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The connection and background mechanisms of social fears and problematic social networking site use: A structural equation modeling analysis

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**ABSTRACT**

Previous research warned that internet and social media use could have a negative effect on the social lives of excessive users (Abn, 2011). Social relationships not only have a crucial role in development but the skills we learn or do not learn affect our later lives as well (Dishion and Patterson, 2015). Although interaction through the internet, e.g. using social networking sites (SNS), can have positive effects such as forming communities and fostering social support (Allen et al., 2014; Bonetti et al., 2010; Yen et al., 2012), computer-mediated communication (CMC) also comes with a serious pitfall of lacking many social cues (Postmes et al., 1998). The two major features of CMC is anonymity and the control it offers over managing social situations (Caplan, 2002; Hancock and Dunham, 2001). According to the social compensation hypothesis, i.e. individuals turn to online communication due to their difficulty in forming friendships offline (Bonetti et al., 2010; Weidman et al., 2012), these features might be the reason why socially anxious individuals – who feel uncomfortable communicating face-to-face (FTF) – prefer CMC instead (Pierce, 2009; Weidman et al., 2012; Yen et al., 2012). Similarly, the compensatory internet use theory (CIUT) (Kardefelt-Winther, 2014) proposes that different forms of problematic internet use (PIU) serve as a compensatory behavior to cope with existing problems (Wolniewicz et al., 2018) such as shyness (Chak and Leung, 2004), loneliness (Caplan, 2007), and fear of missing out (Wolniewicz et al., 2018). Thus, in the present study, we investigated whether individuals with higher levels of social anxiety are more likely to prefer CMC over FTF communication due to either the anonymity or the control offered by the internet, and SNSs in particular, over social interactions. According to the CIUT, we used increased PIU and problematic SNS use as indicators of favoring CMC over FTF communication. Our results may help to find effective preventive methods of problematic SNS use and to aid individuals with higher levels of social anxiety.

A defining characteristic of social anxiety is fear of social or performance situations in which the person is exposed to possible scrutiny by others (American Psychiatric Association, 2013; Bügels et al., 2010; Stein and Stein, 2008), that is, people with social anxiety fear that this scrutiny could be embarrassing or humiliating and that others will judge them in a negative way. Indeed, it was shown (Winton et al., 1995) that people with higher levels of social anxiety have a bias towards identifying others’ emotional expressions as negative. Fear of negative evaluation in social situations (Winton et al., 1995) and distorted negative self-beliefs (Goldin et al., 2009) could indicate a vulnerability to social anxiety; possibly because such individuals show a reduced tendency to self-favoring compared to others (de Jong, 2002). Further, low self-esteem could increase the possibility of developing problematic SNS use (Baturay and Toker, 2017). Indeed, the

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anticipation of negative evaluation by others in individuals who have lower self-esteem can result in anxiety in social situations (Kocovski and Endler, 2000). Low self-esteem (You et al., 2019) plays an important role in the development of social anxiety. The anonymity and control of the internet and CMC could set such individuals free from references to prior negative experiences related to social situations (Young and Lo, 2012). Thus, individuals with low self-esteem could also favor CMC over FTF communication. Previous studies (Pierce, 2009; Prizant-Passal et al., 2016; Yen et al., 2012) showed that social anxiety was lower in highly socially anxious individuals when using CMC, resulting in feelings of relative comfort at online platforms.

Social anxiety is a shared precursor of the development of PIU (Yen et al., 2012). It was also shown that low self-esteem was positively related to PIU (Kahraman and Demirci, 2018; Kim and Davis, 2009). While it has been proposed that psychological benefits could be derived from CMC (Allen et al., 2014; Bonetti et al., 2010; Yen et al., 2012), long-term effects of problematic SNS use could include cyberbullying behavior and depression (Kircaburun et al., 2018), higher alienation from peers (Assunção and Matos, 2017), victimization (Martínez-Ferrer et al., 2018) and loneliness (Moody, 2001). Therefore, it is vital to map possible points of intervention to help socially anxious people avoid PIU and problematic SNS use. Nonetheless, results are still mixed which could be due to the fact that the majority of the aforementioned studies are still only correlational in nature. There is a strong call (Prizant-Passal et al., 2016) to establish causal relationships between social anxiety and internet use.

In the present study we sought to test a possible model on the connection and background mechanisms of social anxiety and problematic SNS use (see Fig. 1). In this model, we hypothesized that social anxiety and self-esteem (level 1) will facilitate fear of negative evaluation in face-to-face social situations (level 2). In turn, negative evaluation would lead to heightened PIU and problematic SNS use (i.e., seeking online anonymity and control by favoring CMC communication, level 3).

2. Methods

2.1. Participants

We recruited 215 Caucasian participants (132 females), aged 18–60 years (M = 33.81, SD = 14.59) through the Internet by posting invitations on various forums and mailing lists to obtain a heterogeneous sample. The data were collected in 2019, before the COVID-19 pandemic. The participants filled out the questionnaires online, using Google Forms, on a voluntary basis. None of them reported having a psychiatric disorder. Additionally, we deleted three invalid entries (one duplication and two fakes), thus they were not analyzed. The research was approved by the Hungarian United Ethical Review Committee for Research in Psychology and was carried out in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki). Informed consent was obtained from all participants.

