Original Article

Adolescents' Online Communication and Self-Disclosure to Online and Offline Acquaintances

Differential Effects of Social Anxiety and Depressed Moods

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Abstract: Adolescents commonly use the Internet to communicate with their acquaintances. This study examines how social anxiety and depressed moods influence adolescents' online communication – both its frequency and the level of self-disclosure. We propose that these relationships are mediated by adolescents' preference for online social interaction (POSI), which helps explain the mixed results of previous research. Moreover, since the communication patterns may differ based on communication partners, we differentiate between online and offline acquaintances. Using structural equation modeling, we tested our hypotheses on survey data from 1,530 Czech adolescents (ages 13–18, 50.1% female). Our results suggest that while social anxiety is directly related to less online communication, indirectly, through higher POSI, it is related to more online communication. Notably, these associations are canceled out in communication with online acquaintances, but the inhibitions predominate in communication with offline acquaintances. Experiencing depressed moods is associated with more extensive online communication, both directly and via POSI, indicating that adolescents use online communication to cope with negative feelings. Theoretically, our findings support both the rich-get-richer and social-compensation hypotheses and suggest they are complementary. Moreover, they emphasize the role of adolescents' perceptions of online communication within the social-compensation mechanism.

Keywords: online communication, online self-disclosure, social anxiety, depressed moods, preference for online social interaction, communication partners

Online communication is commonplace among adolescents. Across Europe, most adolescents communicate online with friends or family daily, and having such conversations is one of the most popular online activities (Smahel et al., 2020). Many adolescents also use the Internet to interact with people they do not know face to face – between 23% (Italy) and 57% (Norway) of 9–16-year-olds did so in the previous year (Smahel et al., 2020). For adolescents, having conversations with their peers and sharing information about themselves is essential for the developmental tasks of forming identity, exploring intimacy and sexuality, and developing peer relationships (Steinberg,

2008; Vijayakumar & Pfeifer, 2020). Adolescents also use online communication platforms to self-disclose, that is, to share intimate information about themselves (Valkenburg & Peter, 2011). A series of Dutch studies demonstrate that online communication and self-disclosure foster quality friendships and thus improve adolescents' well-being (Valkenburg & Peter, 2007a, 2007b, 2009). Moreover, online communication with people adolescents meet on the Internet brings additional opportunities, for example, to discuss interests that people in their offline social circle do not share or sensitive issues that one may feel uncomfortable discussing with them (Borca et al., 2015; Pascoe, 2011).

However, adolescents differ in how much they communicate with and self-disclose to others online. Personality characteristics (e.g., extraversion), skills, moods, and affects, among others, influence adolescents' online communication (e.g., Kraut et al., 2002; McKenna et al.,

2002; Rodríguez-de-Dios et al., 2018). In the current study, we focus on the role of social anxiety and depressed moods because both can inhibit adolescents' social interaction (Biggs et al., 2012; Kahn & Garrison, 2009) and tend to increase in adolescence (Miers et al., 2013; Natsuaki et al., 2009). Online communication can be particularly beneficial for adolescents who experience such inhibitions – it may help overcome them (McKenna et al., 2002) or gain additional social support (Frison & Eggermont, 2016). It is unclear whether adolescents leverage these opportunities by using online communication more; the current research provides inconsistent results for both social anxiety (see Prizant-Passal et al., 2016) and depressed moods (Frison et al., 2019; van den Eijnden et al., 2008). The primary goal of our study is to clarify these mixed results. To do so, we investigate the mediating effect of adolescents' perceptions of online communication, specifically their *preference for online social interaction* (POSI), that is, the belief that online social interaction is more comfortable and safer than offline social interaction (Caplan, 2003). We also consider with whom adolescents communicate, a perspective that has been lacking in existing research. We differentiate between two types of communication partners: those whom adolescents know from offline environments (i.e., offline acquaintances) and those whom they only know from the Internet (i.e., online acquaintances). Lastly, we focus on two aspects of online communication essential for adolescents' social development: how often adolescents talk online with others (i.e., frequency of online communication) and how often they discuss personal topics (i.e., online self-disclosure).

