The Influence of SNS Usage, Social Comparison, and Self-Esteem on Social Media Addiction

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Abstract

Social media has evolved to play an important role in our daily lives. Excessive forms of social media use are commonly referred to as social media addiction. Past research placed particular emphasis on the role of social networking site (SNS) usage, social comparison, and self-esteem. Nevertheless, it remains unclear how these concepts interact with each other and influence social media addiction. Thus, this study aimed at generating new insights by examining the relationships between SNS usage, social comparison, and self-esteem, as well as their impact on social media addiction. This was achieved by the means of a cross-sectional correlation design. Most of the participants identified as female and were students. There were no in or exclusion criteria for participants. Moreover, structural equation modelling was used to evaluate the hypotheses. The results showed that social media addiction was negatively associated with self-esteem and positively associated with active SNS usage. Moreover, self-esteem was negatively associated with upward social comparison. This suggests that active SNS usage acts as promotive factor whereas self-esteem acts as a protective factor for social media addiction. This research built on the work of previous scholars and helped expand the current understanding of social media addiction and determine possible promotive and protective factors.

Keywords: social media addiction, social networking sites usage, active SNS usage, passive SNS usage, social comparison, upward social comparison, downward social comparison, self-esteem

Introduction

Within the last decade, social media has evolved to play an important role in our daily lives. Around four billion active users around the globe were estimated in July 2020 (Cheng et al., 2021). For young and old alike connecting with others and the outside world has never been so easy and becomes almost unthinkable without using social media.

Positive effects of social media can be encompassed by ample opportunity to connect with others online at all times. This creates an environment that allows users to build communities, give and receive social support, express themselves freely and learn from each other. Moreover, social media enables users to deepen and expand their offline contacts and relations (Sadagheyani & Tatari, 2021; Paakkari et al. 2021). However, researchers noticed a connection between social media use and psychopathology. That is, anxiety, depression, low self-esteem, feelings of isolation, body dysmorphia, and psychological distress seem to represent the downside of social media (Pantic, 2014; Sadagheyani & Tatari, 2021).

The negative consequences of social media arise when it is used in a problematic manner (Cheng et al., 2021). This can include, scrolling through social media apps instead of studying or working. Moreover, using social media during important personal activities, such as spending time with friends and family. This can have negative influences on work and interpersonal relationships. The time and energy usually spent on keeping up with personal and work-related responsibilities are dedicated to excessive social media use (Zivunska, et al., 2019).

These extreme forms of social media use that hinder individuals from keeping up with important responsibilities in their daily lives such as school, work, and relationships are commonly labeled as social media addiction (Hou et al., 2019). This type of addiction is still a new phenomenon and is intensively investigated by researchers due to its prominent influence on mental health (Cheng et al., 2021). Despite the growing body of research on social media addiction and its negative consequences on mental health it has not found recognition in the DSM-5 as an addictive disorder (van den Eijden et al. 2016; Singh et al., 2020). Therefore, understanding and determining promotive and protective factors is crucial to not only protect social media users from becoming addicted but also to further understand and conceptualize this new form of addiction.

Social media addiction

Social media addiction can be defined as being intensively engaged with social networking sites (SNS) (Andreassen & Pallesen, 2014). More precisely, “to be driven by a

strong motivation to log on to or use SNSs, and to devote so much time and effort to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being" (Andreassen & Pallesen, 2014, p.4054). Andreassen (2015) and Dalvi-Esfahani et al. (2019) pointed out that people concerned with this addiction have trouble regulating their urge to use social media and therefore, spend more time on them than anticipated. Moreover, it was suggested that the people affected use social media to suppress personal problems and cope with negative feelings such as depression and anxiety. Withdrawal symptoms involve feelings of stress, restlessness, and irritation (Andreassen, 2015). Furthermore, attempts to reduce time spent on social media are usually unsuccessful and priority conflicts arise when family, partners, work studies, etc. are neglected due to social media (Dalvi-Esfahani et al., 2019). Overall, addicts use social media to such an extent that it has negative consequences on the quality of their mental health, relationships, and well-being (Andreassen, 2015; Dalvi-Esfahani et al., 2019).

Self-esteem

An important factor related to social media addiction is self-esteem which "refers to an individual's overall positive evaluation to the self." (Abdel-Khalek, 2016, p.2) and has been linked to all kinds of psychopathologies (Ziegler-Hill, 2011). It seems that particularly individuals with low self-esteem are missing the necessary resources to protect themselves from experiences that may hurt their self-esteem such as failure or rejection (Ziegler-Hill, 2011). Thus, putting them at risk of developing depression, anxiety, addiction, and other psychological disorders (Kocak et al., 2021).

Since the rise of social media experiencing self-esteem boosters as well as self-esteem threats is not only limited to the offline world. Therefore, researchers have argued that self-esteem is an important factor worth examining in the context of social media use (Cingel et al., 2022; Midgley, 2021). In connection to addiction, a lot of scholars found that self-esteem negatively influenced social media addiction (Andreassen et al., 2017; Hawi & Samaha, 2017; Purnama et al., 2021). It seemed that individuals who express higher levels of self-esteem tend to be less dependent on social media. Further research is required to explain this relationship however, the following hypothesis is proposed: Self-esteem negatively predicts social media addiction. Moreover, the findings of prior research implied that factors such as how individuals use and compare themselves on social media has an important influence on their self-esteem levels and therefore on social media addiction (Donnelly & Kuss, 2016; Wang et al., 2017).

