Self-Esteem and Its Association with Social Media Use in University Students: An Experience Sampling Study

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Abstract

Background. Nowadays, social media is commonly used in daily life by a wide range of people. Especially adolescents and young adults are targets of such platforms. Using them for communicational purposes and for keeping contact with others, social media has the ability to strengthen mental health. Nevertheless, there are concerns regarding inappropriate and excessive use of social media. Previous studies highlighted the adverse effects social media use has on users´ mental health in general and on their self-esteem in particular. These studies however, mainly relied on one-time measurement tools, neglecting the fact that self-esteem and social media use can fluctuate from one point in time to another. **Objective.** The current study aims to close this gap by focusing on state-levels of self-esteem and social media use over the course of 9 days. Particularly, it was investigated whether there is an association between state self-esteem and state social media use. Further, it was examined if the association of both variables is more reflected on a between- or on a within-person level. Finally, the moderation effect of trait social media use on the association between state self-esteem and state social media use was investigated as well. **Method.** A total of 40 participants partook in a semi-structured, repeated measure, experience sampling study. The Rosenberg Self-Esteem Scale (RSE) and self-developed questionnaires form the basis for assessing trait-levels of self-esteem and social media use once at the beginning of the study. For assessing their state counterparts, the 10 items of the RSE were rephrased. Further, 2 items assessing social media use were constructed. Both questionnaires were prompted 3 times per day over a period of 8 days. **Results.** The outcome of the linear mixed model (LMM) analysis revealed no significant association between state self-esteem and state social media use. Also, findings suggest no association on a between- or within-person level. Finally, LMM analysis showed no moderation effect of trait social media use on the association between state self-esteem and state social media use. **Conclusion.** The present study shows that there is no major problem for social media use in relation to self-esteem for this type of sample. However, it is not clear whether the findings hold true for individuals. Thus, it is advised to focus on inter-individual levels to see if a positive or negative association is present for some individuals. Moreover, future research should focus on the type of social media platform since only assessing time spent on social media does not accurately represent social media use.

Self-Esteem and Its Association with Social Media Use in University Students: An Experience Sampling Study

The popularity of social media platforms has immensely increased over the past two decades. A particular target group of social media platforms are adolescents and young adults between the age of 15 and 25. A study conducted in the US in 2020 found that 63% that use the internet and fall within this age range make use of the social media platform Instagram (Statista, 2022). Besides Instagram, platforms such as Snapchat and Facebook are the most popular ones among college students (Knight-McCord, Cleary, Grant, Herron, Jumbo, Lacey, Livingston, Robinson, Smith, & Emanuel, 2016). These platforms allow users to create profiles, to post pictures and to update or communicate with other platform users on what they are doing, with whom they are with or how they are feeling. Clearly, social media platforms have great value in establishing and keeping contact with other people via the Internet. But besides keeping contact, social media platforms are being heavily criticised for the adverse effects its use has on people's mental health. In their article, Bashir and Bhat (2017), identified for example depression, stress, loneliness or cyber bullying as factors that directly or indirectly affect social media user´s mental health. Especially adolescents and young adults are affected by the adverse effects of social media use on mental health as they are using these platforms for a considerable amount of time in their daily lives (Bashir & Bhat, 2017).

One particular concept that is afflicted with social media users' mental health, mentioned in various studies, is self-esteem (Mann, Hosmann, Schaalma, & de Vries, 2004; Vogel, Rose, Roberts and Eckles, 2014; Jan, Soomro, & Ahmad, 2017). Self-esteem is developed based on people's past experiences which makes it relatively stable within a person. However, momentarily experienced emotions can also influence the current level of people's self-esteem (Heartherton & Wyland, 2003). Due to the different views on the stability of self-esteem there is an imbalance in literature. Until now, researchers have mainly focused on trait self-esteem, which is reflected in the use of *one-time*, memory-based measurement tools such as the Rosenberg Self-Esteem Scale (RSE). Thus, studies utilising these measurement tools rely on participants´ memory of their self-esteem at one particular moment in the past which is often prone to biases (Robins, Hendin, & Trzesniewski, 2001; Jan et al., 2017; van Berkel, Ferreira, & Kostakos, 2017). Consequently, the results of these types of studies reflect biased data. Moreover, studies assessing self-esteem in the context of mental health and social media at one

point in time are of cross-sectional nature, thus only providing insights on between-person levels. However, Cingel, Carter and Krause (2022) state that the true association between social media and self-esteem is “person-specific and based on individual susceptibilities" by referring to recent studies assessing person-specific *within-person* effects. Overall, it becomes apparent that previous research, on the one hand, neglected the fact that fluctuations of self-esteem can falsify data when utilising measurement tools that were not designed to capture fluctuations. On the other hand, previous research also failed to capture within-person associations of self-esteem in the context of social media by ignoring person-specific factors.

Both limitations can be accounted for by adapting a study design that requires participants to indicate self-esteem levels at multiple points in time. For one, the burden on participants´ memory is decreased. Consequently, more accurate data can be ensured by using ambulatory assessment procedures that are proven to be less biased and more valid self-report measurements (Conner & Barrett, 2012). Additionally, state data (gathered at multiple time points) can be used for within-person analyses. In the following sections, social media, self-esteem, and their possible association are explored in more detail.

Social Media Use

The term “social media" was first used in 1994 and soon after, the first social media platforms were developed and launched. Ever since, these platforms are used to interact and connect with others, however, social media shifted from solely interacting with other users to sharing content with them. Celebrities and companies embrace the advantages of social media platforms to reach and influence as many people as possible (Aichner, Grünfelder, Maurer, & Jegeni, 2021). This influence especially reaches adolescents and young adults since they are the main target group using social media platforms in daily life (Berryman, Ferguson, & Negy, 2018; Statista, 2022).

A study conducted in 2020 (O´Reilly, 2020) concluded that the relationship between social media and mental health in general is multidimensional and complex and identified advantages as well as disadvantages in the association of social media and mental health. For one, the emphasis is put on the connectivity humans need and that strong relationships to peers and having support networks are helpful in preventing the onset of mental health conditions and in increasing psychological well-being. Nevertheless, social media has its downsides too.

Inappropriate or excessive use of social media for instance is linked to low self-esteem, sleeping problems or anxiety. According to the participants of the study, these dangers of social media use are strongly linked to the feeling of "missing out" and the need to belong to a social community. In order to avoid missing out or being excluded from a social network, adolescents and young adults feel the pressure to be accessible at any time. Moreover, the participants describe being bullied, trolled, and exposed to self-harm and suicidal ideations as the highest risk to their mental health. At first, it seems as if social media holds more disadvantages than benefits, but it is important to note that social media on its own is not accountable for mental health problems. Genetic, economic, or social factors need to be taken into account as well when talking about the association between social media and mental health (O´Reilly, 2020).

To conclude, social media can increase mental health when it is used in connective ways. When social media is used excessively, however, it is linked to mental health problems. Thus, rather the amount of time spent on social media than social media by itself are crucial factors for mental health. How much time an individual spends on social media is different depending on the individual. In their meta-analysis on social media and its impact on young people's mental health Valkenburg, Meier and Beyens (2022) call for a person-specific approach in order to understand "when, why, and for whom social media use can lead to positive or negative effects on mental health" (Valkenburg et al., 2022). In this context, constructs like self-esteem might be influenced by social media use. To investigate such an association, self-esteem in ots own and in conjunction with social media use are introduced in the following two sections.

Self-Esteem

Self-esteem is one construct often researched in relation to mental health in the last century in clinical psychology. To that effect, many different definitions and differentiations of self-esteem exist. Generally, self-esteem represents the extent to which an individual holds positive or negative self-evaluation and is related to beliefs about one's own abilities/skills and social relationships (Abdel-Khalek, 2016). Hereby, the difference between the wish of being successful in areas of importance and the perceived quality of performance is indicating whether self-esteem is high or low. The discrepancy, however, is not fixed. Instead, enhancing one's abilities and skills or adapting the wish to succeed alters the level of self-esteem.