2.2. Materials

2.2.1. Rosenberg self-esteem scale (RSES)

The RSES contained 10 items (Urbán et al., 2014) rated on a 4-point Likert-type scale. Higher scores indicate more positive self-esteem. The Cronbach’s alpha was 0.89.

2.2.2. Fear of negative evaluation (bFNE)

We used the 8-item brief version of the FNE questionnaire (Perczel-Forintos and Kresznerits, 2017; Weeks et al., 2005). All items are rated on a 5-point Likert-type scale with higher scores implying higher fear of negative evaluation by others. The Cronbach’s alpha was 0.93.

2.2.3. Social phobia scale (SPS)

We used the 6-item version of the SPS (Peters et al., 2012) dedicated to measuring specific scrutiny fears. Although we have started the Hungarian adaptation of this scale, it has not yet been published. In the adaptation study, 3213 adults (916 males, age range 19–80, M = 29.4, SD = 12.1) completed the survey. The confirmatory factor analysis showed an acceptable fit (CFI = 0.978, TLI = 0.972, RMSEA = 0.051, 90%CI = [0.047 – 0.056], SRMR = 0.025) with factor loadings ranging from 0.67 to 0.82. Items are rated on a 5-point Likert-type scale. Higher scores indicate a higher level of social anxiety. In this study, Cronbach’s alpha was 0.87.

2.2.4. Problematic internet use questionnaire (PIUQ)

The questionnaire consists of 18 items and three subscales: obsession, neglect, and control disorder. All items are answered on a 5-point Likert-type scale. The three subscales add up to the total score, where a higher score signifies a higher level of problematic internet use (Demetrovics et al., 2008). The Cronbach’s alpha was 0.88.

2.2.5. Problematic social network site use

Problematic SNS use was measured with the Bergen Social Media Addiction Scale (BSMAS). The BSMAS contains six items reflecting core addiction elements regarding SNS use (Andreassen et al., 2016; Bányai et al., 2017). Items are rated on a 5-point Likert-type scale. Higher scores imply higher levels of problematic social media use. The

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![Diagram](image_url)

**Fig. 1.** Our proposed model on the connection and background mechanisms of social anxiety and problematic social networking site use. All reported estimates are the maximum likelihood standardized point-estimates. Statistically significant (p < .05) unstandardized point estimates are highlighted in bold and indicated with a star.
Cronbach’s alpha was 0.87.

2.3. Data analyses

We performed a Structural Equation Modelling using the JASP statistical software version 0.11.1 for Windows (JASP Team, 2019) utilizing the lavaan (v. 0.6–1) package for R (Rosseel, 2012) to assess fit measures for our proposed models. We used the diagonally weighted least squares (DWLS) estimator (Bandaloğlu, 2014). To evaluate model fit, we used the chi-square, the comparative fit index (CFI), the Tuck-er–Lewis index (TLI), and the root mean square error of approximation (RMSEA). The cutoffs for good model fit were nonsignificant chi-square (Kline, 1998), CFI and TLI values of 0.95 or greater (Hu and Bentler, 1998), RMSEA value of 0.08 or lower (Brown and Cudeck, 1992). For the indirect pathways, we also calculated the percentage of indirect effects.

3. Results

The test yielded a good model fit ($X^2(4) = 7.720, p = .102$, TLI = 0.981, CFI = 0.992, RMSEA = 0.052, 90%CI = [0.00–0.14], SRMR = 0.032). In line with our hypothesis SPS ($β = 0.55, p < .001$) and RSES ($β = -0.38, p < .001$) scores predicted bFNE ($R^2 = 0.66$). Further, bFNE predicted both PIUQ scores ($β = 0.49, p < .001$, $R^2 = 0.24$) and BSMAS ($β = 0.44, p < .001$, $R^2 = 0.19$). We did not find a direct effect from RSES or SPS to either PIUQ ($β = 0.07, p = .296$ and $β = 0.02, p = .787$, respectively) or BSMAS ($β = -0.01, p = .891$ and $β = 0.11, p = .081$, respectively). Regarding the indirect pathways, we found that SPS through bFNE predicted both PIUQ ($β = 0.27, p < .001$, 93.4%) and BSMAS ($β = 0.24, p < .001$, 65.9%) scores. Similarly, RSES predicted both PIUQ ($β = -0.19, p < .001$, 74.5%) and BSMAS ($β = -0.17, p < .001$, 95.5%) scores through bFNE. Regarding covariances, SPS and RSES ($β = -0.50, p < .001$), and PIUQ and BSMAS ($β = 0.65, p < .001$) scores showed strong covariances as expected. See Fig. 1 for the model and Table 1 for descriptive statistics of the sample on all measures used; Supplementary Table 1 lends further support to the social compensation hypothesis (Bonetti et al., 2010; Weidman et al., 2012) and the CIUT (Kardefelt-Winther, 2014) such that social anxiety and lower self-esteem could lead to favoring CMC – indicated by higher scores on problematic internet and SNS use measures – as a compensatory behavior to cope with fear of negative evaluation. The overview of the hierarchical organization of the model provides several important implications.

