RESEARCH ARTICLE

The Role of Social Comparison and Online Social Support in Social Media Addiction Mediated by Self-Esteem and Loneliness

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Introduction: The diversity of information on social media provides a ubiquitous possibility for social comparison. Online social comparisons have both detrimental and beneficial effects; besides lowering one's self-esteem, heightening loneliness and addiction, they also bring together people with similar interests which may offer a form of social support.
Aims: This study examines a path model for understanding the link between social comparison and social media addiction while examining online social support, loneliness, and self-esteem.
Methods: Hungarian university students (N = 201, 70.6% women, aged between 18 and 30 years, SD = 2.77) completed an online survey in the spring of 2022.
Results: The final path model suggests that social comparison can directly contribute to social media addiction. This link was mediated by loneliness and self-esteem, resulting in a path with different outcomes: a) social comparison may strengthen loneliness (β = .22, p < .001) which can lead to lower self-esteem (β = .60, p < .001), and b) social comparison may have a negative effect on self-esteem (β = -.22, p < .001) which can reduce social media addiction (β = -.26, p < .001). In addition, social comparison may help obtain online social support (β = .15, p < .050) which can reduce loneliness (β = -.41, p < .001) but increase the likelihood of addiction (β = .26, p < .001).
Conclusions: These findings draw attention to the double-edged sword of social comparison and online social support: we need to learn to consciously manage online social comparison tendencies.

Keywords: social comparison, online social support, social media addiction, loneliness, self-esteem

Introduction

Social media includes various internet-based websites, services, and related tools that provide space for socializing, entertaining, and sharing content. Social networking sites are widely accessible and can help individuals with maintaining existing social connections or creating new ones, reading messages and comments, disclosing personal information, and seeking social support (Boyd & Ellison, 2007; Winstone et al., 2021). Social media has become one of the most essential platforms in our everyday life (Cheng et al., 2021). For university students, it provides important sources of information in terms of managing their studies (sharing school-related experiences, searching for notes and books). The most articulated reason for using it, however, is to communicate with other

people (Koo et al., 2015). Interestingly, people tend to be more sociable online than in face-to-face settings, partly due to differences in interacting styles, types of feedback, or cue systems (Mantzouranis et al., 2019). Among others, social comparison plays a decisive role in forming our attitudes and behavior in a virtual environment, which constitutes this study's primary focus. More precisely, we are interested in the link between social comparison and social media addiction, also including a beneficial online activity; namely, online social support, together with other psychological variables in a complex path model.

Social comparison theory, a concept initially proposed by Festinger (1954), states that individuals evaluate their own opinions and abilities by comparing themselves to others. While using upward social comparison, we compare ourselves to those we perceive as superior since they are above us in terms of physical attractiveness or abilities, downward comparison acts in the opposite way; whether these two serve as a self-enhancement or not is related to the similarity or contrast relative to others (Suls et al., 2002).

Comparing ourselves to others remains a fundamental social need, and on social networking sites, the diversity of information provides a ubiquitous possibility for social comparison. Social media provides a context for social comparison processes while viewing a number of profiles or contents which may lead to dissatisfaction, particularly generating a great exposure to upward social comparison (Haferkamp & Krämer, 2011). This form of social comparison can lead to worsening psychological well-being, lower self-esteem, and even an increase in the reporting of depressive symptoms (Appel et al., 2016; Burnell et al., 2019; Hawes et al., 2020; Vogel et al., 2014). Unfortunately, due to the nature of social media, users of these sites tend to be more prone to upward rather than downward social comparison since many people use these platforms to present positive self-image, life events, and success stories – often showing off some slightly improved version (Xiaojun et al., 2019). In the case of receiving favorable responses, the level of self-worth would be expected to rise, but this scenario does not apply across the board and can result in conflicting ideas that may lead to lower self-esteem and well-being, anxiety, or even depression (Alsunni & Latif, 2021; Samra et al., 2022; Wang et al., 2017). Consequently, depending on the users' personality and their actual psychological well-being, social comparison can either help self-enhancement or increase the likelihood of negative mental health consequences.