This notion highlights an important aspect of self-esteem: change. It can be distinguished between *trait* and *state* self-esteem. A trait is a relatively enduring and stable construct that is developed early in life. Hence, people repeatedly having success or being valued by others display higher self-esteem levels. A state, in contrast, is a momentary experience and can fluctuate over time (Endler & Kocovski, 2001; Heartherton & Wyland, 2003). Performing badly in an exam, for instance, can lead to a momentary decrease of self-esteem, even though the person normally displays high levels of self-esteem. Overall, self-esteem exists on a trait as well as on a state level because people high in self-esteem can experience doubt and contrary, people with a rather negative view of themselves can also experience moments of success that increase their self-esteem in that particular moment of time (Heatherton & Wyland, 2003). Rises and falls in self-esteem can be caused by various factors of which one might be the use of social media.

Social Media Use and Self-Esteem

Social media provides a platform where people can fall into the trap of social comparison. According to the *Social Comparison Theory* developed by Festinger (1954), people look at how others portray themselves and based on this portrait they compare themselves to these idealised images. Generally, people engage in two types of social comparison: *upward* and *downward* comparison. When people compare themselves to others superior to themselves, they engage in upward comparison. Here, people look for positive attributes they have in common with superior individuals or groups. Contrary, comparing oneself to people that are inferior is called downward comparison and people compare themselves to others who are doing worse than them. Logically, one would say that social comparison serves to enhance people´s self-evaluations and therefore, their self-esteem. However, upward comparison could not only inspire people to replicate superior role models. It could also hold the danger of negative self-evaluations that lead to feelings of inferiority and resultantly diminish one's self-esteem as people on social media compare their offline lives with idealised online lives. A study conducted with 150 Pakistani students at the Institute of Business Management (IoBM) concluded that the use of social media platforms makes people feel bad about themselves and their lives which leads to low self-esteem and negative well-being (Jan et al., 2017).

The study of Vogel et al. (2014) supports what the theory of Festinger already suggests. They found that frequent Facebook use is associated with lower levels of trait and state self-

esteem. The association between state-level self-esteem and social media was also investigated in other research papers. A recent article summarised previous findings that investigated, amongst others, state-level self-esteem in the context of social media by utilising a diary style of data collection and ecological momentary assessment (EMA) study designs. A negative association between both constructs was found in female adolescents (Cingel et al., 2022). Another study with a similar design however, found a positive relationship between self-esteem on a state level and the quantity and quality social media use which shows the influence of social media content on self-esteem levels at one specific moment in time (Cingel et al., 2022).

By now, it is apparent that studies of state self-esteem and social media use are rare, and findings seem to show different outcomes regarding their associations. Since previous literature indicates adolescents and young adults as the main target group using social media, the current sample consists of university students. Further, already conducted studies with a similar study design mostly focused on one particular social media platform. To be able to make a more general claim on the association between self-esteem and social media use the current study provided a range of social media platforms to choose from, focussing on the most popular ones used by adolescents and young adults. Doing so ensures having a realistic view on social media platforms used by the main target group on a daily basis. In addition, there is an imbalance in literature regarding the investigation of state self-esteem and social media use. To close this gap and to be able to quickly promote mental health of social media users, the current study focuses on state-level self-esteem. Also, Cingel et al. (2022) addresses the need for more diary-like or EMA studies to assess momentary fluctuations in self-esteem and social media consumption to provide “information regarding the transactional nature of the relationship between social media and self-esteem” (Cingel et al., 2022). Furthermore, it was found that social media use per se does not negatively affect self-esteem levels. Instead, the quantity of use plays a significant role. Hence, the current study captures trait and state levels of social media use by assessing the amount of time spent on social media platforms

Purpose of the Present Study

The current study aims to investigate the association between state-level self-esteem and social media use in university students over the course of eight days. Thus, the first research question is as follows: How is state self-esteem of individuals associated with state social media

use over time? Based on previous findings a negative association between both constructs is hypothesised (Vogel et al., 2014; Jan et al., 2017). Further, researchers highlighted the need for within-person associations between state-level self-esteem and social media use. The second research question is therefore as follows: Is the association of state self-esteem and state social media use more reflected on a trait (between-person) or on a state (within-person) level? Both predictions can be possible as Curran and Bauer (2011) indicate that trait-like associations do not necessarily apply to state-like associations. Furthermore, social media use differs in length and the content that is consumed depends on the individual supposing within-person associations. Third, previous literature highlighted the fact that social media use per se has no negative influence on mental health and self-esteem. Rather confounding variables such as the quality of social media content and the amount of time spent on social media platforms are crucial. By now, there are contradicting findings of studies. A recent longitudinal study found that time spent on social media is not predictive of poor mental health (Coyne, Rogers, Zurcher, Stockdale, & Booth, 2019). However, other studies indeed show an association between time spent on social media and mental health problems (O´Reiley, 2020; Valkenburg et al., 2022). Thus, the third research question is as follows: Is the association of state self-esteem and state social media use over time moderated by trait social media use? It is hypothesised that the association between self-esteem on a state level and state social media use is stronger when the amount of time spent on social media on a trait level is low, because it is less likely to engage with problematic social media use when not using social media.

Method

Design

The current study made use of an already existing dataset where momentary experiences of self-esteem and momentary social media use were gathered by using the Experience Sampling Method (ESM) (Eveslage, 2021). The ESM is especially suitable for this type of study design as it captures real world and real-time data by using a self-report diary style of data collection (Myin-Germeys & Kuppens, 2021; van Berkel et al., 2017). Capturing real world experiences implies that studies using ESM do not manipulate the environment of participants but gather experiences and changes as they occur. Furthermore, assessing experiences and changes in real time means to capture them “as closely in time as possible to their actual occurrence” (Myin-Germeys & Kuppens, 2021). Doing so avoids participants relying on their memory too much and resultantly prevents memory biases from occurring (van Berkel et al., 2017). In addition, assessing people's experiences and emotions in their natural environment, ensures high ecological validity (source). Overall, using the ESM corrects the previously mentioned limitations of other studies when assessing self-esteem in the context of social media.

Participants

For recruiting participants, a convenience sampling strategy was utilised. The former researcher shared the study via social media platforms like WhatsApp and Facebook. The participants did not receive any compensation for participating in the study. Besides WhatsApp and Facebook, the study was also shared via the Test Subject Pool BMS (SONA) System so students at the University of Twente could participate and earn an expense in the form of partial study credits.

To be allowed to participate in the study, the following four inclusion criteria needed to be fulfilled. (1) Participants needed to be between the ages of 18 and 30. It was decided on this age range since according to Perrin (2015), 90% of this age group use social media and are active on at least one social media platform. (2) A proficient level of the English language was required to be able to comprehend the content and surveys of the study. (3) Another criterion for participation was the use of at least one social media platform over the course of one week. (4) Lastly, to meet the compatibility requirements of the application Ethica which was the platform

providing the study, the participants needed to have a smartphone on which Ethica could be installed.

Data collection took place from October to November in 2020 and was completed by each participant over the course of nine days. Of the overall nine days, eight were meant for measuring state level self-esteem and amount of time spent on social media. According to van Berkel et al. (2017) a study duration of eight days is sufficient to gather fluctuations of the state variable and to get an average and realistic grasp of the participants´ social media consumption.

Materials

The tool of choice to collect the data was the application Ethica. Overall, three surveys were constructed in Ethica, one for assessing demographic variables, another one for assessing trait-level self-esteem and trait social media use and finally, one survey for assessing self-esteem on a state level and state social media use. In order to have an objective measurement tool for measuring screen time the study made use of a screen time measurement tool.

