Social media use and its relationship with mental health and well-being

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Abstract

Social media use is a regular and frequent behaviour for most young adults and its importance increased during the pandemic. A range of studies suggest that social media use is related to negative mental health outcomes such as increased loneliness while others indicate ways through which social media use may be related to higher well-being. Considering the growing relevance of social media use, it is important to better understand the relationship between these concepts. Therefore, the current study aimed to investigate if social media use predicted loneliness in young adults by also considering potential influences of social comparison orientation, age and nationality. To this end, an online self-report survey was answered by a sample of mostly Dutch and German university students at the University of Twente (N=113). Social media use was operationalized as a combination of screen time, passive and active use.

Social media use did not significantly predict loneliness and social comparison orientation, age and nationality had no moderation effect on this relationship. Social media use and social comparison orientation only explained a small percentage of variance within loneliness. A significant positive but weak correlation between social comparison orientation and loneliness was found, suggesting that people scoring high on social comparison orientation are likely to score higher on loneliness.

This implies that social media use may not be a relevant variable for interventions aimed at reducing loneliness. The finding that social comparison orientation positively correlates with loneliness could inform further development of the Theory of Social Comparison Orientation. Future research is recommended to focus on more heterogenous samples and use a better way to obtain screen time data. In the current study, it seemed the item on screen time was misunderstood by several participants and it is suggested that providing a slider as a way to answer instead of a text field might reduce the risk of misunderstanding. Additionally, investigating subscales of loneliness and including demographic variables and individual social media platform as moderator variables in the relationship between social media use and loneliness could help in understanding the relationship between these concepts better.

Keywords: social media use, loneliness, social comparison orientation, young adults, mental health

Introduction

Social media use has become an important activity in many people's lives. This seems to be especially the case for young adults, as 98.5% of 18-25-year-olds in the Netherlands reported to use social media compared to 87.4% of the general population (Centraal Bureau voor de Statistiek, 2019). Social media can be defined as "forms of media that allow people to communicate and share information using the Internet or mobile phones" (Cambridge Dictionary, 2022, Business English Section). Among these forms of media, YouTube, Instagram and Facebook can be considered the most popular websites among young adults (Anderson & Auxier, 2021). According to Rideout and Fox (2018), an important reason for young adults to use these platforms is because it helps them find a sense of support, inspiration and connection with other people which is suggested to be of special importance during times of poor well-being, anxiety and stress. Despite this positive connotation, social media use (SMU) has been found to be connected to a variety of negative health and well-being outcomes for young adults (Glaser et al., 2018; Sherlock & Wagstaff, 2018).

Recent studies suggest different pathways explaining how the use of social media correlates with the behaviour and health of users. SMU may affect the health of young adults through a change in communication style and social norms. The one-to-many form of communication that is characteristic for most social media platforms is suggested to be associated with more egocentric tendencies and less prosocial behaviour (Chiou et al., 2014). An example for this communication style is creating a post that is not personalized for or directed towards another individual but to all contacts a person has on social media. It is argued that thereby, users only talk about themselves and have a monologue without any regard for what a specific recipient of this post might be interested in (Chiou et al., 2014). Additionally, being exposed to alcohol-related content on social media has been shown to increase the level of alcohol consumption young adults view as being the social norm which could have harmful consequences (Fournier et al., 2013).

Next to negative changes in perceived social norms, high SMU seems to be associated with more direct health risks. Notably, high SMU in terms of screen time has been reported to be correlated with depression and anxiety (Glaser et al., 2018). More specifically, a high frequency of Instagram use has been found to be related to depressive symptoms, general- and body appearance anxiety as well as body dissatisfaction in young women (Sherlock & Wagstaff, 2018). However, in both studies it was not clear whether the experience of these mental health problems led to higher SMU or if SMU caused these complaints (Glaser et al., 2018; Sherlock & Wagstaff, 2018). The results of an experiment by Yuen and colleagues

(2019) (N=312) suggest that spending time on Facebook correlates with lower mood than doing other activities on the Internet, indicating that the use of this platform predicts lower well-being. The researchers proposed that one reason for this may be that participants reported a feeling of wasting time on Facebook (Yuen et al., 2019). Additionally, the findings of an experiment by Li and colleagues (2017) (N=84) suggest that being exposed to social media content can reduce the desire to seek out offline social interactions, thereby potentially affecting the well-being of users in a negative way. Similarly, spending more time on social media has been found to be associated with higher perceived social isolation in young adults (Bonsaksen et al., 2021; Primack et al., 2017).

