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

Andras N. Zsido*, Nikolett Arato, Andras Lang, Beatrix Labadi, Diana Stecina, Szabolcs A. Bandi

Institute of Psychology, University of Pécs, Pécs, Hungary

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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. Based on the social compensation hypothesis, however, factors related to social fears could lead to problematic social networking site (SNS) use because individuals try to compensate for their offline popularity. It was shown that individuals with higher levels of social fears tend to prefer computer-mediated (CMC) instead of face to face (FTF) communication. Here, we aimed to create a model that shows the direct and indirect effects of social anxiety and self-esteem on problematic SNS use. A total of 215 participants filled out our survey including measures of social anxiety, self-esteem, fear of negative evaluation, social media and Internet addiction. Using structural equation modeling we tested the indirect and direct effects between the variables. Our results indicated that social anxiety and lower self-esteem could lead to favoring CMC over FTF communication, which may result in problematic internet (PIU) and SNS use as a compensatory behavior to cope with fear of negative evaluation. The indirect pathways might highlight relevant differences behind the motivation of PIU – anonymity – and problematic SNS use – control. Theoretical as well as practical implications are discussed.

1. Introduction

Concern arose that the internet could negatively affect the social lives of excessive users (Ahn, 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; Bögels 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

* Corresponding author.at: Institute of Psychology, University of Pécs, 6 Ifjusag Street, Pécs, Baranya H 7624, Hungary.
E-mail address: zsido.andras@pte.hu (A.N. Zsido).

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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 = [.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

