

**The Association between State Self-Esteem and State Self-Compassion in the  
Context of Social Media Use in Daily Life**

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Enschede, January 2021

### Abstract

**Background.** Previous studies have investigated the association between self-esteem and self-compassion in social comparison settings. However, until now, research mainly investigated this association in physical social settings. Yet, as social comparison is increasingly taking place online nowadays, it is important to investigate the role of state self-esteem and state self-compassion in the context of social media consumption. **Objective.** The goal of the current study was to explore the state levels of self-esteem in association with the state levels of self-compassion in the context of social media use over the course of 9 days. In particular, it was investigated whether daily social media consumption associates with state self-esteem over time. Next, it was investigated how state self-esteem and state self-compassion are associated over time. Additionally, it was explored how the self-compassion component common humanity is associated with state self-esteem. **Method.** A repeated measure, online experience sampling study was conducted. 40 participants volunteered in the study. Rosenberg Self-Esteem Scale (RSE), Self-Compassion Scale Short-Form (SCS-SF) as well as a self-developed questionnaire focusing on overall social media consumption were used to measure trait level self-esteem, trait levels self-compassion and overall social media consumption. For the state measures, a questionnaire composed of 10 edited items of the RSE, 3 edited items of the SCS-SF and 2 items assessing social media consumption was utilized and administered 3 times per day over a period of 8 days on the participants' smartphones. **Results.** The results of a linear mixed modelling (LMM) analysis revealed no significant association between social media consumption and state self-esteem. Individual case analyses supported these findings. In contrast, LMM analysis revealed a very weak and negative association between state self-esteem and state self-compassion indicating a within-person effect. Finally, LMM analysis revealed no significant association between state self-esteem and common humanity. **Conclusion.** The current study provides novel evidence about the association of state self-esteem and state self-compassion within the context of social media consumption investigating the within-person level. In order to accurately capture the association between social media consumption and state self-esteem as well as common humanity and state self-esteem, it is recommended to focus on the type of social media platforms used. A weak and negative within-person association was found between self-compassion and self-esteem differing from its between-person association. This could indicate that the association of self-compassion and self-esteem on a momentary basis could indeed differ from its trait level association. Future research needs to replicate the study in order to establish generalization of the results.

**Keywords:** experience sampling method, state measure, self-esteem, self-compassion, social media consumption

### **The Association between State Self-Esteem and State Self-Compassion in the Context of Social Media Use in Daily Life**

Facebook, Instagram, Snapchat or YouTube – everyone knows them, many people use at least some of them. In the year 2020, more than 3.8 million people worldwide were reported using at least one of these social media platforms. Especially, adolescents and young adults between the age of 18 and 29 years are active on various social media platforms, often multiple times a day (Anderson & Jiang, 2018; Statistisches Bundesamt, 2020). However, besides the popularity of those social media platforms, concerns about the adverse effects of social media on people's mental health have grown accordingly throughout the past years (Griffiths, Kuss, & Demetrovics, 2014; Royal Society for Public Health, 2017). Researchers repeatedly found associations between the use of social media and several mental health issues (Blackwell, Leaman, Tramposch, Osborne, & Liss, 2017; Royal Society for Public Health, 2017). In particular, adverse effects of social media consumption on user's self-esteem levels have been established. As social media platforms promote people to make social comparisons, the psychological distress of users increases. This results in lower overall self-esteem (Jan, Soomro, & Ahmad, 2017). According to research by Hawi and Samaha (2017) social media users frequently visit other people's profiles and start envying some of these individuals, causing poor self-evaluation. Social media users seem to compare their realistic offline selves with idealized online selves (Vogel, Rose, Roberts, & Eckles, 2014).

One construct that has been investigated more recently together with self-esteem in social comparison settings is self-compassion. Self-compassion is conceptualized as having a healthy attitude toward oneself without any evaluations of self-worth (Neff, 2011). In line with that, being self-compassionate involves being kind toward oneself while taking into account one's weaknesses as well as realizing that imperfections are a shared human experience. Moreover, self-compassion involves taking a broader perspective on one's personal experiences (Neff, 2011). High levels of self-compassion are associated with, amongst others, greater life satisfaction, social connectedness, and less self-criticism (Neff & Vonk, 2009). Interestingly, Neff and Vonk (2009) found that self-compassion seems to be a strong negative predictor of social comparison. That is, people compassionate toward themselves rarely tend to compare themselves excessively to others. Drawing from this it could be assumed that people high in self-compassion may be less prone to poorer self-esteem caused by social comparisons made on social media platforms.

Nevertheless, considering the existing body of research investigating self-esteem in the context of social media consumption as well as the association between self-esteem and self-compassion, especially two limitations become apparent. For one, many studies exploring levels of self-esteem in the context of social media consumption as well as studies exploring levels of self-compassion made use of reflective

self-reports. That is, applying measurement methods which require participants to reflect upon a past time period and not the current moment. This type of methodology is often prone to memory bias (Bennett, 2020). Consequently, indications about people's social media consumption as well as self-esteem levels could in fact not reflect the actual situation but a biased impression. Secondly, studies utilizing such methodologies are often cross-sectional meaning they only provide insights about associations assessed at one specific point in time only. Therefore, these studies only allow for between-person analyses and do not qualify for inferences on the within-person level (Steel & Holt, 1996). When participants were asked in cross-sectional studies to reflect upon their levels of self-esteem, self-compassion and social-media consumption, only between-person associations were revealed (Alfasi, 2019). Thus, in order to investigate whether previous findings will still hold true on the within-person level, it is suggested, to measure momentary (also referred to as state) self-esteem and self-compassion as well as social media consumption repeatedly daily in life.

Additionally, until now, research mainly investigated the association between state self-compassion and people's state self-esteem in physical social settings (Slater, Varsani, & Diedrichs, 2017). Yet, as social comparison is increasingly taking place online, it would be of high value to investigate the role of state self-compassion and state self-esteem in the context of social media usage. Insights about the association between self-compassion and self-esteem in the context of social media consumption could provide ideas on how to facilitate and promote mental health among adolescents and young adults using social media.

In the following sections, the constructs self-esteem and self-compassion will be explored in more detail. Trait and state levels of self-esteem and self-compassion as well as measurement possibilities will be discussed. Moreover, existing research about these two constructs in the context of social media will be elaborated.

### **Self-Esteem**

In general, self-esteem is conceptualized as an individual's evaluation of the self. That is the extent to which an individual views the self as worthy and competent or unworthy (Coopersmith, Sakai, Beardslee, & Coopersmith, 1967). It is a personal judgement about one's worthiness expressed in the attitude individuals hold towards themselves (Coopersmith, 1967). Hence, self-esteem is related to personal beliefs about one's abilities, skills, social relationships and future outcomes (Heatherton & Wyland, 2003). According to Vogel et al. (2014), self-esteem can be understood as the evaluative emotional component of the self-concept. It is important to note that self-esteem is related to the self-concept, however, it cannot be equated with it. An individual's self-concept represents the totality of beliefs one holds about oneself, including every aspect (e.g., name, age, beliefs, values and appearance details) that is

known about the self, while self-esteem represents the emotional evaluative response about these aspects. Consequently, individuals are able to believe objectively positive aspects about themselves but continue to not like themselves, hence, experience lower self-esteem (e.g., “Even though I am good at school I don’t think I am smart enough.”). By the same token, individuals are able to think highly of themselves and experience high levels of self-esteem despite having any objective aspects that could support their positive view on the self (e.g., “I believe I am smart even though I am really bad in school.”) (Heatherton & Wyland, 2003).

Importantly, self-esteem levels have a significant impact on people’s health as well as mental health. Accordingly, people generally experiencing higher levels of self-esteem are found to be happier, more satisfied with life and less prone to mental health illnesses, such as depression or eating disorders. Additionally, researchers revealed that people with higher levels of self-esteem are able to cope more effectively with challenges (Baumeister, Campbell, Krueger, & Vohs, 2003; Baumeister & Vohs, 2018). People generally experiencing lower levels of self-esteem, on the contrary, are found to be related to poorer physical health as well as mental health. Subsequently, people experiencing lower levels of self-esteem are often at risk to experience loneliness as well as anxiety, depression and eating disorders (Heatherton & Wyland, 2003). Given these aspects, the significant influence of self-esteem on people’s lives becomes evident.

Another important consideration about self-esteem is its conceptualization as a global trait or as a context-specific state. Most theories view self-esteem as a relatively stable trait developing slowly over time through personal experiences (Heatherton & Wyland, 2003). Subsequently, individuals who repeatedly succeed at various tasks or who are continuously valued by others, experience higher levels of self-esteem. Yet, a number of studies suggested that self-esteem is a rather dependent than independent variable implying that self-esteem could be manipulated or influenced momentarily (Wells & Marwell, 1976). Nevertheless, subsequent research has come to the conclusion that self-esteem should be conceptualized as both, a stable baseline that evolves throughout time as well as a fluctuating construct that alters depending on contextual factors (Rentzsch & Schröder-Abé, 2018). Interestingly, it seems like most research done about self-esteem applied one-time, reflective measurement tools. That is, administering measurement tools (i.e., validated questionnaires such as RSE) which require participants to reflect on one particular moment in time upon their self-esteem (Bruun & Ahm, 2015). Hence, global self-esteem was mainly assessed rather than state self-esteem. Applying such assessment tools does provide valid and reliable indications about people’s global self-esteem levels, yet it misses out on the momentary fluctuations and does therefore not provide any insights on the within-person associations of self-esteem (Naab, Karnowski, & Schlütz, 2019; Rentzsch & Schröder-Abé, 2018). This problem is especially apparent in the current research about self-esteem in the context of social media.

Throughout the past years, researchers started to observe the strong impact of social media on individuals' behaviours. Social media platforms are mainly used for accessing information, communication and the building and maintaining of relationships. However, researchers found that most people active on social media end up making social comparisons with others (Jan et al., 2017). On a general note, humans are thought to have a fundamental drive to compare themselves with others in order to fulfil their need for affiliation, evaluating the self, decision-making, and regulating emotions (Vogel et al., 2014). Social comparisons are generally divided into upward social comparisons and downward social comparisons. Upward social comparisons occur when individuals compare themselves to superior others who are thought to have positive characteristics while downward social comparisons take place when individuals compare themselves to inferior others who are thought to have negative characteristics. Even though upward social comparisons can be beneficial in inspiring people, it more often rises feelings of inadequacy, negative affect and poorer self-evaluations resulting in lower overall self-esteem (Vogel et al., 2014). Studies revealed that upward social comparisons are more frequent on social media platforms than downward social comparisons. Interestingly, several studies investigating the effect of social media on people's mental health found that upward social comparisons are associated with poorer state as well as global self-esteem (Alfasi, 2019; Wirtz, Tucker, Briggs, & Schoemann, 2020; Vogel et al., 2014). Hence, it is of high importance to further investigate this association in order to develop ideas and concepts of how to promote mental health among adolescents using social media.

Nevertheless, considering the existing research on self-esteem in the context of social media, further limitations become apparent. For one, many studies investigating the association between self-esteem and social media consumption almost exclusively focused on the social media platform Facebook. As adolescents and young adults nowadays frequently engage in more than one platform, it becomes essential to examine the effect of using additional social media platforms to investigate whether similar findings can be established. Moreover, most papers only included total screen-time as their variable representing social media consumption. Yet, the number of platforms used might be relevant as well. The number of social media platforms used captures another facet of people's social media behaviour and thus their social media consumption. As an example, people who are only active on a single social media platform seem to be less exposed to content that could possibly affect their self-esteem levels than people who frequently engage on several social media platforms (Bennet et al., 2020). To conclude, it is of high value to investigate whether previous findings will be made when investigating momentary fluctuations of self-esteem.

