**Social Comparison of Ability and Fear of Missing Out Mediate the Relationship between
Subjective Well-Being and Social Network Site Addiction**

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Abstract

As social network sites (SNS) gain more users, the problem of unhealthy user behavior such as SNS addiction arises. We conducted a cross-sectional study ($n = 296$) on how subjective well-being (SWB) impacts SNS addiction by investigating two possible mediators: social comparison and the fear of missing out (FOMO). While doing so, we tested two distinct effects of social comparison: social comparison of ability (SCA) and social comparison of opinion (SCO). Splitting two components of social comparison is important because, while SCA involves social outcomes often depicted in SNS posts (e.g., performance, material wealth, health, and achievements) that might evoke negative emotions such as FOMO and jealousy, SCO involves presenting or sharing one's beliefs and values in SNS posts (e.g., arguments, comments, and statements) that might evoke relatively little negative emotions. We replicated previous findings by showing that social comparison and FOMO jointly mediated the relationship between SWB and SNS addiction. More importantly, SCA (together with FOMO), but not SCO, uniquely mediated the relationship between SWB and SNS addiction. Such distinct effects call for future research on identifying specific elements of social comparison contributing to the relation between FOMO and SNS addiction.

Keywords: subjective well-being, social comparison of ability and opinion, FOMO, SNS addiction, serial mediation

1. Introduction

Social network sites (SNS) provide a possibility to connect with people from all over the world, which is even more relevant in times of a worldwide pandemic where social contact is limited. However, with the rise of SNS like Facebook, Instagram, Snapchat or TikTok, together with an ever-increasing number of SNS users, new problematic behaviors emerge. In particular, excessive usage of SNS can develop into a form of addiction towards engaging in SNS activities also termed as SNS addiction (Andreassen & Pallesen, 2014). SNS addiction occurs when users are too concerned about SNS, with a strong motivation to use SNS and invest excessive time and effort online, thereby negatively impacting important life domains like social activities, work, and relationships, as well as mental health and well-being (Andreassen & Pallesen, 2014; Donnelly & Kuss, 2016; Kuss & Griffiths, 2017; Moqbel & Kock 2018; Reer, Tang, & Quandt, 2019). SNS addiction has been associated with numerous negative outcomes, such as lower subjective well-being (Satici, 2019), depression (Li, 2019; Steers, Wickham, & Acitelli, 2014), anxiety (Lee, 2014), low self-esteem (Midgley, Thai, Lockwood, Kovacheff, & Page-Gould, 2020) and loneliness (Marino, Gini, Vieno, & Spada, 2018; Satici, 2019).

Of our interest, subjective well-being (SWB), defined as the level of well-being individuals experience in relation to their subjective evaluations of their lives (Diener & Ryan, 2009), can be highly affected by SNS activities because positive or negative life events involve fluctuating feelings and judgements about satisfaction with life, work, relationships, health, among other important domains that can easily be portrayed in SNS posts (Yang, 2020). On the one hand, SNS activities such as posting and looking through others' life events modulate how the SNS users evaluate their own lives, on the other hand, dissatisfaction with life might trigger SNS users to engage in more SNS activities as an easy way to boost own well-being (Chen, Fan, Liu, Zhou, & Xie, 2016; Satici, 2015). This bidirectional relationship between SWB and SNS use might turn into a cyclic relationship, triggering constant social

comparison processes which also severely affect users' SWB (Chen et al., 2016) and self-esteem (Kim, Schlicht, Shardt, & Florack, 2021).