Preference for Online Social Interaction

Online communication differs from offline, face-to-face communication. It allows people to manage what information they share about themselves (i.e., invisibility, anonymity), think through and edit their responses (i.e., controllability), reduce audiovisual cues in the conversation, and easily access diverse communication partners (Nesi et al., 2018; Valkenburg & Peter, 2011). Thus, some adolescents may feel more comfortable communicating and opening up about themselves on the Internet than in "offline" life. This is known as POSI, a "construct characterized by beliefs that one is safer, more efficacious, more confident, and more comfortable with online interpersonal interactions and relationships than with traditional FtF [face-to-face] social activities" (Caplan, 2003, p. 629). While POSI is mainly used in the literature about problematic Internet use, some studies focusing on adolescents' online communication use conceptually similar constructs such as *online disinhibition* (Schouten et al., 2007) or *perceived depth of online communication* (Valkenburg & Peter, 2007a). In both

studies, adolescents who felt more comfortable talking online used online communication more frequently and self-disclosed online more (Schouten et al., 2007; Valkenburg & Peter, 2007a). Accordingly, higher POSI should translate to more extensive use of online communication. The following sections explain how this mechanism helps clarify the relationships between adolescents' social anxiety or depressed moods and online communication.

Social Anxiety

Social anxiety is a trait characterized by the fear of situations where one can be judged by others and concerns that one's behavior will result in humiliation (Stein & Stein, 2008). Therefore, socially anxious people feel discomfort in social situations and tend to avoid them. Social anxiety also fosters adolescents' negative self-perceptions about their communication abilities (Miers et al., 2009), further discouraging them from interacting with others. As a result, they prefer to be alone, initiate fewer conversations, talk less often, and avoid self-disclosure (Biggs et al., 2012; Schlenker & Leary, 1985). Overall, social anxiety affects both the frequency of offline communication and its depth (i.e., self-disclosure).

According to the *rich-get-richer hypothesis* (Kraut et al., 2002), this should also apply to social interactions on the Internet. Since more socially apt adolescents find it easier to socialize face-to-face and on the Internet, they should use the Internet as an additional opportunity for social interactions more often than less socially apt peers (Gross et al., 2002; Kraut et al., 2002). Conversely, the hypothesis implies that more socially anxious adolescents should use the Internet for communication and self-disclosure less. Indeed, Wang et al. (2011) showed that socially anxious adolescents spend less time on instant messengers. Thus, we expect that social anxiety directly relates to a lower frequency of adolescents' online communication and online self-disclosure (Hypothesis 1).

However, empirical support for the overall effect of social anxiety is mixed. For instance, an Australian study found no relationship between adolescents' social anxiety and the time spent communicating online (Bonetti et al., 2010). A meta-analysis of 10 studies shows that social anxiety does not affect how frequently people communicate with others using instant messaging or email (Prizant-Passal et al., 2016). Nevertheless, there were marked differences between the results of individual studies, with some reporting a positive association, some negative, and some no relationship (see Prizant-Passal et al., 2016).

Adolescents' POSI may help explain these contradictory findings. The features of online communication (e.g., reduced cues and controllability) may help socially anxious adolescents overcome their inhibitions. Consequently, such

adolescents are more likely to prefer this type of communication. Supporting this, previous research shows that POSI is higher among university students who experience more social or communication anxiety (Akhter et al., 2022; Caplan, 2007; Chen, 2019). Through this link with POSI, social anxiety might indirectly stimulate adolescents' online communication and self-disclosure. In other words, online communication features may reduce or even eliminate the inhibitions caused by social anxiety.

Several previous studies lend credibility to this notion. In a Dutch study, social anxiety did not correlate with adolescents' online self-disclosure. Nevertheless, more socially anxious adolescents perceived reduced cues and the controllability of online communication as more important, which led to more disinhibition (equivalent to higher POSI) and, ultimately, more online self-disclosure (Schouten et al., 2007). The same pattern emerged for private self-disclosure on Facebook among university students (Green et al., 2016). Similarly, in another study, social anxiety indirectly increased online communication by strengthening adolescents' perception that they can communicate more deeply and broadly online. By contrast, the direct effect of social anxiety on the extent of adolescents' online communication was negative (Valkenburg & Peter, 2007a). Thus, although social anxiety may hamper some adolescents' online communication, at the same time, some socially anxious adolescents may perceive online communication as less threatening and prefer it to face-to-face interactions, leading to more online communication. Overall, we expect that indirectly, through its association with higher POSI, social anxiety is related to a higher frequency of adolescents' online communication and online self-disclosure (Hypothesis 2).