Social networking site usage (SNS usage)

Another important factor related to both the self-esteem of social media users and social media addiction is social networking site usage (SNS usage). Previous research found that an increase in SNS usage was related to social media addiction and had negative effects on the mental health of individuals (Donnelly & Kuss, 2016). SNS usage is frequently divided into active and passive use. Active SNS usage involves "producing content on SNSs without directing the content to specific individuals" (Yang & Robinson, 2018, p. 50). An example can be posting pictures or stories on personal Instagram pages. Passive usage on the other hand refers to "browsing and consuming SNS content" (Yang & Robinson, 2018, p. 50).

Passive and active SNS usage might both be related to social media addiction. Recent research indicated that social platforms are equipped with features targeted especially at passive users to make them more addicted (Purohit & Holzer, 2021). This involves infinite newsfeed loops directed at constantly providing users with new content that they can consume. Thus, leading them to mindlessly scroll through social media apps for hours on end (Purohit & Holzer, 2021). Therefore, it can be expected that passive SNS use is a promotive factor for social media addiction. Similar expectations can be raised for active SNS use. A recent study found that individuals identifying as active SNS users used social media more intensely placing them at risk of developing an addiction as well (Trifiro & Prena, 2021). However, the direct association of active and passive use on social media addiction has not been investigated yet.

Moreover, SNS usage was found to be significantly related to self-esteem (Saipoo et al., 2020). Research suggested that individuals who identified as active social media users also expressed higher self-esteem levels (Trifiro & Prena, 2021; Wang et al., 2017). Contrarily, passive SNS users seemed to experience lower levels of self-esteem (Wang et al., 2017). To examine the influence of SNS usage on self-esteem and social media addiction further research is required. However, the following hypotheses can be made: Active and passive SNS usage positively predict social media addiction. Furthermore, due to its association with both social media use and addiction, self-esteem may help explain the influence of SNS usage on social media addiction. That is, it can be expected that self-esteem mediates the association between active and passive SNS usage and social media addiction.

Social comparison

Social media exposes its users to the lives of other people such as family, friends, and co-workers, creating an environment that facilitates constant social comparison (Wang et al., 2017). Past research found that social comparison significantly influenced the self-esteem of

individuals and therefore, may play an important role in the context of social media use and addiction (Vogel et al., 2014). More specifically, the social comparison theory assumes that people have a strong tendency to compare themselves with others to assess their own performance and abilities (Wang et al., 2017). Social comparison can be divided into upward and downward comparison tendencies. Upward social comparison "occurs when comparing oneself with superior others who have positive characteristics" (Vogel et al., 2014, p. 206). Contrarily, downward social comparison "occurs when comparing oneself with inferior others who have negative characteristics" (Vogel et al., 2014, p. 206).

Passive SNS usage was found to predict upward social comparison (Wang et al. 2017). Users that spend their time passively viewing content on social media were more likely to engage in upward social comparison (Wang et al., 2018). Social media is filled with content that showcases the lives, looks, skills, etc. of other people tempting its users to engage in social comparison (Vogel et al., 2015). Especially passive use, such as scrolling through one's Instagram feed, constantly exposes individuals to the presumably perfect lives of friends, family, celebrities, etc. facilitating opportunities for upward social comparison (Wang et al., 2017; Wang et al., 2018; Hu & Liu, 2020).

Wang et al. (2017) also found that upward social comparison predicted lower levels of self-esteem. The more individuals compared upward on social media the lower their self-esteem (Wang et al., 2017; Schmuck et al., 2019). Being exposed to content that primarily shows the positive highlights of other people's lives seems to negatively influence perceptions of self-worth and lead to feelings of inadequacy (de Vries & Kühne, 2015). In alignment with that, Wang et al. (2017) found that upward social comparison mediated the relationship between passive SNS use and self-esteem. Therefore, passively using social media may expose users more frequently to upward social comparison targets that lead them to compare to people who seem to be doing better than them which in turn may reduce their self-esteem.

On the other hand, Kong et al. (2021) found that active SNS usage was positively associated with downward social comparison. It was suggested that certain features such as "liking" and "commenting" on social media may animate users to engage in downward social comparison. This involves, receiving likes and comments on social media seems to encourage users to feel better off than others (Kong et al., 2021). Therefore, active SNS users may be more likely to engage in downward social comparison. Moreover, Vogel et al. (2014) found that individuals exposed to downward rather than upward comparison targets on social media had

higher levels of self-esteem. Hence, active users may express higher levels of self-esteem by comparing themselves to people who are worse off than them on social media.

Due to the important of influence of SNS usage and social comparison on self-esteem they may play an important role in the context of social media addiction. Specifically, social comparison may help explain the relationship between SNS usage and self-esteem. Hence, the following hypotheses are proposed: Downward social comparison mediates the association between active SNS use and self-esteem and upward social comparison mediates the association between passive SNS use and self-esteem.

This study will add to the growing body of research on social media addiction by examining the role of SNS usage, social comparison, and self-esteem. Past research placed particular emphasis on their relevance in the context of social media (Donnelly & Kuss, 2016; Vogel et al., 2014). Nevertheless, it remains unclear how these concepts interact with each other and influence social media addiction. Thus, this study aims to generate new insights by examining the relationships between SNS usage, social comparison, and self-esteem, as well as their impact on social media addiction. Particularly breaking down SNS usage in active and passive use, and social comparison in upward and downward comparison, allows for a more nuanced differentiation of how individuals use social media. Hence, it may become more clear what type of SNS usage has an actual influence on the development of social media addiction. Lastly, this research builds on the work of previous scholars and can help to expand the current understanding of social media addiction and detect its promotive and protective factors. A conceptual model with all hypotheses can be examined in *Figure 1*.