This finding is important because perceived social isolation or also known as loneliness can be a more dangerous health risk than smoking and depression (Erzen & Çikrikci, 2018). This is because high levels of loneliness often precipitate suicidal ideation, low well-being and poor physical health. Next to that, loneliness is suggested to be positively correlated with depression (Erzen & Çikrikci, 2018; Tiwari, 2013). In this context, loneliness or perceived social isolation can be defined as perceiving oneself to be isolated from others and alone (Tiwari, 2013). Especially since the COVID-19 pandemic, both loneliness and SMU increased in young adults; which is likely due to physical distancing restrictions (Horigian et al., 2021; Lisitsa et al., 2020). Therefore, it becomes increasingly important to have a better understanding of the relationship between these two factors.

To date, research into the association between SMU and loneliness does not allow for a clear conclusion. As an explanation for the finding that SMU correlates positively with loneliness, different researchers indicate that either young people who experience loneliness tend to use social media more frequently to reduce this feeling or that high SMU leads to higher loneliness (Glaser et al., 2018; Primack et al., 2017; Sherlock & Wagstaff, 2018). The latter might happen because SMU could replace offline social activities or because users experience feelings of envy when their peers present their lives overly positive and inauthentically on social media (Primack et al., 2017). In support, the results of an experiment by Hunt and colleagues (2018) (N=143) suggest that limiting SMU decreases loneliness in university students. Contradictorily, Pittman and Reich (2016) found that use of image-based social media platforms such as Instagram may be associated with a reduction of loneliness in young adults. This association could not be found for solely text-based social media platforms such as Twitter. The researchers argued that a reason for this could be that images account for higher perceptions of intimacy and connectedness among users (Pittman & Reich, 2016).

However, this finding could not be replicated by Yavich and colleagues (2018) who found no significant relationship between SMU and loneliness in university students. Accordingly, further research into the relationship between SMU and loneliness is required.

Similarly, findings regarding the relationships between SMU and other mental health and well-being outcomes remain ambiguous. Despite the previously mentioned suggested negative associations of SMU, there is a growing body of research on its potential benefits. Regular SMU has been found to be associated with higher social well-being, self-rated health and positive mental health (Bekalu et al., 2019). The researchers argued that a reason for this might be that social media provides a way to maintain social connections despite physical distance (Bekalu et al., 2019). This finding matches the results of Verduyn and colleagues (2017) who found that SMU is positively associated with life satisfaction, positive affect and feelings of social connectedness. It is suggested that this might be because the use of social media increases social interactions and thereby contributes to the reduction of social isolation. This positive correlation was found to be stronger when users take active engagement rather than passive monitoring of content (Verduyn et al., 2017). The suggestion that the kind of activities a user performs on social media play an important role in the user's well-being is supported by Reinecke and Trepte (2014) who found that presenting oneself authentically on social media was positively associated with well-being. However, this was not the case for users experiencing low well-being. It is therefore suggested that authentic self-presentation on social media only offers benefits to users whose well-being is already high (Reinecke & Trepte, 2014). Conclusively, it can be said that there are strong lines of research on both negative and positive mental health associations of SMU.

Considering the previously mentioned studies, the question arises why findings regarding the relationship between SMU and well-being are contradictory. One explanation is offered by Bekalu and colleagues (2019), whose findings suggest that SMU in general is related to positive health outcomes while being emotionally attached to social media is associated with negative mental and physical health. While the reason for this remains unclear, Bekalu and colleagues propose the idea that SMU on its own may be a beneficial behaviour whereas other psychological factors such as emotional attachment might explain why some studies found associations of poor health and well-being with SMU (Bekalu et al., 2019). Next to emotional attachment, negative affect seems to be a moderator in the relationship between SMU and mental health in college students during the COVID-19 pandemic (Zhao & Zhou, 2020).