Depressed Moods

During adolescence, the prevalence of experiencing depressed moods (e.g., sadness, cheerlessness, dissatisfaction with life) markedly increases (e.g., Natsuaki et al., 2009). However, existing research does not clearly explain how experiencing such depressed moods relates to adolescents' online communication. Systematic reviews suggest a small positive association between depressed moods (or the conceptually related but more trait-like depression) and online communication or social networking sites (SNS) use, but results are often mixed and vary across dimensions of SNS use (Keles et al., 2020; Liu et al., 2019; Piteo & Ward, 2020). Among studies that looked specifically at the frequency of online communication, some report a positive association with depression (Frison et al., 2019), while others report nonsignificant or negligible effects (Ohannessian, 2009; van den Eijnden et al., 2008).

Two opposing theoretical explanations exist for the association between depressed moods and online communication. First, according to the *fever model*, when people experience psychological distress, they tend to alleviate it by self-disclosing to others (Stiles, 1987). In this way, communication serves as a coping mechanism; hence experiencing more depressed moods should lead to more communication. This mechanism was supported in a cross-sectional study – adults experiencing higher levels of depression had stronger motivation for alleviation, which was related to more time spent communicating online (Kim et al., 2015). By contrast, other research shows that people with mood and anxiety disorders have a stronger tendency to suppress their negative emotions and the expression of these emotions (Campbell-Sills et al., 2006). Similarly, in a nonclinical sample of university students, depressive symptoms were associated with suppressing emotional expressions and less disclosure of emotion to others (Kahn & Garrison, 2009). Thus, depressed moods may also lower one's willingness to discuss specific issues and inhibit communication. Since these perspectives diverge in their predictions and previous research offers inconsistent findings, we examine how depressed moods relate to the frequency of adolescents' online communication and self-disclosure (Research Question 1) without formulating a hypothesis.

As mentioned above, people experiencing depressive moods may limit their self-disclosure to avoid visibly showing their emotions (Kahn & Garrison, 2009). They may prefer to self-disclose online, where they can discuss emotional subjects without showing their emotional expressions to the communication partner. Moreover, people who experience depression tend to have more negative perceptions of their social competence (Segrin, 2000). Again, they may prefer relatively more controllable and less threatening online communication to face-to-face interaction. This is supported by research where undergraduates who reported higher levels of depression or lower subjective well-being also had higher POSI (Caplan, 2003; Ye & Lin, 2015). Thus, we expect that indirectly, through higher POSI, adolescents' depressed moods relate to more frequent online communication and self-disclosure (Hypothesis 3).

Communication Partners

Studies on adolescents' online interactions typically do not differentiate between communication partners (e.g., Bonetti et al., 2010; Schouten et al., 2007; Wang et al., 2011).

However, social anxiety and depressed moods may relate to adolescents' communication differently, depending on whom they talk to. For instance, some issues behind adolescents' depressed moods may be easier to share with people

outside one's offline social circle because such disclosure is less likely to affect adolescents' everyday interactions with schoolmates or parents than disclosure to offline contacts. Similarly, socially anxious adolescents may disclose more to online acquaintances because they tend to have fewer offline friends (Van Zalk et al., 2011), thus fewer opportunities to disclose to them. Therefore, considering different communication partners may shed further light on the aforementioned inconsistencies found in previous research. We focus on two types of communication partners – *offline acquaintances*, that is, people that adolescents already know from offline settings, and *online acquaintances*, that is, those whom adolescents have not met face-to-face and who are typically outside the adolescents' offline social circle. We investigate how social anxiety and depressed moods relate to adolescents' online interactions with these two groups of communication partners (Research Question 2).