Among the different online activities, social networking sites are the most addictive platforms (Baccarella et al., 2018). Although social media addiction (or problematic social media use) is not officially listed and defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM−5, American Psychiatric Association, 2013), the guidelines foreshadow that this phenomenon has become a well-known concept in the general well-being literature (Pellegrino et al., 2022; Sun & Zhang, 2021). A person becomes overly engaged with social media and cannot control the urge to log on to or use social media. This behavior interferes with other important areas of life, such as neglecting social relationships or deteriorating academic performance (Kitsantas et al., 2016). When normal use develops into a problematic behavior, it may bring unfavorable health consequences including depressive symptoms (Vidal et al., 2020), worsening physical fitness (Shimoga et al., 2019), disordered eating (Wilksch et al., 2020), increased suicide risk (Sedgwick et al., 2019), and anxiety (Vannucci et al., 2017). Despite the expansive research reporting on social media addiction, further clarification is warranted on the direct and indirect roles of social comparison and other potential mediators, such as loneliness, self-esteem, or social support.

Despite contradictory experiences, social comparison processes may directly or indirectly be related to social media addiction (Kim et al., 2021). In this study, social media addiction was highly positively correlated with overall social comparison tendencies and also with all dimensions of social comparison including inspiration but also envy or anger. All these suggest that social comparison as a background variable of social media addiction should get more attention in research.

Not surprisingly, loneliness stands as one of the most important reasons for individuals to spend time on social network sites where they can easily interact with friends or strangers (Caba Machado et al., 2023; Mahapatra, 2019). Social media meets the human need for belongingness and prevents social isolation through positive self-disclosure (Park et al., 2016). Besides the feeling of social connectedness, it can also be beneficial in terms of obtaining social support (Savci et al., 2022). However, the need for belongingness does not necessarily lead to a greater level of perceived social support (Wong et al., 2019). We therefore need to know more about the positive and negative aspects of online communication, social interactions, social support, and their relationships with social media activities and any related media addiction.

Besides loneliness, self-esteem is also a relevant psychological construct regarding the use of social networking sites and social media addiction. As a subjective perception of one's overall personal worth (Rosenberg, 1979), it has a great influence on behavioral decisions. Studies usually find a negative relationship between self-esteem and

the addictive use of social media (Andreassen et al., 2017). On the other hand, social networking sites seem a safer place for people with low levels of self-esteem to present themselves as compared to the offline world. Besides, self-esteem bears a direct link to well-being; social comparison and social support also play a role in whether the outcome is favorable or not (Wang et al., 2017).

Among predictors of social media addiction, researchers emphasize social support factors (Wang & Wang, 2013). While offline social support is often found to be a protective factor insulating individuals against internet and social media addiction (van Duin et al., 2021), the results of online social support are contradictory. At one level, online social interactions tend to be positively associated with prosocial behavior that may promote voluntary activities, such as guiding and helping (Li et al., 2022). It may serve as a form of social capital, a resource of useful information, and emotional or instrumental support, even when stemming from weak ties (Maksl & Young, 2013). A great advantage is that social media can bring people together into specific groups with similar interests, thereby providing support to members when needed (Eastin & LaRose, 2005). At a much different level, online social support can contribute to internet and social media addiction (Luchtefeld & Jordan, 2022; van Duin et al., 2021). As the relationship between online social support and the latter one remains only scarcely studied, we believe that it warrants a closer inspection.

The present study builds on the above-mentioned work and explores the roles of social comparison and online social support in social media addiction. While the majority of studies concentrate on these separately, the interrelationship among them and the joint common role in social media addiction is not entirely clear. In addition, as previous studies suggest, we consider other relevant factors including self-esteem and loneliness. More precisely, we examine a path model for social comparison and social media addiction with online social support, loneliness, and self-esteem (see Figure 1 for the hypothesized model). Besides a direct positive link between social comparison and social media addiction, and loneliness and social media addiction, we also hypothesize a positive role of online social support and self-esteem's negative role in social media addiction. Furthermore, we expect that social comparison would be negatively associated with self-esteem and positively with online social support and loneliness. Finally, we assume that online social support would be negatively related to loneliness, while positively related to self-esteem. It should be noted that no study to date has examined these hypothesized relationships as we have stated here. We believe that this path model, going beyond simple regression models, allows us to see these associations in their complexity. Such a model can serve as a useful tool for understanding correlations of background variables predicting outcome variables in a cross-sectional study, even though it does not confirm cause-and-effect relationships.