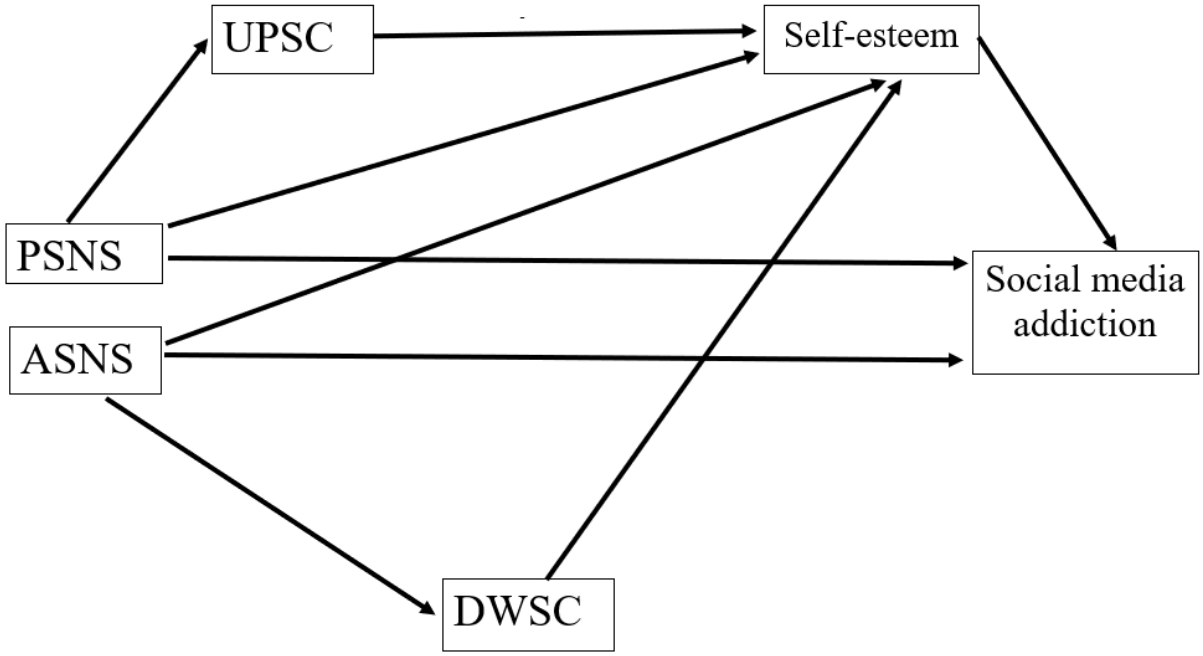

Figure 1. Conceptual model. PSNS (Passive social networking sites), ASNS (Active social networking site), UPSC (Upward social comparison), DWSC (Downward social comparison), Self-esteem, and Social media addiction.

Method

Design

In this research, the hypotheses were tested using a cross-sectional correlational design. A cross-sectional correlation design investigates the collected data from a specific population at a specific point in time (van der Stede, 2014).

Participants

The participants consisted of 130 individuals who were recruited via social media, personal connections, and SONA, the test subject pool of the BMS faculty at the University of Twente. Participants recruited through the subject pool received compensation of 0.25 credits. The remaining participants did not receive any compensation for taking part in this research. The research was approved by the BMS Ethics Committee of the University of Twente in April 2022.

Individuals who completed less than 80% (n=17) of the questionnaire were removed leaving 113 responses. Completing less than 80% would not have yielded a sufficient amount of information to analyse the relevant variables. Specific demographic characteristics such as age, gender, occupation, educational level, and favourite social media can be examined in *Table 1*.

Table 1.

Demographic characteristics of participants (age, gender, occupation, educational level, favorite social media)

Demographic characteristic	N	Percentage	Mean	Std.
Age	113	100%	23.62	5.10
Gender				
Female	63	55.8%	-	-
Male	49	43.4%	-	-
Third gender/ non-binary	1	0.9%	-	-
Occupation				
Student	87	77%	-	-
Employee	21	18.6%	-	-
Unemployed	1	0.9%	-	-

Self-employed	1	0.9%	-	-
Educational level				
12^{th} grade or less	6	5.3%	-	-
High school graduates or equivalent	51	45.1%	-	-
Vocational training	3	2.7%	-	-
Bachelor's degree	33	29.2%	-	-
Master's degree	18	15.9%	-	-
Doctorate	1	0.9%	-	-
Favorite social media				
WhatsApp	43	38.1%	-	-
Instagram	43	38.1%	-	-
Facebook	1	0.9%	-	-
TikTok	8	7.1%	-	-
Twitter	6	5.3%	-	-
Snapchat	5	4.4%	-	-

Materials

Active SNS usage. To assess active social networking site usage, participants indicated their level of agreement with 4 items adopted from the research of Li (2016). Respondents were invited to indicate how frequently they use social media in an active manner. This was evaluated with a 6-point Likert scale ranging from 1= "Never" to 6 = "Constantly/All the time". Exemplary items are "I comment on other's posts on social media sites" and "I share content on social media sites with my connections.".

Passive SNS usage. To assess passive social networking site usage, participants indicated their level of agreement with 3 items adopted from the research of Li (2016). Respondents were invited to indicate how frequently they use social media in a passive manner. This was evaluated with a 6-point Likert scale ranging from 1= "Never" to 6 = "Constantly/All the time". Example items are "I watch videos or pictures posted on social media sites" and "I read online discussions on social media sites.".

Social media addiction. To measure social media addiction the Bergen social media addiction scale was used (Leung et al., 2020). Social media addiction is operationalized based on six symptoms indicative of addiction (salience, conflict, mood modification, withdrawal, tolerance, and relapse) (Andreassen et al., 2017). The scale assesses addiction with 6 items on a 5-point Likert scale ranging from 1 = "Very rarely" to 5= "Very often". Exemplary items are "You spend a lot of time thinking about social media or planning how to use it" and "You feel an urge to use social media more and more".