Method

Sample and Procedure

Our study uses data from 1,530 Czech adolescents aged 13–18 (M = 15.37, SD = 1.71, 50.1% female). The data come from a more extensive online survey of parent–adolescent dyads (we use only adolescent data), which focused on various ICT usage and well-being dimensions. A professional survey agency collected the data from a sample of their online panel (approx. 25,000 panelists; over 90% were recruited offline during face-to-face data collections). Eligible participants were parents/guardians of 13–18-year-old adolescents. The agency used quota sampling to ensure (1) an equal representation of adolescents based on their age and gender and (2) household representation proportional to Czech households with children by net household income, municipality size, and region of residence (according to the Nomenclature of Territorial Units for Statistics [NUTS] Level 3, which divides the country into 14 regions; see European Commission & Eurostat, 2020).

The data were collected in November 2020, that is, during the COVID-19 pandemic. The agency invited parents via email. First, parents responded to eligibility questions. Then, adolescents filled in their part of the questionnaire, followed by parents answering the parental questionnaire. Parents were instructed to ensure privacy while answering the questionnaire, and each participant was asked whether they completed the questionnaire without anyone's oversight. The questionnaires were locked upon completion, so the parent could not access the adolescent's answers and vice versa. Each household received approximately €4 for their participation.

Informed consent was obtained from each parent and participating adolescent. The Ethics Board of the Masaryk University approved the data collection.

Measures

All items included a response option, "Don't know/prefer not to answer," which was treated as a missing value. For some scales, we used shortened versions to prevent long questionnaire completion times and respondent fatigue. Measures are available on Open Science Framework (OSF): https://osf.io/b9kwy/ (Mýlek et al., 2023).

Social Anxiety

Social anxiety was measured by five of the six original items (e.g., "I have difficulty talking with other people") of the Social Interaction Anxiety Scale (Peters et al., 2012). The excluded item referenced a work-related situation irrelevant to adolescents. To keep consistent with the rest of the survey, we changed the anchors of the 5-point Likert scale to 1 = *completely untrue* to 5 = *completely true*. We tested the scale structure using confirmatory factor analysis (CFA). While some indices suggested that the one-factor model fit our data (CFI = 0.99, TLI = 0.98, SRMR = .02), other statistics implied poor fit, $\chi^2(5)$ = 71.04, p < .001, RMSEA = .09 with 90% CI = [.07, .11]. All corrected item–total correlations were sufficiently high (r = .51–.71), and an exploratory factor analysis suggested only one underlying factor. Therefore, the scale structure is likely more complex (i.e., not unidimensional) but still *essentially unidimensional*, meaning that there is one dominant factor, and the items capture one construct. The scale reliability was good (ω = .84, M = 2.38, SD = 0.92).

Frequency of Online Communication

We asked adolescents how often in the past few months they used the Internet to communicate with (1) offline acquaintances, defined as people known face-to-face (M = 4.86, SD = 1.18), and (2) online acquaintances, defined as people known from the Internet whom the adolescent has not met face-to-face (M = 2.37, SD = 1.49). Adolescents responded on a 6-point frequency scale (1 = *never* to 6 = *several times a day*).

Online Self-Disclosure

We created a new scale inspired by the Self-Disclosure Index (SDI; Miller et al., 1983). Instead of the original 10 SDI items, we devised four more generally worded items (e.g., "About how I really feel"), asking how often participants talked about these things (1 = *never* to 6 = *several times a day*). Only adolescents who participated in online communication (either with offline or online acquaintances) were asked about online self-disclosure to reduce survey

completion times. Adolescents who responded "never" to questions about online communication were assigned the response "never" in online self-disclosure items. We measured online self-disclosure with offline and online acquaintances using the same four items. When asking about offline acquaintances, we emphasized that respondents should only consider how often they discussed the topics over the Internet (i.e., not in face-to-face conversations). CFA showed that the scales both for offline acquaintances, $\chi^2(2) = 0.91$, $p = .635$, CFI = 1.00, TLI = 1.00, RMSEA = .00 with 90% CI = [.00, .04], SRMR = .00, and for online acquaintances, $\chi^2(2) = 11.37$, $p = .003$, CFI = 1.00, TLI = 1.00, RMSEA = .06 with 90% CI = [.03, .09], SRMR = .00, were unidimensional. Reliability was excellent (offline acquaintances: $\omega = .92$, $M = 2.83$, $SD = 1.21$; online acquaintances: $\omega = .95$, $M = 1.60$, $SD = 1.01$).