### **Self-Compassion**

The term compassion originated from Buddhist psychology. In the classical teachings of the Buddhist tradition, compassion is viewed as the noblest quality of the human heart. It is often conceptualized as a multi-textured response to suffering which includes empathy, kindness, generosity and acceptance (Feldman & Kuyken, 2011). While Buddhist conceptions of compassion exist already over 2500 years, compassion has been introduced only more recently to individualistic society. As an example, Kristin Neff (2003) first introduced the term self-compassion within the field of psychology. Self-compassion is a proposed alternative to self-esteem to conceptualize having a healthy attitude towards oneself excluding any evaluation of self-worth. Behaving in a self-compassionate way implies being kind to oneself rather than being judgmental as well as feeling a sense of common humanity rather than isolation. Moreover, behaving in a self-compassionate way requires considering situations with greater objectivity (Neff, 2003; Neff & Vonk, 2009).

Even though research about self-compassion can still be considered rather novel, a growing body of research suggests that self-compassion is associated with mental health. It was found that high levels of self-compassion are associated with emotional intelligence, social connectedness as well as mastery goals. Moreover, high levels of self-compassion seem to be related to less self-criticism, depression, anxiety, perfectionism and eating disorders (Adams & Leary, 2007; Neff, Hseih, & Dejithirat, 2005; Neff, Kirkpatrick, & Rude, 2007). Overall, it can be assumed that self-compassion regulates negative emotions and converts them into more neutral or positive ones resulting in greater overall life-satisfaction (Terry & Leary, 2011). Considering this, it becomes evident that self-compassion serves as a well-established emotion regulating and well-being enhancing construct.

Neff (2011) proposed that self-compassion consists of three main components, self-kindness, mindfulness, and common humanity. Self-kindness refers to the tendency to be caring and understanding of oneself rather than being overly critical and judgmental whereas mindfulness refers to taking a meta-perspective on one's personal experiences in order to consider them with greater objectivity. Common humanity, on the other hand, refers to the realization that imperfections are a shared human experience. Considering personal failures, mistakes and inadequacies from a broader and more inclusive perspective enables individuals to feel more connected rather than isolated (Neff, 2011). The quality of common humanity consequently requires the ability to identify certain commonalities between oneself and others rather than differences (Neff, 2011).

Interestingly, Neff and Vonk (2009) found self-compassion to be a strong negative predictor of social comparisons. Gilbert and Irons (2005) suggested that having compassion for oneself in moments of feeling inadequate is linked to a sense of calmness and security. Consequently, little attentional resources are directed to obsessively worrying whether the self is good or bad. Considering these findings, one

could argue that holding compassion toward oneself could protect individuals not only from making excessive social comparisons in physical situations but also on social media platforms. Moreover, it could be suggested that in the process of making social comparisons the component common humanity might be especially of high relevance. In fact, one could assume that being able to identify shared commonalities between oneself and social media users relates negatively to feelings of inadequacy caused by social comparisons. Nevertheless, until now, no research investigated the role of self-compassion in the context of social media.

### **Self-Compassion and Self-Esteem in the Context of Social Media**

Considering the existing literature about self-esteem and self-compassion it becomes evident that both constructs seem to be related to each other. In fact, Neff (2003) originally attempted to expand the understanding of healthy self-attitudes by introducing the construct of self-compassion. In line with Neff's (2003) research, a moderate association between self-esteem and self-compassion was found. This moderate association can be traced back to the conclusion that both constructs represent a sense of positive self-regard. Nevertheless, Neff and Vonk (2009) point out that although self-compassion seems to be similar to self-esteem, the two constructs differ. For one, self-esteem mainly functions as a representation of the self-concept while self-compassion is not particularly defined as an evaluative representation of the self. Therefore, self-esteem is thought to represent an evaluation of superiority or inferiority while self-compassion is thought to rather alleviate boundaries between the self and others and point out commonalities (Neff, 2011). Self-compassion could rather be understood as a benevolent awareness embracing all aspects of personal experiences (Neff & Vonk, 2009). Considering these differences, it is suggested that self-compassion becomes especially relevant when people feel inadequate, hence, experience low levels of self-esteem. Moreover, Neff and Vonk (2009) proposed that self-compassion becomes available when self-esteem fails us. Taking these findings into the context of social media consumption, this implication is seemingly of high relevance. It could be argued that people who suffer from low self-esteem as a consequence of frequent social comparisons made on social media platforms, might have less compassion toward themselves. However, self-compassion could be triggered at moments of low self-esteem when social comparisons take place. By the same token, it could be argued that people who have higher levels of self-esteem even though they frequently engage in social comparisons on social media platforms tend to have higher levels of self-compassion. Moreover, it would be of high value to investigate whether one of the three self-compassion components particularly associate with people's self-esteem level while making social comparisons on social media platforms. As previously proposed, it could be argued that the component common humanity particularly protects individuals from poor self-esteem as it enables them to find more commonalities between their



comparison targets resulting in feelings of connectedness. Still, no existing research has investigated these points of interest before.

### **Purpose of the Present Study**

The present study investigates the state levels of self-esteem in association with the state levels of self-compassion in the context of social media over a longer time. First, it will be investigated whether social media consumption associates with students' state self-esteem over time. In line with previous research, it is hypothesized that high social media consumption is associated with low state self-esteem. Second, it will be investigated whether and how strong state self-compassion is associated with state self-esteem over time. In contrast to previous research investigating trait levels of self-compassion and self-esteem, it is hypothesized that on a state level, high levels of self-compassion are associated with low levels of self-esteem (Neff & Vonk, 2009). Finally, it is explored how common humanity, the second component of self-compassion, associates with students' state self-esteem over time. It is hypothesized that high levels in common humanity are associated with high levels of state self-esteem (Neff & Vonk, 2009).

## **Methods**

### **Design**

One methodology that has been developed to assess momentary experiences in real life is the Experience Sampling Method (ESM), also referred to as Ecological Momentary Assessment (EMA). This methodology offers the opportunity to study individuals in their natural environment, in real-time, repeatedly on different occasions (Conner & Mehl, 2015). It circumvents the challenge of memory bias, which often occurs in studies using self-report measures. As this methodology enables researchers to measure state variables in real-time on different occasions, it allows inferring associations on the within-person level (Curran & Bauer, 2001; Kuppens, Oravecz, & Tuerlinckx, 2010). Since ESM assesses the participants report based on their context and feelings in their natural environment, the ecological validity of this method is supposed to be high (Myin-Germeys, et al., 2018).

Applying ESM within this study circumvents previously mentioned limitations that were associated with investigating state levels of self-esteem and self-compassion in the context of social media consumption. It enables to explore the fluctuations and momentary experiences of the participants' state self-esteem and self-compassion levels in detail (Connor & Barrett, 2012). Secondly, ESM allows for inference on within-person associations (Curran & Bauer, 2001).

### **Participants**

A convenience sampling strategy was applied to recruit participants. The study was shared through social network platforms such as WhatsApp and Facebook. No compensation was offered for their participation. Additionally, the study was published on the Test Subject Pool BMS (SONA) System of the University of Twente. In SONA, students could receive partial study credits as compensation for their participation.

Four inclusion criteria were formulated that participants needed to fulfil in order to participate in the study. (1) Since adolescents and young adults especially are active on various social media platforms, it was assumed that this age group might be most prone to make various experiences in the context of social media, also with regards to their state self-esteem and state self-compassion (Anderson & Jiang, 2018). Therefore, it was decided that participants needed to be between 18 and 30 years old. (2) Moreover, the participants needed to have good English proficiency levels in order to be able to comprehend the content of this study as well as the surveys. (3) Next, the participants needed to be active on at least one social media platform over the course of a week. (4) Finally, the participants needed to own and use a smartphone with either iOS or Android operating systems to meet the compatibility requirements of the Ethica application used in this study.

The study was conducted during October and November 2020. Each participant conducted the study during a course of nine days. Of these nine days, eight consecutive days were used to measure the state variables self-esteem and self-compassion as well as the participants' social media consumption. The time frame of eight consecutive days was considered as sufficient to capture momentary fluctuations of all state levels. Furthermore, the time period was considered as acceptable minimizing the participants' strain resulting from frequent phone use induced by the study (Van Berkel, Ferreira, & Kostakos, 2017).

In total, 40 participants took part in the study. Reviewing existing literature on ESM studies, Van Berkel et al. (2017) found a median number of 19 participants for ESM studies. Taking these findings into consideration, the current study considered a similar sample size to be suitable while taking into account possible dropouts and missing data. In fact, from the original sample of 40 participants, 2 participants were removed due to dropouts, 14 participants were excluded due to low compliance, and 1 participant was removed as they did not fulfil the inclusion criteria. Based on the guidelines of Connor and Lehman (2012) participants with a response rate of less than 50% were excluded from the sample. The final sample consisted, thereof, of 23 participants between the ages of 18 and 30 ( $Mean_{age}=22.09$ ;  $SD_{age}=3.34$ ). Of these 23 participants, 17 were female and 6 were male. Moreover, 18 participants were German, 2 were Indian, 1 participant was Dutch, 1 was Finnish and 1 participant was from Ukraine.

## Materials

The measurement tool of this study comprises several materials. For one, an online survey was created assessing trait and state levels of self-esteem and self-compassion as well as general and daily social media consumption. The online survey was created using the online research platform Ethica (<https://ethicadata.com/>). The survey was designed as a questionnaire composed of three components, one component asking for the participants' demographics, a second component assessing trait levels of self-esteem and self-compassion as well as participants' overall social media consumption and a third component assessing state levels of self-esteem and self-compassion as well as participants' daily social media consumption. Additionally, this study made use of a screen time measurement tool applicable on iOS and Android operating systems enabling the participants to monitor their daily social media consumption.

### *Ethica*

Ethica is an online research platform created to quantify human behaviour. It can be used as a web application or as a mobile app applicable on Android systems or iOS devices. Researchers are able to construct a variety of questionnaires within Ethica. Participants, on the other hand, can take these questionnaires within the app or on the webpage. Ethica provides the opportunity to trigger different surveys on different days at various times a day. Participants receive a push notification on their smartphones as soon as a questionnaire is triggered. This automatically reminds the participants to complete a questionnaire. In addition, expiration dates can be set for each survey to ensure that measurements take place during the intended time frame. For the present study, the researcher created and published the survey within Ethica whereas the participants took part in the survey using the Ethica application on their smartphones. Prior to the data collection, the survey created on Ethica was evaluated in a three-day pilot study.

### *Trait Questionnaires*

**Rosenberg Self-Esteem Scale (RSE).** The Rosenberg Self-Esteem Scale (RSE) is a 10-item Guttman scale measuring participants' self-esteem (see Appendix A). The RSE is the most widely used measure of global self-esteem and represents therefore an adequate measure of trait self-esteem (Demo, 1985). Significant stability was proven by the test-retest reliability showing correlations of 0.85 and 0.88 (Rosenberg, 1979). Significant concurrent, predictive and construct validity were demonstrated for the RSE (Robins, Hendin, & Trzesniewski, 2001). The questionnaire involves a method of combined ratings. Items 1, 2, 4, 6, and 7 are scored from 4 (*Strongly Agree*) to 1 (*Strongly Disagree*) while items 3, 5, 8, 9, and 10 are scored reversely from 1 (*Strongly Agree*) to 4 (*Strongly Disagree*). The scale ranges from 0 to 30. Scores below 15 suggest low levels of self-esteem, whereas scores between 15 and 25 are considered within a normal range while scores above 25 suggest high levels of self-esteem (Rosenberg, 1979).