Figure 1. The Hypothesized Model
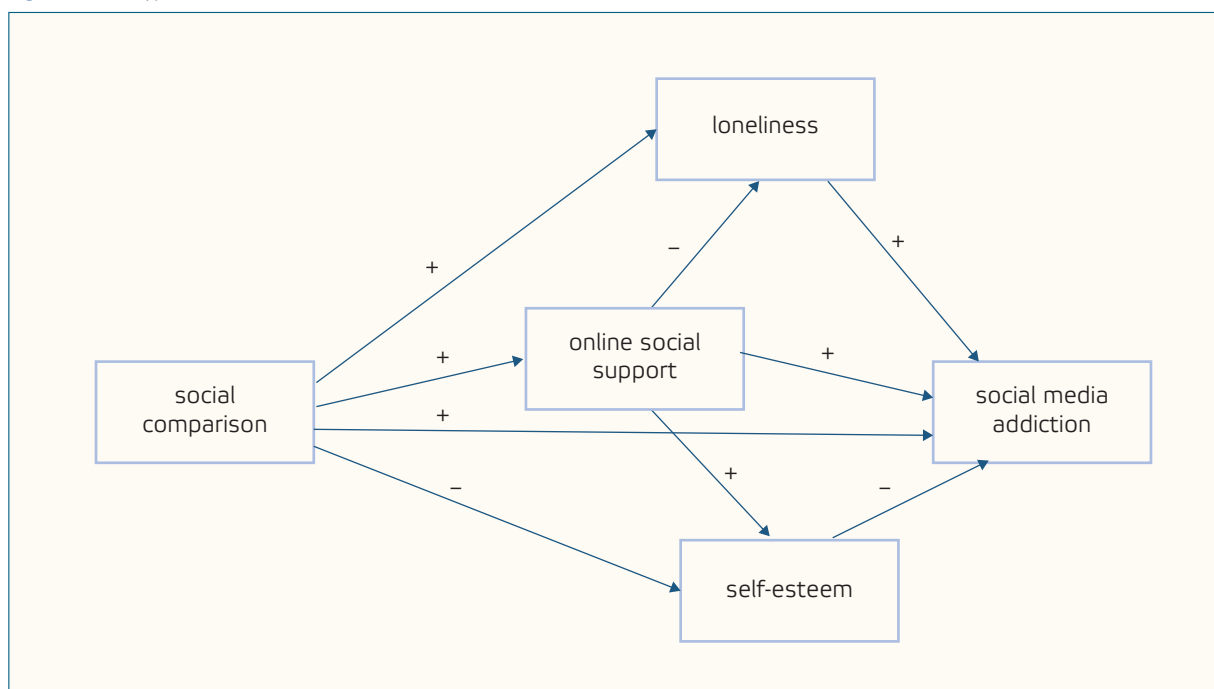
Methods

Participants and Data Collection

The present study is based on data from a cross-sectional online survey. The study procedures were carried out in accordance with the Declaration of Helsinki. The study protocol was approved by the Institutional Review Board of the Doctoral School of Education, University of Szeged, Hungary (No. 6/2021). All subjects were informed about the study and all provided informed consent. After obtaining the ethical permission, data were collected in the spring of 2022. Students of the University of Szeged were recruited via an online questionnaire package hosted on Google Forms. Calls for participation were posted on different social networking sites as well as in specific university groups and communities in which we expected higher rates of engagement. Participation was voluntary and confidential: to be eligible, students had to be 1) at least 18 years old, 2) Hungarian citizens, and 3) willing to participate in the study. Respondents were informed about the details of the study and their consent was obtained.

A total of 201 participants (70.6% women, aged between 18 and 30 years, M = 21.80 years; *SD* = 2.77) completed the questionnaire. We note the higher engagement of females while recognizing that this phenomenon is not unusual in online surveys, due to the higher willingness of women to take part and feel more comfortable responding to online surveys.