A different set of explanations is offered by Petropoulos Petalas and colleagues (2021), who outlined three main reasons for why findings differ regarding the influence of SMU on mental health in adolescents and young adults. Firstly, researchers and academics operationalize variables of interest differently in the context of social media, potentially leading to rather incomparable measurements. Secondly, these different measures of SMU do not capture actual behaviour with the same reliability and validity. Lastly, it is suggested that individual differences, especially in age and gender, account for some variability in findings (Petropoulos Petalas et al., 2021).

In order to make research into the topic of SMU more comparable, the results of a meta-analysis by Meier and Reinecke (2020) suggest to use the channel- and the communication centred approach. While the former measures screen time, the latter focuses on the kind of activities users perform on social media and primarily investigates if users spend more time interacting or passively monitoring content. To obtain more nuanced results, it is suggested to use both ways of measurement (Meier & Reinecke, 2020; Petropoulos Petalas et al., 2021).

Another factor that could explain the differences in findings is social comparison orientation (SCO). Sherlock and Wagstaff (2018) suggest SCO potentially has an interaction effect on the relationship between SMU and negative health and well-being outcomes. It is argued that the frequency of Instagram use only predicts symptoms of depression and anxiety in young women when users have tendencies of social comparison (Sherlock & Wagstaff, 2018). SCO can be defined as the tendency to compare oneself, one's life, experiences and success with that of peers (Yang, 2016). According to the Theory of Social Comparison Orientation, SCO can be considered a personality trait and people vary in the frequency and extent to which they compare themselves with others (Guimond, 2005).

On social media, users often present themselves and their lives in an overly positive way which could lead users high in SCO to conclude that they have a worse life than their peers, potentially resulting in negative health and well-being outcomes (Primack et al., 2017; Vogel et al., 2015). This could be a reason why SCO seems to moderate the relationship between Instagram use and loneliness with high levels of Instagram use and SCO predicting higher loneliness in university students (Yang, 2016). However, research on this topic is scarce and Yang's study only included participants from an American university of which

78% were female. Additionally, this study only investigated Instagram use without considering other popular social media websites such as Facebook (Yang, 2016).

. Another factor influencing the relationship between SMU and loneliness could be demographic variables. As the findings of a meta-analysis by Meier and Reinecke (2021) suggest, age and nationality might moderate the relationship between these variables. For younger adults, the negative effects of SMU on loneliness seemed to be higher but this moderation was not consistent among samples. Similarly, the relationship between SMU and loneliness depended on the culture it was investigated in, but no consistent trends were found (Meier & Reinecke, 2021).

Overall, research into the area of SMU and loneliness remains inconclusive and a better understanding of this subject is of importance due to the increasing relevance of SMU and the considerable health risks of loneliness (Centraal Bureau voor de Statistiek, 2019; Erzen & Çikrikci, 2018). Therefore, the first research question of the current study: To what extent does social media use predict loneliness in young adults? will be explored. To account for a potential impact of SCO, the second research question: To what extent does social comparison orientation moderate the relationship between social media use and loneliness in young adults? will be investigated. Lastly, to consider the potential influence of age and nationality, the third research question: To what extent do age and nationality moderate the relationship between social media use and loneliness in young adults? will be examined. Based on previous research findings it is hypothesized that SMU predicts loneliness and that SCO, age and nationality moderate this relationship with high levels of SCO and being younger predicting a stronger positive influence of SMU on loneliness. (Bonsaksen et al., 2021; Hunt et al., 2016; Meier & Reinecke, 2021; Primack et al., 2017; Yang, 2016).

Methods

Design

To answer the research questions of the current study, a cross-sectional survey design with a moderation effect was employed. The concepts of SMU, loneliness and SCO were measured in a self-report online survey as part of a larger collaboration study by three researchers at the University of Twente. The other researchers focused on the relationships

between the independent variables depression and body image and the dependent variable SMU.

Participants

Participants were recruited with both a convenience and a voluntary response sampling. A power analysis revealed that a minimum of 100 participants was required for the sample to be representative. In order to account for the potential exclusion of the data of some participants due to inconformity with inclusion criteria, it was aimed to obtain data of 150 participants. The researchers reached out to friends and acquaintances via email with a link to the questionnaire to distribute the survey and the questionnaire was published on the Sona system, accessible to all Sona users at the University of Twente. As an incentive, all participants of the study were rewarded with 0.25 Sona credits of which a certain amount is mandatory for graduation (University of Twente, 2022a).