**Self-Compassion Scale-Short Form (SCS-SF).** The Self-Compassion Scale – Short Form was invented by Kristin Neff and is composed of 12 items (see Appendix B) (Raes, Pommier, Neff, & Van Grucht, 2011). Measures indicate high internal consistency (0.86) and high correlation with the Self-Compassion Scale long-form (0.97) (Raes et al., 2011). The items are scored through a 5-Point-Likert Scale ranging from 1 (*Almost Never*) to 5 (*Almost Always*). Scores ranging between 1.0 – 2.5 represent a low level of self-compassion, 2.6 – 3.5 suggest a moderate level of self-compassion, and 3.6 – 5.0 indicate high levels of self-compassion.

**Overall Social Media Consumption.** Three questions related to (1) the amount of time spent on social media platforms and (2) the number of platforms time was spent on were formulated to assess the participants' overall social media consumption (see Appendix C). The first question asked the participants to indicate how many social media platforms they are using on a daily basis. This question was formulated open-ended such that the participants could indicate individual numbers. The second question asked the participants to indicate which social media platforms they are using on a daily basis. The participants could choose multiple given options. Finally, the participants were asked to indicate how much time they are approximately spending on social media during a day. Answer options were categorized into “*less than 30 minutes*”, “*between 30 and 60 minutes*”, “*between 60 and 90 minutes*”, “*between 90 and 120 minutes*”, and “*more than 120 minutes*”. A similar approach was applied in the study conducted by Bennett et al. (2020) investigating the impact of social media on mood and body dissatisfaction using ESM.

### *Daily Questionnaires*

**State Self-Esteem.** State self-esteem was assessed by using all 10 items of the RSE. The items were rephrased to measure participants' current feelings (see Appendix D). Accordingly, participants rated how they feel about themselves at the moment (e.g., “*At the moment, I am satisfied with myself:*” or “*At the moment, I feel I do not have much to be proud of.*”). This approach was derived from a study conducted by Alfasi (2019) who transformed the items of the RSE into situation-based questions. Similar to the original questionnaire, items 1, 2, 4, 6, and 7 are scored from 4 (*Strongly Agree*) to 1 (*Strongly Disagree*) while items 3, 5, 8, 9, and 10 are reversed in valence and are consequently scored from 1 (*Strongly Agree*) to 4 (*Strongly Disagree*).

**State Self-Compassion.** State self-compassion was assessed through a single item from the SCS-SF. By adding the phrase “*During the last minute*”, the item was rephrased into “*During the last minute, I have been tolerant of my own flaws and inadequacies.*” (see Appendix E). This approach was applied in a study conducted by Li, Deng, Lou, Wang, and Wang (2019). Additionally, the two items of the common

humanity scale were added to the questionnaire in order to assess the participants' state levels of the common humanity component. These two items were rephrased as well to measure the participants' current feelings (see Appendix E). The scoring was done using a 5-Point-Likert Scale ranging from 1 (*Never*) to 5 (*Always*) for all three items.

**Daily Social Media Consumption.** To assess the participants' daily social media consumption, participants were asked two questions regarding (1) the amount of time spent on social media platforms and (2) the number of platforms time was spent on. First, the participants were asked to check their current social media consumption via their screen time measurement application. Each participant was then asked to indicate the amount of time spent on social media platforms calculated by the measurement application. Next, the participants were asked to indicate which social media platforms they were using up until this moment since the last survey. The participants could choose multiple options (see Appendix F).

### ***Screen Time Measurement Tool***

The majority of research shares a similar methodology when assessing social media consumption. As previously mentioned, this typically involves a reflective measurement such as asking participants for a duration estimate or a qualitative reflection concerning their own experiences rather than objectively measuring behaviour from a device (Ellis, 2019). However, throughout the past decade, several applications have been developed quantifying some aspects of smartphone usage (Ellis, Davidson, Shaw, & Geyer, 2019). One of these applications are screen time measurement tools which offer the opportunity to capture various variables. For one, the screen time spent during a day is displayed. Additionally, daily consumption times of each application, including social media applications, are assessed and displayed. Overall, most applications keep track of screen time consumptions every minute and calculate this accordingly.

These screen time measurement tools offer the opportunity to objectively keep track of social media consumption. Users are able to keep track of their overall consumption time as well as of application-related consumption. This enables a more objective measurement of the participants' social media consumption. However, one disadvantage that arises with the implementation of a screen time measurement tool is its cumulative data. That is, participants can only observe and indicate the total time they spent on social media platforms assessed from the first moment of measurement. Consequently, participants are not able to indicate the differences in social media consumption between the measurement points but could only indicate the total amount of social media consumption they have for each measurement point. Nevertheless, the screen time measurement tool was included in this study as a prerequisite. Every participant was offered to use the original screen time measurement function offered

on their smartphones. In case the participants' smartphones did not offer this function, they were advised to download the application Screen Time from the AppStore or Play Store.

### **Procedure**

For each participant, the study took place for nine days in total. On the first day, participants needed to download the app Ethica. Each participant was required to create a participant account through their email address and a password. Afterwards, the participants could enrol for this study through a participation code that had to be inserted in Ethica. As soon as the participants enrolled for the study, they received detailed information about the intentions and the duration of the study as well as their rights as participants. After reading these, the participants were asked to consent to participate. With confirming the consent form, the participants received instructions on how to continue with the survey.

First, they were asked to check their smartphones for a screen time tracking feature. In case their smartphones did not offer this feature, the participants were asked to download a screen time tacking App such as Screen Time. Afterwards, the participants could start filling out the first survey, including a questionnaire about their demographics, the RSE trait questionnaire, the SCS-SF trait questionnaire and the questionnaire about their general social media consumption. If the participants forgot to finish one of those questionnaires, Ethica sent automatic reminders to motivate the participants to finish the surveys.

During the following days (day 2 to 9), each participant was sent the daily questionnaire on three separate time occasions per day. Every day, the first questionnaire was triggered between 9:00 a.m. and 11:30 a.m. followed by the second trigger starting between 2:00 p.m. and 3:30 p.m. The final questionnaire was triggered between 8:00 p.m. and 9:30 p.m every day. Each survey was presented to the participants through a notification from Ethica. If the participants did not answer after 30 minutes, a second reminder was sent. In case the second reminder was not noted as well, a third reminder was sent after 60 minutes. If the participants did not answer the survey after 90 minutes after the first notification, the survey expired automatically.

On the final day (day 9), participants were sent a final notification revealing the end of the study and thanking them for their participation. Additionally, the researcher's email address was stated so that participants could contact the researcher in case of any remaining questions. Finally, the participants' responses were evaluated and analyzed.

### **Data Diagnostic**

The data were analyzed using IBM SPSS Statistics Version 25 (IBM Corp, 2017). From the sample, all participants with a response rate of over 50% were included in the analyses (Connor & Lehmann, 2012). To begin with the data diagnostic, several variables were recoded or transformed. First, the answers participants indicated about their social media consumption using the screen time measuring tool

were analyzed. As mentioned before, the answers participants could indicate from their screen time measuring tool were cumulative. Hence, the differences in social media consumption between measurement points needed to be calculated manually. As the data showed high compliance rates and little missing data, it was decided to calculate the differences between measurement points through subtracting the descending measurement point from the ascending measurement point while missing data was kept. Differences between days were not calculated. In case of a missing data point, still, the number of the descending measurement point was subtracted from the number of the ascending measurement point (e.g., if the second measurement point was missing, the first measurement point was subtracted from the third measurement point). This was preferred over the possibility to impute data as this would have caused more error in the results. Secondly, the answers participants indicated about the types of social media platforms they used were transformed into total scores.

Moreover, mean scores for the trait questionnaires of self-esteem and self-compassion were calculated. To get an overview of the data, descriptive analyses were performed for the demographics, including gender, age and nationality, as well as for the trait self-esteem, trait self-compassion, and overall social media consumption to estimate means, minima, maxima and standard deviations across the sample.

Next, Little's Missing Completely at Random (MCAR) test was conducted analyzing the pattern of missing data to check whether the data were missing completely at random. In addition, mean scores for the state self-esteem scale were calculated as well as mean scores for the state self-compassion scale and common humanity scale. Finally, for the variables state self-esteem, state self-compassion, and common humanity, as well as the variables daily time spent on social media and number of social media platforms used, the average level over seven days per participant, was calculated using person means (PM). PM scores enable between-person analyses. In order to perform within-person analyses, the person mean-centred scores (PM-centered) were estimated for every participant for all measurements of self-esteem, self-compassion, common humanity and social media consumption. These scores show the differences between the mean scores of state self-esteem, state self-compassion, common humanity as well as daily social media consumption and the individual measurement point (Curran & Bauer, 2011).

In addition, to determine the reliability of the RSE and the SCS-SF within this sample, Cronbach's alpha was calculated. Considering the interpretations of Taber (2017) a Cronbach's alpha of  $> 0.9$  represents excellent reliability. A Cronbach's alpha of  $> 0.8$  shows good reliability,  $> 0.7$  is acceptable while  $> 0.6$  is questionable. Scores below 0.6 are considered as unacceptable. Moreover, in order to assess the internal consistency of the state items measuring self-esteem and self-compassion split-half reliability was calculated following the approach of Csikszentmihalyi and Larson (2014). Accordingly, mean scores of one half of the scores per person were correlated with the other half of the scores per person to assess

the internal consistency. Moreover, to determine the validity of the edited items of the RSE and the single item measuring self-compassion as well as the two items of the common humanity scale, Pearson Correlation analyses between state self-esteem (PM) and the RSE and state self-compassion (PM) and the SCS-SF were conducted. The resulting correlation coefficients  $r$  were interpreted according to Cohen's (1988) effect size interpretations. Consequently,  $r > 0.5$  demonstrates a strong effect,  $r > 0,3$  a moderate effect and  $r > 1.0$  a weak association.

### **Data Analysis**

First, simple linear regressions were conducted to investigate the associations between variables on a trait level. Next, several Linear Mixed Model (LMM) analyses were performed. In order to account for the missing measurement points and the dependency of the longitudinal data, first-order autoregressive (AR1) covariance matrix with homogeneous variances was incorporated (Curran & Bauer, 2011).

First, to determine the association between the participants' daily social media consumption with the variables daily time spent on social media platforms (PM-centered) and number of social media platforms used (PM-centered) and state self-esteem (PM-centered), an LMM analysis was performed. Prior to the analysis, the variables were standardized. The standardized score of state self-esteem was used as the dependent variable while the standardized scores of the variables daily time spent on social media and number of social media platforms used were used as the fixed independent variables.

To investigate the association between participants' state self-compassion and state self-esteem, LMM analysis was performed. State self-esteem (PM-centered) was set as the dependent variable and state self-compassion (PM-centered) as the fixed independent variable. Prior to the analysis, all variables were standardized.

To explore the association between state self-esteem and the self-compassion component common humanity, again LMM analysis was conducted. The variables of state self-esteem and common humanity were standardized prior to the analysis. The standardized score of state self-esteem (PM-centered) was used as the dependent variable while the standardized score of common humanity (PM-centered) was used as the fixed independent variable.

Finally, individual case analyses were conducted in order to obtain a more precise picture of the participants' social media consumption, state self-esteem as well as state self-compassion.