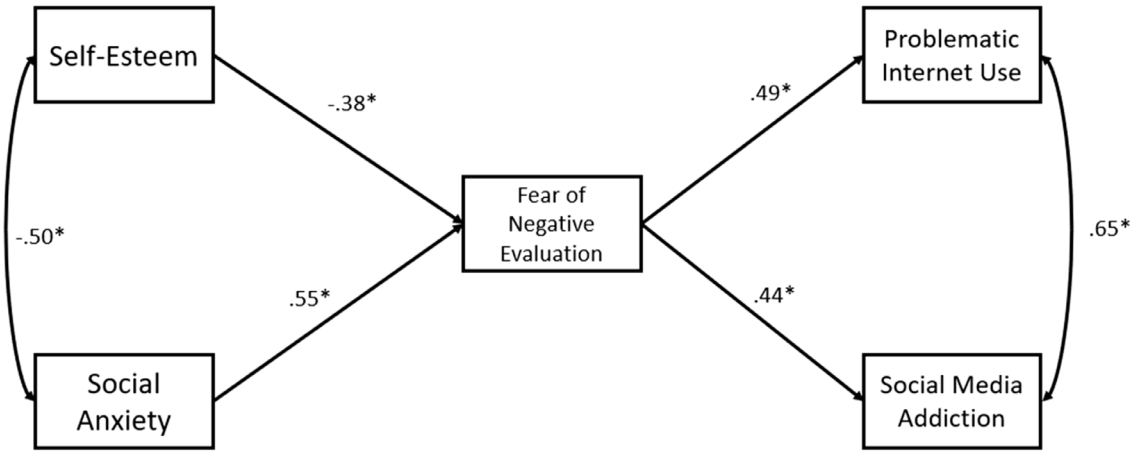

Fig. 1. Our proposed model on the connection and background mechanisms of social anxiety and problematic social networking site use. All reported estimates are the maximum likelihood standardized point-estimates. Statistically significant ($p < .05$) unstandardized point estimates are highlighted in 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 (Bandalos, 2014). To evaluate model fit, we used the chi-square, the comparative fit index (CFI), the Tucker–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 (Browne 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 = [.00 – 0.14], SRMR = 0.032). In line with our hypothesis SPS ($\beta = 0.55$, $p < .001$) and RSES ($\beta = -0.38$, $p < .001$) scores predicted bFNE ($R^2 = 0.66$). Further, bFNE predicted both PIUQ scores ($\beta = 0.49$, $p < .001$, $R^2 = 0.24$) and BSMAS ($\beta = 0.44$, $p < .001$, $R^2 = 0.19$). We did not find a direct effect from RSES or SPS to either PIUQ ($\beta = 0.07$, $p = .296$ and $\beta = 0.02$, $p = .787$, respectively) or BSMAS ($\beta = -0.01$, $p = .891$ and $\beta = 0.11$, $p = .081$, respectively). Regarding the indirect pathways, we found that SPS through bFNE predicted both PIUQ ($\beta = 0.27$, $p < .001$, 93.4%) and BSMAS ($\beta = 0.24$, $p < .001$, 65.9%) scores. Similarly, RSES predicted both PIUQ ($\beta = -0.19$, $p < .001$, 74.5%) and BSMAS ($\beta = -0.17$, $p < .001$, 95.5%) scores through bFNE. Regarding covariances, SPS and RSES ($\beta = -0.50$, $p < .001$), and PIUQ and BSMAS ($\beta = 0.65$, $p < .001$) 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 shows the unstandardized coefficients and confidence intervals. See Supplementary Table 2 for correlational coefficients between the variables included in the model.

4. Discussion

The goal of our study was to test a model on the connection and background mechanisms of social anxiety and problematic SNS use. We proposed that higher levels of social anxiety and lower self-esteem will facilitate fear of negative evaluation. Through fear of negative evaluation, these would lead to problematic internet use and problematic SNS use, probably due to favoring CMC over FTF communication. Our results are in line with that of previous studies (Pierce, 2009; Stein et al., 2001; Stein and Stein, 2008; Weidman et al., 2012; Yen et al., 2012) showing that highly socially anxious individuals prefer using CMC over FTF because it reduced their anxiety. The novelty of the present study is that we showed that heightened social anxiety as well as low self-esteem could result in the overuse of the Internet and SNSs and that this happens due to fear of negative evaluation of others. Our findings may lend 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.

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	bFNE	SPS	PIUQ	BSMAS
Mean	31.92	16.38	9.67	28.74	9.98
Standard deviation	6.09	7.46	4.42	8.57	3.84
Minimum	14	8	6	18	6
Maximum	40	40	30	66	24

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; Perczel-Forintos and Kresznerits, 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 *control* over social interactions offered by social media sites. In contrast, negative self-esteem and fear of negative evaluation could also lead to 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 Meijden 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 aspects 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

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 (Bleidorn 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 due to the COVID-19 pandemic. Although this shift might result in heightened PIU and problematic SNS use, but perceived social support could be a protective factor in terms of psychological well-being (Vine et al., 2019; Zeidner et al., 2016). Accordingly, overuse of the internet and SNSs for social purposes can have a positive effect 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.psychres.2020.113323.

References

Ahn, J., 2011. The effect of social network sites on adolescents' social and academic development: current theories and controversies. J. Am. Soc. Inf. Sci. Technol. 62, 1435–1445. https://doi.org/10.1002/asi.21540.

Allen, K.A., Ryan, T., Gray, D.L., McInerney, D.M., Waters, L., 2014. Social media use and social connectedness in adolescents: the positives and the potential pitfalls. Aust. Educ. Dev. Psychol. https://doi.org/10.1017/edp.2014.2.

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. Author, Washington, DC.

Andreassen, S.C., Billieux, J., Griffiths, M.D., Kuss, D.J., Demetrovics, Z., Mazzoni, E., Pallesen, S., 2016. The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: a large-scale cross-sectional study. Psychol. Addict. Behav. 30, 252–262. https://doi.org/10.1037/adb0000160.

Asher, M., Asnaani, A., Aderka, I.M., 2017. Gender differences in social anxiety disorder: a review. Clin. Psychol. Rev. https://doi.org/10.1016/j.cpr.2017.05.004.

Assunção, R., Matos, P.M., 2017. Adolescents' profiles of problematic Facebook use and associations with developmental variables. Comput. Hum. Behav. 75, 396–403. https://doi.org/10.1016/J.CHB.2017.05.034.

Bandalos, D.L., 2014. Relative performance of categorical diagonally weighted least squares and robust maximum likelihood estimation. Struct. Equ. Model. 21, 102–116. https://doi.org/10.1080/10705511.2014.859510.