Measures

Bergen Social Media Addiction Scale (BSMAS)

The Hungarian validated version (Bányai et al., 2017) of the six-item Bergen Social Media Addiction Scale (Andreassen et al., 2017) was used to assess the level of social media addiction. The scale was adapted from the previously validated Bergen Facebook Addiction Scale (Andreassen et al., 2012). The items concern experiences occurring over the past 12 months and are rated on a five-point Likert scale ranging from 1 (very rarely) to 5 (very often) (e.g., "How often during the last year have you used social media so much that it has had a negative impact on your job/studies?"). Participants' ratings were summed across the six items of the scale to form a total "problematic social media score", with higher scores indicating a greater level of problematic use. The overall scale was reliable with a Cronbach's α = .74.

Iowa Netherlands Comparison Orientation Measure (INCOM)

The Hungarian version (Piko et al., 2005) of the Iowa Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999) was used to explore social comparison tendencies. The scale included 11 items (e.g., "I often compare myself to others with respect to what I have accomplished in life."). Participants could rate their agreement with each statement on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher score reflects a greater tendency to make social comparisons. The overall scale was reliable with a Cronbach's α = .82.

Online Social Support Scale (OSSS)

For measuring the level of online social support, the authors translated and back-translated the 40-item Online Social Support Scale (Nick et al., 2018). This self-report inventory evaluates various forms of online social support, such as guidance or attachment (e.g., "People tell me things I want to know online."), which showed evidence of a single underlying (unidimensional) factor. Answers were scored on a five-point Likert-type scale from 1 representing "never" to 5 representing "a lot"; higher summary scores reflect greater levels of online social support. The overall scale was reliable with a Cronbach's α = .97.

Rosenberg Self-Esteem Scale (RSE)

The Hungarian validated version (Sallay et al., 2014) of the Rosenberg Self-Esteem Scale (Rosenberg, 1979) was applied to measure individual self-esteem. The scale included ten items assessing positive and negative self-cognitions. Replies were scored on four-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). Negative items were first reverse-scored and then added to the sum of the positive items. Higher scores suggest greater levels of self-esteem. The overall scale was reliable with a Cronbach's α = .92.

UCLA Loneliness Scale (revised form)

We measured loneliness using the Hungarian version (Csóka et al., 2007) of the UCLA Loneliness Scale (revised form) (Russell et al., 1980). The scale contains 20 items (e.g., "I have nobody to talk to.") with ten reverse-scored items (e.g., "There are people who really understand me."). Responses were coded from 1 to 4 (indicating levels of agreement with each statement). The overall scale was reliable with a Cronbach's α = .94.

Statistical Analysis

First, after testing our data for normal distribution, descriptive statistics and correlation coefficients were calculated for study variables. As the main focus of our study, we ran structural equation modeling by IBM SPSS AMOS 24.0 to test the goodness of fit for our hypothesized model. Although the cross-sectional design does not allow us to justify cause-and-effect relationships, this model might provide useful information on associations among study variables. We based the path analysis on the maximum likelihood estimation method, and acceptable model fit criteria consisted of the following: nonsignificant chi-square value, root mean square error of approximation (RMSEA) ≤ .06, comparative fit index (CFI) ≥ .95, and standardized root mean square residual (SRMR) ≤ .08 (Hu & Bentler, 1998). Coefficients of direct and indirect effects were estimated with a bias-corrected percentile method, 2000 bootstrap samples, and a 95% confidence interval. We applied a user-defined estimated function to determine specific indirect effects within the model.

Results

Table 1 shows descriptive statistics (mean, *SD*, minimum and maximum values) for the scales, as well as zero-order correlations among the study variables. The social media addiction score was positively correlated with online social support, social comparison, and loneliness, while negatively with self-esteem: correlations varied from weak to moderate. Online social support was negatively associated with loneliness and positively (but only slightly) with social comparison and self-esteem. A moderate positive relationship existed between loneliness and social comparison, with the latter being negatively (and also moderately) related to self-esteem. Finally, we found a strong negative correlation between loneliness and self-esteem.

Regarding the hypothesized model, there was a significant chi-square value (χ^2 = 86.49, *df* = 2, *p* <.001), CFI = .57; RMSEA = .05; SRMR = .14, suggesting a poor model fit. Thus, we introduced a new path due to a strong

Table 1. Descriptives and Correlations (*N* = 201).