Being between the ages of 18 and 30 and a proficiency in English were inclusion criteria as participants needed to understand the survey and only young adults were targeted. Exclusion criteria included incomplete or anomalous data such as giving the same answer to every item or finishing the survey in less than three minutes. 144 participants answered the survey of the current study. However, the data of 30 participants needed to be left out due to incomplete answers on the survey and the data of one participant was left out due to an indicated daily screen time of over 24 hours. In total, the data of 113 participants was analysed. An overview of the sample demographics for the variables age, gender, nationality, education and marital status is provided in Table 1.

Table 1

Sample characteristics

Variable	Category		
Age	M=20.98 (Min. 18, Max. 26)	SD=1.793	
Gender	Female=87 (77%)	Male=25 (22.1%)	Prefer not to answer= 1 (0.9%)
Nationality	Dutch=19 (16.8%)	German=84 (74.3%)	Other=10 (8.8%)
Education	Highschool=103 (91.2%)	Bachelor=9 (8%)	Master=1 (0.9%)
Marital status	Single=73 (64.6%)	Partnership=36 (31.9%)	Married=3 (2.7%)

Materials

Firstly, items on basic demographics including the variables age, nationality, gender, education level and marital status were presented. To measure SCO, the short version of the Iowa-Netherlands Comparison Orientation Measure (INCOM) containing six items (2,4,5,8,9,10) was employed (Schupp & Schneider, 2011). Participants were asked to provide their answers to these items with a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. This scale has been found to have good reliability and validity in a German population (Schupp & Schneider, 2011). Additionally, this scale has been found to have good psychometric qualities in a Dutch population (Gibbons & Buunk, 1999). While the exact Cronbach's alpha was not reported in both studies, Gerson and colleagues (2017) found a Cronbach's alpha of α=0.9 for the INCOM in an international sample.

With regards to loneliness, the University of California Los Angeles Loneliness Scale (ULS)-8 scale containing 8 items which is the short version of the ULS-20 was used as its reliability and validity have been found to be good and a Cronbach's alpha of α=0.84 was

reported for the ULS-8. (Hays & Dimatteo, 1987). Responses were recorded with a five-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’ (Hays & Dimatteo, 1987).

SMU was operationalized in terms of screen time, passive SMU and active SMU in accordance with Petropoulos Petalas and colleagues (2021) and Escobar-Viera and colleagues (2018). Screen time was chosen to be measured with log data while passive vs active SMU was measured using 7 items developed by Escobar-Viera and colleagues (2018). The items of active SMU (α=0.80) and passive SMU (α=0.72) were found to have good reliability. These items asked for the frequency of certain behaviours on social media and participants were required to provide their answers with a five-point Likert scale ranging from ‘never’ to ‘several times a day’ (Escobar-Viera et al., 2018). The short versions of the above-mentioned scales were used to keep the questionnaire short to minimize the time burden on participants without comprising validity and reliability. These items on SMU, loneliness and SCO were combined with the items of other researchers investigating SMU, body image and depressive symptoms at the University of Twente into a single questionnaire that was to be filled out once by participants.

Procedure

A request for ethical approval of the current study with the request number 220303 was issued to the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente. Ethical approval was granted concerning the current study and all participants gave their informed consent at the start of the study. The survey was created and could be taken by participants in the online environment Qualtrics (University of Twente, 2022b). In the distributed emails, in Sona and lastly again in Qualtrics, participants were introduced to the study, its aim and the investigated concepts in a short explanatory text. Before starting the survey, participants received information on how their data will be handled, confidentiality, inclusion criteria and their right to withdraw from the study at any time and were asked to give their informed consent on these conditions. In case participants had questions, the email address of the researchers was provided. After having answered all items, participants were informed that their answers were recorded and were thanked for their participation. Additionally, the email address of the researchers was provided at the end of the survey in case participants had further questions or were interested in the results of the study.

On average, the questionnaire took 12 minutes and 20 seconds to fill in. The total data collection lasted from 6th April 2022 until 30th April 2022 and took 24 days.

Data analyses

The data analyses were conducted using IBM SPSS Statistics 25. The demographic variables gender, marital status and nationality were coded as nominal variables while education level was coded as an ordinal variable and age was coded as a ratio variable. Screen time, active SMU and passive SMU were considered as independent variables. Loneliness was considered as a dependent variable, while SCO, age and nationality were included as a moderator variable. For the independent, dependent and moderator variables, the assumptions of normality, homogeneity, linearity and independence were checked to determine if a non-parametric test or a multiple regression analysis was required.