Bányai, F., Zsila, Á., Király, O., Maraz, A., Elekes, Z., Griffiths, M.D., Andreassen, C.S., Demetrovics, Z., 2017. Problematic social media use: results from a large-scale nationally representative adolescent sample. PLoS ONE 12, e0169839. https://doi.org/10.1371/journal.pone.0169839.

Baturay, M.H., Toker, S., 2017. Self-esteem shapes the impact of GPA and general health on facebook addiction. Soc. Sci. Comput. Rev. 35, 555–575. https://doi.org/10.1177/0894439316656606.

Bleidorn, W., Arslan, R.C., Denissen, J.J.A., Rentfrow, P.J., Gebauer, J.E., Potter, J., Gosling, S.D., 2016. Age and gender differences in self-esteem - a cross-cultural window. J. Pers. Soc. Psychol. 111, 396–410. https://doi.org/10.1037/pspp0000078.

Bögels, S.M., Alden, L., Beidel, D.C., Clark, L.A., Pine, D.S., Stein, M.B., Voncken, M., 2010. Social anxiety disorder: questions and answers for the DSM-V. Depress. Anxiety 27, 168–189. https://doi.org/10.1002/da.20670.

Bonetti, L., Campbell, M.A., Gilmore, L., 2010. The relationship of loneliness and social anxiety with children's and adolescents' online communication. Cyberpsychol. Behav. Soc. Netw. 13, 279–285. https://doi.org/10.1089/cyber.2009.0215.

Browne, M.W., Cudeck, R., 1992. Alternative ways of assessing model fit. Sociol. Methods Res. 21, 230–258. https://doi.org/10.1177/0049124192021002005.

Caplan, S.E., 2007. Relations among loneliness, social anxiety, and problematic internet use. Cyberpsychol. Behav 10, 234–242. https://doi.org/10.1089/cpb.2006.9963.

Caplan, S.E., 2002. Problematic Internet use and psychosocial well-being: development of a theory-based cognitive–behavioral measurement instrument. Comput. Hum. Behav. 18, 553–575. https://doi.org/10.1016/S0747-5632(02)00004-3.

Chak, K., Leung, L., 2004. Shyness and locus of control as predictors of internet addiction and internet use. Cyberpsychol. Behav 7, 559–570. https://doi.org/10.1089/cpb.2004.7.559.

Cheng, G., Zhang, D., Ding, F., 2015. Self-esteem and fear of negative evaluation as mediators between family socioeconomic status and social anxiety in Chinese emerging adults. Int. J. Soc. Psychiatry 61, 569–576. https://doi.org/10.1177/0020764014565405.

de Jong, P.J., 2002. Implicit self-esteem and social anxiety: differential self-favouring effects in high and low anxious individuals. Behav. Res. Ther. 40, 501–508. https://doi.org/10.1016/S0005-7967(01)00022-5.

Demetrovics, Z., Szeredi, B., Rózsa, S., 2008. The three-factor model of internet addiction: the development of the problematic internet use questionnaire. Behav. Res. Methods 40, 563–574. https://doi.org/10.3758/BRM.40.2.563.

Dishion, T.J., Patterson, G.R., 2015. The development and ecology of antisocial behavior in children and adolescents. Developmental Psychopathology. John Wiley & Sons, Inc., Hoboken, NJ, USA, pp. 503–541. https://doi.org/10.1002/9780470939406.ch13.

Dogaheh, E.R., Mohammadkhani, P., Dolatshahi, B., 2011. Comparison of group and individual cognitive-behavioral therapy in reducing fear of negative evaluation. Psychol. Rep. 108, 955–962. https://doi.org/10.2466/02.21.PR0.108.3.955-962.

Goldin, P.R., Manber-Ball, T., Werner, K., Heimberg, R., Gross, J.J., 2009. Neural mechanisms of cognitive reappraisal of negative self-beliefs in social anxiety disorder. Biol. Psychiatry 66, 1091–1099. https://doi.org/10.1016/j.biopsych.2009.07.014.

Hancock, J.T., Dunham, P.J., 2001. Impression formation in computer-mediated communication revisited: an analysis of the breadth and intensity of impressions. Commun. Res. 28, 325–347. https://doi.org/10.1177/009365001028003004.