## **Results**

### **Descriptive Analyses**

Little's MCAR test revealed that the data were missing completely at random,  $\chi^2 = 71.82$ ,  $p = 0.45$ . Consequently, across the missing values and the different measurement points, no clear pattern of missing data could be identified. Therefore, no imputation method was used. The percentages of missing values



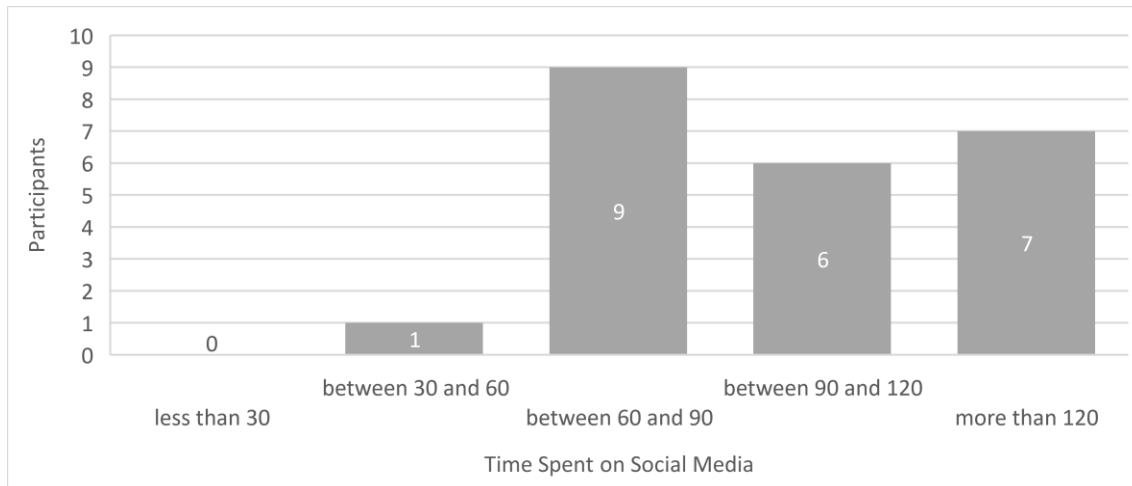
across the 23 measurement points varied between 13.2% and 15.5%. Therefore, the compliance rate varied between 84% and 87%.

The Shapiro Wilk Test confirmed normally distributed data for trait self-esteem ( $W = 0.99, p = 0.98$ ) and trait self-compassion ( $W = 0.92, p = 0.054$ ). In contrast, the Shapiro Wilk Test revealed non normal distributions for the social media consumption variables time spent on social media platforms ( $W = 0.79, p = 0.001$ ) and number of social media platforms used ( $W = 0.87, p = 0.01$ ). The descriptive statistics, including the minimum and maximum, mean and standard deviation of trait self-esteem and trait self-compassion as well as the variable number of social media platforms used can be viewed in Table 1. Additionally, frequency analysis was conducted to explore the variable time spent on social media platforms. The outcomes can be viewed in Figure 1.

**Table 1**  
*Minimum and maximum scores, means and standard deviation of trait self-esteem, trait self-compassion and number of social media platforms used.*

Variables	N	Minimum (Scale Minimum)	Maximum (Scale Maximum)	Mean	SD
Rosenberg Self-Esteem Scale	23	1.30 (0)	3.30 (30)	2.25	0.52
Self-Compassion Scale Short-Form	23	1.83 (1.0)	3.83 (5.0)	2.94	0.61
Number of Social Media Platforms Used	20	2	5	3.75	1.02

**Figure 1**  
*Frequencies of categories of time spent on social media platforms (measured in minutes) per day.*



The RSE showed excellent reliability with a Cronbach's alpha of 0.91 and the SCS-SF showed good reliability with a Cronbach's alpha of 0.87. The split-half reliability calculated for the state self-esteem items revealed a significant and strong association ( $r = 0.91, p = 0.0$ ). Consequently, the strong association indicates excellent internal consistency. The split-half reliability calculated for the edited items of the SCS-SF revealed a significant and strong association ( $r = 0.98, p = 0.0$ ). Thus, the strong association presents excellent internal consistency among the state SCS-SF items.

Finally, correlation analyses were conducted to validate the applied state questionnaires. Correlation analysis between state self-esteem (PM) and the RSE resulted in a negative weak and non-significant correlation ( $r = -0.08, p = 0.72$ ). The same analysis was performed with state self-compassion (PM) and the SCS-SF resulting in a moderate and non-significant correlation ( $r = 0.35, p = 0.10$ ). Lastly, common humanity (PM) was correlated with the SCS-SF resulting in a weak and non-significant correlation ( $r = 0.29, p = 0.18$ ).

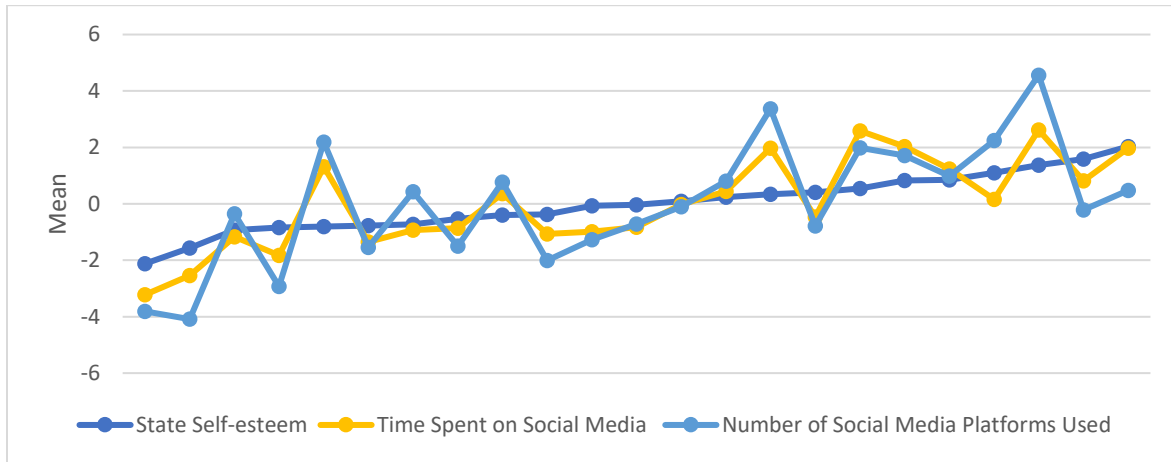
### Associations on the Mean Level

#### *Association between Social Media Consumption and State Self-esteem*

First, a visual observation was done by exploring the means of state self-esteem, daily time spent on social media and daily number of social media platforms used per measurement point over time. As depicted in Figure 1, a positive association between state self-esteem and daily time spent on social media platforms as well as between state self-esteem and daily number of social media platforms used was apparent (see Figure 2).

### Figure 2

*Mean state self-esteem, mean daily time spent on social media and mean daily number of social media platforms used per participant.*



*Note.* Standardized PM-centered scores were used for each variable. Scores are ordered from the lowest to the highest level of average state self-esteem with the corresponding levels of time spent on social media and number of social media platforms used per participant.

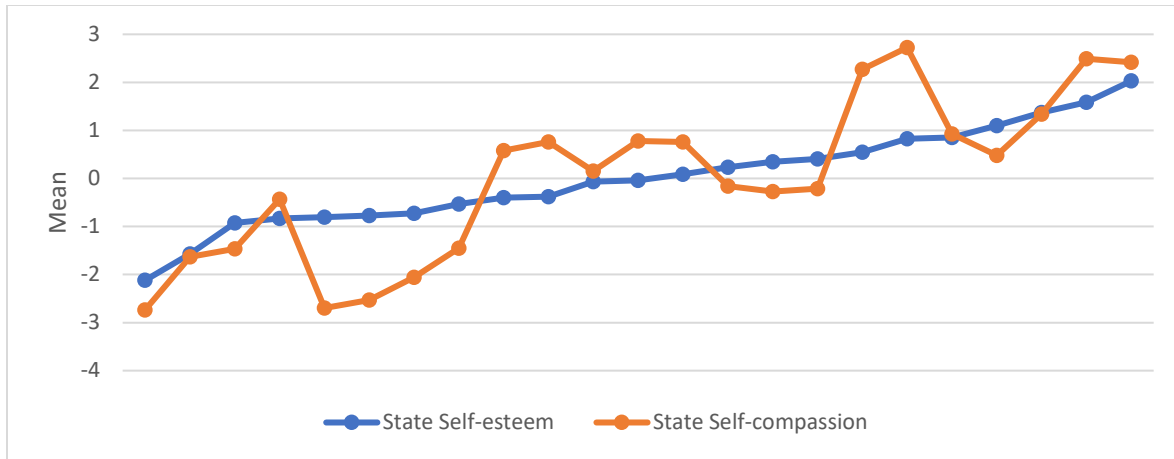
A simple linear regression was then conducted to predict state self-esteem on time spent on social media. No significant relation was found [ $F(1,21)=1.60, p<0.22$ ]. Next, a simple linear regression was conducted to predict state self-esteem on number of social media platforms used. No significant relation was found [ $F(1,21)=0.31, p<0.58$ ].

***Association between State Self-Compassion and State Self-Esteem***

Prior to the analysis, a visual observation of the means of state self-esteem and state self-compassion per measurement point over time was done (see Figure 3). A positive relationship between the two variables became apparent.

**Figure 3**

*Mean state self-esteem and mean state self-compassion per participant.*



Note. Standardized PM-centered scores were used for each variable. Scores are ordered from the lowest to the highest level of average state self-esteem with the corresponding levels of state self-compassion per participant.

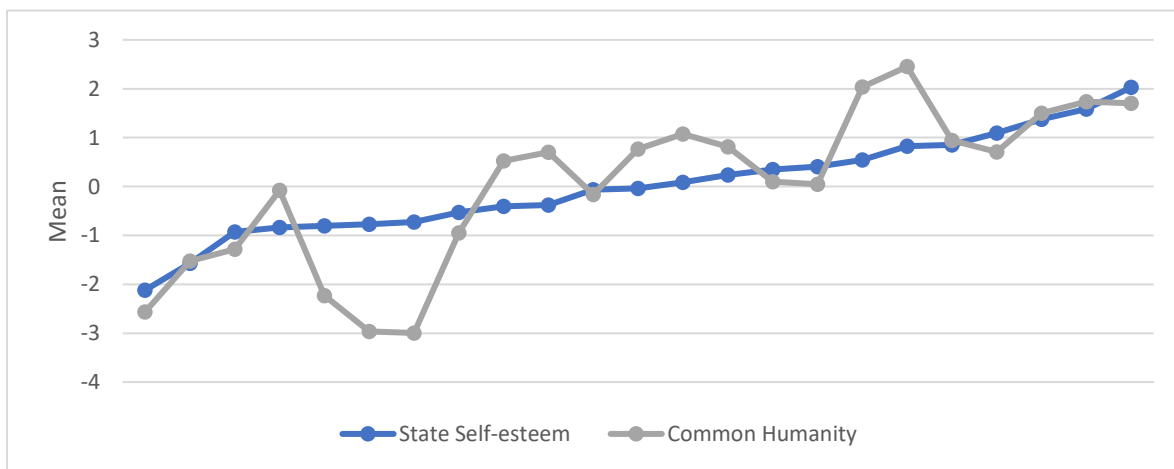
A simple linear regression was conducted. The state self-compassion was set as the predictor variable while state self-esteem was set as the outcome variable. No significant relation was revealed [ $F(1,21)=3.58, p=0.07$ ].

**Association between State Self-Esteem and Common Humanity**

The visual representation of mean state self-esteem and common humanity per measurement point over time seemed to suggest a positive relationship (see Figure 4).