Self-esteem. Measuring the self-esteem of the participants was achieved by using the Rosenberg self-esteem scale (Rosenberg, 1965). The scales assess self-esteem with 10 items on a 4-point Likert scale ranging from 1= "Strongly Disagree" to 4= "Strongly Agree". General feelings about oneself are measured with items indicative of positive self-evaluation (e.g., "On the whole, I am satisfied with myself.") and negative self-evaluation (e.g., "At times I think I am no good at all."). The negative items are reverse scored, thus higher scores indicate higher self-esteem.

Upward social comparison. To measure upward social comparison on social media two items were used adapted from the research of Hwang (2019). On a 5-point Likert scale ranging from 1= "Strongly disagree" to 5= "Strongly agree" participants indicated to what extent they engage in upward social comparison on social media. The items consisted of "I compare myself to other people on social media whose performance or abilities are better than mine." and "I compare myself with other people on social media whose lives are better than mine.".

Downward social comparison. Assessing downward social comparison on social media was achieved by again using two items adopted from the research of Hwang (2019). On a 5-point Likert scale ranging from 1= "Strongly disagree" to 5= "Strongly agree" participants indicated to what extent they engage in downward social comparison. The items consisted of "I compare myself to other people on social media whose performance or abilities are worse than mine." and "I compare myself with other people on social media whose lives are worse than mine.".

Procedure

This study was conducted with the online survey tool Qualtrics. The participants recruited via the test subject pool could sign up to fill out the questionnaire through the SONA website. After signing up, they accessed the link to the survey via the websites. Participants reached through social media or personal connections directly received the link to the survey from the researcher. Once the participants accessed the survey tool, they were presented with the participant information sheet and consent form. More precisely, they were informed about

the purpose of this research, the right to decline and withdraw from the research at any time, the benefits of their participation, and the confidentially of the collected data. Next, the participants were asked to indicate their demographics which consisted of the participant's gender, age, highest level of education, and current occupation. Furthermore, they were invited to state what social media they use and what their favorite social media is. Next, participants filled out the questionnaires measuring social media usage, social comparison, self-esteem, and social media addiction. The survey ended with a short message informing the participant that they have reached the end of the survey and thanking them for their participation in this research. The data was collected between the 29th of April 2022 and the 9th of May 2022. Lastly, it took the participants about 10 minutes to fill out the complete survey.

Data Analysis

In this research structural equation modelling (SEM) was used for the data analysis and testing the associations between variables. SEM was performed using "R" an environment for statistical computing and graphics. The main applied packages were "sem" and "lavaan". The goodness of fit of the hypothesized model was assessed with the following indices: Comparative fit index (CFI), Tucker Lewis index (TLI), root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). Perfect and acceptable fit values with corresponding values were based on the suggestions of Kang and Ahn (2021) and can be examined in *Table 2*.

Evaluating the model was achieved with the help of the two-step approach suggested by Anderson and Gerbing (1988). First, the measurement model was examined by performing confirmatory factor analyses (CFA) for each respective questionnaire. Items with factor loading <0.55 were removed from the analyses (Hair et al., 1998). The reliability of the questionnaires was assessed using Cronbach's alpha and Lambda 2. When acceptable fit indices were determined means and correlations between the variables were estimated using "R". Moreover, for scales with less than three items a correlational analysis was performed with r >. 70 being an indicator of an acceptable correlation (Yong & Pearce, 2013).

Second, the structural model was examined to analyse the structural relationship between the latent constructs. This was achieved by adding the hypothesized effects. Lastly, examined variables that expressed correlation associations larger than r =.5 were allowed to correlate (Berry & Mielke, 1988).

Table 2.

Goodness of fit indices for structural equation modelling (Kang & Ahn, 2021)

Index	Perfect fit	Accepted values
CFI	.97<CFI <1	.90 CFI <.97
TLI	.95 <TLI <1	.90 TLI <.95
RMSEA	0 <RMSEA<.05	.05 <RMSEA < .08
SRMR	0 <SRMR <.05	.05 <SRMS <.08

Results

Measurement model

Active SNS usage. The one-factor CFA yielded that all items, except the item "I "like" posts on companies' social media sites (clicking the like button)", exceeded the cut-off value and sufficiently loaded on the underlying construct. Therefore, the item was removed which resulted in a perfect model fit (CFI=1.0.; TLI=1.0; RMSEA=0.0, SRMR=0.0). Moreover, the items provided good reliability (α = .82; λ-2= .85).

Passive SNS usage. The one-factor CFA showed that all items, except the item "I watch videos or pictures posted on social media sites" exceeded the cut-off value and sufficiently loaded on the underlying construct. The item was removed, and a perfect model fit was reported (CFI=1.0.; TLI=1.0; RMSEA=0.0, SRMR=0.0). Thus, indicating a good fit between the observed data and the latent construct of passive SNS usage. Lastly, the items proved good reliability (α = .82; λ-2= .87).

Social media addiction. The one-factor CFA of the BSMAS scale proved that all items exceeded the cut-off value. However, only an acceptable comparative fit index of (CFI)= .90 was observed. Based on the suggestions of Muthén and Asparouhov (2021) two residual correlations were added. First, between the items "You spend a lot of time thinking about social media or planning how to use it." and "You have tried to cut down on the use of social media without success.". Second, between the items "You spend a lot of time thinking about social media or planning how to use it." and "You use social media so much that it has had a negative impact on your job/studies.". This resulted in a good fit with a CFI = .99, TLI=.98, RMSEA=.06 and SRMR=.05. Additionally, the scale provided acceptable reliability (α = .79; λ-2= .90).