Frequently used SNS platforms such as Instagram, Facebook or TikTok allow users to present themselves positively and share rewarding experiences mainly via visual contents. The possibility to positively present oneself may evoke social comparison processes in users to compare whether their lives are "better" than that of others (Lin & Utz, 2015). When viewing someone's posts or profiles that are worse off, SNS users might feel more content about their own life which functions as a way to increase their own SWB and self-esteem (Kim et al., 2021). Such social comparison processes may lead to an increase in SNS use directly, but also indirectly via feelings of others having more rewarding experiences from which one feels excluded (Przybylski, Murayama, Dehaan, & Gladwell, 2013), namely FOMO. Due to the excessive amount of positive presentations prevalent in SNS platforms, FOMO can easily occur and thus decrease one's satisfaction with life (Przybylski, Murayama, Dehaan, & Gladwell, 2013; Yin, Wang, Nie, Guo, Feng, & Lei, 2021). In the end, in order to boost one's satisfaction with life, one may turn their eyes to SNS platforms again for an easy way out to escape the feelings of dissatisfaction, reinforcing a vicious circle of behavior, leaving open the possibility of developing SNS addiction. The present study argues that this vicious circle might be one explanation of the uncontrollable SNS use and the impact might be stronger depending on "what" SNS users compare themselves on, when engaging in online social comparisons.

Social comparison generally serves the purpose of self-evaluation by comparing oneself with others' abilities and opinions (Festinger, 1954). The existing literature has shown that engaging in social comparisons is positively associated with increased SNS usage (Ozimek & Bierhoff, 2016; Reer, Tang, & Quandt, 2019). Individuals who report low in SWB also engage more in social comparison processes to reduce self-uncertainty (Butzer & Kuiper, 2006; Gibbons & Buunk, 1999; Reer, Tang, & Quandt, 2019). Nevertheless, previous

findings have so far largely focused on social comparison activities in general (Burnell, George, Vollet, Ehrenreich, & Underwood, 2019; Reer, Tang, & Quandt, 2019), when social comparison activities are comprised of two distinct aspects depending on “what” is being compared: ability and opinion (Gibboons & Buunk, 1999). SNS posts provide ample materials for users to engage in social comparisons of abilities such as performance, physical appearance, material wealth, or achievements which are often disproportionately positively portrayed on SNS platforms. Such posts might induce negative feelings in users because the comparison targets are frequently seen as performing better than themselves (Tandoc, Ferrucci, & Duffy; 2015). In contrast, engaging in social comparisons of opinions might induce relatively little negative feelings because the comparison targets are not necessarily seen better or worse but seen as having the same or different opinions. Indeed, recent study has shown that SNS users with a higher ability comparison orientation experienced more emotions that led to lower life satisfaction like depression and envy, whereas SNS users with a higher opinion comparison orientation were less likely to experience these emotions and therefore reported higher life satisfaction (Park & Baek, 2018).

In the present study, we first examined whether the relation between SWB and SNS addiction can be explained by the tendency to engage in social comparisons and the fear of missing out (FOMO) in a serial mediation model (see Figure 1). Recently, Reer and colleagues (2019) demonstrated that the relationship between SWB and the tendency to engage in SNS activities was explained by the general tendency for engaging in social comparisons and FOMO. Similarly, we predicted that social comparison tendencies and FOMO will jointly mediate the relation between SWB and SNS addiction as the bidirectional nature of SWB and SNS might propel the development of SNS addiction. After testing the first model, we separately tested social comparison of ability (SCA) and social comparison of opinion (SCO) measures consecutively as models 2 and 3.

Figure 1. Proposed serial mediation model

Based on our rationale, our hypotheses are as follows.

H1: The negative relationship between SWB and SNS addiction is jointly mediated by engagement in social comparison and FOMO.

H2: SCA, but not SCO, jointly mediate the relation between SWB and SNS addiction with FOMO.

These main hypotheses are summarized in the model (see Figure 1). To test our hypotheses, we tested three models by integrating and separating SCA and SCO components of the social comparison measure (model 1: SCA and SCO, model 2: SCA, and model 3: SCO).

2. Methods

2.1. Participants

To determine the required sample size, an a-priori Monte Carlo power analysis was conducted by using the mean standardized coefficients from Reer, Tang and Quandt (2019), since their combined model was similar to ours. Using a Monte Carlo simulation, we calculated the minimum sample size as $n = 260$ to achieve a power of .80 for the serial mediation ($\alpha = .05$). The overall sample consisted of 378 participants. After excluding incompletely answered questionnaires ($n = 60$), incorrect attention check (Please select “strongly agree”) answers ($n = 10$) and outliers ($n = 12$) due to violations of mahalanobis distance, leverage and Cook’s distance, the final sample size consisted of 296 participants

($M_{age} = 26.99$ years, $SD_{age} = 7.33$) of which 72.97% identified as female ($n = 216$). Only four participants had a basic school-leaving qualification (*Pflichtschulabschluss*), 15 had a mid-level qualification (*Lehrabschluss*), 107 had the highest school-leaving qualification (*Matura*) and 170 had a university degree.

