



Problematic Facebook use and anxiety concerning use of social media in mothers and their offspring: An actor–partner interdependence model



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ABSTRACT

Previous research has shown significant and positive associations between social anxiety of parents and their adolescent offspring. The main aim of this study was to investigate this relationship in the social media (SM) context. We tested one hundred and fifty-two couples comprising mothers and their adolescent offspring (12–14 years old) on their levels of problematic Facebook use (PFU) and social anxiety concerning SM use. An actor–partner interdependence model highlighted the positive relationship between the PFU scores of mothers and their offspring on the levels of SM social anxiety in the offspring. We discuss the results in the context of intergenerational transfer of problematic technology use and social anxiety.

1. Introduction

Many people make regular use of social networking sites (SNSs), which have become central to the lives of individuals. The numbers of Facebook users, the most famous SNS, serve as evidence. In early 2008, there were about 69 million active users worldwide, whereas in early 2019, the number had grown to more than 2.45 billion (Statista, 2019). Its accessibility has allowed Facebook to deeply penetrate into the everyday lives of its users, to the extent that for some people, a deliberate effort to stay away from the social medium has been considered an act of “self-sacrifice” (Lee-Won, Herzog, & Park, 2015).

On one hand, SNSs offer unique opportunities to communicate with others (McKenna & Bargh, 2000), maintaining and improving networks of real friendship (Chakraborty, 2016), fostering social capital (Ellison, Stainfield, & Lampe, 2007), facilitating support exchange (Nabi, Prestin, & So, 2013), and engaging in peer-to-peer comparisons, with self-presentation and self-confidence related to SNS as elements contributing to the definition of one’s identity, especially among adolescents (Boursier & Manna, 2018; McLean, Jarman, & Rodgers, 2019). On the other hand, an impressive amount of research shows that excessive use of Facebook may cause distress, sadness, and concern over negative evaluation (High & Caplan, 2009; McKenna & Bargh, 2000; Vannucci, Flannery, & Ohannessian, 2017). These evaluations can occur during interactions with the others and when individuals receive undesirable feedback or engage in negative social comparison.

Due to negative feedback and interactions, feelings of anxiety may emerge that are closely related to online social life. The role of social

anxiety (SA) arising from social media (SM) platforms is still understudied, but it is likely that it affects types of online social interaction and communication, development of privacy concerns, and fear of being negatively evaluated by others, and it might even evoke avoidance behaviors on SNSs (Alkis, Kadirhan, & Sat, 2017).

The main aim of the current study was to shed light on the relationship between problematic SNS use and SM anxiety in adolescents, with particular attention to the role that problematic SNS use of mothers might play in this relationship.

1.1. Social anxiety and problematic social networking site use

SA refers to an excessive fear or anxiousness connected with unfamiliar social situations (e.g., going to a party, talking to peers or strangers, meeting new people, speaking in public, eating in public, working in groups) in which individuals think others may negatively evaluate them. These situations are frequently avoided or endured with intense fear or anxiety disproportionate to the level of threat posed by the actual situation (American Psychiatric Association, 2013). Individuals show behaviours that are in line with their subjective states, such as sweating, trembling, and fidgeting during social interactions perceived as threatening (Stein & Stein, 2008). These avoidance behaviours are associated with a restriction of the social world and can cause problems in a lot of different domains, such as a higher risk of early school dropout (Stein & Kean, 2000), online and offline victimization (Jimenez & Estevez, 2017), and problematic Internet use (Stavropoulos et al., 2017). Research has shown that SA is linked with negative

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experiences in the relationship with parents (Schimmenti & Bifulco, 2015). Also, several studies found that SA is associated with depression (Beesdo et al., 2007), suicide attempts (Bolton et al., 2008), increased risk of alcohol dependence, and substance abuse (Black et al., 2015). It is one of the most common forms of adolescent psychopathology (Di Blasi et al., 2015). It has an early onset and quickly increases after the age of 9, reaching its peak between 10 and 17 years (Beesdo et al., 2007). Following the self-presentation theory (High & Caplan, 2009), SA may be generated from a desire to create a positive impression on the interaction partner matched with a subjective appraisal of personal inadequacies to achieve one's self-presentation goals. In this context, SNSs have taken a central role for individuals with social interaction difficulties. Research shows that individuals with high levels of SA tend to prefer text-based interactions more than face-to-face communications, thanks to an increased sense of anonymity and a reduction in concern over appearance (McKenna & Bargh, 2000). Therefore, in many cases, electronic interactions might play an important role in mitigating SA problems by reducing its related concerns (High & Caplan, 2009).