Ethica

Ethica is an online application that is utilised in the fields of health, psychology, kinesiology, and others. People having smartphones with the operating systems of iOS or Android can install and use the application, but also a web application for Ethica exists. From the participants´ perspective, Ethica provides them with studies in which they can partake if they are interested. For researchers, Ethica provides a web desktop setting to design surveys, provide them to participants, monitor their response rates and evaluate the responses afterwards (https://ethicadata.com/). Before starting the actual data collection, the surveys were tested in a three-day pilot study.

Trait Questionnaires

Rosenberg Self-Esteem Scale (RSE). The Self-Esteem Scale of Rosenberg was utilised to assess the participants´ individual levels of trait-level self-esteem (see Appendix A). The RSE is a 10-item Guttman scale that can be answered on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). A minimum score of 0 and a maximum score of 30 can be reached. Thus, the scale ranges from 10 (lowest self-esteem) to 40 (highest self-esteem).

Particularly, scores below 15 suggest low levels of self-esteem, scores between 15 and 25 represent a normal range of self-esteem, whereas scores above 25 reflect high levels of self-esteem (Rosenberg, 1995). Looking at the Guttman scale coefficient of reproducibility (= .92) the excellent internal consistency of the RSE becomes apparent. Furthermore, the reliability scores are of adequate stability (correlation of .85 and .88) according to a test-retest reliability measure conducted by Ciarrochi and Bilich (2006). For the current study, the reliability of the trait questionnaires was also assessed by calculating Cronbach's alpha. The score was interpreted according to Shelby (2011). A correlation coefficient of at least .40 can be interpreted as acceptable, adequate reliability is achieved with the coefficient being between .65 and .70 and to have excellent reliability within the questionnaire, a score of at least .80 should be achieved. For the RSE a coefficient of 0.91 was calculated and resultantly, the reliability in the current study can be interpreted as excellent.

Trait Social Media Use. The trait social media use was also assessed once at the beginning of the study. To do so, three questions were formulated (see Appendix B). First, the participants were asked an open-ended question about the number of social media platforms they are actively using daily. Next, it was asked which particular social media platforms are used by them. They could choose between the platforms Facebook, Instagram, Snapchat, TikTok, YouTube, Twitter, Pinterest, Tumblr. Another answer option including “other” was also given. Finally, the amount of time spent on these social media platforms was asked. The participants had the possibility to indicate the exact time for each measurement point. However, the researcher categorised the answer options into 5 different categories afterwards (“less than 30 minutes”, “between 30 and 60 minutes”, “between 60 and 90 minutes”, “between 90 and 120 minutes” and “more than 120 minutes”).

State Questionnaires

State Self-Esteem. The RSE utilised to assess trait-level self-esteem served as the basis for the construction of the survey questions capturing self-esteem on a state level. All 10 items of the RSE were rephrased to be used to measure the participants´ current feelings and experiences (see Appendix C). Rephrasing already existing items of a well validated and reliable scale has already been proven to be successful in a study conducted by Alfasi (2019) who changed the items of the RSE to assess global self-esteem into items that assess momentary experiences and

feelings. The answer options on the 4-point Likert scale remained the same as for the RSE, ranging from 1 (strongly disagree) to 4 (strongly agree).

State Social Media Use. Similar as for trait social media use, questions were asked regarding (1) the amount of time spent on social media platforms from one measurement point to the next and (2) the number of platforms that were used by participants for the same time period. To have accurate measures of social media consumption, participants were asked to indicate the amount of time spent on social media that was observed by the screen time measurement tool. Additionally, the participants were asked to indicate the kinds of platforms they were using up until the particular moment of answering the survey since the last one. Here, they were offered the possibility to choose from multiple answer options (see Appendix D).

Screen Time Measurement Tool

A screen time measurement tool was used to get an objective grasp of daily screen time not depending on participants´ approximate calculations or assumptions. Screen time measurement tools are designed to capture variables such as time spent on the screen per day and per application. Participants were asked to download the application Screen Time from the App- or Playstore. Besides the advantage of objectivity, the data collected with a screen time measurement tool is of cumulative nature meaning that participants can only indicate the overall time spent on social media that was captured from the first time of measurement. Thus, the difference of social media use between timepoints could not be indicated but only the total amount of time spent on social media per day. Still, due to its objectivity the screen time measurement tool was included.

Procedure

The first day of the study was dedicated to downloading the application Ethica and to the creation of an account by indicating an email address and setting up a password. Next, participants received a participation code which they had to type in to Ethica to enrol for the study. When they enrolled, participants received detailed information about the study and a consent form which they had to agree to after reading all the information. When participants decided to consent with the study, they got further instructions regarding the study.

Before starting to fill in the surveys, they were asked to check whether their smartphones have a pre-installed screen time measurement feature. In case of missing such a feature, participants were asked to download the application called Screen Time from the App- or Playstore. After doing so, participants could start to fill in all surveys that needed to be answered one time in the beginning of the study such as demographic information, the RSE trait questionnaire and their trait social media use. Automatic reminders were sent to the participants when one or more of the questionnaires were forgotten to be filled in.

From the second day on, participants received the state questionnaires about self-esteem and social media use three times per day over the course of the following eight days. In total, two questionnaires needed to be filled in at each measurement point in time. A semi-random sampling was utilised, and reminders were sent between 09:00 a.m. and 11:30 a.m., 02:00p.m. and 03:30 p.m. and between 08:00 p.m. and 09:30 p.m. Within these intervals, participants were free to choose the time to answer the questionnaires. In order to prevent unfilled questionnaires, participants were sent reminders to finish the surveys in a distance of 30 minutes. However, when the questionnaires were not filled in after 90 minutes the first reminder was sent, it expired automatically. On the last day of the study, participants got a message indicating the end of the study and they were thanked for their participation. In the case, participants would have remaining questions after the completion of the study, the email address of the researcher was given to them. After gathering all questionnaires, the researcher began to evaluate and analyse the data.

Data Analysis

Version 25 of IBM SPSS Statistics was utilised to analyse the data exported from Ethica. All participants with a response rate higher than 50% are included in the final dataset as Conner and Lehman (2012) suggest this as a common cut-off point for studies using the ESM. To prepare the dataset it must be accounted for the cumulative nature of the screen time data. To do so, the differences of social media use between timepoints were manually calculated by subtracting the lower from the higher points in time. The missing data was kept since the dataset only contains little missing data and has a high response rate. To get an overview of the data, descriptive statistics for the participants´ demographic data (gender, age, and nationality) and trait self-esteem were calculated to estimate the minimum, maximum, mean and standard

deviation. Further, the amount of time spent on social media representing trait social media use was assessed by carrying out a frequencies analysis. To have descriptives of the state items, a box plot was created. In order to visualise certain representative associations between state self-esteem and social media use, graphs were created which show both variables over the course of the study. To make a claim about the reliability of the state questionnaire of self-esteem was assessed using the split-half reliability measure. To do so, the sample was divided into two halves (first half of the week and second half of the week). Next, the mean scores of the first half per participant were correlated with the mean scores of the second half per participant using Pearson's Correlation (Pronk, Molenaar, Wiers, & Murre, 2021). The reliability of the trait questionnaire was also calculated. The results can be found in the method section.

To execute between- and within-person analyses, the person mean (PM), and person mean centred (PM-centred) scores of state self-esteem and state social media use were calculated (Curran & Bauer, 2011). The PM score is the average score of the state data for the course of the study duration. The PM-centred score shows the difference between the individual measurement points of the state data and the PM and provides information about state-level associations. Afterwards, all PM and PM-centred scores are standardised by calculating their corresponding z-scores. Finally, a dummy variable of the average time spent on social media (representing trait social media use) was created to visualise whether a participant´s media use is low (= 0) or high (= 1). To be able to decide whether the amount of time spent on social media is low or high, the median of the total scores is determined to be used as a cut-off point. A by-hand calculation of the median using a calculator suggests a cut-off point at 120 minutes per day to distinguish between low and high social media use.