**Figure 4**

Mean state self-esteem and mean common humanity per participant.



*Note.* Standardized PM-centered scores were used for each variable. Scores are ordered from the lowest to the highest level of average state self-esteem with the corresponding levels of common humanity per participant.

Again, a simple linear regression was conducted with common humanity as the predictor variable and state self-esteem as the outcome variable. No significant relation was found between the two variables [ $F(1,21)=1.61, p<0.22$ ].

### **Associations on the State Level**

#### ***Association between Social Media Consumption and State Self-esteem***

The LMM analysis revealed no significant association between state self-esteem and daily time spent on social media platforms ( $\beta_{pmc} = 0.03, SE = 0.04, p = 0.46$ ) and no significant association between state self-esteem and daily number of social media platforms used ( $\beta_{pmc} = 0.002, SE = 0.04, p = 0.94$ ).<sup>1</sup>

In order to obtain a more precise picture of the participants' daily social media consumption and state self-esteem over time, a number of participants with representative scores were selected as examples for a further examination on the individual level. In total, 3 participants were selected. The first example, participant 17 spent the least time on social media over the course of 8 days ( $Mean = 16.74, SD = 13.94$ ). The minimum time this participant spent on social media was 0.0 minutes and the maximum time this participant spent on social media platforms was 50.0 minutes. At the same time, this participant used on average only 1 social media platform over the course of 8 days. In contrast, their state self-esteem ( $Mean = 2.39, SD = 0.16$ ) indicated average levels over the course of 8 days. The second example, participant 14 represents the average level of social media consumption over the course of 8 days. They spent on average 67.14 minutes on social media platforms ( $Mean = 67.14, SD = 39.75$ ) with a minimum of 1.0 minute and a maximum of 160.0 minutes over the course of 8 days. Additionally, they used on average 3 social media platforms over the course of 8 days. Similar to the previous participant, participant 14 showed average levels of state self-esteem ( $Mean = 2.43, SD = 0.01$ ). The final example, participant 2 spent the most time on social media over the course of 8 days. They spent on average 103.8 minutes

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<sup>1</sup> As previously mentioned, the data of the variable daily time spent on social media was calculated manually. Differences were calculated between the descending point and the ascending point. This could have caused potential noise affecting the outcome of the LMM analysis. To control for this, only differences between subsequent numbers were calculated while missing data points were kept. Cases that did not allow for this procedure were excluded from the data set. In total, 14 cases were remaining. LMM analysis was conducted again, revealing findings similar to the first trial. No association was found between state self-esteem and daily time spent on social media ( $\beta_{pmc} = 0.05, SE = 0.05, p = 0.33$ ) as well as between state self-esteem and daily number of social media platforms used ( $\beta_{pmc} = 0.001, SE = 0.05, p = 0.98$ ).

( $Mean = 103.8$ ,  $SD = 80.12$ ) on social media over the course of 8 days. The minimum time spent was 12.0 minutes while the maximum time spent was 266.0 minutes. Participant 2 used 2 social media platforms over the course of 8 days. Similar to the previous participants, they indicated average levels of self-esteem ( $Mean = 2.55$ ,  $SD = 0.15$ ).

A visual observation of the participants' state self-esteem, daily time spent on social media and daily number of social media platforms was conducted. No clear pattern of association among those variables became apparent in each of the three cases. Details and figures for each individual case can be viewed in Appendix G. The examination of the individual cases was consistent with the aggregated findings.

### ***Association between State Self-Compassion and State Self-Esteem***

The LMM indicated a within-person effect, revealing a very weak, negative association of state self-esteem with state self-compassion ( $\beta_{pmc} = -0.09$ ,  $SE = 0.04$ ,  $p = 0.02$ ).

Individual case analyses were additionally conducted to obtain a more precise picture of the participants' state self-compassion and state self-esteem. Again, in total, 3 participants were selected. The first example, participants 16, indicated the lowest levels of self-compassion with a mean score of 2.24 ( $SD = 0.44$ ). The self-esteem scores indicated average levels of state self-esteem ( $Mean = 2.39$ ,  $SD = 0.05$ ). Next, participant 7 was examined. They indicated average levels of state self-compassion over the course of 8 days. The mean score of the participant's self-compassion levels was 3.05 ( $SD = 0.80$ ) with a minimum score of 2 and a maximum score of 4. Similar to the previous participant, participant 7 showed average levels of state self-esteem ( $Mean = 2.37$ ,  $SD = 0.10$ ). Finally, participant 12, was examined in more detail. Participant 12 indicated high levels of self-compassion over the course of 8 days with a mean score of 4.5 ( $SD = 0.79$ ). Similar to the previous examples, this participant indicated average levels of state self-esteem ( $Mean = 2.58$ ,  $SD = 0.20$ ).

For each participant, a visual observation of the variables state self-compassion and state self-esteem was conducted. For each of the three cases, no clear pattern of association between state self-compassion and state self-esteem became apparent. Details and figures for each individual case can be viewed in Appendix H. Even though previous findings indicated a very weak, negative association between state self-compassion and state self-esteem, the examination of the individual cases can still be considered as consistent with the previous findings.

### ***Association between State Self-Esteem and Common Humanity***

Again, LMM analysis was conducted. The results of the analysis revealed no significant association between state self-esteem and the self-compassion component common humanity ( $\beta_{pmc} = -0.06$ ,  $SE = 0.04$ ,  $p = 0.15$ ).

## Discussion

The purpose of this study was to investigate the state levels of self-esteem and self-compassion in the context of social media consumption over the course of 9 days. The results revealed no significant association between social media consumption, measured in daily time spent on social media and daily number of social media platforms used, and state self-esteem. In contrast, a very weak, negative association was found between state self-compassion and state self-esteem. This association indicated a within-person association between state self-compassion and state self-esteem. Finally, the results revealed no significant association between state self-esteem and the self-compassion component common humanity.

### Trait and State Questionnaires

To ensure correct interpretations of the results, the association between the trait questionnaires (RSE, SCS-SF) and their corresponding state items was tested. First, testing the association between the trait questionnaire assessing self-esteem (RSE) and the mean of its state items gathered repeatedly over a week, the results revealed no significant association. Nevertheless, for both questionnaires separately the internal consistency was very high. Consequently, the questionnaires seem to measure something different, even though both provide a reliable measure of self-esteem individually. These findings are somewhat surprising since the state items originated from the RSE and were transformed into situational items as it was done in the study of Alfasi (2019). However, comparing the content of the questionnaires, no real difference becomes apparent. The items of the trait questionnaire were rephrased by adding “*at the current moment*” to the beginning. As an example, the item “*I wish I could have more respect for myself*” was rephrased into “*At the moment, I wish I could have more respect for myself*”. A change in meaning does not become apparent.

One possible explanation that could account for the non-significant correlation might be the conceptualization of self-esteem. Rentzsch and Schröder-Abe (2018) came to the conclusion that the construct self-esteem can be conceptualized as both a stable baseline, a more generalized and global construct, as well as a fluctuating construct which alters depending on contextual factors. Thus, the construct self-esteem consists of two differing conceptualizations. Taking this to the present study, it might be that the trait questionnaire (RSE) mainly assessed self-esteem as the global construct whereas the state questionnaire mainly assessed the fluctuating construct which was influenced by contextual factors. Consequently, as both questionnaires were measuring different conceptualizations of the construct, no significant correlation could be revealed. Another possible explanation could be the tendency for socially desirable responding (Van de Mortel, 2008). It describes the tendency of participants to present a favourable image of themselves when answering a questionnaire. While

answering trait questionnaires, participants often think about their ideal selves and indicate answers that comply with their ideal selves. However, when answering daily state questionnaires, it might be difficult to keep up their ideals and they indicate answers that match more with their real selves (Van de Mortel, 2008). Consequently, incongruence between the answers participants gave during the trait questionnaire and the answers participants gave during the state questionnaires might occur. Hence, the state items do not have a significant correlation with their trait items.

Secondly, results revealed no association for the trait questionnaire assessing self-compassion (SCS-SF) and its corresponding state item. Similarly, no significant association was found between the SCS-SF and the two items assessing common humanity. Interestingly, both, the state self-compassion and common humanity items originated from the SCS-SF and were transformed into situational items as it was proposed by Li et al. (2019). One possible explanation for these findings could be provided through previous ESM studies investigating state self-compassion. It becomes apparent that state self-compassion was almost always assessed through multiple items (Thies & Kordts-Freudinger, 2019). As self-compassion consists of three components, measuring self-compassion with only one item might not be appropriate. The state item of this study stems from the self-kindness component. Therefore, it might not assess the complete construct of self-compassion. Consequently, the single item does not have a significant correlation with its trait component. By the same token, the two items assessing common humanity might not correlate with the trait questionnaire assessing self-compassion.

### **Social Media Consumption and State Self-Esteem**

At first, average social media consumption, measured in daily time spent on social media platforms and daily number of social media platforms used, and state self-esteem seemed to be positively related to each other. Even though this impression was rejected through regression analyses, it presents the opposite to previous research findings which were suggesting a negative association between social media consumption and state self-esteem (Alfasi, 2019; Vogel, et al., 2014; Wirtz et al., 2020). Additionally, further investigations on the within-person level did not reveal any association between the variables. These findings were further supported through individual case analyses. Consequently, the original hypothesis of social media consumption being negatively associated with state self-esteem was rejected.

One possible explanation for these results might be that the sample of this study does not engage in problematic social media consumption. Instead, a large portion of the participants' social media consumption might be connected to being in contact with friends over social media platforms rather than engaging in comparison behaviour while being active on social media platforms. Taking into account that the present study was conducted during the COVID-19 pandemic where several regulations restricted



people from having physical social interactions, for most people social media platforms were often the only way to stay in contact with others (Bendau, Petzold, & Pyrkosch, 2020). This could explain why state self-esteem levels seem to rise rather than to decrease with increasing social media consumption (Alfasi, 2019). Moreover, this explanation raises the question whether certain types of social media platforms, platforms that facilitate social comparisons, might be of higher relevance than others when investigating the association between social media consumption and state self-esteem. As an example, Vogel et al. (2014) and Alfasi (2019) both decided to include Facebook into their experiments as Facebook offers intensive opportunities for social comparisons. Consequently, the usage of social media platforms enabling social comparisons might affect state self-esteem levels more than other platforms.

Taking these findings to the current study, a possible explanation for the discrepancy in results becomes apparent. In contrast to the previous studies, the current study focused only on social media consumption measured in time and number of social media platforms used. No focus was placed on the type of social media platforms used and the number of social comparisons taking place on these platforms.

### **State Self-Compassion and State Self-Esteem**

Originally, it was expected that high levels of state self-compassion would associate with low levels of state self-esteem. On average, state self-compassion and state self-esteem seemed to be positively related to each other. In contrast to that, the analyses on the within-person level revealed a very weak, negative association meaning that high levels of self-compassion are associated with low levels of self-esteem. Consequently, the original hypothesis of state self-compassion being associated with low levels of state self-esteem was accepted.

These findings seem to suggest a reversed association between state self-compassion and state self-esteem being positive on the between-person level and negative on the within-person level. Many previous studies focused on the between-person level rather than on the within-person level when investigating the association between self-compassion and self-esteem (Neff, 2011). As an example, Neff (2003) revealed a moderate positive association between self-compassion and self-esteem. Additionally, Neff (2003) mentioned that people lacking self-compassion are likely to experience lower levels of self-worth. In contrast, people experiencing high levels of self-compassion seem to experience heightened feelings of self-worth. Subsequently, the association between the two constructs seems to be positive on the between-person level but negative on the within-person level. Drawing from Van Berkel et al. (2017) it is possible for people to be on average very self-compassionate and to have high levels of self-esteem, yet, to experience something different on a momentary basis. On a momentary basis, external factors,

such as traumatic and stressful events, might come in to play and affect both, levels of self-compassion as well as self-esteem (Van Berkel et al., 2017).