However, excessive or otherwise problematic SM use has the potential to generate or increase SA (Schimmenti & Caretti, 2017). In fact, a research area that has been considered very close to research on SA concerning SM is related to "problematic social media use." With this term, we refer to difficulties in controlling the time spent on SNSs and to withdrawal responses when an individual cannot access SM (High & Caplan, 2009; Prizant-Passal, Shechner, & Aderka, 2016). Over the past few years, most research on problematic SNS use has been specifically focused on problematic Facebook use (PFU; see Dempsey, O'Brien, Tiamiyu, & Elhai, 2019; Lee-Won et al., 2015; Marino, Vieno, Altoè, & Spada, 2017). In this context, the Generalized Problematic Internet Use model (GPIU; Caplan, 2010), predicts that individuals who prefer to interact in online social environments may use the Internet to regulate their moods, thus being more likely to engage in an excessive use of the Internet, which in turn predicts negative outcomes, such as SA. This model may offer a good base for investigating PFU, because it focuses on elements that are specifically implicated in this potentially addictive behaviour, namely preference for online social interactions, Internet use for cognitive and emotional regulation, and negative consequences of maladaptive use of the Internet (Marino et al., 2017).

There is broad consensus in literature on the positive relationship between PFU and SA, but little is known on the direction of such association. In fact, some literature suggests that SA constitutes an important risk factor for the development of problematic SM use (Bodroža & Jovanović, 2016; Casale & Fioravanti, 2015); while others empirical findings showed that PFU may increase levels of anxiety symptoms (McCor, Rodebaugh & Levinson, 2014; Shaw, Timapano, Tran & Joormann, 2015; Vannucci et al., 2017).

Research has shown that the family has a key role in the intergenerational transmission of SA (Brook & Schmidt, 2008). According to Van der Bruggen, Stams, and Bögels (2008), inappropriate parenting can increase children's perception of threat (Rapee, 2001), thus reducing their perceived threat control (Chorpita & Barlow, 1998) or limiting their opportunities to explore their surroundings and to learn how to cope with unexpected environmental events (Barlow, 2002). Furthermore, parents who suffer from anxiety themselves tend to transfer their anxiety about social situations to their children, preventing children's normal acquisition of social skills (Ollendick & Hirshfeld-Becker, 2002). This might be particularly relevant for addiction research, which already showed that several addictive behaviors, such as smoking (Brook, Rubenstone, Zhang, Finch, & Brook, 2013), alcoholism (Kendler, Ohlsson, Sundquist, & Sundquist, 2018), and gambling (Dowling et al., 2018), are intergenerationally transmitted.

Surprisingly, the intergenerational transmission of problematic SM use has been scarcely investigated. From an intergenerational perspective, it is likely that PFU in parents increases the risk to develop both PFU and SA concerning SM use in their offspring. For example, PFU in children might be developed via social learning and imitation of

problematic parental behaviours in Facebook (Bandura, 1977; Burke, Wozzidlo, & Segrin, 2013), whereas SA concerning SM use in the offspring might represent the effect of the children's overinvolvement in Facebook and of their excessive reliance on this social media to affirm a positive social identity (Casale & Fioravanti, 2015). An excessive emotional investment on Facebook use to develop a positive self-image, in turn, might be further reinforced by observing a parental excessive or otherwise inappropriate use of this SM.

2. The current study

Further research is needed to clarify the role of problematic SM use in the development of SA symptoms among adolescents. In fact, adolescence is a particular time in the life of an individual for the creation of personal identity, in which experimentation in one's own behaviour takes place in all existing social spaces. Thus SNSs become places where adolescents test new forms of interaction, and in which problematic media use could be linked with SA concerns.

Therefore, in the present study, we aimed to analyse the relationship between problematic SM use and SA according to a somewhat different logic than what has been observed so far in the literature, hypothesizing that problematic behaviour on SM could affect SA. In this context, we hypothesized from a developmental and transactional perspective that PFU in mothers could affect the development of SA concerning SM use in their offspring. We also investigated the opposite effect (i.e., that adolescents' PFU may increase SA concerning SM use in mothers) because we believed it deserved empirical testing, regardless of its unlikelihood.