Afterwards, the association between state self-esteem and state social media use is investigated using a Linear Mixed Model (LMM). The standardised scores of state social media use (PM-centred) represent the time-varying predictor variable, whereas the standardised scores of state self-esteem (PM-centred) acts as the outcome variable. Further, in order to make a claim about whether the association between state self-esteem and state social media use is more reflected on a between-person (trait-like) or on a within-person (state-like) level, another LMM analysis is performed. State self-esteem (PM-centred) remains the outcome variable and the standardised PM-centred scores of state social media use account for the investigation on a within-person level and is the first predictor variable. The second predictor variable is the

standardised PM score of state social media used to investigate the between-person level. Lastly, a moderation analysis within the LMM is utilised. Here, social media use on a trait level serves as the time-invariant, binary variable and is added to the first described LMM as an interaction effect. In addition to the LMM analyses, individual case analyses of some representative participants were conducted to get a clearer picture of the within-person association between state self-esteem and state social media use.

Results

Participant Flow

Altogether, 40 participants participated in the study. However, due to dropouts, 2 participants needed to be removed from the sample. Further, 14 participants were excluded because of their low compliance rates and another 1 participant was excluded due to nonfulfillment of inclusion criteria. Thus, the study sample contained a total of 23 participants between the ages of 18 and 30 ($Mean_{age}$=22.09; SD_{age}=3.34) with 17 (73.9%) participants being female and 6 (26.1%) being male. The majority of the participants were from Germany (78.2%), however, Dutch, Finnish, Indian and Ukrainian nationalities were also represented in the sample.

Descriptive Statistics

First, descriptive statistics of trait self-esteem and frequency analysis of time spent on social media reflecting trait social media use were performed (see Table 1). In addition, the descriptives of the state items for self-esteem per participant are displayed in Figure 1. Next, the reliability of the state items was assessed conducting split-half reliability testing. The results show excellent reliability (r = .91, *p = .00*). This strong and significant association reveals an excellent internal consistency meaning that the state items are measuring the same construct. In Figure 1, the descriptives of the state items of self-esteem are displayed in a boxplot. Little variation become apparent here.

Table 1

Mean, Standard Deviation, Minimum and Maximum Scores of Trait Self-Esteem and Frequencies and Percentage of Trait Social Media Use (Time).

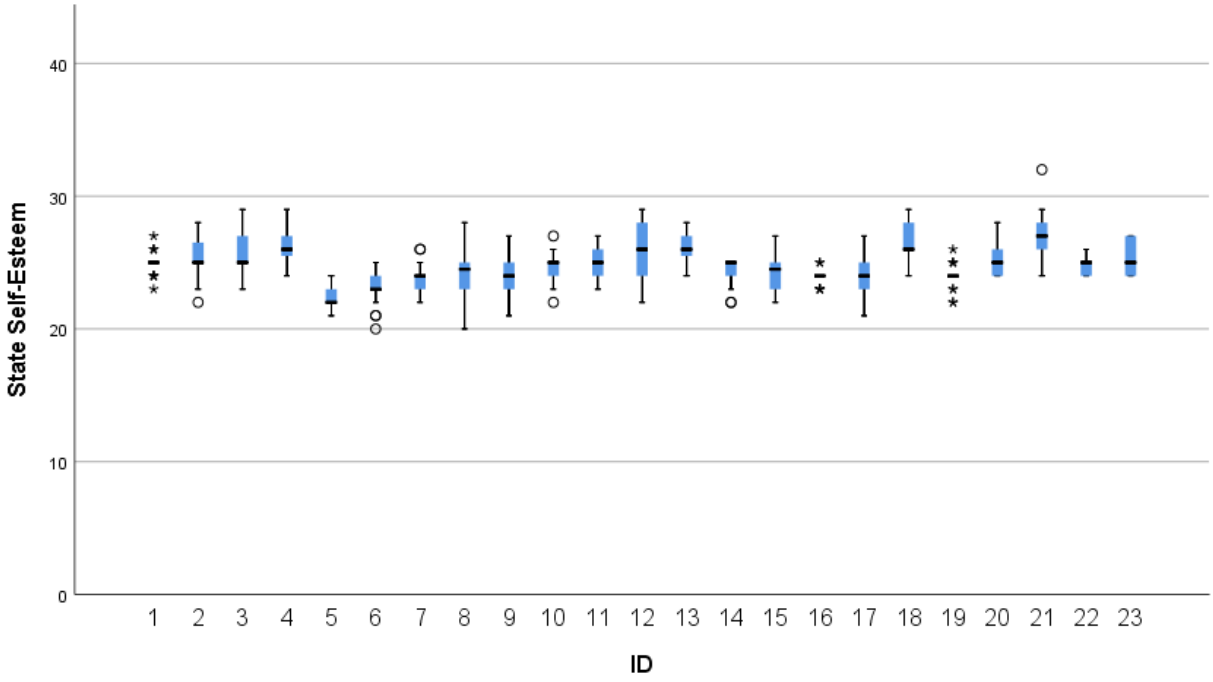
Variables	N	Minimum	Maximum	Mean	Std. Deviation

Trait Self-Esteem	23	13	33	22.52	5.18

Time Spent on Social Media (in minutes per day)	Frequency	Percentage
30-60 min	1	4.3
60-90 min	9	39.1
90-120 min	6	26.1
>120 min	7	30.4

Figure 1

Descriptives of the State Items of Self-Esteem per Participant displayed in a Box Plot.



Associations on the State Level

Associations between State Self-Esteem and State Social Media Use

There was no association between state self-esteem and state social media use over the course of the study. In addition, state self-esteem was neither associated with average state social media use (between-person, PM-centred) nor state social media use (within-person, PM). Finally, there was no moderation effect of trait social media use on the association between state self-esteem and state social media use. All information regarding the estimated fixed effects of self-esteem and social media use can be found in Table 2.

Table 2

Estimated Fixed Effects of Self-Esteem and Social Media Use.

						95% CI	
Variables	ß	SE	df	t	p	LL	UL
Self-Esteem and Social Media Use	.04	.11	75.75	-.29	.68	-.17	.26
Between-Person Effects	.04	.11	211.43	.37	.71	-.18	.26
Within-Person Effects	-.02	.07	77.33	-.26	.80	-.16	.12
Low Social Media Use	-.07	.14	372.96	-.47	.64	-.34	.21
High Social Media Use	.03	.05	436.23	.63	.53	-.07	.13