Variables (Min.–Max.)	Mean (SD) Skewness (SE) Kurtosis (SE)	1	2	3	4	5
1. Bergen Social Media Addiction Scale (BSMAS) (6–30)	15.54 (4.64) 0.11 (.17) −0.47 (.34)	1	.03	.37	.71	0.14
2. Online Social Support Scale (OSSS) (40–191)	111.31 (34.26) −0.07 (.17) −0.64 (.34)	.24**	1			
3. Iowa Netherlands Comparison Orientation Measure (INCOM) (15–55)	39.14 (7.62) −0.57 (.17) 0.02 (.34)	.29***	.15*	1		
4. UCLA Loneliness Scale (revised form) (20–77)	38.38 (12.18) 0.57 (.17) −0.33 (.34)	.15*	−.37***	.16*	1	
5. Rosenberg Self-Esteem Scale (RSE) (10–40)	27.90 (7.37) −0.08 (.17) −0.80 (.34)	−.27***	.16*	−.32***	−.63***	1

Notes. Correlation coefficients. **p* < .050.
***p* < .010.
****p* <.001.

Figure 2. The Final Model of Social Media Addiction with Significant Paths, Standardized Estimates and Explained Variance
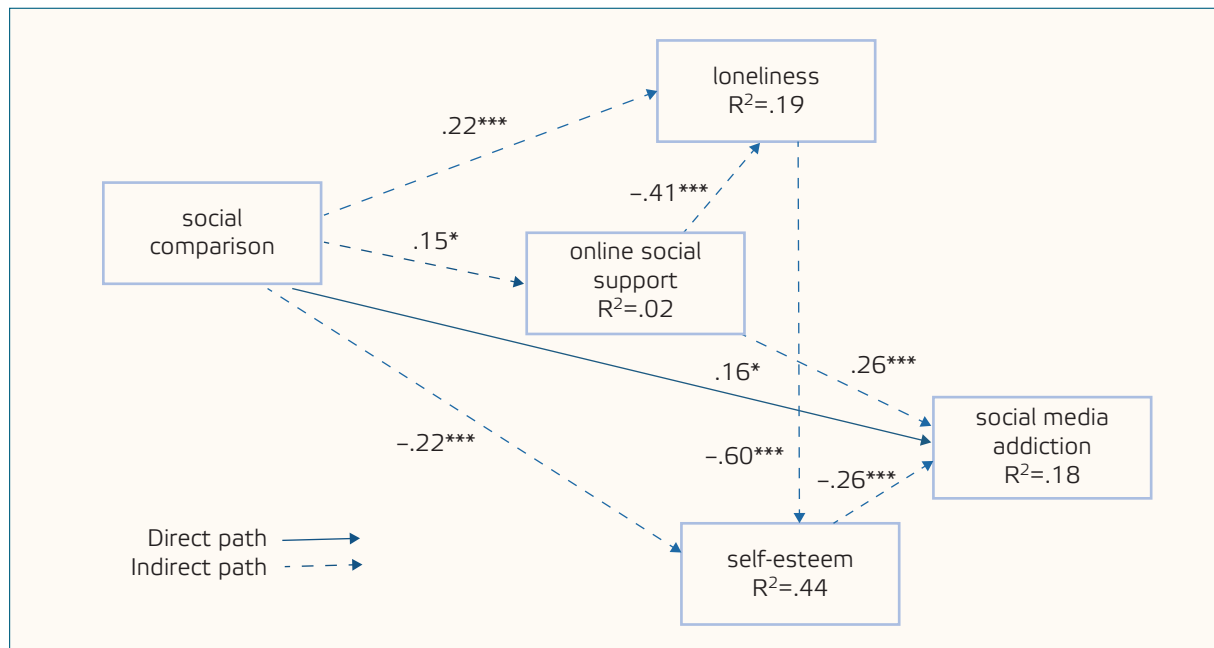
*p < .050, **p < .010, ***p < .001.

correlation between loneliness and self-esteem. The implementation of an additional path from loneliness to self-esteem resulted in a path model which had a good fit with indicators of a nonsignificant chi-square (χ^2 = 1.31; df = 1; p > .050); CFI = .99; RMSEA = .04; SRMR = .01 (see Figure 2).

