should be validated by comparing it to log data.

Another limitation of our study is that we cannot make any claims about causality, as we merely report correlational data. Future studies could use other designs to link objective SNS use to well-being, for example, experience sampling methods.

Females make up 82.2% of our sample, which is an important imbalance to acknowledge. Furthermore, the data collection took place in the Summer of 2021 and, therefore, the results might have been partly influenced by the COVID-19 pandemic. Research has pointed out that users changed their social media use during this time (Marzouki et al. 2021). Repeating the data collection at a later time, when the impact of the pandemic is expected to have diminished, could provide valuable insights into the different patterns of use during and after the pandemic and their impact on well-being.

Informed by extant research and our own findings, we plan to further leverage the data donation method of data collection and ask participants to share their SNS-specific data archives (e.g., Instagram archive), storing the details of their interactions with the platform. Indeed, combining objective measures of media exposure, like the time spent on a platform, with the platform logs of specific activities (posting giving Likes, commenting, etc.) presents great potential for a deeper understanding of the effects of SNS use on users' well-being. Moreover, such an approach will allow us to identify the groups of people, based on their media practices, that are more susceptible to detrimental media effects.

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