SCO, age and nationality were included as moderator variables in a multiple regression analysis with the three SMU variables as independent variables and loneliness as a dependent variable. The correlation between the independent variable gender and the dependent variable loneliness was investigated with a one-way ANOVA.

Results

On average, participants spent 207 minutes and 28 seconds (3.45 hours) per day using social media. The means and standard deviations of the SMU variables, loneliness and SCO can be found in Table 2. The assumptions of normality, homogeneity, linearity and independence were met for all independent variables and the dependent variable which means that a multiple regression analysis needed to be employed.

Table 2

SMU, loneliness and SCO

Variable	Mean	Standard Deviation
Screen time	207.47 minutes/ 3.45 hours	127.826 minutes/ 2.13 hours
Passive SMU	3.462 (Min.1, Max.5)	0.719
Active SMU	2.452 (Min.1, Max.5)	0.799
Loneliness	2.401 (Min.1, Max.5)	0.843
SCO	3.509 (Min.1, Max.5)	0.682

A multiple regression analysis investigating the influence of SMU on loneliness revealed that the three SMU variables together explained 2.8% of variance in loneliness (R^2=.028, F(6,107)=1.029, p>0.05). Screen time (ß=.000, p>0.05), active use (ß=.046, p>0.05) and passive use (ß=.182, p>0.05) did not significantly predict loneliness. This means that all SMU variables had no significant impact on loneliness.

Similarly, a multiple regression analysis considering a moderation effect of SCO on the relationship between SMU and loneliness showed that all predictor variables accounted for 5.3% of variance in loneliness (R^2=.053, F(6,107)=0.993, p>0.05). A non-significant moderation effect of SCO on the relationship between the independent variables screen time (B=-0.001, ß=-.125, t=-1.253, p>0.05), active use (B=-0.005, ß=-.004, t=-0.33, p>0.05) and passive use (B=-0.005, ß=-.004, t=-0.04, p>0.05) and the dependent variable loneliness was found. Accordingly, SCO did not moderate the relationship between SMU and loneliness. However, a Pearson's correlational analysis revealed a weak positive correlation between SCO as an independent variable and loneliness that was significant (r(113)=0.32, p=0.008). This means that high scores on SCO corresponded with higher loneliness.

A one-way ANOVA with gender as an independent variable and loneliness as a dependent variable revealed that women scored higher on loneliness than men, although this difference was insignificant [F(2, 111)=0.678; p>0.05]. The mean screen time and loneliness score for each category of the demographic variables gender, marital status, nationality and education can be found in Table 3.

Table 3

Descriptive statistics, screen time and loneliness

Variable	M (screen time)	SD (screen time)	M (loneliness, Min. 1, Max. 5)	SD (loneliness
Gender (female)	216.33	13.8	2.44	0.09
Gender (male)	162.55	48.21	2.245	0.168
Marital status (Single)	222.43	14.59	2.461	0.098
Marital status (Partnership)	179.35	21.07	2.26	0.139
Marital status (Married)	180	73.11	2.625	0.486
Nationality (Dutch)	193.684	29.271	2.5	0.192
Nationality (German)	212.12	14	2.344	0.091
Nationality (Other)	195.1	40.346	2.7	0.265
Education (High School)	203.52	24.57	2.43	0.083
Education (Bachelor)	264.4	83.59	2.181	0.279

A multiple regression analysis investigating the moderation effects of age and nationality on the relationship between screen time, passive SMU, active SMU and loneliness revealed that these variables accounted for 7.2% of variance in loneliness (R^2=.072, $F(9,104)=0.931$, $p>0.05$). All moderation effects were non-significant, and the effect size of each moderator variable can be found in Table 4. Accordingly, age and nationality did not moderate the relationship between the three SMU variables and loneliness.

Table 4

Moderation effects of age and nationality on the relationship between screen time, passive SMU, active SMU and loneliness

Variable	B	ß	t	p-value
Age and screen time	.001	0.299	0.239	>0.05
Nationality and screen time	.000	0.078	0.153	>0.05
Age and passive SMU	-.115	-2.084	-1.813	>0.05
Nationality and passive SMU	-.023	0.227	-0.101	>0.05
Age and active SMU	.025	0.498	0.421	>0.05
Nationality and active SMU	-.206	-0.398	-0.895	>0.05

Overall, SMU did not significantly predict loneliness, even when considering moderation effects of SCO, age and nationality.