Considering the time frame during which the data of this study was collected, external factors that could have acted as a moderating variable between self-compassion and self-esteem might have been the implications of the COVID-19 pandemic. Several measures, such as quarantine, physical distancing and lockdown were launched nationwide in order to get in control of the pandemic. These regulations caused feelings of uncertainty amongst many people. In line with that, Pan et al. (2020) recently found that people not experiencing depressive or anxiety disorders prior to the pandemic suffered more symptoms during the pandemic. Consequently, it might be possible that these drastic interventions could have affected the participants mental health and thus their levels of self-compassion and self-esteem on a momentary basis resulting in a negative association on the within-person level. **State Self-Esteem and Common Humanity**

Originally, it was hypothesized that high levels of common humanity are associated with high levels of state self-esteem. It was proposed that common humanity particularly protects people from low self-esteem when being active on social media platforms as it enables them to find more commonalities between them and their comparison targets (Neff & Vonk, 2009). However, the results revealed no significant association between state self-esteem and common humanity. Consequently, the original hypothesis was rejected.

As previously suggested, it might be that the sample of the current study does not engage in comparison behaviour when being active on social media platforms. Rather they seem to use social media platforms mainly to stay in contact with their friends (Bendau, Petzold, & Pyrkosch, 2020). Consequently, most participants might not have been exposed to content that could have led them to compare themselves with others. Hence, the participants might not have been required to identify commonalities between themselves and others (Neff, 2011). To conclude, as participants might not engage in comparison behaviour when consuming social media, the self-compassion component common humanity might not come into play. Thus, no association could be revealed between common humanity and state self-esteem. Nevertheless, as this topic of research is investigated for the first time, no previous research is available providing subsequent explanations.

### **Strengths, Limitations and Recommendations**

Several strengths can be drawn from the present study. For one, because this study made use of the experience sampling method, high ecological validity is ensured. The study measured precisely how people's social media consumption, state self-esteem levels and state self-compassion levels fluctuate over time. In line with that, the present study provides novel findings for associations between social

media consumption and state self-esteem, state self-compassion and state self-esteem as well as common humanity and state self-esteem on the within-person level. Moreover, a high compliance rate between 84% and 87% was achieved. Therefore, a coherent picture of the state components over a week was provided. Another important strength of the present study was its approach to capturing social media consumption through the screen time measurement tool. Previous research often made use of reflective measurements such as asking participants for a duration estimate or a qualitative reflection concerning their own experience rather than objectively measuring behaviour from a device (Ellis, 2019). With the application of a more objective measurement tool, potential bias is prevented, and more accurate data is ensured. Finally, the present study is the first study to the author's knowledge that investigated the association between self-esteem and the self-compassion component common humanity. Accordingly, the present study filled a literature gap and provided the first attempt for further research on the association between self-esteem and the self-compassion component common humanity.

Nevertheless, there are some potential limitations concerning the results of the present study. To begin with, the first limitation comprises the difference in measurement of the trait and state questionnaires. Accordingly, the trait and state questionnaires measure different constructs. This limitation complicates to correctly interpret the results and to draw clear inference from the results. To prevent this particular limitation, it is recommended to use different questionnaires to assess the state levels. As an example, in order to assess state self-compassion, multiple items should be used rather than a single item to ensure a valid measurement (Thies & Kordts-Freudinger, 2019). Moreover, despite the advantage of the more objective screen time measurement tool assessing the participants' social media consumption, two main issues arise with its application. For one, the screen time measurement tool presents another burden for the participant such that the participants first have to check the app before answering the related question. It might be that some participants did not always indicate correct answers but simply entered a random number in order to avoid the burden of checking the screen time app. Additionally, as the screen time measuring tool tracks the screen time consumption in an ascending total score, the data participants indicated were cumulative. Consequently, differences between measurement points needed to be calculated manually. These calculations might have caused some error in the analyses.

### **Practical Implications and Directions for Future Research**

Although the present study shows several limitations, this study also provides some theoretical and practical implications. First of all, the present study might have revealed a tendency for socially desirable responding among the participants. When answering one-time trait questionnaires, participants indicate their answers thinking about their socially desirable self-image. However, when answering daily

questionnaires, it might become difficult for the participants to keep up their ideals and they indicate answers that correspond more with their real selves (Van de Mortel, 2008). This tendency might not only account for validation issues between trait and state questionnaires, but it also raises the question to what extent previous and current findings were obscured through socially desirable responding. Consequently, it is recommended to replicate the current study while detecting and controlling for possible socially desirable responding.

Another important theoretical implication and suggestion for future research regard the investigation of the association of social media consumption and state self-esteem. The current study revealed that only capturing time spent on social media and the number of social media platforms used as factors of social media consumption might not be sufficient. Instead, more emphasis should be placed on the type of social media platforms used. As it was found that most people active on social media platforms engage in social comparisons frequently, it is proposed that social media platforms facilitating social comparisons might affect self-esteem levels significantly more than other social media platforms (Alfasi, 2019; Vogel et al., 2014). As an example, researchers investigated mainly Facebook but also started to focus on Instagram and Pinterest (Alfasi, 2019; Lewallen & Behm-Morawitz, 2016; Lup, Trub, & Rosenthal, 2015). In line with the previous implication, it is suggested to replicate the investigation of the association between the self-compassion component common humanity and state self-esteem. The present study revealed that participants were possibly not engaging in comparison behaviour while consuming social media. Yet, as it was hypothesized that common humanity comes into play when self-esteem levels are affected through social comparisons, no association between common humanity and state self-esteem could be found. In order to enable a detailed investigation of this association, social comparison needs to be enabled.

Finally, the present study revealed a weak association between state self-compassion and state self-esteem indicating a within-person association. Interestingly, this association seems to be the reverse from the association between self-compassion and self-esteem on the between-person level which was found in previous studies (Neff, 2003). However, as mentioned by Van Berkel et al. (2017), external factors, such as the COVID-19 pandemic, could have affected both, state self-compassion and state self-esteem and thus the association between these two variables. In order to test whether the within-person association of self-compassion and self-esteem was moderated by external factors, such as the pandemic, it is recommended to replicate the study. An important practical implication of the study is its application of a more objective measurement tool assessing social media consumption, the screen time measurement tool. Previous studies often asked only for duration estimates or qualitative reflections concerning the participants' social media behaviour rather than applying objective measures to keep track of the participants' social media consumption. This resulted in rather biased results (Ellis, 2019). The screen

time measuring tool presents an adequate approach to collect objective data about the participants' social media consumption and should be considered as a measurement tool during future ESM studies investigating social media consumption. Nevertheless, some improvements are suggested to overcome certain limitations. For one, it is recommended to add the screen time measuring function to the Ethica application such that the application is able to automatically record the participants' time spent on social media platforms. This approach would minimize the participants' additional burden of checking their screen time and would provide an even more precise measurement. Additionally, no more error would be included through mistakes in manual calculations.

In conclusion, the present study provides novel evidence about the association of state self-esteem and state self-compassion within the context of social media consumption. In particular, the present study provides insights about potential issues regarding the validation of trait and state questionnaire. Moreover, it was found that besides the variables time spent on social media platforms and number of social media platforms used, the type of social media platforms used might be of high relevance. Investigating this more closely could provide insights about the potential association between social media consumption and state self-esteem as well as common humanity and state self-esteem. Finally, the findings of a weak and negative within-person association between self-compassion and self-esteem differ from their between-person association. Consequently, it is recommended to replicate the study in order to eliminate potential contextual factors and in order to establish generalization of the results.

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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**

## Self-Compassion Scale – Short Form (SCS-SF)

1. When I fail at something important to me, I become consumed by feelings of inadequacy\*.
2. I try to be understanding and patient towards those aspects of my personality I don't like.
3. When something painful happens, I try to take a balanced view of the situation.
4. When I'm feeling down, I tend to feel like most other people are probably happier than I am\*.
5. I try to see my failings as part of the human condition.
6. When I'm going through a very hard time, I give myself the caring and tenderness I need.
7. When something upsets me, I try to keep my emotions in balance.
8. When I fail at something that's important to me, I tend to feel alone in my failure\*.
9. When I'm feeling down, I tend to obsess and fixate on everything that's wrong\*.
10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
11. I'm disapproving and judgmental about my own flaws and inadequacies\*.
12. I'm intolerant and impatient towards those aspects of my personality I don't like\*.

*\*Items with reversed scoring*

## Appendix C

### Overall Social Media Consumption

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 D**

## 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 E**

State Self-Compassion – Self-Compassion Scale Short-Form Edited

1. During the last minutes, I have been tolerant of my own flaws and inadequacies.

Common Humanity – Self-Compassion Scale Short-Form Edited

1. During the last minutes, I tried to see my failings as part of the human condition.
2. During the last minutes, I tried to remind myself that feelings of inadequacy are shared by most people.