Only one path from online social support to self-esteem was found to be non-significant in the hypothesized model (β = -.01; p > .050), thereby we excluded it from further analyses. Social comparison was positively associated with social media addiction (β = .16; p = .020), loneliness (β =.22; p < .001), and online social support (β = .15; p = .030), while it was negatively associated with self-esteem (β = -.22; p < .001). Loneliness was a negative correlate of self-esteem (β = -.60; p < .001). Online social support was associated with social media addiction (β = .26; p < .001) and it was negatively related to loneliness (β = -.41; p < .001). Finally, self-esteem was negatively associated with social media addiction (β = -.26; p < .001) "(see Figure 2 and Table 2).

The specific indirect effect of social comparison on social media addiction via the mediators, that is, loneliness and self-esteem, was significant. Moreover, this same effect was mediated by online social support which was significant, as well. As we expected, based on previous literature, this investigated indirect effect mediated by self-esteem was also significant. Finally, the specific indirect effect of social comparison on social media addiction mediated by online social support and loneliness was found to be significant (see Table 3).

Table 2. Unstandardized Parameters of Path Analysis

Path	B	S.E.	C.R.	p	Label
social comparison → online social support	.69	.31	2.21	.030	p5
social comparison → loneliness	.36	.10	3.44	.000	p1
online social support → loneliness	−.14	.02	−6.27	.000	p3
social comparison → self-esteem	−.21	.05	−3.99	.000	p8
online social support → self-esteem	−.01	.01	−0.48	.630	p7
loneliness → self-esteem	−.36	.04	−10.31	.000	p4
online social support → social media addiction	.04	.01	3.85	.000	p6
social comparison → social media addiction	.10	.04	2.374	.020	p2
self-esteem → social media addiction	−.17	.04	−3.78	.000	p9

Notes. Abbreviations: SE: Standard error of regression weight estimate; CR: Critical Ratio.

Table 3. Estimates of Specific Indirect Effects

Specific indirect effect	Estimate	Lower	Upper	p
social comparison → loneliness → self-esteem → social media addiction	–.010	–.022	–.001	.019
social comparison → online social support → social media addiction	.024	.003	.058	.030
social comparison → self-esteem → social media addiction	.035	.013	.075	.001
social comparison → online social support → loneliness → social media addiction	–.002	–.004	–.001	.001

Discussion

Our study aimed to further explore the role of social comparison combined with online social support, loneliness and self-esteem, and their relationship to social media addiction with special emphasis on their opposing inter-relationships. This contradiction may stem from both beneficial and unfavorable consequences of social comparison and online social support on social media platforms. Our results suggest that social comparison does appear to directly contribute to social media addiction. In addition, the association between online social support and social media addiction was also significant. Several paths – including online social support, loneliness, and self-esteem – mediated the link between social comparison and social media addiction.

Our result concerning the direct relationship of social comparison with social media addiction stands consistent with previous findings (Kim et al., 2021; Vogel et al., 2014). Despite the fact that upward social comparison may lower one's self-worth and help develop envy and even anxiety or depression (Appel et al., 2016; Haferkamp & Krämer, 2011; Hawes et al., Vogel et al., 2014; Wang et al., 2017), it may also strengthen one's positive self-concept and provide feelings of inspiration, drive, or even contentment (Kim et al., 2021). Our findings on the negative association with self-esteem and the positive one with loneliness may also support these expected relationships. Comparing ourselves to others remains a basic human need that can urge people to overuse social media to the point of addiction. This may be an explanation for social networking sites being the most popular and addictive platforms on the internet (American Psychiatric Association, 2013).

Moreover, social comparison is not necessarily upward in its direction and the individual can experience not only negative but also positive experiences from the social comparison processes. Our study also suggests that social comparison may help develop online groups for people with similar interests which results in online social support as a source of social capital (Li et al., 2022). Our results on the negative association between online social support and loneliness also imply that online social support may be a remedy for loneliness. Based on all this, we can say that social media is Janus-faced. Those having strong social comparison tendencies are more likely to experience loneliness (Dibb & Foster, 2021). However, obtaining online social support can reduce feelings of loneliness.

Despite these aforementioned beneficial effects, online social support can strengthen addiction. In the current study, online social support was positively associated with social media addiction. This finding supports previous work on the addictive role of online social support (Luchtefeld & Jordan, 2022). Those seeking and receiving social support on social media enjoy these favorable effects (Caba Machado et al., 2023; Luchtefeld & Jordan, 2022; van Duin et al., 2021). While recent studies have reported that offline social support might serve as a protective factor against internet and social media addictions (van Duin et al., 2021), our data support the controversial role of online social support. Thus, due to several differences from offline social support, relationships with social media addiction needed further examination.