Self-esteem. The one-factor CFA yielded that all items exceeded the cut-off value thus, sufficiently loaded on the underlying construct. A good model fit was observed indicating a

good fit between the observed items and the latent construct of self-esteem (CFI=1.0.; TLI=1.0; RMSEA=0.06, SRMR=0.04). The items provided adequate reliability (α = .78; λ-2= .94).

Upward social comparison. Both items that measured upward social comparison showed a high correlation ($r(112) = 0.81$, $p < .001$). The items proved good reliability (α = .92; λ-2= .97).

Downward social comparison. The two items that measure downward social comparison also showed a high correlation ($r(112) = 0.81$, $p < .001$). Additionally, the items proved good reliability (α = .92; λ-2= .97).

Descriptive statistics

Overall, the participants in this sample expressed higher scores for passive SNS usage in comparison to active SNS usage. Moreover, the participants seem to compare more upwards than downwards on social media. A cut-off score of 19 out of 30 possible points on the Bergen social media addiction classifies an individual as at-risk of problematic social media use (Bányai et al., 2017). This corresponded to 17.7% (n=20) of the participants in this sample. Specific mean scores, standard deviation, and Pearson's correlations of all measured variables can be examined in *Table 3*.

Table 3.

Pearson correlations of Active SNS usage, Passive SNS usage, Social media addiction, Upward Social Comparison, Downward Social Comparison, Self-esteem, and Age (n=113)

	M	SD	1	2	3	4	5	6	7
1. Active SNS usage	3.00	1.04	-						
2. Passive SNS usage	4.35	1.05	.21*	-					
3. Social media addiction	2.25	.87	.25**	.05	-				
4. Upward social comparison	3.02	1.21	.24**	.21*	.43**	-			
5. Downward social comparison	2.41	1.13	.20	.20*	.20*	.57**	-		
6. Self-esteem	3.1	.59	.05	.12	-.28**	-.20**	.01	-	
7. Age	23.62	5.2	-.19*	-.18	-.36**	-.27**	-.17	.12	.05

*Note Variable 1 and 2 were measured on a 6-point Likert scale, variables 3,4 and, 5 on a 5-point Likert scale, variable 6 on a 4-point Likert scale and variable 7 was an open question.

**Correlation is significant at the .01 level (2-tailed).

*Correlation is significant at the .05 level (2-tailed

Structural model

Evaluating the structural model reviled an acceptable fit indicating that the model adequately reflected the collected data (CFI=.95; TLI=.95; RMSEA=.05, p=.69, 95% CI [0.03, 0.06]; SRMR= .08). An overview of the structural model with regression coefficients can be examined in *Figure 2*. The complete structural model with latent variables, observed variables, residuals, and variances can be viewed in the Appendix (*see Appendix C*).

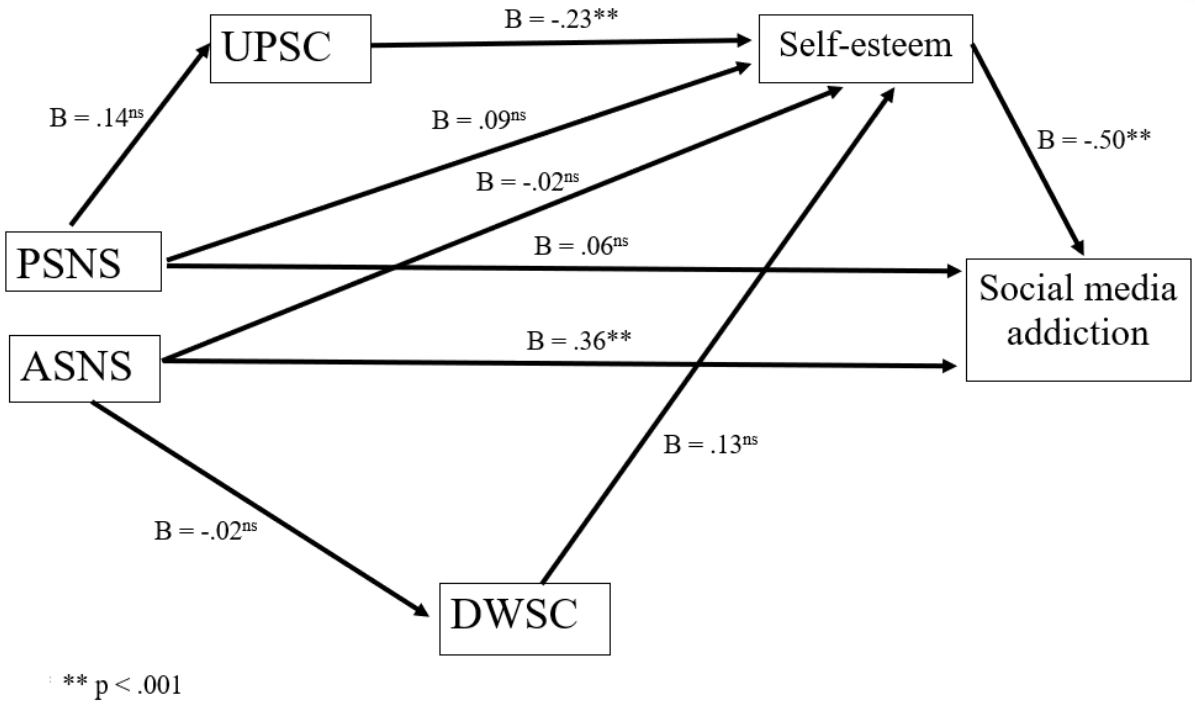

Figure 2. Conceptual model with regression estimates. PSNS (Passive social networking sites) ,ASNS (Active social networking site), UPSC (Upward social comparison), DWSC (Downwa rd social comparison), Self-esteem, and Social media addiction (ns= non-significant).