**Appendix F**

## Daily Social Media Consumption

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



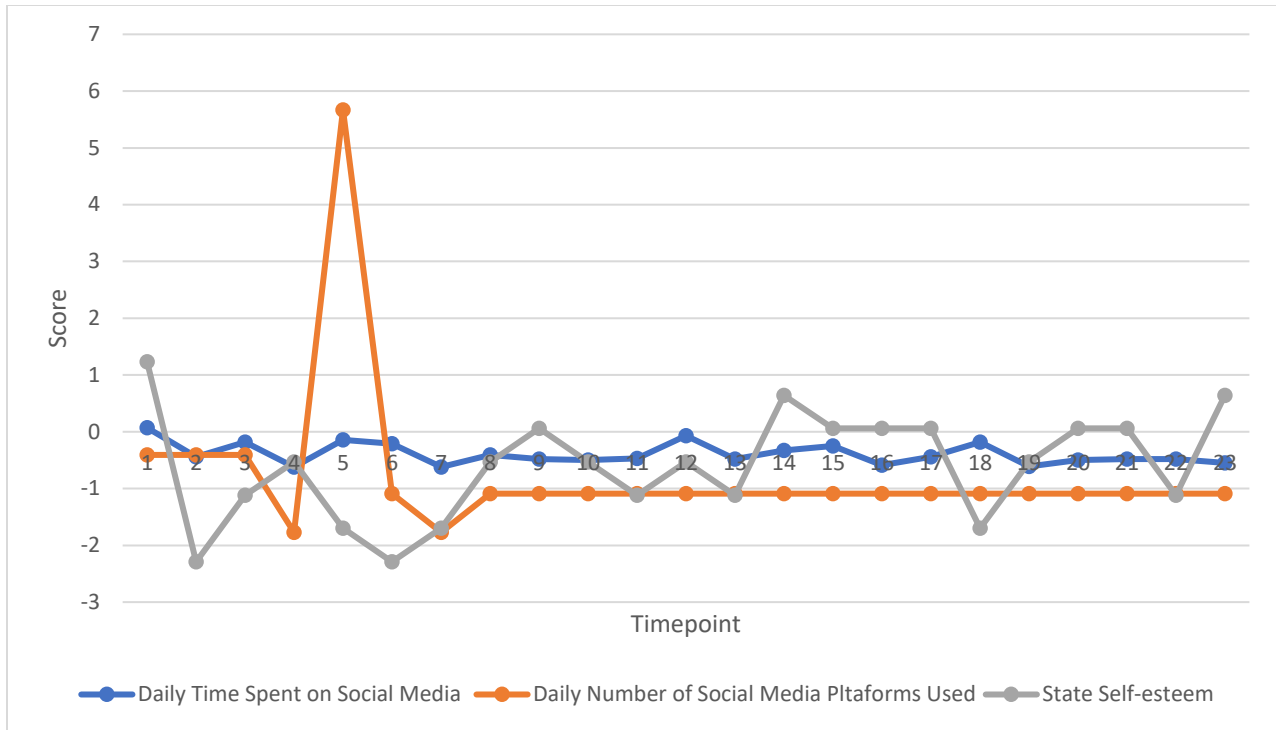
## Appendix G

### Individual Case Analyses – Daily Social Media Consumption and State Self-esteem

The first example, participant 17, spent the least time (measured in minutes) on social media over the course of 8 days ( $Mean = 16.74, SD = 13.94$ ). The minimum time this participant spent on social media was 0.0 minutes and the maximum time this participant spent on social media platforms was 50.0 minutes. At the same time, this participant used on average only 1 social media platform over the course of 8 days. In contrast, their state self-esteem ( $Mean = 2.39, SD = 0.16$ ) indicated moderate levels over the course of 8 days. The minimum state self-esteem level was 2.10 while the maximum state self-esteem level was 2.70. In order to compare all three variables within one graph, the scores were standardized. The pattern of the participant's state self-esteem scores and their daily time spent on social media platforms as well as the daily number of social media platforms used can be seen in Figure 4. The lines of state self-esteem and daily time spent on social media platforms show some variations over the course of 8 days. In contrast, the line of daily number of social media platforms used, spikes at the beginning of the study, yet it seems stable over the course of the week. The magnitude in change appears to be somewhat more pronounced in state self-esteem than in the social media consumption represented by the two variables daily time spent on social media platform and daily number of social media platforms used. No clear pattern of relation becomes apparent among these variables.

### Figure 5

*Participant 17 daily scores for state self-esteem), time spent on social media platforms (green) and number of social media platforms used per measurement point over time.*

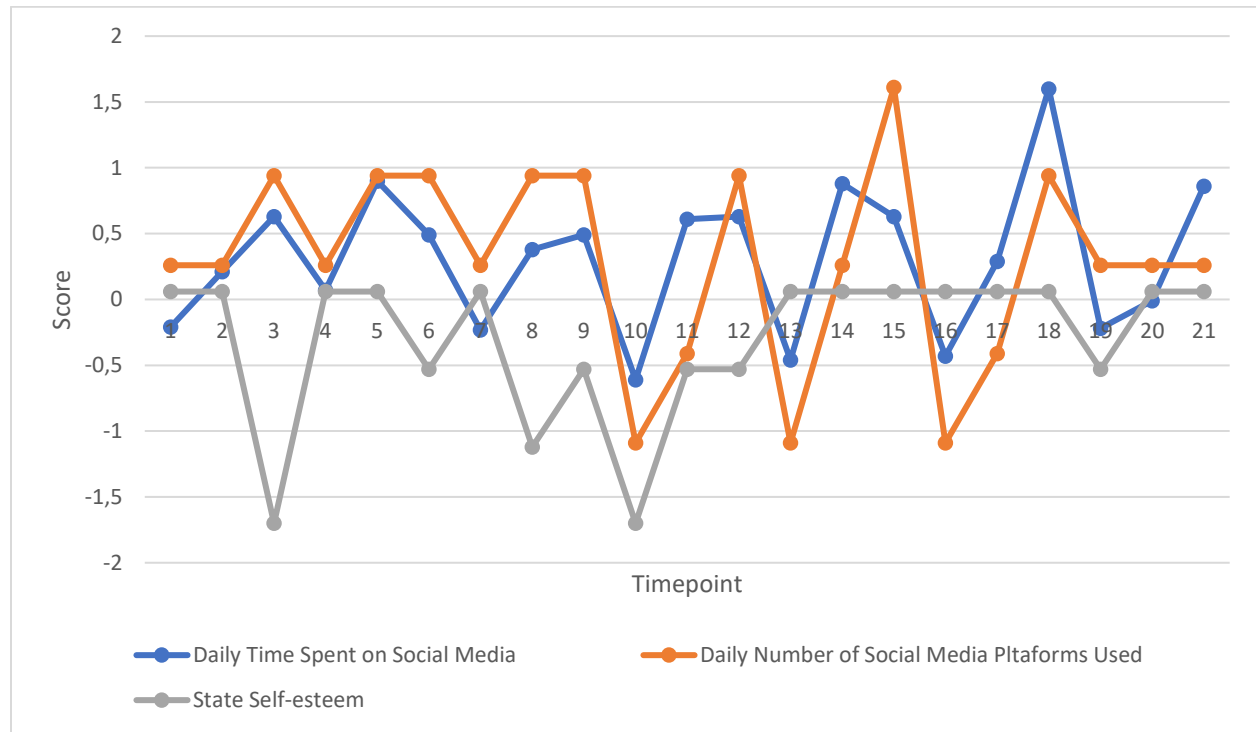


Note. This participant did fulfil the survey for every measurement point. There is no missing data included.

The second example, participant 14, represents the average level of social media consumption over the course of 8 days. This participant spent on average 67.14 minutes on social media platforms ( $Mean = 67.14, SD = 39.75$ ) with a minimum of 1.0 minute and a maximum of 160.0 minutes over the course of 8 days. Additionally, they used on average 3 social media platforms over the course of 8 days. The minimum of social media platforms used for this participant was 1 while the maximum was 5. Similar to the previous participant, participant 14 showed moderate levels of state self-esteem ( $Mean = 2.43, SD = 0.01$ ). The minimum score for state self-esteem was 2.20 while the maximum score was 2.50. Again, in order to compare all three variables within one graph, the variables were standardized. In Figure 5, the pattern of the participant’s state self-esteem, time spent on social media platforms and number of social media platforms used can be observed. The pattern shows variation in state self-esteem, time spent on social media but also in number of social media platforms used over the course of 8 days. Considering measurement point 3, 6, and 8 the fluctuations of state self-esteem and social media consumption seem to reveal a pattern as social media consumption represented by daily time spent on social media and daily number of social media platforms used increases at times where state self-esteem levels are low. However, considering measurement point 1, 7, 17 and 20 the pattern does not endure. For this participant, the magnitude in change is pronounced in all three variables over the course of the week. Subsequently, there is no clear pattern of relation among the variables.

**Figure 6**

*Participant 14 daily scores for state self-esteem, time spent on social media platforms and number of social media platforms used per measurement point over time.*



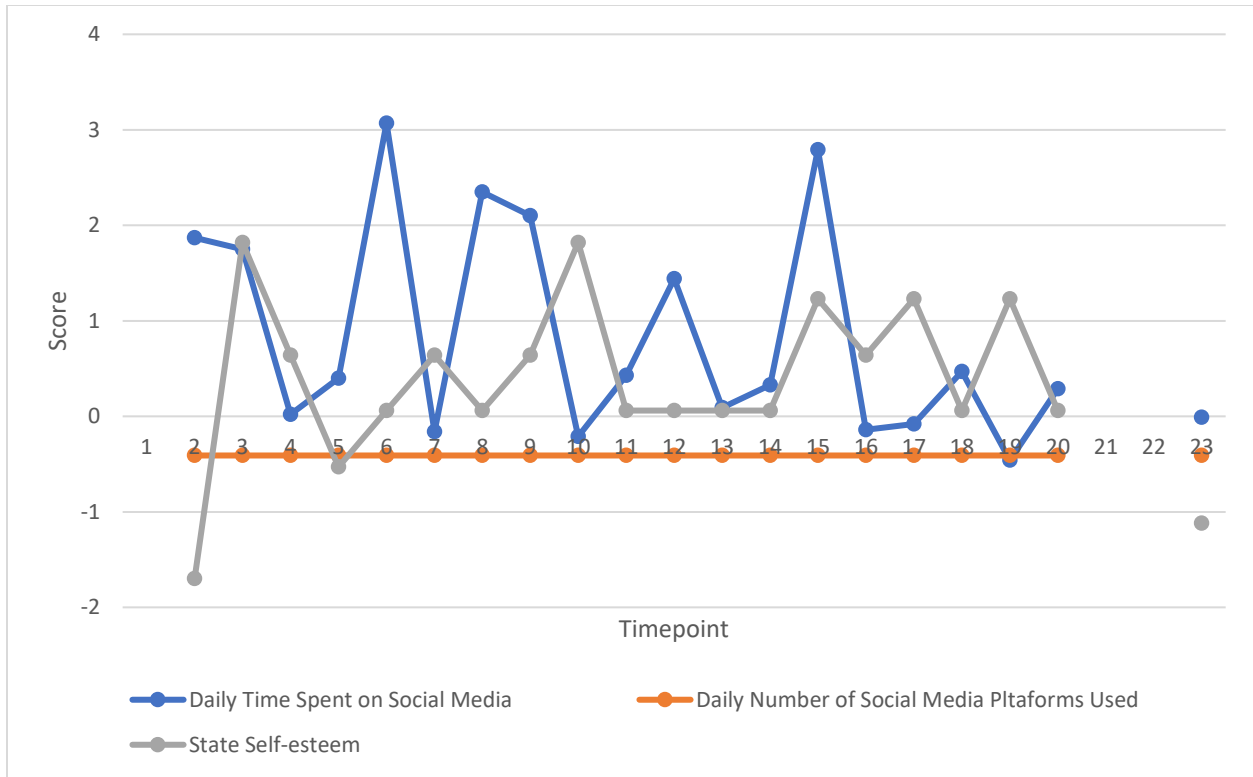
*Note.* Timepoint 22 and 23 are missing indicating missing data. The participant did not fulfil the survey during those sessions.

The third example, participant 2, spent the most time on social media over the course of 8 days. They spent on average 103.8 minutes ( $Mean = 103.8, SD = 80.12$ ) on social media over the course of 8 days. The minimum time spent was 12.0 minutes while the maximum time spent was 266.0 minutes. Participant 2 used 2 social media platforms over the course of 8 days. Similar to the previous participants, they indicated moderate levels of self-esteem ( $Mean = 2.55, SD = 0.15$ ) with a minimum score of 2.20 and a maximum score of 2.80. Again, in order to compare all three variables within one graph, the variables were standardized. The pattern of the participant's state self-esteem, time spent on social media and number of social media platforms used can be found in Figure 6. Similar to the previous participant, the pattern shows variation in state self-esteem and time spent on social media over the course of 8 days. The magnitude in change is more pronounced for the variables state self-esteem and time spent on social media platforms. Similar to participant 14, the fluctuations of state self-esteem and daily social media consumption seem to reveal a pattern as daily time spent on social media seems to increase at times where state self-esteem levels are low and to decrease at times where state self-esteem levels are high. This can be observed at time point 5 and 8 or at timepoint 10 and 19. However, observing the remaining

measurement points, this pattern does not endure. Subsequently, there is no clear pattern of relation among the variables.

**Figure 7**

*Participant 2 daily scores for state self-esteem (blue), time spent on social media platforms (green) and number of social media platforms used (red) per measurement point over time.*



*Note.* Timepoint 1, 21 and 22 are missing indicating missing data. The participant did not fulfil the survey during those sessions.