Besides a direct positive contribution to social media addiction, loneliness and self-esteem also mediated the link between social comparison and social media addiction, resulting in a path with a different outcome. Namely, social comparison may strengthen loneliness, which has a negative effect on self-esteem, and finally, self-esteem can reduce the use of social networking sites and services. Self-esteem had been previously found to be a protective factor against social media addiction (Andreassen et al., 2017). This path suggests that when people do not benefit from online activities, such as obtaining social support – as these may increase loneliness and lower people's self-esteem – they are less predisposed to addiction due to negative experiences.

Strengths and Limitations

The current study provides evidence to the multiple links between social comparison, online social support, loneliness, self-esteem and social media addiction. To the best of our knowledge, this is the first study investigating these associations among the younger Hungarian population, therefore this can be understood as another novelty of our study. Despite the uniqueness of the study, we note some limitations. First, the cross-sectional study design does not allow us to justify cause-and-effect relationships. Since our data were exclusively based on self-reporting, biases may happen in evaluation of certain feelings. We included only university students (specifically students of one university whom we could reach easily on special Facebook groups). Whereas our experience indicates that this procedure would elevate the validity of replies, the nonrepresentative sampling may lower the level of generalizability. The sample size stood relatively low due to the small willingness of university students to participate; however, we decided to include only motivated and voluntary students without any pressure or providing them with financial or academic benefits. All in all, we really think that these preliminary findings would motivate further investigations into these associations with greater sample size, particularly in relation to online social support and social comparison. Future research should also include various dimensions of social comparisons in analyzing social media addiction, both online and offline. Other variables may also be included in future models, e.g., social anxiety or depression.

Conclusion, Implications, and Future Directions

In conclusion, we highlight the importance of paying attention to the double-edged sword of social comparison and online social support: despite their beneficial role in bringing together people with similar interests, they may lead to addiction. On social networking sites, people can easily get into contact with others and obtain online social support (Caba Machado et al., 2023). They may feel that belonging to an online community can satisfy their social needs which may lower their loneliness (Koo et al., 2015). While self-esteem may be protective against addiction, negative experiences through social comparison can bear a detrimental effect on one's self-worth and increase loneliness. Although online social support may foster prosocial behavior (Li et al., 2022), the more time spent online, the greater the chance to develop an addiction, thus neglecting other parts of our social life; e.g., offline social relationships (Haferkamp & Krämer, 2011; Koo et al., 2015; Mantzouranis et al., 2019).

It is a great challenge to avoid the trap of getting addicted to social media when we experience temporary beneficial events in online activities. We underscore the importance of learning to consciously manage social comparison tendencies (online, offline), which may contribute to negative cognitive concepts such as envy or anxiety, and even social media addiction. While media literacy: i.e., a skill to interpret media messages, has been recognized a long time ago, we also need to develop a training/course for university students about social media literacy to understand not only the risks and negative social and health consequences but also positivity biases on social media (Schreurs & Vandenbosch, 2022). Future research should thus focus on effective interventions towards reasonable online activities in order to avoid the trap of social media addiction without missing out on the benefits of online social support.

Author contribution
Bettina F. PIKO: conceptualization, design, methodology, investigation, project administration, data management, formal analysis, interpretation, supervision, writing original draft, writing review and editing.
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Alice HARTMANN: conceptualization, design, methodology, investigation, project administration, formal anal-

ysis, interpretation, writing review and editing.
Csaba HAMVAI: conceptualization, investigation, data management, formal analysis, interpretation, writing review and editing.
Kevin M. FITZPATRICK: conceptualization, investigation, interpretation, writing review and editing.

Declaration of interest statement
The authors declare no conflict of interest.

Ethical statement
This manuscript is the authors' original work.
All participants participated in the research voluntarily and anonymously, and provided their written informed consent to participate in this study.
The studies involving human participants were reviewed and approved by the Institutional Review Board of the Doctoral School of Education, University of Szeged Hungary (No. 6/2021).

Data Availability Statement
No datasets were presented in this article.

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