2.2. Material

Subjective well-being. For measuring SWB, the German translated version of the 5-item Satisfaction with Life Scale (SWLS) was used (Diener, Emmons, Sem, & Griffin, 1985; Janke & Glöckner-Rist, 2014). Participants indicated to what extent they agreed with each item ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Social comparison. The Iowa-Netherlands Comparison Orientation Measure (INCOM) by Gibbons and Buunk (1999) is widely used for measuring both SCA and SCO. For this study, the shortened German version of 6-item INCOM by Schneider and Schupp (2011) was used. Participants indicated to what extent they agreed with each item given a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items 1, 2 and 3 served to measure SCA and items 4, 5 and 6 served to measure SCO.

Fear of missing out. To measure FOMO, the German adaptation of the 10-item Fear of Missing Out Scale (FOMOS) was used (Przybylski, Murayama, Dehaan, & Gladwell, 2013; Spitzer, 2015). It consists of 10 items ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

SNS addiction. The German adaption of the Bergen Social Networking Addiction Scale (BSNAS) was used to measure SNS addiction, which gauges the propensity of SNS addiction towards various SNS platforms in general (Andreassen, Torbjørn, Brunborg, & Pallesen, 2012; Kim, Schlicht, Shardt, & Florack, 2021). It consists of six items ranging from 1 (*very rarely*) to 5 (*very often*).

2.3. Procedure

Participants were recruited through the SNS platforms such as WhatsApp, Facebook,

Instagram, and Reddit, as well as the survey platforms (survey-circle.com and poll-pool.com). Participants who answered the question “Do you use Social Media?” with “Yes” took part in the survey. Participants gave an online informed consent by clicking a button to continue and complete the survey. Completing the online survey took participants 5.83 minutes on average. Our study was ethically approved by the Institute of Review Board at the department of occupational, economic, and social psychology.

3. Results

Demographic information and intercorrelations are reported in Table 1. To test H_1 and H_2 , three different mediation models were calculated. Paths were tested using bootstrapping (5000 samples) with 90% bias-corrected confidence intervals (CI). Based on previous research, age served as a control variable for social comparison, SCA, SCO, FOMO and SNS addiction, while gender served as a control variable for social comparison, SCA, SCO and FOMO (Kuss & Griffiths, 2017; Ozimek & Bierhoff, 2016; Przybylski, Murayama, Dehaan, & Gladwell, 2013; Reer, Tang, & Quandt, 2019). The fit of the three models was tested by calculating the following fit-indices: Tucker-Lewis index (TLI) $>.95$, comparative fit index (CFI) $>.95$, and root mean square error of approximation (RMSEA) $<.06$ (Hu & Bentler, 1999). All three models showed a very good fit (see Figures 2, 3, and 4).

H_1 predicted that the negative relationship between SWB and SNS addiction is jointly mediated by engagement in social comparison and FOMO. As Figure 2 shows, lower SWB was significantly related to higher engagement in social comparison (Path A1) for Model 1 ($\beta = -0.15, p = .011$). The relationship between social comparison and SNS addiction (Path A2) was not significant for Model 1 ($\beta = 0.13, p = .054$). Higher engagement in social comparison was positively related to higher FOMO (Path D) for Model 1 ($\beta = 0.57, p < .001$). Lower SWB led to higher FOMO (Path B1) for Model 1 ($\beta = -0.12, p = .012$). Higher FOMO was significantly related to higher SNS addiction (Path B2) for Model 1 ($\beta = 0.30, p < .001$). The relationship between SWB and SNS addiction (Path C) was negative

for Model 1 ($\beta = -0.18, p < .001$).

Table 1. Demographic information and intercorrelations of measures.