Hu, L., Bentler, P.M., 1998. Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification. Psychol. Methods 3, 424–453. https://doi.org/10.1037/1082-989X.3.4.424.

JASP Team,2019. JASP (Version 0.10.2)[*Computer software*].

Kahraman, Ö., Demirci, E.Ö., 2018. Internet addiction and attention-deficit-hyperactivity disorder: effects of anxiety, depression and self-esteem. Pediatr. Int. 60, 529–534. https://doi.org/10.1111/ped.13573.

Kardefelt-Winther, D., 2014. A conceptual and methodological critique of internet addiction research: towards a model of compensatory internet use. Comput. Hum. Behav. 31, 351–354. https://doi.org/10.1016/J.CHB.2013.10.059.

Kim, H.-.K., Davis, K.E., 2009. Toward a comprehensive theory of problematic Internet use: evaluating the role of self-esteem, anxiety, flow, and the self-rated importance of Internet activities. Comput. Hum. Behav. 25, 490–500. https://doi.org/10.1016/J.CHB.2008.11.001.

Kircaburun, K., Demetrovics, Z., Király, O., Griffiths, M.D., 2018. Childhood Emotional Trauma and Cyberbullying Perpetration Among Emerging Adults: a Multiple Mediation Model of the Role of Problematic Social Media Use and Psychopathology. Int. J. Ment. Health Addict. 1–19. https://doi.org/10.1007/s11469-018-9941-5.

Kline, R.B., 1998. Structural Equation Modeling. The Guilford Press, New York, NY, US.

Kocovski, N.L., Endler, N.S., 2000. Social anxiety, self-regulation, and fear of negative evaluation. Eur. J. Pers. 14, 347–358. https://doi.org/10.1002/1099-0984(200007/08)14:4<347::AID-PER381>3.0.CO;2-7.

Martínez-Ferrer, B., Moreno, D., Musitu, G., 2018. Are adolescents engaged in the problematic use of social networking sites more involved in peer aggression and victimization? Front. Psychol. 9, 801. https://doi.org/10.3389/fpsyg.2018.00801.

Moody, E.J., 2001. Internet use and its relationship to loneliness. Cyberpsychology Behav 4, 393–401. https://doi.org/10.1089/109493101300210303.

Perczel-Forintos, D., Kresznerits, S., 2017. Szociális szorongás és önértékelés: a „Félelem a negatív megítéléstől" (FÉLNE) kérdőív hazai adaptációja. Orv. Hetil. 158, 843–850. https://doi.org/10.1556/650.2017.30755.

Peters, L., Sunderland, M., Andrews, G., Rapee, R.M., Mattick, R.P., 2012. Development of a short form social interaction anxiety (SIAS) and social phobia scale (SPS) using nonparametric item response theory: the SIAS-6 and the SPS-6. Psychol. Assess. 24, 66–76. https://doi.org/10.1037/a0024544.

Pierce, T., 2009. Social anxiety and technology: face-to-face communication versus technological communication among teens. Comput. Hum. Behav. 25, 1367–1372. https://doi.org/10.1016/J.CHB.2009.06.003.

Postmes, T., Spears, R., Lea, M., 1998. Breaching or building social boundaries? SIDE-effects of computer-mediated communication. Commun. Res 25, 689–715. https://doi.org/10.1177/009365098025006006.

Prizant-Passal, S., Shechner, T., Aderka, I.M., 2016. Social anxiety and internet use – a meta-analysis: what do we know? What are we missing? Comput. Hum. Behav 62, 221–229. https://doi.org/10.1016/J.CHB.2016.04.003.

Rosseel, Y., 2012. Lavaan: an R package for structural equation modeling. J. Stat. Softw. 48. https://doi.org/10.18637/jss.v048.i02.

Ruppel, E.K., Gross, C., Stoll, A., Peck, B.S., Allen, M., Kim, S.Y., 2017. Reflecting on connecting: meta-analysis of differences between computer-mediated and face-to-face self-disclosure. J. Comput. Commun. 22, 18–34. https://doi.org/10.1111/jcc4.12179.

Shirotsuki, K., Noda, S., 2019. Cognitive behavior therapy and mindfulness-based intervention for social anxiety disorder, in: anxiety disorders - from childhood to adulthood. Intech Open. https://doi.org/10.5772/intechopen.79345.