Hypothesis testing

As predicted social media addiction was negatively associated with self-esteem (β = -.50, p = <.001) and positively associated with active SNS usage (β = .36, p =.01). However, passive SNS usage was not significantly related to social media addiction.

It was expected that self-esteem mediates the relationship between active/passive SNS use and social media addiction. Both active and passive SNS usage were not significantly associated with self-esteem therefore the hypotheses were rejected (*see Table 4*).

Furthermore, it was expected that social comparison mediates the relationship between SNS usage and self-esteem. The hypotheses had to be rejected as well since both active and passive SNS usage were not significantly associated with self-esteem (see Table 4). Nevertheless, self-esteem was negatively associated with upward social comparison (β = -.23, p <.001) and marginally with downward social comparison (β = .13, p =.08). An overview of all associations can be examined in *Table 4*.

Table 4.

Estimates of the structural model

Regression weights					
Variable		Estimate	Std. Error	z-value	p-value
Upward Social Comparison ~					
	Passive SNS usage	.14	.10	1.42	.15
Downward Social Comparison ~					
	Active SNS usage	-.02	.13	-.17	.86
Self-esteem~					
	Passive SNS usage	.09	.06	1.34	.18
	Active SNS usage	.08	.09	.087	.39
	Upward social comparison	-.23	.08	-2.95	.00
	Downward social comparison	.13	.08	1.77	.08
Social media addiction ~					
	Active SNS usage	.36	.14	2.53	.01
	Passive SNS usage	.06	.09	.66	.51
	Self-esteem	-.50	.16	-3.20	.00

Discussion

This study examined the associations between self-esteem, social networking site usage, social comparison, and social media addiction. The results imply that self-esteem and active SNS usage have an impact on social media addiction. Additionally, upward social comparison was also found to be associated with self-esteem.

First, it was expected that self-esteem would negatively influence social media addiction, which could be confirmed by the results of this study. This is consistent with the findings of past research that found a significant negative association between social media addiction and self-esteem (Hawai & Samaha, 2017; Purnama et al., 2021; Andreassen et al., 2017). Schivinski et al. (2020) proposed that users with low self-esteem may rely more on social media to improve their levels of self-esteem. In other words, people with lower self-esteem may rely more on social media to enhance their feelings of self-worth by, for example, receiving likes and comments on their posts (Schivinski et al., 2020). This might add to the research of Burrow and Rainone (2017) who found that receiving likes on social media is positively associated with self-esteem. Additionally, it was suggested that people with high self-esteem levels may rely less on social media since they are already satisfied with themselves (Schivinski et al., 2020).

Second, it was assumed that active/passive SNS usage would positively predict social media addiction. As expected, active SNS usage positively influenced social media addiction, however, passive use did not. Previous research suggested that active users use social media more intensively which is in alignment with the findings of this study. Intense active use might make individuals feel more socially connected with others which they can achieve by posting, sharing, and commenting on content (Trifiro and Prena, 2021). This in turn is often rewarded by receiving likes and comments from other users eliciting feelings of being connected (Escobar-Viera et al., 2018). In contrast, passive SNS use was not related to social media addiction. Prior research suggested that the endless newsfeed loops on social media put passive users at risk of becoming addicted (Purohit & Holzer, 2021). Considering the results of this study it might be that passive social media users spent a significant amount of time scrolling through, for example, their newsfeed on social media. However, this does not seem to make them addicted. As suggested by the research of Coyne et al. (2020) time spent on social media does not seem to be indicative of mental health problems.

Third, self-esteem was expected to mediate the association between SNS usage and social media addiction. However, no evidence of self-esteem mediating this relationship was found. Passive SNS usage did not influence the self-esteem levels of social media users. Contrarily,

Wang et al. (2017) found a direct influence of passive SNS usage on self-esteem. Passive use was indicative of lower self-esteem levels. Nevertheless, only slight correlations between the variables were observed. The current study could not replicate these findings. This could be due to a significantly smaller sample size. Additionally, passive use alone might not influence self-esteem levels. It was expected that upward social comparison functions as a mediator in this relationship. In contrast to previous research, this study did not find that upward social comparison accounted for the relationship between passive SNS use and self-esteem (Lui et al., 2016). Nevertheless, in accordance with Vogel et al. (2014) upward social comparison negatively influenced self-esteem levels. This suggests that upward social comparison online happens independently of whether social media is used in a passive manner or not. However, future research should consider examining additional mediators that might explain the relationship between passive SNS usage and self-esteem. For instance, social comparison and fear of missing out mediated the relationship between passive SNS usage and self-esteem in the research of Burnell et al. (2019).

Furthermore, the results of this study indicate that using social media passively instead of actively has fewer negative consequences. Active SNS usage did not influence self-esteem levels but social media addiction. This implies that active SNS usage promotes social media addiction independent of an individual's self-esteem level. Prior research found that self-esteem mediated the relationship between active SNS usage and loneliness. Similar to this research, active SNS use was not directly related to self-esteem. However, it was indirectly affected by the mediator of social support. Nonetheless, only a weak correlation was reported between the variables (Lin et al., 2020). In contrast, this study found no correlation between active SNS use and self-esteem. Examining different mediators can help explain this relationship. In this study, it was expected that downward social comparison mediates the relationship between active SNS usage and self-esteem. However, this could not be confirmed since active SNS usage did not significantly influence downward social comparison. As argued by Yang and Robinson (2018) it may be that active SNS usage is not related to social comparison on social media. More specifically, using social media in an active manner seems to focus on producing content rather than receiving or exchanging information which is essential for any form of social comparison (Yang & Robinson, 2018).