Measures	M	SD	1	2	3	4	5	6	7
1. SWLS	25.03	6.02	(.88)						
2. INCOM	17.83	5.05	-.15*	(.80)					
3. SCA	8.47	2.92	-.22***	.86***	(.73)				
4. SCO	9.36	2.95	-.04	.86***	.48***	(.78)			
5. FOMOS	24.79	6.71	-.21***	.61***	.56***	.49***	(.78)		
6. BSNAS	13.49	4.84	-.27***	.38***	.35***	.30***	.46***	(.76)	
7. Gender	0.73	0.44	.04	.15*	.13*	.12*	-.03	.06	
8. Age	26.99	7.33	.03	-.25***	-.23***	-.20***	-.31***	-.28***	-.03

Note. * $p < .05$; ** $p < .01$; *** $p < .001$. Internal validities (Cronbach's alphas) are reported in the diagonal.

Figure 2. Model 1: Estimated serial mediation.

Path weights are standardized betas. * $p < .05$; ** $p < .01$; *** $p < .001$.

Model fit: CMIN/df = 1.124, TLI = 0.995, CFI = 1, RMSEA = 0.02, 90% CI = [0, 0.157]

Figure 3. Model 2: Estimated serial mediation.

Path weights are standardized betas. * $p < .05$; ** $p < .01$; *** $p < .001$.

Model fit: CMIN/df = 1.474, TLI = 0.978, CFI = 0.998, RMSEA = 0.04, 90% CI = [0, 0.166]

Figure 4. Model 3: Estimated serial mediation.

Path weights are standardized betas. * $p < .05$; ** $p < .01$; *** $p < .001$.

Model fit: CMIN/df = 1.421, TLI = 0.977, CFI = 0.998, RMSEA = 0.038, 90% CI = [0, 0.165]

As Table 2 shows, the indirect effect 1 (Path A1 x Path A2) was not significant for Model 1 ($\beta = -0.02$, CI = [-0.04, 0.00], $p = .129$). The indirect effect 2 (Path B1 x Path B2) was significant for Model 1 ($\beta = -0.03$, CI = [-0.06, -0.01], $p = .032$), indicating that lower SWB led to higher SNS addiction. In support of *H1*, the indirect effect 3 (Path A1 x Path D x Path B2) was significant for Model 1 ($\beta = -0.02$, CI = [-0.04, -0.01], $p = .033$), indicating that lower SWB led to higher SC, which increased FOMO, leading to a higher tendency for SNS addiction.

H2 predicted that the mediating effect of SCA (Model 2) would be significant but not that of SCO (Model 3). As seen in Figures 3 and 4, path A1 (Model 2: SWB x SCA; Model 3: SWB x SCO) was significantly negative for Model 2 ($\beta = -0.21$, $p < .001$) but not significant for Model 3 ($\beta = -0.04$, $p = .513$), showing that lower SWB was related to higher engagement in SCA but not SCO. Path A2 (Model 2: SCA x SNS addiction; Model 3: SCO x SNS addiction) was not significant for Model 2 ($\beta = 0.09$, $p = .171$) and Model 3 ($\beta = 0.10$, $p =$

.077). Path D (Model 2: SCA x FOMO; Model 3: SCO x FOMO) was positive for Model 2 ($\beta = 0.51, p < .001$) and Model 3 ($\beta = 0.45, p < .001$), indicating that higher engagement in SCA, as well as in SCO was related to higher FOMO. Path B1 (SWB x FOMO) was not significant for Model 2 ($\beta = -0.09, p = .063$) but was negative for Model 3 ($\beta = -0.18, p < .001$), indicating that higher SWB only led to higher FOMO when SCO was present. The relationship between FOMO and SNS addiction (Path B2) was positive for Model 2 ($\beta = 0.33, p < .001$) and Model 3 ($\beta = 0.32, p < .001$), showing that higher FOMO led to higher levels of SNS addiction, regardless of SCA or SCO being present. The relationship between SWB and SNS addiction (Path C) was negative for Model 2 ($\beta = -0.17, p < .001$) and Model 3 ($\beta = -0.19, p < .001$), also indicating that regardless of the presence of SCA or SCO, lower SWB led to higher levels of SNS addiction.

Table 2

Model 1: Indirect, direct and total effects.