Stein, M.B., Chartier, M.J., Lizak, M.V., Jang, K.L., 2001. Familial aggregation of anxiety-related quantitative traits in generalized social phobia: clues to understanding ?disorder? heritability? Am. J. Med. Genet. 105, 79–83. https://doi.org/10.1002/1096-8628(20010108)105:1<79::AID−AJMG1067>3.0.CO;2-F.

Stein, M.B., Stein, D.J., 2008. Social anxiety disorder. Lancet 371, 1115–1125. https://doi.org/10.1016/S0140-6736(08)60488-2.

Urbán, R., Szigeti, R., Kökönyei, G., Demetrovics, Z., 2014. Global self-esteem and method effects: competing factor structures, longitudinal invariance, and response styles in adolescents. Behav. Res. Methods 46, 488–498. https://doi.org/10.3758/s13428-013-0391-5.

Valkenburg, P.M., Peter, J., 2009. Social consequences of the Internet for adolescents: a decade of research. Curr. Dir. Psychol. Sci. 18, 1–5. https://doi.org/10.1111/j.1467-8721.2009.01595.x.

Van Der Meijden, H., Veenman, S., 2005. Face-to-face versus computer-mediated communication in a primary school setting. Comput. Hum. Behav. 21, 831–859. https://doi.org/10.1016/j.chb.2003.10.005.

Vine, V., Hilt, L.M., Marroquín, B., Gilbert, K.E., 2019. Socially oriented thinking and the biological stress response: thinking of friends and family predicts trajectories of salivary cortisol decline. Psychophysiology 56. https://doi.org/10.1111/psyp.13461.

Weeks, J.W., Heimberg, R.G., Fresco, D.M., Hart, T.A., Turk, C.L., Schneier, F.R., Liebowitz, M.R., 2005. Empirical validation and psychometric evaluation of the brief fear of negative evaluation scale in patients with social anxiety disorder. Psychol. Assess. 17, 179–190. https://doi.org/10.1037/1040-3590.17.2.179.

Weidman, A.C., Fernandez, K.C., Levinson, C.A., Augustine, A.A., Larsen, R.J., Rodebaugh, T.L., 2012. Compensatory internet use among individuals higher in social anxiety and its implications for well-being. Pers. Individ. Dif. 53, 191–195. https://doi.org/10.1016/J.PAID.2012.03.003.

Winton, E.C., Clark, D.M., Edelmann, R.J., 1995. Social anxiety, fear of negative evaluation and the detection of negative emotion in others. Behav. Res. Ther. 33, 193–196. https://doi.org/10.1016/0005-7967(94)E0019-F.

Wolniewicz, C.A., Tiamiyu, M.F., Weeks, J.W., Elhai, J.D., 2018. Problematic smartphone use and relations with negative affect, fear of missing out, and fear of negative and positive evaluation. Psychiatry Res 262, 618–623. https://doi.org/10.1016/j.psychres.2017.09.058.

Yen, J.-Y., Yen, C.-F., Chen, C.-S., Wang, P.-W., Chang, Y.-H., Ko, C.-H., 2012. Social anxiety in online and real-life interaction and their associated factors. Cyberpsychol. Behav. Soc. Netw. 15, 7–12. https://doi.org/10.1089/cyber.2011.0015.

You, Z., Zhang, Y., Zhang, L., Xu, Y., Chen, X., 2019. How does self-esteem affect mobile phone addiction? The mediating role of social anxiety and interpersonal sensitivity. Psychiatry Res 271, 526–531. https://doi.org/10.1016/J.PSYCHRES.2018.12.040.

Young, C.M.Y., Lo, B.C.Y., 2012. Cognitive appraisal mediating relationship between social anxiety and internet communication in adolescents. Pers. Individ. Dif. 52, 78–83. https://doi.org/10.1016/J.PAID.2011.09.001.

Zeidner, M., Matthews, G., Shemesh, D.O., 2016. Cognitive-social sources of wellbeing: differentiating the roles of coping style, social support and emotional intelligence. J. Happiness Stud. 17, 2481–2501. https://doi.org/10.1007/s10902-015-9703-z.