Discussion

The current study aimed to assess if SMU as measured with screen time, passive and active use predicted loneliness and if SCO, age and nationality moderated this relationship. To investigate this question, a cross-sectional survey design was applied in a self-report online survey as part of a collaborative study with two other researchers at the University of Twente. The data of 113 participants was analysed and SMU did not significantly predict loneliness. Additionally, no moderation effects of SCO, age or nationality on this relationship were observed. Accordingly, all three hypotheses were rejected. Gender was found to not be significantly associated with loneliness. A positive but weak correlation between SCO and loneliness was observed. SMU, SCO, gender, age and nationality only explained a small percentage of variance in loneliness.

The finding that SMU is not related to loneliness is in line with Yavich and colleagues (2018) who found no significant correlation between the two variables in university students. This might be due to SMU being an important part of education and therefore not necessarily being related to the degree young adults engage in personal communication (Yavich et al., 2018). In contrast, the findings of Yang (2016) suggest that Instagram use is negatively correlated with loneliness. The reason for this might be that Yang (2016) only focused on Instagram use in young adults in the US while the current study additionally includes other social media platforms and focused mainly on Europeans. Accordingly, this relationship might be different depending on the social media platform and cultural differences between western Europe and the US might account for the difference in findings. Glaser et al. (2018) offers an alternative explanation, as the researchers found that the relationship between SMU and mental health is moderated by offline social capital and internet addiction which are variables that were not accounted for in the current study.

In contrast to Sherlock and Wagstaff (2018), no moderation effect of SCO on the relationship between SMU and loneliness was found. This could be explained by the fact that Sherlock and Wagstaff (2018) only investigated women and Instagram use, which suggests that gender and individual social media platform could influence this relationship. No other studies could be found that suggest no moderation effect of SCO on the relationship between SMU and loneliness which might be due to a lack of studies on this topic as only six studies investigating this effect were found in a systematic review by O'Day and Heimberg (2021). Additionally, other studies used different operationalizations for SMU and mainly used screen time as the only measure for this concept which might account for this difference in findings (O'Day & Heimberg, 2021).

Similarly, moderation effects of age and nationality on the relationship between SMU and loneliness were found to be insignificant which does not align with the findings of Meier and Reinecke (2021). An explanation for this difference might be that the participants of the current study had a limited age range and no participant was older than 26 while Meier and Reinecke (2021) also focused on older age groups. Additionally, the majority of participants of the current study were of German or Dutch nationality which is why these findings are not representative for other nationalities. In support of the current study, Primack et al. (2017) found no significant moderation effect of age on the relationship between SMU and mental health in young adults. In addition, O'Day and Heimberg (2021) found no significant difference between nationalities regarding the correlation between SMU and mental health.

In accordance with Yavich and colleagues (2018), no significant correlation between gender and loneliness was found. This challenges the findings of Adamczyk (2016), who discovered a higher loneliness in young men than in young women. Adamczyk (2016) indicated that this difference was observable in the subscale social loneliness and might occur because men tend to have smaller social networks than women. In the current study, no subscales of loneliness were investigated in detail which could be the reason why this difference could not be observed.

Lastly, a positive correlation between SCO and loneliness was observed which supports prior literature (Buunk & Gibbons, 2006; Johnson, 2020). A reason for this might be that people scoring high on SCO tend to be more insecure about their social connectedness (Buunk & Gibbons, 2006). Johnson (2020) suggests that people who score low on SCO might be more inclined to engage in more social activities as they tend to worry less about the opinion of others in social settings.

Strengths and limitations

Considering strong points of the current study, only questionnaires were used whose psychometric qualities have been found as at least adequate for the investigated population (Buunk & Gibbons, 1999; Escobar-Viera et al., 2018; Hays & Dimatteo, 1987; Schupp & Schneider, 2011). A more differentiated operationalization of SMU was applied as active and passive use were taken into account next to screen time and use of all social media platforms was considered. Additionally, the current study was one of the first to consider use of all social media platforms in a non-American sample.