Pathway	Estimate	SE	Z	p
Indirect 1: SWB→SC→SNS ADD	-0.02	0.01	-1.64	.10
Indirect 2: SWB→FOMO→SNS ADD	-0.03	0.02	-2.29	.02
Indirect 3: SWB→SC→FOMO→SNS ADD	-0.02	0.01	-2.30	.02
Direct	-0.18	0.05	-3.59	.00
Total	-0.26	0.05	-5.01	.00

Note. SC: social comparison; FOMO: fear of missing out; SNS ADD: SNS addiction.

As shown in Tables 3 and 4, the indirect effect 1 (Path A1 x Path A2) was not significant for Model 2 ($\beta = -0.02, CI = [-0.05, 0.00], p = .203$) and Model 3 ($\beta = 0.00, CI = [-0.02, 0.00], p = .580$). The indirect Effect 2 (Path B1 x Path B2) was not significant for Model 2 ($\beta = -0.03, CI = [-0.05, 0.00], p = .085$) but significant for Model 3 ($\beta = -0.06, CI = [-0.08, -0.02], p = .003$), indicating that lower SWB led to higher FOMO, which led to higher

SNS addiction, but only if SCO was present. Confirming H_2 , the indirect Effect 3 (Path A1 x Path D x Path B2) was significant for Model 2 ($\beta = -0.04$, $CI = [-0.05, -0.01]$, $p = .004$) but not for Model 3, ($\beta = -0.01$, $CI = [-0.02, 0.01]$, $p = .527$), indicating that lower SWB led to higher SCA, which increased FOMO, leading to a higher tendency for SNS addiction.

Table 3

Model 2: Indirect, direct and total effects.

Pathway	Estimate	SE	Z	p
Indirect 1: SWB→SCA→SNS ADD	-0.02	0.01	-1.40	.16
Indirect 2: SWB→FOMO→SNS ADD	-0.03	0.02	-1.78	.08
Indirect 3: SWB→SCA→FOMO→SNS ADD	-0.04	0.01	-3.09	.00
Direct	-0.17	0.05	-3.42	.00
Total	-0.26	0.05	-5.00	.00

Note. SCA: social comparison of abilities; FOMO: fear of missing out; SNS ADD: SNS addiction.

Table 4

Model 3: Indirect, direct and total effects.

Pathway	Estimate	SE	Z	p
Indirect 1: SWB→SCO→SNS ADD	0.00	0.01	-0.62	.53
Indirect 2: SWB→FOMO→SNS ADD	-0.06	0.02	-3.19	.00
Indirect 3: SWB→SCO→FOMO→SNS ADD	-0.01	0.01	-0.65	.51
Direct	-0.19	0.05	-3.78	.00
Total	-0.26	0.05	-5.00	.00

Note. SCO: social comparison of opinions; FOMO: fear of missing out; SNS ADD: SNS addiction.

4. Discussion

Overall, our results showed that the relationship between subjective well-being and SNS addiction was jointly mediated by social comparison and FOMO. The lower level of subjective well-being was associated with increased engagement in social comparison, which was associated with the increased level of FOMO, ultimately leading to higher levels of SNS addiction.

In line with previous research (Burnell, George, Vollet, Ehrenreich, & Underwood, 2019; Reer, Tang, & Quandt, 2019), the tendency to engage in social comparison was found to be closely associated with FOMO and mediated the relationship between subjective well-being and FOMO. This finding supports previous claims that people who report the low level of subjective well-being compare themselves more often with others, as a possible way to reduce self-uncertainty (Butzer & Kuiper, 2006; Gibbons & Buunk, 1999; Reer, Tang, & Quandt, 2019). Consequently, frequent social comparison might result in amplified FOMO as a feeling that others have more rewarding experiences than oneself. Our results also showed that FOMO fully mediated the relationship between social comparison and SNS addiction supporting the claim that one of the reasons for frequent social comparison resulting in SNS addiction might be via FOMO.