Note. N = 23; CI = confidence interval; LL = lower limit; UL = upper limit

Individual Case Analyses

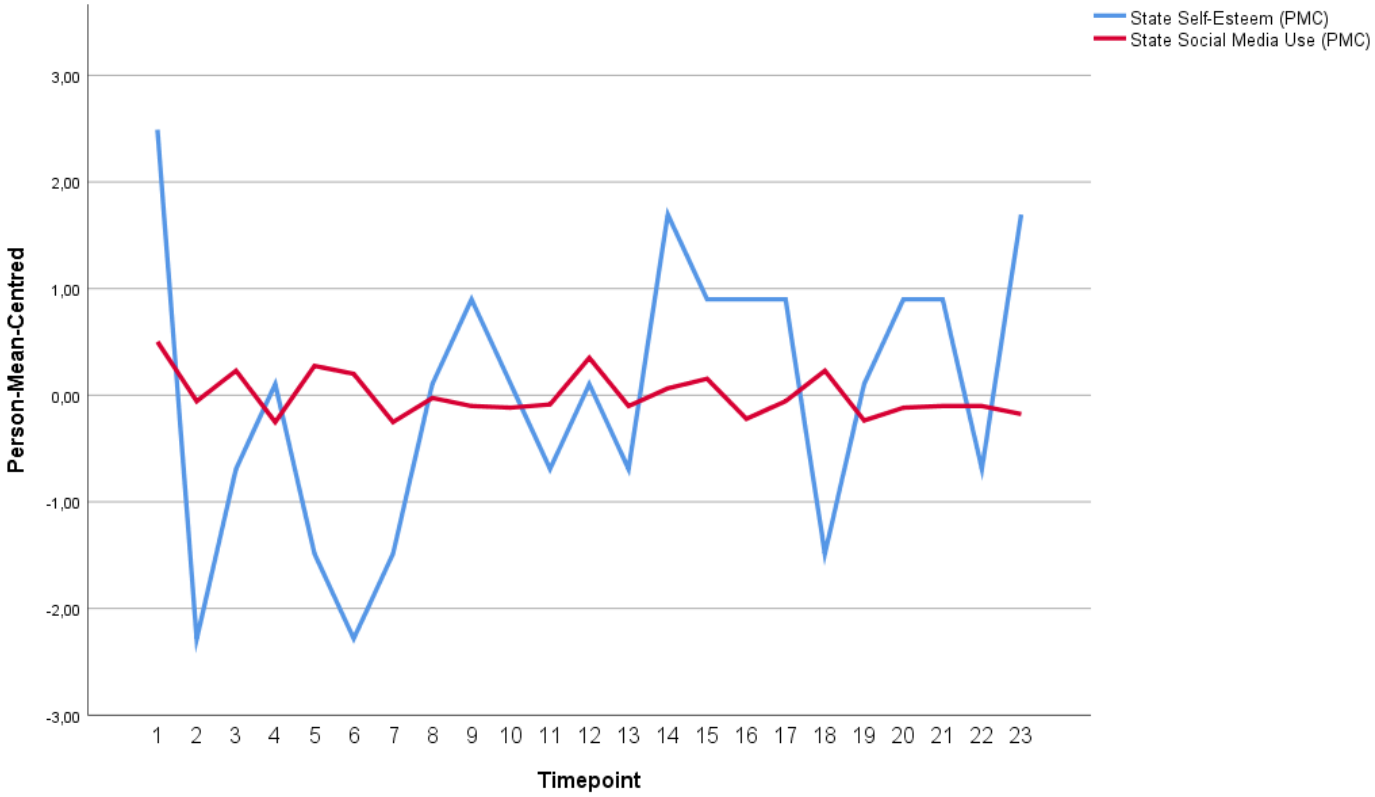
In the following, representative individuals were chosen to conduct individual case analyses to explore the within-person association between state self-esteem and state social media use in more detail. Three participants were selected in total, displaying low, moderate, and high state social media use. In order to make a choice, descriptives were calculated for all participants to reveal minimum and maximum time spent on social media. Another criterium was the mean time spent on social media as well as the missing data within the questionnaire.

Participants with a response rate of 19 timepoints and more were included in the selection of representatives. To allow for an accurate comparison, the standardised scores of the PM-centred scores of state self-esteem and state social media use were utilised within the individual case analyses.

Participant 17 was the first to be selected as a representative who spends the least time on social media over the course of the study (Mean = 28.74, SD = 26.17). It became apparent that she spent a minimum of 0.0 minutes and a maximum of 95.0 minutes on social media while simultaneously having no missing data. The participant is female, 18 years old and indicated an Ukrainian nationality. With a score of 19 she displayed a moderate level of trait self-esteem, and her state self-esteem level was at 23.9 indicating a moderate level of self-esteem as well. The association between state self-esteem and social media use can be seen in Figure 2. Here it becomes apparent that the use of social media is relatively stable over the course of the study, whereas the state level of self-esteem fluctuates a lot. In addition, no clear pattern of relation can be observed on a within-person level among the two variables. To underline that claim, a Pearson's Correlation was conducted ($r = -.06$, $p = .98$) indicating a negligible association for participant 17.

Figure 2

The Association between State Self-Esteem and State Social Media Use of Participant 17.

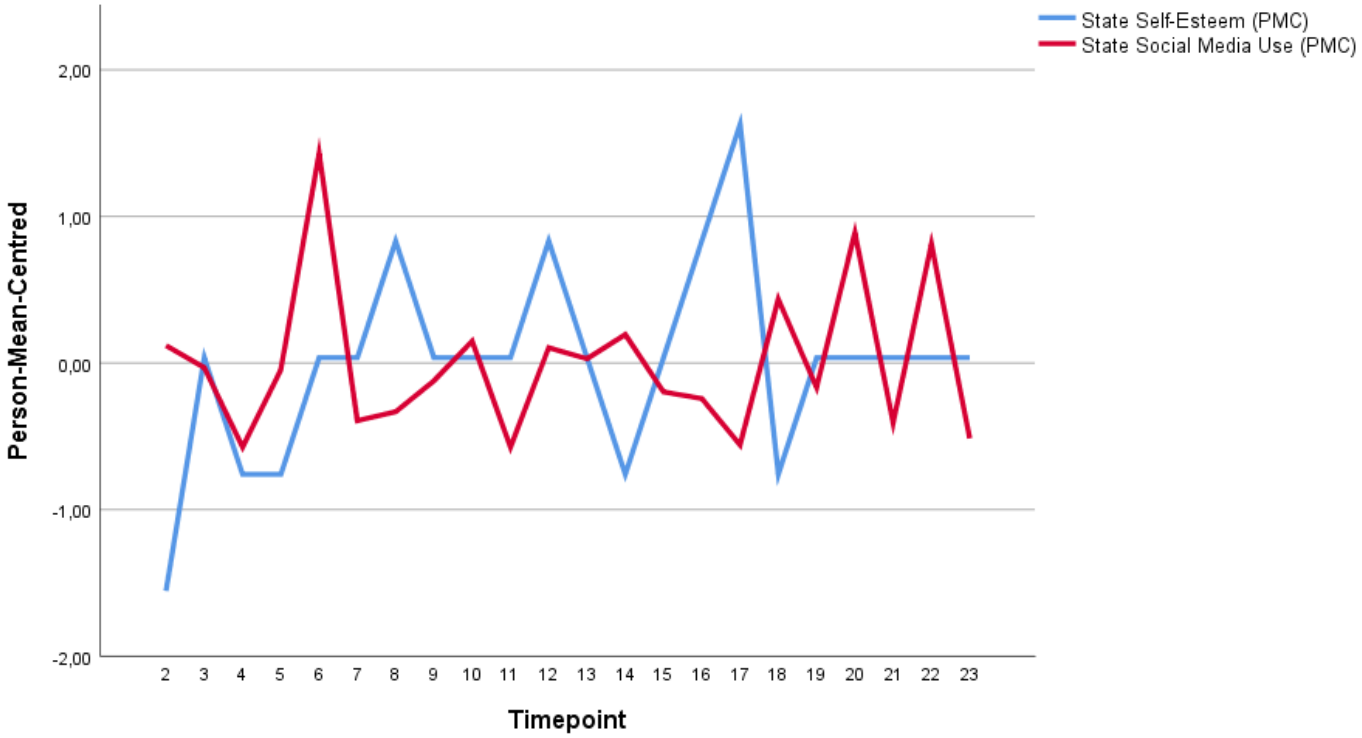


As a second representative participant, participant 1 was chosen as she displayed an average level of social media use over the course of the study (Mean = 73.90, SD = 46.90). The participant spent a minimum of 4.0 minutes and a maximum of 180 minutes on social media while only having one missing data point. She is female, 20 years old and indicated coming from Germany. Her trait-level self-esteem was at 14 being rather low, whereas her state-level self-esteem was surprisingly high with a score of 25. The association of state self-esteem and social media use can be seen in Figure 3. It becomes clear that both variables fluctuate over the course of the study. In more detail, it seems that at some points in time when social media use is low, peaks in self-esteem can be observed (e.g., timepoints 8, 12, 17). However, a clear pattern of relation cannot be seen between state self-esteem and state social media use. Again, a Pearson's Correlation was utilised in order to support the statement based on Figure 3. The calculation yields a negative correlation between state self-esteem and state social media use (r = -.20, p =

.37). Nevertheless, it can be confirmed that no clear relational pattern exists since the results are not significant.