Limitations of the current study were that firstly, data collection was done via the Sona system of the University of Twente which is limited to certain academic disciplines, wherefore it can be assumed that most participants attended the same university and a limited range of study programmes. This means findings may not apply to other universities and students. Secondly, the majority of participants were female, of German nationality and between 20 and 23 years of age which decreases generalizability to other demographics. Lastly, screen time was measured with log data which is generally more reliable than pure self-report but some of the data indicate misunderstandings (Hodes & Thomas, 2021). One participant indicated to spend more than 24 hours per day on social media while others indicated a higher daily Instagram use than total social media screen time. This suggests that

the item was misunderstood by some participants who instead might have indicated their weekly screen time or their daily screen time in hours although the answer should have been provided in minutes. Additionally, the way to obtain log data of screen time is slightly different for Apple and Android phones which potentially contributed to the misunderstandings. Next to that, screen time on other devices than the participants' smartphones could not be assessed. Accordingly, the validity of the screen time data is unclear.

Implications and future research

The current study contributed to the understanding of SMU, loneliness, SCO and their relationships in a population of Dutch and German higher educated young adults. This is a relevant endeavour because loneliness is a considerable health risk and because loneliness and SMU increased during the COVID-19 pandemic in young adults while already 98.5% of Dutch 18-25-year-olds used social media in 2019 (Centraal Bureau voor de Statistiek, 2019; Erzen & Çikrikci, 2018; Horigian et al., 2021; Lisitsa et al., 2020). While SMU and loneliness did not seem to be related and SCO, age and nationality had no moderation effects on this relationship, a positive correlation between SCO and loneliness was found. This implies that SMU may not play a role in explaining loneliness in this target group and interventions targeting this aspect of mental health should focus on other variables. Furthermore, these findings have implications for the Theory of Social Comparison Orientation (Guimond, 2005). A modernised version of this theory could include further considerations of the ways in which SCO and mental health interact as people high in SCO seem to be lonelier.

Future research should focus on investigating subscales of loneliness such as social loneliness as this could provide deeper insight into this concept and its correlates. Additionally, including demographic variables and individual social media platforms as moderators in the relationship between SMU and loneliness could contribute to a better understanding of these variables. Next to that, employing more demographically heterogenous samples and finding a better way to construct the item regarding screen time data is recommendable. Föckel (2022) advises to provide a slider for answering the item rather than a text field which should indicate to the participant if their answers are provided in hours or minutes.

Conclusion

Social media use is a frequent behaviour of young adults and its relevance only increased during the pandemic. However, its relationship with mental health has not been explored conclusively. Therefore, the current study aimed to investigate this relationship by also considering potential moderation effects of social comparison orientation, age and nationality. Social media use did not predict loneliness in young adults and social comparison orientation, age and nationality did not moderate this relationship. This suggests that social media use may not be an important variable to consider when targeting loneliness in an intervention. Further research is required to verify this suggestion by investigating subscales of loneliness, including other demographic variables and individual social media platforms as moderators and using a differently constructed item to obtain screen time data.

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Appendix A: Informed consent form

Dear participant,

Social media has gotten increasingly popular in the last few years. Research between social media and well-being showed very mixed findings. Therefore, it is not clear if social media has a positive or negative impact on mental health. The results of this study might contribute to a better understanding of the relationship between social media use and mental health.

This survey assesses your social media use, body image, depressive symptoms, loneliness, mindfulness and social comparison.

For participation in this study, participants are required to be between the ages of 18 and 30 and have proficiency in the English language and access to the Internet.
Filling in the survey will take about 15 minutes.

Please note that this survey will be best displayed on a laptop or computer. Some features may be less compatible for use on a mobile device.

The collected data will be handled confidentially and will only be used for analysis purposes and only for this study. All participation is anonymous.

By clicking the first 'I consent' button below, you confirm that you are fully informed about this study and do not have any further questions.

By clicking the second ‘I consent’ button, you acknowledge that your participation in the study is voluntary and that you can cancel your participation in this study at any time without needing to provide an explanation.

For any further questions about this study or the way the data is being handled, please contact Viktoria Tiltmann (v.tiltmann@student.utwente.nl).

Thank you in advance!
Kindest regards,

Nina Nordmann
Viktoria Tiltmann
Yannick Gerhards