Accordingly, in this study, we tested the actor-partner effect of PFU in mothers and their offspring on SA concerning SM use in the couple via an actor-partner interdependence model (APIM; Kashy & Kenny, 2000), which examines the reciprocal influence of the members of a couple.

3. Method

3.1. Participants

One hundred and fifty-two couples of mothers (mean age = 43.70; $SD = 4.60$) and their offspring (mean age = 13.70; $SD = 0.55$; 42.7% female) participated in this study. The racial/ethnic breakdown of the sample was: 90.9% Caucasian, 6.5 Africans, 2.6% Asian. The dyads were recruited in a school context. Students from eleven classes (8th and 9th grade) and their mothers were contacted, after approval of the study by the dean of the school. We informed the participants about the aim of the research (no incentives were given) and their mothers provided written informed consent. Of 200 eligible dyads (mothers and their adolescent son or daughter who both used Facebook), 152 completed the questionnaires entirely. Forty-eight couples were excluded from the study because only the mother or the son completed the questionnaires. Students were contacted during school hours, and they were asked to respond to a questionnaire concerning their SNS use. The maximum time allowed for compilation was thirty minutes. Each student was asked to bring home a copy of the questionnaire and ask his or her mother to fill it. The questionnaire was delivered to one of the teachers, and then returned to the researchers. We assigned a key code for each couple and made the questionnaires anonymous. All procedures performed were in accordance with the ethical standards of the institutional research committee and the Helsinki declaration.

3.2. Measures

3.2.1. Social anxiety concerning social media use

SA concerning SM use was assessed with the 21-item Social Anxiety Scale for Social Media Users (SAS-SMU; Alkis et al., 2017). The scale measures SA concerning SM platforms by examining different

dimensions such as shared content anxiety, privacy concern anxiety, interaction anxiety, and self-evaluation anxiety. An example item from this scale (1 = *never* to 5 = *always*; $\alpha = 0.88$) is, “I am concerned about being ridiculed by others for the content I have shared.”

3.2.2. Problematic Facebook use

PFU was assessed with the Problematic Facebook Use Scale (PFUS; Marino et al., 2017), which assesses problematic use of Facebook among male and female adolescents and young adults. The participants were asked to show their agreement on an 8-point scale (1 = *definitely disagree* to 8 = *definitely agree*; $\alpha = 0.91$). A sample item is, “I prefer communicating with people online rather than face-to-face.”

3.3. Statistical analysis

We computed descriptive statistics for all variables in the study. We calculated Pearson’s *r* coefficients to examine the associations among scores on SA concerning SM use and PFU reported by adolescents and their mothers. We also calculated correlations between these variables and mothers’ and offspring’s age. An APIM was employed to test the effects of PFU on SA concerning SM use in the mother–offspring dyads, controlling for sociodemographic covariates, such as gender, age of adolescents, and age of their mothers. The APIM allowed us to estimate the influence of one variable on the other in the same individual (i.e., actor effect) and concurrently the reciprocal effects between the dyad members (i.e., partner effect; Cook & Kenny, 2005). We performed the APIM analysis via the APIM_SEM app (Stas, Kenny, Mayer, & Loeyes, 2018).

4. Results

Descriptive statistics and correlations are reported in Table 1. Adolescents’ age was negatively correlated with mothers’ scores on PFU; all scores on SA concerning SM use and PFU correlated positively among them. The model investigated through APIM analysis is reported in Fig. 1. The overall test of distinguishability, in which a model comparison is performed between a model with distinguishable members and a model with indistinguishable members, was significant, $\chi^2(15) = 38.31, p < 0.001$; thus, our data analytic approach in which the members of the dyads were considered distinguished was supported.

The actor effect for mothers (mothers’ PFU predicting mothers’ SA concerning SM use) was positive and significant ($B = 0.12, 95\% \text{ CI } [0.01, 0.22]; \beta = 0.23, \text{ partial } r = 0.18, p = 0.026$). The actor effect for offspring (adolescents’ PFU predicting adolescents’ SA concerning SM use) was also positive and significant ($B = 0.25, 95\% \text{ CI } [0.12, 0.38]; \beta = 0.34, \text{ partial } r = 0.29, p < 0.001$). The overall actor effect was $B = 0.19$ and was significant ($95\% \text{ CI } [0.11, 0.26], p < 0.001$).