Figure 3

The Association between State Self-Esteem and State Social Media Use of Participant 1.



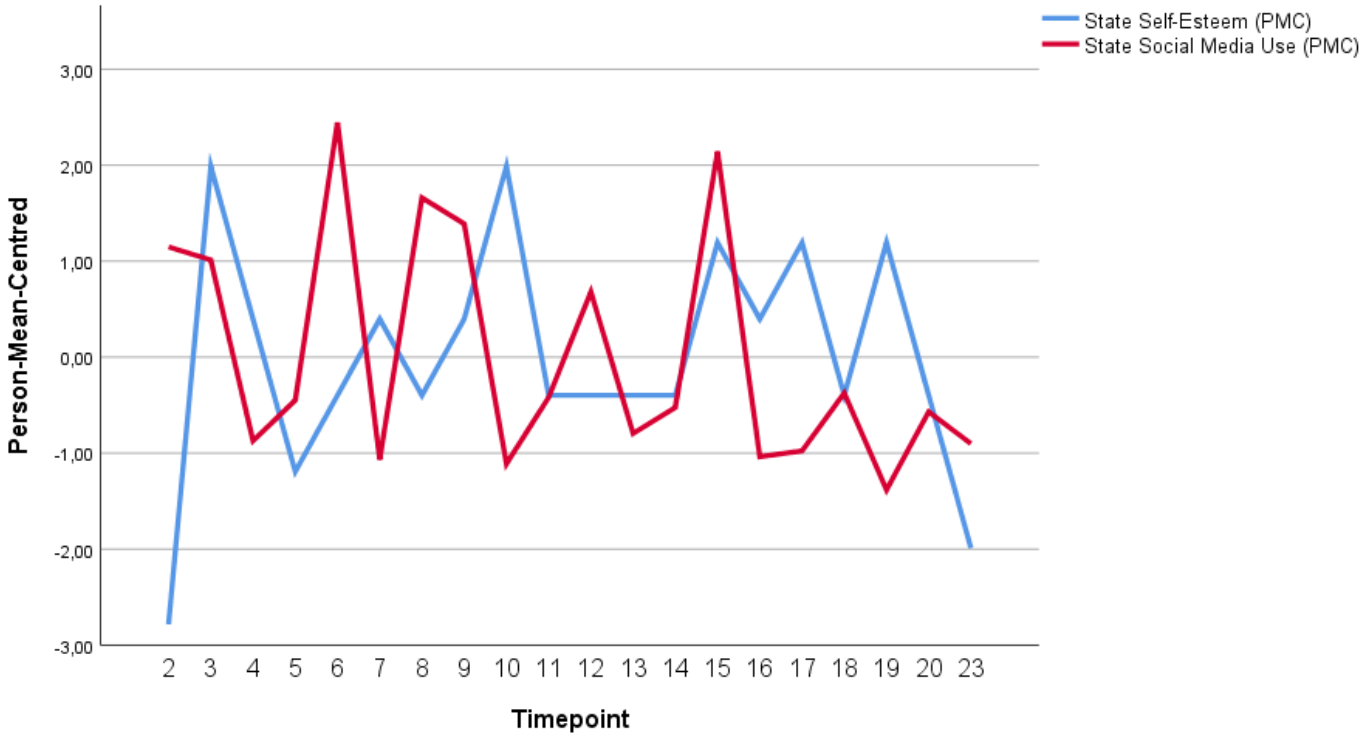
Note. Timepoint 1 is missing due to missing data. The participant did not fill in the survey at this point in time.

Finally, participant 2 was chosen as a representative for spending the most time on social media over the course of eight days (Mean = 154.86, SD = 133.40). The maximum amount of time the participant spent on social media platforms was 410.0 minutes and the least amount of time was 12 minutes. In total, the participant had 3 missing data points. She is female, German and indicated an age of 21. Her self-esteem on a trait level was moderate with a score of 23. Her state self-esteem is only somewhat higher with a score of 25.5. The association of state self-esteem and social media use is displayed in Figure 4. Both variables show a high amount of fluctuation over the course of the study. Further, at some points in time, when social media use is low, peaks in self-esteem can be observed (e.g., timepoints 7, 10 and 19). Nevertheless, there are also some simultaneous highs and lows in both variables at the same time, for instance at the

timepoints 4 and 5 as well as for timepoint 15. Therefore, no clear pattern of relation between state self-esteem and state social media use can be detected. The Pearson's Correlation that was conducted afterwards shows a negative association between both variables (r = -.10, p = .67). As with the other individual case analyses, the results are not significant revealing no linear relationship between both variables within participant 2.

Figure 4

The Association between State Self-Esteem and State Social Media Use of Participant 2.



Note. Timepoints 1, 21 and 22 are missing due to missing data. The participant did not fill in the survey for these points in time.

Discussion

The aim of the current study was to investigate the state levels of self-esteem and social media use over the course of 9 days. The results show no significant associations between state self-esteem and social media use (measured in daily time spent on social media platforms). Moreover, the between- and within-person associations of self-esteem and social media use were investigated, and no associations were found. Individual case analyses found no significant linear associations for the selected participants either. Further, a possible moderation effect of trait social media use on the associations between state self-esteem and state social media use was examined. The results show no moderation effect. Overall, none of the prior set hypotheses could be confirmed within the scope of this daily life study.

Associations between State Self-Esteem and State and Trait Social Media Use

State Self-Esteem and State Social Media Use

Overall, no associations are found between state levels of self-esteem and social media use. Investigations on the between- and within-person level yielded similar results and no associations could be found. The original hypothesis of a negative association between both constructs is therefore rejected as the findings of the current study do not associate more time spent on social media with lower levels of state self-esteem.

The exploration of the data revealed somewhat surprising results since most of the studies conducted in this field of research revealed a negative association (Vogel et al., 2014; Jan et al., 2017). However, Blomfield and Barber (2013) for example found a positive association between self-esteem and state social media use. The fact that different studies yield different results underlines diversity of findings and shows literature is discordant with regards to the association between social media use and self-esteem. A possible explanation for the findings of the current study might be the non-problematic use of social media as the way people engage with social media platforms can influence whether social media content has a positive or negative effect on mental health in general and self-esteem levels specifically. It might be that the participants of the current study mainly used social media platforms to establish or to keep contact with family and friends. This particular feature is a major advantage of social media platforms and reflects non-problematic use. In addition, it is important to note that the data collection took place in

2020, the year of the onset of a worldwide pandemic due to COVID-19. In order to prevent the virus from spreading even further, many governments decided to impose a lockdown valid for whole populations. In Germany, the lockdown included for example restrictions to meet in large groups. Many stores dispensable for daily life were closed for indeterminate time. It was also advised to stay at home and only leave the house, if necessary, for instance to go grocery shopping. Consequently, people spent most of their time at home during autumn and winter 2020, not being able to see friends or family (Tagesschau, 2020). In such exceptional circumstances, keeping contact with others became especially important. This might be a reason why the current study showed positive associations between state self-esteem and state social media use.

In addition to the pandemic, the current study did not focus on any particular social media platform. In their study, Vogel et al., (2014) for example put their emphasis on the social media platform Facebook. Facebook provides the opportunity of social comparison, since users are confronted with glorified, idealised, and internalised standards of living, relationships etc. Thus, it seems logical that the findings of that study indicate a decrease in mental health when using social media frequently. Within the scope of the current study, the focus is put on various platforms including Facebook and Instagram as well as Whatsapp and Snapchat. Particularly, Whatsapp is a platform designed for contact keeping but also Instagram or Snapchat have the option of personal messaging that facilitates contact establishing and keeping. It might be that the participants of the study mainly used this option which might explain that no association between social media use and self-esteem was found.