Most importantly, we tested the role of two different types of social comparison (ability and opinion) as a joint mediator with FOMO. We predicted that ability comparison would play a mediating role but not opinion comparison because a stronger ability comparison orientation is associated with negative emotions such as depression and envy, which often lead to lower life satisfaction (Park & Baek, 2018). Our results showed that when including the ability comparison as a social comparison variable, the joint mediating role of social comparison was the strongest (effect estimate = -0.04). In contrast, when including opinion comparison as a social comparison variable, the jointly mediating role of social comparison disappeared, confirming our hypotheses.

A possible explanation for the different roles played by ability and opinion comparisons might stem from distinct functions each type of comparison has in SNS contexts. First, as users mainly post visual contents, SNS might be a suitable platform for sharing pictures and videos directly relating to one's skills, possessions, and physical traits, whereas one's opinions or attitudes are rather indirectly portrayed in visual contents. Second, ability and opinion comparisons might guide SNS users to perceive the comparison target in a different way. When engaging in ability comparisons, the comparison target might be perceived as a competitor, but when engaging in opinion comparisons, the comparison target might be perceived as someone who shares the same or different beliefs. When the comparison target is seen as an out-performing competitor, negative emotions such as the feeling of inferiority, envy, and the impression that others have better lives than oneself can be evoked. For the reason that such emotions serve as key elements of FOMO (Yin et al., 2021), future research should focus on whether those negative emotions stemmed from engaging in ability comparisons play a crucial role in explaining a potential vicious circle of subjective well-being, ability comparison, FOMO, and SNS addiction.

It is also important to note that the directionality of the relationship between subjective well-being and SNS addiction is not clear. Reer and colleagues (2019), for example, proposed a model with the same direction as the present study, while Burnell and colleagues (2019) proposed the opposite direction (SNS use leading to subjective well-being), and in both lines of research, the directionality was not clearly confirmed. Other researchers have argued that the relationship between subjective well-being and SNS use might be bidirectional (Wang, Gaskin, Rost, & Gentile, 2018). Indeed, people who engage in SNS activities in an effort to increase their life-satisfaction might contrarily experience decreased well-being due to the negative emotions evoked by making ability comparisons. In turn, people who experienced lower life-satisfaction might turn their attention to SNS platforms for a way to boost well-being. Due to the nature of the cross-sectional design, our

data could not test this possibility but future research using a longitudinal design to verify a potential cyclic relationship is highly warranted.

Another limitation of the present study is that our sample was not a clinical population. Examining the joint mediating role of ability comparison and FOMO on the relation between subjective well-being and SNS addiction in those with a high SNS addiction tendency might offer a fuller picture of the behavioral mechanism. Comparing clinical and non-clinical samples might also verify whether distinct mechanisms relevant to social comparison constructs underlie in SNS behavior.

Our findings provide some implications on how to support people who suffer from excessive SNS use. First, users might be advised to actively avoid contents that might increase chances to engage in ability comparisons by regulating their SNS contents using filters and such, to minimize contents that show ability comparison materials (e.g., physical appearance, skills, performance) and maximize contents that focus more on sharing and comparing opinions and attitudes. Second, reassessing how the comparison target is viewed so not to perceive comparison targets as a competitor might help SNS users to avoid negative feelings (e.g, envy). When the comparison target is viewed as someone to learn from, social comparison might serve as an inspiration. Based on our findings, shifting one's comparison process away from ability to opinion comparison might help reduce negative feelings and facilitate a controllable SNS use. Accordingly, focusing more on opinion comparison might also reduce the level of FOMO as negative emotions evoked by engaging in ability comparisons are closely linked to FOMO (Yin et al., 2021).

Our findings demonstrated the mediating roles of social comparison and FOMO in the relation between subjective well-being and SNS addiction while separately examining the role of ability and opinion social comparisons. The present research emphasizes the importance of dividing the social comparison components when investigating SNS behavior. Our data suggest that the tendency to engage in ability rather than opinion comparisons might play a

bigger role leading to SNS addiction and that FOMO in SNS contexts may be based more on the process of ability than opinion comparisons. As the distinctive roles of ability and opinion comparisons are often neglected by researchers (c.f., Kim et al., 2021), investigating further dissociable and overlapping roles of ability and opinion comparisons in the context of SNS behavior is highly recommended for future research.

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