Limitations

Besides discussing the findings of this research, a few limitations should be examined. First, most of the participants were students in higher education and identified as female. Thus, this demographic group is mainly represented in the findings of this study making it difficult to produce representative results for the whole population.

Another limitation is the use of a cross-sectional study approach which does not allow to make inferences about the causality of the examined relationships. Therefore, the results of this study need to be treated with caution. To realize this, longitudinal designs, as well as experimental studies, would be more appropriate for determining the effects on social media addiction and to draw definite conclusions on its relationship with mental health.

Third, this research relied entirely on self-reports. Thus, the answers the participants provided in the survey were based on their subjective self-evaluation. More objective measures may help control for this bias (Valkenburg, 2021). For instance, Valkenburg (2021) suggested to examine the data obtained through screen-time applications to for instance, objectively measure social media use. Additionally, it can be considered to use apps that measure the number of times individuals pick up their phone, etc.

Fourth, the validity and reliability of the applied methods were partly limited. The measures used were validated by previous research nonetheless, one item had to be removed from the active SNS usage scale as well as passive SNS scale (Li, 2016). Moreover, upward, and downward social comparison were measured with two items, respectively. A minimum of three to five strong loading items are needed to avoid estimation problems (Costello & Osborne, 2005).

Implications

This research added to the growing body of research on social media addiction investigating its promotive and protective factors. In this study, self-esteem was found to be a protective factor whereas active SNS usage was a promotive factor of social media addiction. These findings have important implications for the clinical practice. First, the results imply that people affected by social media addiction could benefit from interventions that discourage active social media use. To help prevent or reduce addiction, practitioners can encourage their clients to take a break from using social media in an active manner. For example, inviting them to lower their posting, liking, and sharing habits on social media platforms. This might help reduce frequently logging on to social media and make clients less engaged with their favourite platforms. Hence,

offering them the opportunity to dedicate their time and energy to other important daily life responsibilities.

Second, practitioners could prevent addiction by enhancing the self-esteem levels of their clients. As suggested by the results this can be achieved by avoiding upward social comparison on social media. For instance, practitioners could recommend their clients to unfollow accounts on social media that make them feel bad about themselves. Thus, their newsfeeds will no longer expose them to content that could harm their self-esteem. On the contrary, their feeds will be filled with people and things that make them feel good about themselves.

These implications can also be particularly helpful in times of social distancing. Recently, scholars seem to put special emphasis on the connection between the COIVD-19 pandemic and the increase of social media use (Marengo, 2022; Muzi, 2021; Paschake,2021). The lockdowns and social distancing measures forced people to reduce opportunities to socialize in person. This resulted in a significant rise in the use of social networks and messaging applications which resulted in possible trends of people becoming increasingly addicted to social media (Paschke et al., 2021).

Future research on social media addiction should consider using longitudinal designs as well as experimental studies to draw definite conclusions on its relationship with mental health. To measure addiction more accurately, it should also be considered the use of both subjective and objective methods. Moreover, it is important to further investigate different mediators and moderators that explain the relationships particularly, between SNS usage, social comparison, and self-esteem. This might help determine further protective and promotive factors.

Conclusion

This study added to the growing body of research on social media addiction by examining the role of SNS usage, social comparison, and self-esteem using a cross-section correlation design. The results of this study suggest that active social networking site usage and self-esteem are significantly associated with social media addiction. This implies that active SNS usage acts as promotive factor whereas self-esteem acts as a protective factor for becoming addicted to social media. Practitioners can use these insights to prevent and treat social media addiction. More specifically, patients could benefit from interventions that discourage active social media use and enhance their self-esteem by avoiding upward social comparison on social platforms. It still remains unclear how SNS usage, social comparison, and self-esteem relate to each other and influence social media addiction. However, this research provided new insights on the role of active SNS use and self-esteem in the context of addiction. Future research might

consider investigating different mediators and moderators to further explain the relationships between SNS usage, social comparison, self-esteem, and social media addiction.

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Appendix

Appendix A

Informed Consent

Dear participant! Thank you for deciding to participate in my research. In this study, I investigate the relationship between social media use, mental health, and well-being. Your participation is completely anonymous, and the data you provide cannot be used to identify who you are. There are no associated risks expected when participating in this study. Your participation is entirely voluntary, and you have the right to withdraw from the study at any time. You do not have to explain, and I will remove your data from the study. By participating, you contribute to exploring the effects of social media usage further.

This research is part of my Bachelor's thesis, which Mirjam Radstaak supervises. The BMS Ethics Committee approved the study in April 2022, and the results might be published on the website of the University of Twente. However, no data can be traced back to the individuals participating in my research.

If you have any questions or concerns about the study prior, during, or after the study, feel free to contact me via email: l.f.b.schafer@student.utwente.nl.

By indicating "Yes, I do consent", you agree to participate in this research.

Appendix B

Survey Questionnaires

Active Social Networking Site usage

**Assessed on a 6-point Likert scale, (Never = 1; Constantly all the time = 6)*

Please indicate to what extent these statements apply to you.

1. I comment on others' posts on social media sites.
2. I "like" posts on companies' social media sites (clicking the like button).
3. I share content on social media sites with my connections.
4. I post content on my own social media page.

Passive Social Networking Site usage

**Assessed on a 6-point Likert scale, (Never = 1; Constantly all the time = 6)*

Please indicate to what extent these statements apply to you.

1. I watch videos or pictures posted on social media sites.
2. I read online discussions on social media sites.
3. I read user comments/ratings/reviews on social media sites.