Overall, there are several possible explanations for the findings of the study. In this context it is finally important to note that the current study measured social media use in the form of time spent on social media. The way of use was not in focus. Hence, whether problematic or non-problematic engagement with social media took place cannot be determined here. For the current study there was simply no evidence for a problematic momentary association between social media use and self-esteem different to the findings of Valkenburg, Beyens, Pouwels, van Driel and Keijsers (2021) which is, to the best of the author´s knowledge, the only other experience sampling study investigating state social media use and self-esteem. In the next section, the findings of the current study are interpreted in the light of the findings of Valkenburg et al. (2021).

Between- and Within-Person Associations of State Self-Esteem and State Social Media Use

Originally, it was assumed that on both levels, between- and within-person, an association is possible since trait-like associations (between-person) do not necessarily hold for state-like associations (within-person) (Curran & Bauer, 2011). However, the results of the current study led to rejecting the hypothesis as, on both levels, no associations were found.

Most previous studies used a cross-sectional study design or focused, besides others, on between-person associations (Robins et al., 2001). Valkenburg et al. (2021) however, conducted an ESM study design and focused, besides others, on the between-person levels of self-esteem and social media use. They found a negative association between both constructs meaning that "participants who spent more time with social media across the three weeks had a lower average level of self-esteem compared to participants who spent less time with social media across this period" (Valkenburg et al., 2021). These contrary findings on the between-person level might be ascribed to the way of social media use as well. Again, it is likely that the participants of the current study engaged in non-problematic social media use. In addition, the amount of time spent on social media might also play a role here. The majority of the sample spent 60 to 90 minutes per day on social media. For the sample of the study of Valkenburg et al. (2021), the participants received surveys 6 times a day and had an average usage time of 17 minutes on each measurement point, resulting in about 102 minutes spent on social media per day. Therefore, the participants of the current study spend less time on social media which might reflect the non-problematic momentary association between state levels of self-esteem and social media use, whereas the participants of the study of Valkenburg et al. (2021) spent more time on social media. Overall, this finding might indeed suggest that the amount of time spent on social media is crucial for a problematic state association between both variables under investigation.

The same study found no association between both variables on a within-person level (Valkenburg et al., 2021). Thus, the study yields similar results to the findings of the current study. Further, individual case analyses were conducted to grasp the within-person association in more detail. Again, no association was found. It is important to note, however, that the visual representations of the individual cases all show an unique pattern of self-esteem in association with social media use. Participant 17´s social media use, for instance, demonstrates little variation and an overall low use of social media. Her self-esteem levels, however, show high variation within the scope of 8 days. Consequently, factors other than social media use must be

responsible for the change in state self-esteem levels. Previous literature already indicated that high social media use per se is not responsible for low self-esteem levels and vice versa. Instead, economic, social, and personal factors were highlighted to play an important role when looking at the association between self-esteem and social media use (O´Reiley, 2020). Other factors influencing the association between self-esteem and social media use is further supported by the fact that the confidence intervals of the LMM analyses have a wide range. Contrary to a narrow confidence interval, having a wide confidence interval implies having imprecise population estimates. Hence, the results of the current study do not reflect a whole population and therefore, is not generalisable. A narrowed confidence interval can be achieved by increasing the sample size to resemble whole populations and to enable making claims about them.

The Moderation of Trait Social Media Use

As other factors seemed to play an essential role in the association between state self-esteem and social media use, a moderation analysis should test whether trait social media use as a confounding variable moderates the initial association. Originally, it was expected that trait social media use moderates the association between state self-esteem and state social media use as previous studies found that time spent on social media is predictive of mental health problems (O´Reiley, 2020; Valkenburg et al., 2022). This implies that individuals who are characteristically prone to spend more time on social media engage in online behaviour that has negative consequences for their mental health. The other way around, individuals who spend less time on social media possibly use their free time differently, engaging in activities enhancing their mental health. The current study, however, did not reveal a moderation effect and therefore, the third hypothesis was rejected as well. A possible explanation for the findings might be the disagreement in literature on the topic. Even though some researchers found confounding variables such as time spent on social media associate with poor mental health, the study of Berryman et al. (2018) found that time spent on social media is not predictive for mental health measured as variables like loneliness, social anxiety, or suicidal thoughts. Thus, it might be more likely that other variables than time spent on social media moderate the association between state self-esteem and state social media use. The cross-sectional study of Schivinski, Brzozwska-Wos´, Stansbury, Satel, Montag and Pontest (2020) for example found that problematic social

media use is negatively associated with self-esteem. Thus, not trait social media use per se might be a confounding variable but the way people engage with social media. In the following, strengths and limitations of the current study are discussed that offer possible explanations on the non-significant findings.

Strengths and Limitations

The current study possesses several strengths. First of all, the use of an experience sampling study design ensures high ecological validity. Within the scope of this study, momentary measures of self-esteem and social media use could be captured. Thus, fluctuations of these variables were recorded as they occur in the natural environment of the participants (Myin-Germeys et al., 2021). Furthermore, the study design enabled within-person analysis which is only scarcely represented in current literature. In that sense, the study adds to reduce the imbalance in research on the topic of self-esteem and social media use as mainly trait- and between-person levels were investigated until now. Secondly, the study holds a high compliance rate (84% - 87%), with relatively little missing data. Having a high compliance rate ensures that the variables under investigation are fully captured, hence, the study provides a coherent picture of state levels of self-esteem and social media use over the course of eight days. In addition to that, using a screen time measurement tool to capture time spent on social media is another strength of the study. According to Ellis (2019) previous research often relied on asking participants to estimate their behaviour instead of relying on objective measurement tools to prevent potential biases. Therefore, using an objective measurement tool ensures more accurate data on time spent on social media.

Besides these major strengths, the study also holds some limitations. For one, using an objective screen time measurement tool also has its downsides. Before answering the questionnaires regarding state social media use, participants are obliged to check the application that measures their screen time meaning they have to invest more time. To save time, participants are coaxed to falsify their answers by indicating an approximate number of time instead of the exact number provided by the screen time application. A second burden on participants was to provide a state questionnaire of self-esteem consisting of all 10 items of the trait counterpart. Here, several limitations became apparent. Indeed, high reliability and validity is ensured when using an already well-established and tested questionnaire. However, asking

participants to answer a 10-item questionnaire 3 times a day for a longer period of time is a high burden on them which might result in lower compliance and higher drop-out rates (van Berkel et al., 2017). In the end, out of 40 participants, only 23 could be included in the study mainly because of inclusion criteria. Nevertheless, 2 participants were excluded due to drop-out which might have been prevented, resulting in an overall larger sample size. As the state questionnaire is relatively long, a shorter study duration was chosen to not overburden the participants. A questionnaire with fewer representative state items for self-esteem would justify a longer study duration. With more time, an even more accurate picture of the participants' daily self-esteem and social media use could have been obtained since different situational circumstances influence both variables. According to van Berkel et al. (2017), a study duration of 14 days would lead to a more accurate coverage of the variables under investigation while still considering the compliance rate. Another limitation concerning the state items is the fact that the same questionnaire was utilised to assess trait and state levels of self-esteem. It is in that sense problematic that state and trait constructs are two different concepts. Consequently, a questionnaire designed to assess trait self-esteem cannot be used to assess state self-esteem. The fact that the descriptives of the state items only show little variation supports the claim. The little variation in answers might be induced by using a questionnaire designed for assessing trait self-esteem for capturing information on a state construct. Finally, the study was conducted by a homogenous sample as the majority of participants is female and German. Making claims about whole populations should be treated with caution as the results of the current study cannot be generalised.