Social anxiety had a significant role in PIU and problematic SNS use through the mediating effect of fear of negative evaluation. According to our results, fear of negative evaluation seems to be the maladaptive social evaluating mechanism that socially anxious individuals compensate for through PIU and problematic SNS use. Features such as the anonymity, feeling of control and CMC might be more appealing for individuals who suffer in FTF situations because of their fears of others’ negative opinions. The role of the appearance of evaluation-based factors could be helpful for possible interventions such as cognitive-behavior therapy approaches focusing on averting the accretion of distorted cognitions potentially leading to social phobia (Dogaheh et al., 2011; Shirotsuki and Noda, 2019). In fact, higher levels of self-esteem could also have a protective role based on its effects on the fear of negative evaluation in our model. This is consonant with previous empirical results (Cheng et al., 2015; Perkel-Fortinos and Kresneritis, 2017) and also in line with previous research highlighting the role of self-esteem and fear of negative evaluation in social anxiety (Kocovski and Endler, 2000; You et al., 2019). Our model supports the social compensation hypothesis (Bonetti et al., 2010; Weidman et al., 2012) such that individuals who fear negative evaluation by others or having higher levels of social anxiety will favor CMC over FTF due to the reduction in social cues and the control afforded by the internet because they will feel more comfortable while communicating with others (Allen et al., 2014; Valkenburg and Peter, 2009).

The indirect pathways might also highlight relevant differences behind the motivation of PIU and problematic SNS use. That is, social anxiety through fear of negative evaluation leads to higher levels of SNS use which, as an epiphenomenon, also means higher scores on PIU. The key here could be that socially anxious individuals will rely on the heightened use of SNSs, but presumably, the ones that offer anonymity to the user (e.g. forums), i.e. “hiding” behind CMC but meanwhile maintaining the seeking for social interactions. The described mechanisms contribute to the preference of CMC above FTF, which was found to be a possible vulnerable aspect of social functioning (Postmes et al., 1998; Ruppel et al., 2017; Van Der Meiden and Veenman, 2005). Although the high correlation between PIU and problematic SNS use might also be a limitation, the shared variance (approx. 50%) showed that while these problematic behaviors share a common root, they also have unique features (Bányai et al., 2017), which might be a proof for the different motivation we discussed.

To sum up, our findings imply that personality-based constructs such as self-esteem and social anxiety could affect behavioral processes, e.g., PIU and problematic SNS use, yet the role of the mediating components is also important. Our model provides an opportunity to better understand the complex interaction of clinically relevant constructs and identify potential assets for intervention. The dispute over the relevance of FTF and CMC forms of social interactions is proved to be an ideal explanatory-framework for a better understanding of these processes. Further longitudinal research is needed to clearly and directly understand their exact role in the appearance and prevalence of internet- and social-media related behavioral addiction.

Limitations of our study include a theoretical assumption of our model placing self-esteem and social anxiety at the same level and therefore allowing a covariance between them. This technical construction does not allow us to identify a causal relationship in the case of the two root-variable, further investigations are needed to clarify the nature of the association. Another important aspect could be, in future

| Table 1 | Descriptive statistics of the sample on rosenberg self-esteem scale (RSES), Fear of negative evaluation (bFNE), Social phobia scale (SPS), Problematic internet use questionnaire (PIUQ), and Bergen social media addiction scale (BSMAS). |
|---------|-------------------------------------------------|
| RSES   | 31.92   | 16.38 | 9.67   | 28.74 | 9.98 |
| bFNE   | 6.92    | 4.42   | 8.57   | 3.84  |
| SPS    | 14      | 8      | 6      | 18    | 6   |
| PIUQ   | 40      | 40     | 30     | 66    | 24  |
| BSMAS  | 40      | 40     | 30     | 66    | 24  |
studies, the question of probable gender differences. In the case of social anxiety, the female dominance is fairly described (Asher et al., 2017), similarly, previous review articles indicate that females can be described with a relatively lower level of self-esteem compared to males (Bledorn et al., 2016). The role of these imbalances and their possible effects on the further levels of our model is still unclear. Although the main goal of the present study was to show whether social anxiety, self-esteem, and fear of negative evaluation can have a role in the development of problematic internet and SNS use, the amount of explained variance by the model indicated that there might be other key factors at play. Future research should aim to explore other major factors that could facilitate problematic SNS use and, thus, help preventive work. These limitations notwithstanding, we showed that personality-based self-reflective psychological constructs could effectively influence the behavioral level of our everyday functioning. In this process, the most important aspect is the role of the mediating variables. Identifying them and clearly define their role could provide potential and promising opportunities for working out preventive psychological options to avoid the emergence of maladaptive behaviors. Our results may also have implications on the current shift from offline to online communication during this time.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jpsychres.2020.113323.

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