Bergen social media addiction scale

**Assessed on 5-point Likert scale, (Very rarely = 1; Very often = 5)*

Please indicate to what extent these statements apply to you.

1. You spend a lot of time thinking about social media or planning how to use it.
2. You feel an urge to use social media more and more.
3. You use social media in order to forget about personal problems.
4. You have tried to cut down in the use of social media without success.
5. You become restless or troubled if you are prohibited from using social media.
6. You use social media so much that it has had a negative impact on your job/studies.

Rosenberg self-esteem scale

Please indicate how strongly you agree or disagree with each statement.

**Assessed on a 4-point Likert scale, (Strongly Disagree= 1; Strongly Agree= 4)*

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

Upward social comparison

**Assessed on a 5-point Likert scale, (Strongly Disagree= 1; Strongly Agree= 5)*

Please indicate to what extent you disagree or agree with the statements below.

1. I compare myself to other people on social media whose performance or abilities are better than mine.
2. I compare myself with other people on social media whose lives are better than mine.

Downward social comparison

**Assessed on a 5-point Likert scale, (Strongly Disagree= 1; Strongly Agree= 5)*

Please indicate to what extent you disagree or agree with the statements below.

1. I compare myself to other people on social media whose performance or abilities are worse than mine.
2. I compare myself with other people on social media whose lives are worse than mine.

Appendix C

Complete structural model

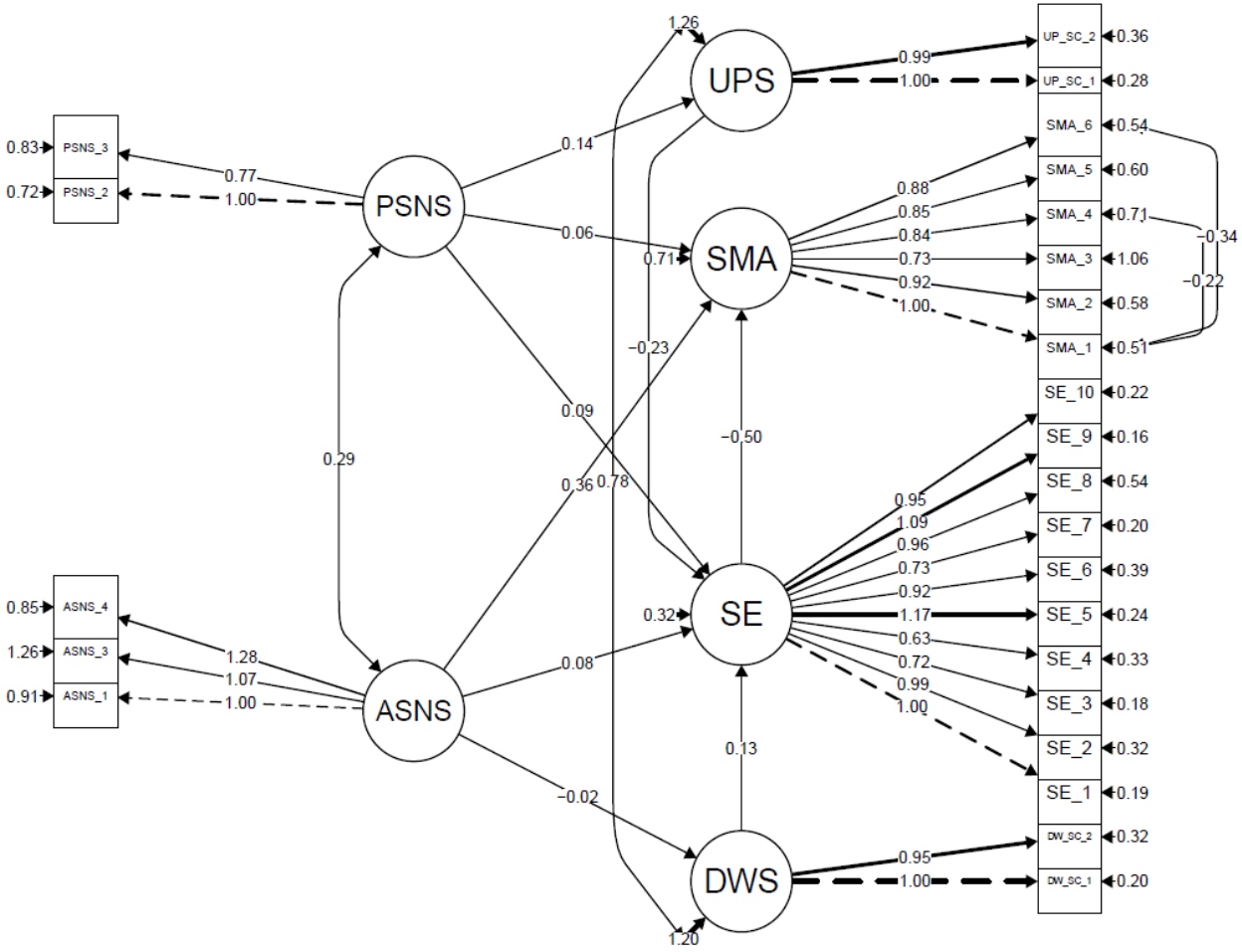

Figure 3. Complete structural model with latent variables, observed variables, residuals, and variances. PSNS (Passive social networking sites), ASNS (Active social networking site), UPS (Upward social comparison), DWS (Downward social comparison), SE (Self-esteem), and SMA (Social media addiction).

Note: Latent variables are represented by circles, observed variables are represented by squares, regression coefficients are represented by single-headed arrows, residual variance is represented by single-headed arrows pointing at a single observed item, covariances between variables is represented by double-headed arrows connecting two variables, dashed lines indicate fixed parameter estimates.