The partner effect from offspring to mothers (adolescents’ PFU predicting mothers’ SA concerning SM use) was $B = 0.09$, which was not significant, as expected ($95\% \text{ CI } [-0.02, 0.19]; \beta = 0.12, \text{ partial } r = 0.14, p = 0.113, \text{ ns}$). The partner effect from mothers to offspring (mothers’ PFU predicting adolescents’ SA concerning SM use) was positive and significant ($B = 0.19, 95\% \text{ CI } [0.07, 0.31]; \beta = 0.25, \text{ partial } r = 0.25, p = 0.003$). The overall partner effect was significant ($B = 0.14, 95\% \text{ CI } [0.06, 0.22], p < 0.001$).

Table 1
Descriptive statistics and bivariate correlations.

	M(SD)	1	2	3	4	5	6
1. Age mothers	13.70(0.55)	–					
2. Age children	43.70(4.60)	0.064	–				
3. Problematic Facebook Use mothers	2.09(0.85)	0.025	–0.209**	–			
4. Problematic Facebook Use children	2.12(0.80)	–0.012	0.158	0.201*	–		
5. Social Anxiety on SM mother	2.42(0.53)	0.069	0.032	0.203	0.173*	–	
6. Social Anxiety on SM children	2.87(0.69)	–0.043	–0.031	0.301**	0.330**	0.425**	–

Note. * $p < 0.05$; ** $p < 0.01$; two-tailed.

The effects of sociodemographic covariates were not statistically significant. The effects of the age of offspring on both mothers’ and offspring’s SA concerning SM use were, respectively, $B = 0.04 (95\% \text{ CI } [-0.11, 0.20], \beta = 0.08, p = 0.578, \text{ ns})$ and $B = -0.04 (95\% \text{ CI } [-0.23, 0.15], \beta = 0.10, p = 0.713, \text{ ns})$. The effects of mothers’ age on both mothers’ and offspring’s SA concerning SM use were, respectively, $B = 0.01 (95\% \text{ CI } [-0.01, 0.03], \beta = 0.01, p = 0.443, \text{ ns})$ and $B = -0.01 (95\% \text{ CI } [-0.03, 0.01], \beta = 0.01, p = 0.432, \text{ ns})$. The adolescents’ gender (coded as 1 = male, 2 = female) did not significantly affect the scores on SA concerning SM use: The effect for mothers was $B = -0.01 (p = 0.890, \text{ ns})$, and the effect for the offspring was $B = 0.14 (p = 0.188, \text{ ns})$.

The *k* ratios (i.e., the ratios of the partner effect to the actor effect) were 0.75 for both mothers and their offspring. We also calculated the 95% confidence intervals of *k* by means of parametric bootstrap (Monte Carlo sampling) to investigate dyadic patterns in the APIM (Kenny & Ledermann, 2010). The 95% confidence intervals of *k* for mothers ranged from –0.51 to 2.01. This interval suggests that the couple ($k = 1$) and the actor-only models ($k = 0$) were both plausible for mothers. The confidence interval of *k* for the adolescents ranged from 0.06 to 1.45, suggesting that the couple model ($k = 1$) was plausible.

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5. Discussion and conclusions

The presence of a direct effect between PFU and SA concerning SM use as formulated in the hypotheses of this study was confirmed. This is especially true in the case of adolescents, but it is also true in the case of mothers. Having high levels of PFU can lead to higher levels of SA concerning SM use. This might happen because the characteristics of physical interaction, such as attractiveness or ease in communication, are not always available to all individuals in face-to-face settings (McKenna, Green, & Gleason, 2002); on the contrary, interactions on the Internet can represent a useful tool by which individuals might overcome these problems (McKenna & Bargh, 2000; McKenna et al., 2002). In fact, according to the social compensation hypothesis (Walther, 1996), it is possible that individuals compensate for poor offline relationships, where the constraints that usually make them interact poorly are reduced (Lee & Stapinski, 2012). By means of a compensation mechanism, these individuals look for what they do not have in real life on SNSs. However, the other side of the coin can be that individuals engaging in PFU may suffer from SA concerning SM use (e.g., may have concerns about their self-evaluation, their shared content, and their privacy on SM) in an effort to maintain the personal benefits in terms of social and personal identity that SM seem to offer them.