Implications for Clinical Practice and Directions for Future Research

In the Introduction it became already apparent that the association between self-esteem and social media is often researched within the context of people's mental health in general. Doing so appears logical since self-esteem is amongst others “the key element of mental health” (Mann et al., 2004) implying that self-esteem possess protective values for physical and mental health. The *Transactional Model of Stress and Coping* (Lazarus & Folkman, 1987) offers a potential explanation on why it is important to include mental health as such in the association between self-esteem and social media use. According to the model, self-esteem impacts how people perceive threats and how they evaluate possible coping strategies. Individuals possessing

high levels of self-esteem, therefore, diminish the perceived threat and increase effective coping making self-esteem a beneficial defence mechanism when facing stressors (Mann et al., 2004). Additionally, various longitudinal studies tested the relation between self-esteem and well-being and show that self-esteem predicts well-being in areas of importance. It is important to note that these studies used methodologically rigorous designs, thereby enhancing their reliability, and controlling for confounding variables such as gender or economic status (Orth & Robins, 2014). Sharing aspects of one's life online makes people that do so prone to judgement and negative comments of others (Jan et al., 2017). Judgement, negative comments and unrealistic standards of living, relationships or materialistic values are only a few examples of threats that an online environment can potentially hold for people. High levels of self-esteem therefore would help appropriately dealing with judgement, hate comments or cyberbullying. According to this theory, the mental well-being of such individuals would not be threatened.

These implications suggest that for one, in psychology, self-esteem should not be viewed on its own but in the context of mental health. Furthermore, in this constellation self-esteem might rather be a moderator variable than an outcome variable. Consequently, future research should treat self-esteem as such, and it is suggested to pay attention to assessing mental health as an additional variable. This could be done by means of, for instance, the Mental Health Continuum - Short Form (MHC-SF) that captures social, emotional, and psychological well-being (Lamers, Westerhof, Bohlmeijer, ten Klooster, & Kleyes, 2010). Also, the MHC-SF is based on the fact that mental health is not only the absence of psychopathology but also the presence of positive feelings and functioning (Lamers et al., 2010). Self-esteem could aid experiencing positive feelings and functioning which consequently enhances mental health. Research on this topic would also offer insights on possible mental health interventions that are necessary nowadays since the use of social media will rather increase than decrease in the future with the effects on people's mental health remaining the same. Interventions aimed at increasing self-esteem might be a short-term solution for the adverse effects social media use has on mental health due to the buffering qualities of self-esteem on stressors people face online.

Another theoretical implication of the study is that capturing social media use only by means of time spent on social media is not sufficient. Research has shown that the content people are consuming on social media and the way they are engaging with social media are important to consider. As social media includes various types of platforms, such content can vary from

sending messages to friends and family to comparing oneself to the perfect life of a celebrity. As Social Comparison Theory already suggested, the latter results in declined levels of self-esteem whereas the former causes the exact opposite (Festinger, 1954). Since the current study revealed that the participants possibly did not engage in problematic social media use, future research should focus particularly on, for instance, social media platforms that promote social comparison or the other way around, platforms that promote non-problematic social media use. One reason for non-problematic engagement with social media might be the COVID-19 pandemic in which data collection of the study took place. Due to governmental restrictions, people were not allowed to have contact with friends and family in real life. Therefore, interactions increasingly took place online. To account for the situational circumstances, the study should be replicated when the pandemic is over, and people live their normal lives again.

It is also important to consider the fact that most previous research focused on trait levels of self-esteem and social media use. Thus, previous findings should be tested empirically in experience sampling study designs. Since traits and states are different concepts, the results of trait-studies should be transferred to a state level to either confirm or reject the previous findings. Solely focussing on trait self-esteem does not provide the whole picture and according to Curran and Bauer (2011) trait-like associations do not necessarily stay true for state-like associations. Thus, research is missing an important aspect here.

Another possible direction for future research is looking into differences per individual. The current study indeed investigated within-person levels, however, only used an average. There is the possibility to find a significant association between state levels of self-esteem and social media use in some individuals even though the average association is insignificant. In their study Kraiss, Kohlhoff and ten Klooster (2022) for example found “considerable inter-individual variability” (Kraiss, et al., 2022) in the association between distress and well-being. These findings might be transferred to the association between self-esteem and social media use and would therefore imply that even no significant association was found on an average within-level, significant associations on an inter-individual level still might be present. Future research should take this into consideration. Identifying possible dynamics between social media use and self-esteem in individuals could aid in designing, for instance, self-esteem interventions. These interventions would be especially beneficial due to the buffering effect self-esteem has on

irritabilities (Lazarus & Folkman, 1987). Thus, investigating inter-individual differences of spending time on social media and self-esteem could form the basis of increased mental health.

In conclusion, the present study tackled the need for balance in literature regarding self-esteem and social media by using an experiencing sampling study design. Moreover, the study provided a person-specific approach by focusing on within-person levels. Additionally, new insights for future research on the association between state self-esteem and state social media use were derived. It became apparent that it is important to not simply include the amount of time spent on social media but also to focus on types of social media and to capture the way people engage with them (problematic or non-problematic use). Moreover, it became apparent the problem of using the same questionnaire to capture state and trait data as they are two distinct concepts. Finally, the importance of a mental health variable in general was highlighted when talking about self-esteem and social media use as it seems that social media use is rather affecting mental health in general. This way, self-esteem might aid effective coping with stressors people are confronted with online which resultantly influences their mental health. However, it cannot be ignored that it is possible that for this type of sample there might not be a major problem with social media use in relation to self-esteem. The same study might have different outcomes when the sample has different preconditions (e.g., age, mental health problems). Overall, it is advised to replicate the current study to overcome the previously mentioned limitations, to enable generalisability and to consider other variables important in the context of self-esteem and social media use.

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Appendices

Appendix A

Rosenberg Self-Esteem Scale (RSE)

1. I feel that I am a person of worth, at least on an equal plane with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure*.
4. I am able to do things as well as most people.
5. I feel I do not have much to be proud of*.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself*.
9. I certainly feel useless at times*.
10. At times I think that I am no good at all*.

** Items with reversed scoring.*

Appendix B

Trait Social Media Use

1. Please indicate how many social media platforms you are using on a daily basis.
2. Please indicate which social media platforms you are using on a daily basis. Note that you can choose multiple options.
    - Facebook
    - Instagram
    - Snapchat
    - TikTok
    - YouTube
    - Twitter
    - Pinterest
    - Tumblr
    - Other
3. Please indicate how much time you spend approximately on social media during a day. Only one answer option is possible.
    - Less than 30 minutes
    - Between 30 and 60 minutes
    - between 60 and 90 minutes
    - between 90 and 120 minutes
    - more than 120 minutes

Appendix C

State Self-Esteem (Rosenberg Self-Esteem Scale Edited)

1. At the moment, I feel that I am a person of worth, at least on an equal plane with others.
2. At the moment, I feel that I have a number of good qualities.
3. At the moment, I am inclined to feel that I am a failure*.
4. At the moment, I am able to do things as well as most other people.
5. At the moment, I feel I do not have much to be proud of*.
6. At the moment, I take a positive attitude toward myself.
7. At the moment, I am satisfied with myself.
8. At the moment, I wish I could have more respect for myself*.
9. At the moment, I feel useless*.
10. At the moment, I feel I am not good at all*.

** Items with reversed scoring.*

Appendix D

State Social Media Use

1. Please check your social media consumption via the application (Screen Time) or your phone´s internal screen time measurement overview. Please indicate for how long (in minutes) you have been using social media platforms until now.
2. Please indicate which social media platforms you have been using until now. Multiple answer options are possible.
    - Facebook
    - Instagram
    - Snapchat
    - TikTok
    - YouTube
    - Twitter
    - Pinterest
    - Tumblr
    - Other