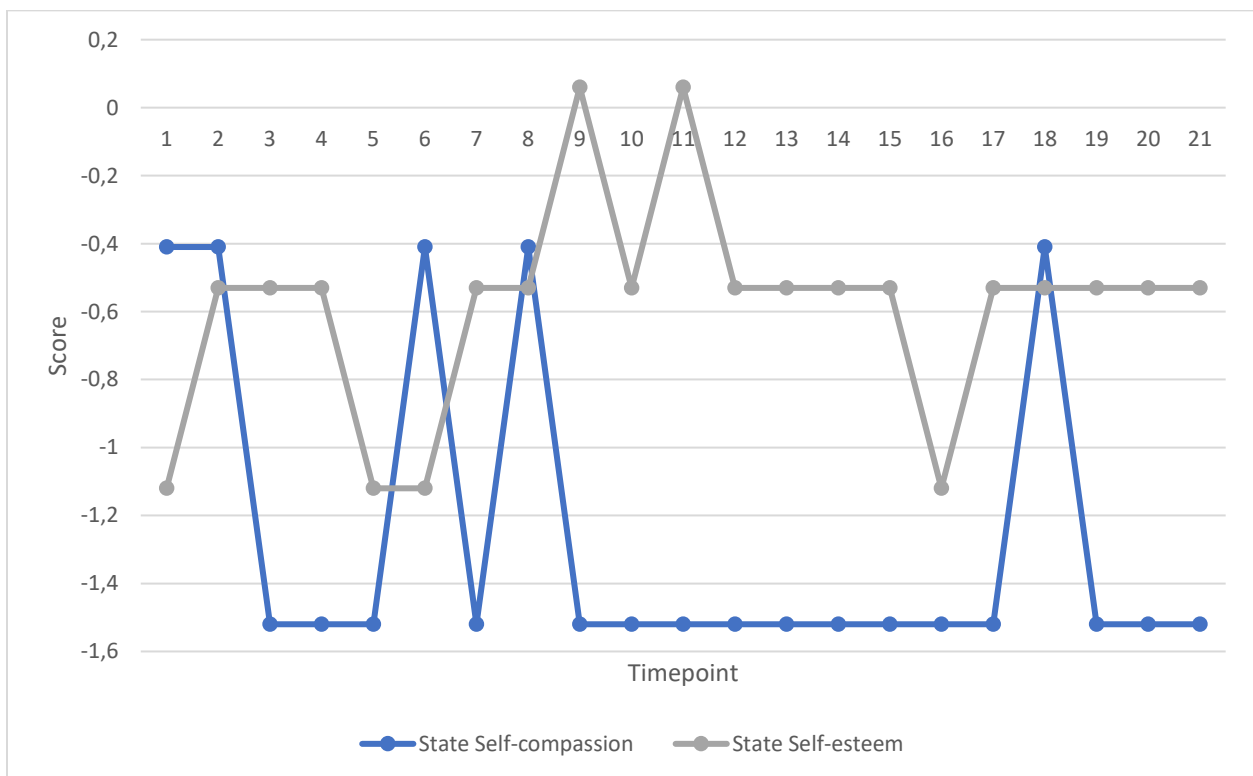
**Appendix H**

Individual Case Analyses – State Self-compassion and State Self-esteem

The first example, participant 16, indicated the lowest levels of self-compassion with a mean score of 2.24 ( $SD = 0.44$ ). The self-esteem scores indicate a moderate level of state self-esteem ( $Mean = 2.39, SD = 0.05$ ). In order to visualize both variables in one graph, the variables were standardized. The pattern of the participant’s state self-compassion and state self-esteem can be observed in Figure 7. Both variables show variations over the course of 8 days. The magnitude in change appears in both variables, state self-compassion and state self-esteem. No clear pattern of relation becomes apparent among the two variables.

**Figure 8**

*Participant 16 daily scores for state self-esteem and state self-compassion per measurement point over time.*



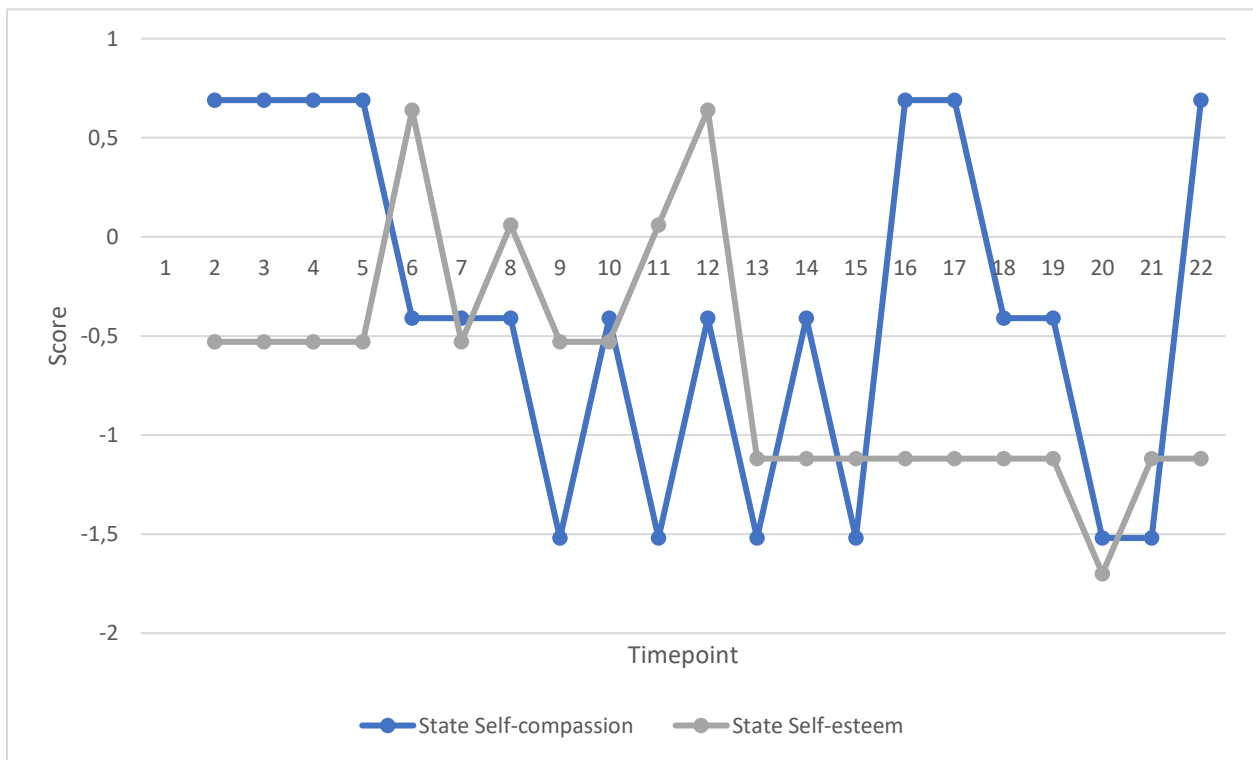
*Note.* Timepoint 22 and 23 are missing indicating missing data. The participant did not fulfil the survey during those sessions.

The second example, participant 7, indicated average levels of state self-compassion over the course of 8 days. The mean score of the participant’s self-compassion levels was 3.05 ( $SD = 0.80$ ) with a

minimum score of 2 and a maximum score of 4. Similar to the previous participant, participant 7 showed moderate levels of state self-esteem ( $Mean = 2.37, SD = 0.10$ ). Again, standardized scores were used to visualize both variables. The pattern of the participant’s state self-compassion and state self-esteem can be observed in Figure 8. Both variables show variations over the course of 8 days. The magnitude in change appears in both variables, state self-compassion and state self-esteem. Again, no clear pattern of relation becomes apparent among the two variables.

**Figure 9**

*Participant 7 daily scores for state self-esteem and state self-compassion per measurement point over time.*



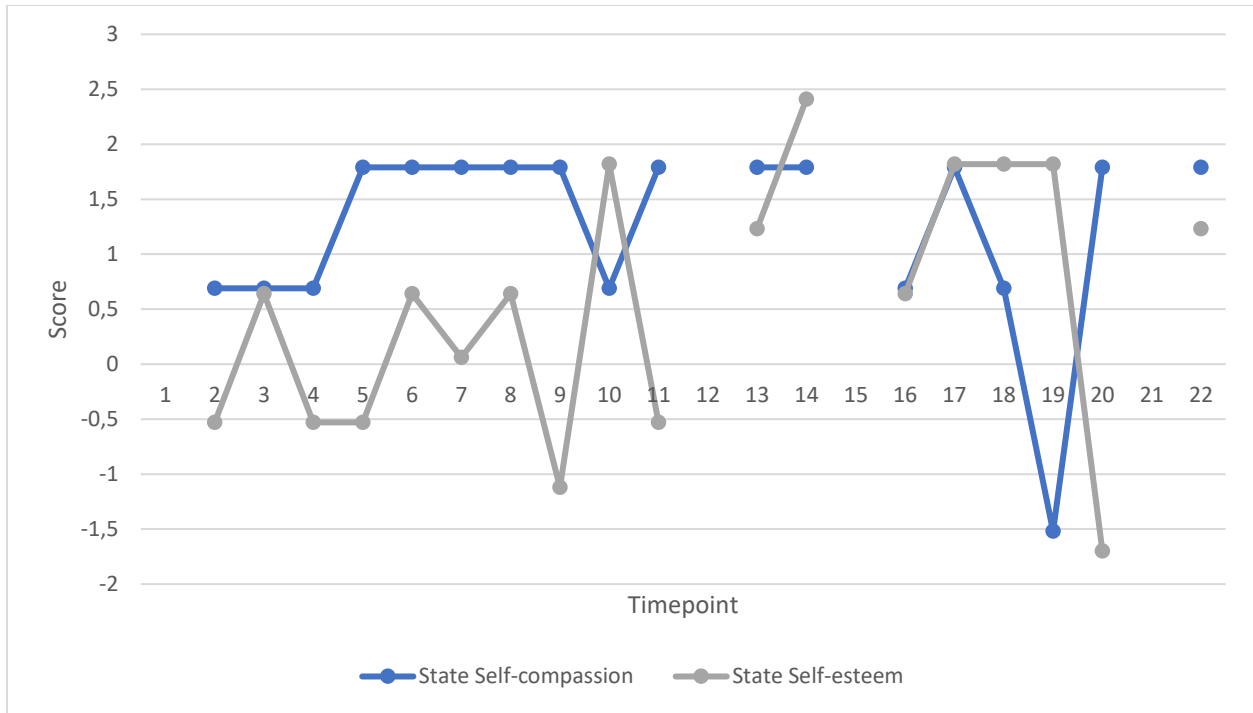
*Note.* Timepoint 1 and 23 are missing indicating missing data. The participant did not fulfil the survey during those sessions.

Finally, participant 12, was examined in more detail. Participant 12 indicated high levels of self-compassion over the course of 8 days with a mean score of 4.5 ( $SD = 0.79$ ). Similar to the previous examples, this participant indicated moderate levels of state self-esteem ( $Mean = 2.58, SD = 0.20$ ). Standardized values were used to visualize both variables. The pattern of the participant’s state self-compassion and state self-esteem can be viewed in Figure 9. As in the previous cases, both variables show variations over the course of 8 days. The magnitude in change appears in both variables, state self-

compassion and state self-esteem. Again, no clear pattern of relation becomes apparent among the two variables.

**Figure 10**

*Participant 12 daily scores for state self-esteem (blue) and state self-compassion (red) per measurement point over time.*



*Note.* Timepoint 1, 12, 15, 21 and 23 are missing indicating missing data. The participant did not fulfil the survey during those sessions.