Alongside the direct effects between PFU and SA concerning SM use, we detected the presence of a reciprocal rather than a unidirectional link (Rapee, 2001) between parenting and offspring behaviour. Even though it was not possible to detect any effect of offspring PFU on SA concerning SM use of the mothers—likely a sign that SA traits in mothers have been acquired almost permanently over the years and thus are characterized as a sort of personal style of interaction (McKenna &

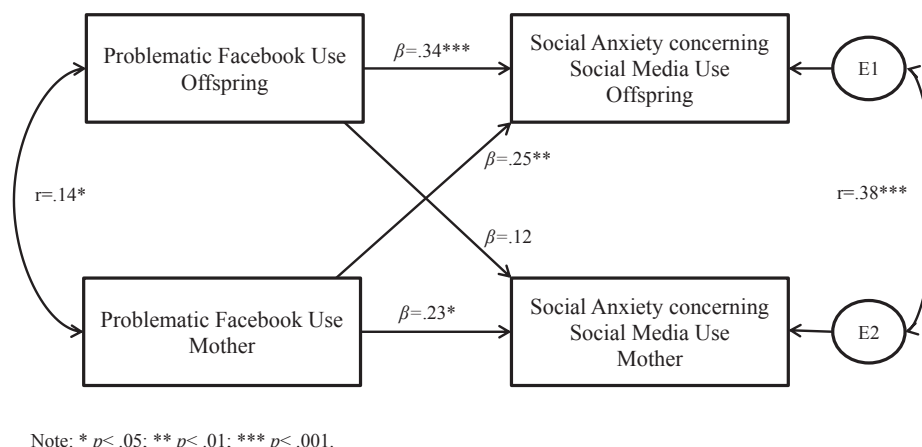


Fig. 1. Actor-Partner Interdependence Model of the relation between problematic Facebook use and social anxiety concerning social media use in mother and their offspring.

Bargh, 2000)—we found a significant actor and partner effect in the relationship between PFU and SA concerning SM use in the offspring. It is then possible that the effect of PFU in mothers on SA concerning SM use in their offspring might represent, at least in part, the result of the effect of the dyadic relationship on adolescents' development of social competence (Feldman, Bamberger, & Kanat-Maymon, 2013). In fact, PFU of the mother could affect her educational role and her support of her children in the exploration of social relationships in the real world, concurrently reinforcing the use of SNSs as instruments to affirm one's own image and establish relational bonds. Therefore, adolescents could perceive SNSs as places in which they can test and evaluate their own social identity (Casale & Fioravanti, 2015). Finally, we found positive associations between PFU and SA concerning SM use in the dyads, suggesting an intergenerational transmission of problematic patterns of SM use, likely as a result of the educational role of the mothers within the dyads.

The present research is not without limitations. The first limitation is related to the nature of the sample. Sampling on a larger scale and with a greater degree of randomness would have guaranteed results that were more generalizable. Another limitation of the study is related to the use of a self-report measure, which could lead to problems of social desirability, especially in terms of topic (SNS usage) and age (adolescence), in which feelings of shame about one's own behavior could be critical. A third limitation is connected to the choice not to include the father in this analysis, focusing on the role of the mother. Analysis of the triad would certainly be more interesting and could lead to much more comprehensive conclusions. Finally, a fourth limitation is connected with the exclusive investigation of Facebook use in this research. It is known (Griffiths & Kuss, 2017; Pew Research Center, 2018) that other social media are becoming more popular among adolescents (WhatsApp, YouTube, Instagram and Snapchat, are currently recognized as the most popular online platforms, especially among teens). On the other hand, Facebook is by far the most used SNS by adults (Pew Research Center, 2018). The specific choice of PFU as the variable of interest was thus motivated by the possibility to test the dyadic effect in the current study. An interesting development of this research could be to examine the relationship between SA and SM use by considering different social platforms, eventually differentiating SNSs oriented to the production and sharing of visual contents from text-based SNSs.

Despite the aforementioned limitations, this research shed new lights on the relationship between problematic SNS use and social anxiety, suggesting an intergenerational transmission of problematic behaviours on SNS that might also involve the development of social anxiety concerning social media use among those adolescents whose mother excessively use SNS.

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No funding sponsor was involved in study design, collection, analysis or interpretation of data, writing the manuscript, or the decision to submit the manuscript for publication.

Contributors

SR designed the study, conducted literature searches, was responsible for data collection, and wrote the first draft of the manuscript. GS provided summaries of previous research studies and conducted the statistical analysis. AP and UP contributed to the analysis of the relevant literature and interpretation of the findings. AS provided clinical inputs on the interpretation of the findings and revised the initial draft. All authors approved the final version of the manuscript.

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.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2020.100256>.

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