Preference for Online Social Interaction

We measured POSI with three items (e.g., "On the Internet, it is easier for me to talk about my feelings") based on the 5-item scale developed by Smahel et al. (2012). Items were rated on a 5-point Likert scale (1 = *completely untrue* to 5 = *completely true*), with higher scores indicating that it was easier for respondents to communicate online than in person. The fit of a CFA model with three indicators cannot be evaluated, but all three items loaded on a common factor ($\beta = .82–.94$), and the scale reliability was good ($\omega = .89$, $M = 2.70$, $SD = 1.13$).

Depressed Moods

We used the Short Depression–Happiness Scale (Joseph et al., 2004), originally consisting of three happiness items (e.g., "I felt happy") and three depression items (e.g., "I felt dissatisfied with my life"), all rated on a 4-point scale (1 = *never* to 4 = *often*). Joseph et al. (2004) found support for the one-dimensional structure of the full 6-item scale. However, a one-factor CFA model did not fit our data, $\chi^2(9) = 961.92$, $p < .001$, CFI = 0.87, TLI = 0.78, RMSEA = 0.26 with 90% CI = [.25, .28], SRMR = .09, which implies that the scale is not unidimensional. Since we focused on depressed moods, we used only the three depression items. The items had satisfactory loadings ($\beta = .77–.83$) and acceptable reliability ($\omega = .79$, $M = 2.20$, $SD = 0.77$).

Results

We tested our hypotheses using structural equations modeling in Mplus v8.7 (Muthén & Muthén, 2017). Our model included two latent predictors (i.e., social anxiety, depressed moods), one latent mediator (i.e., POSI), two latent outcomes (i.e., online self-disclosure with online/offline acquaintances), and two observed outcomes (i.e., online communication with online/offline acquaintances). We tested both direct and indirect effects (via POSI) of each predictor on each outcome. We controlled for adolescents' age and gender by including them in the model as additional predictors and allowed all predictors and controls to covary. We also allowed covariances between the two online self-disclosure variables, the two online communication variables, and between online self-disclosure and online communication with the same group of communication partners (i.e., online/offline acquaintances). Our dataset, analytical scripts, and supplementary materials are available on OSF: https://osf.io/b9kwy/

Since all items used short Likert scales or frequency scales, we treated observed variables as ordinal and used the WLSMV estimator with bootstrapping (5,000 samples). Missing values were handled by the Mplus default pairwise-present method. This method is more efficient than listwise deletion and performs well with lower numbers of missing data (Asparouhov & Muthén, 2010), which applied to our data (lowest covariance coverage = .97). The tested model fit the data well, $\chi^2(200) = 878.29$, $p < .001$, CFI = 0.99, TLI = 0.99, RMSEA = .05 with 90% CI = [.04, .05], SRMR = .03. We present the model in Figure 1 and list all direct, indirect, and total effects in Table 1. For covariances, see Supplementary Table 1 in the OSF repository. Considering our sample size, we evaluated statistical significance at $\alpha = .01$; for indirect effect, we used bootstrapped confidence intervals (Preacher & Hayes, 2008).

Social Anxiety

First, we evaluated the direct effects (controlled for the indirect effects mediated via POSI) of social anxiety on the frequency of online communication and self-disclosure with both online and offline acquaintances (Figure 1). In line with Hypothesis 1, higher social anxiety was related to less frequent online communication and less self-disclosure. This applied to both online and offline acquaintances, although the negative direct effect of social anxiety on self-disclosure was larger in the case of offline acquaintances ($\chi^2 = 13.99$, $p < .001$).

Second, we examined how social anxiety was indirectly related to online communication through higher POSI (Table 1). As expected in Hypothesis 2, social anxiety was indirectly associated with a higher frequency of online communication and more self-disclosure. Again, this effect applied to both online and offline acquaintances. The positive indirect effect of social anxiety on the frequency of online communication was larger for online acquaintances ($\chi^2 = 33.88$, $p < .001$).
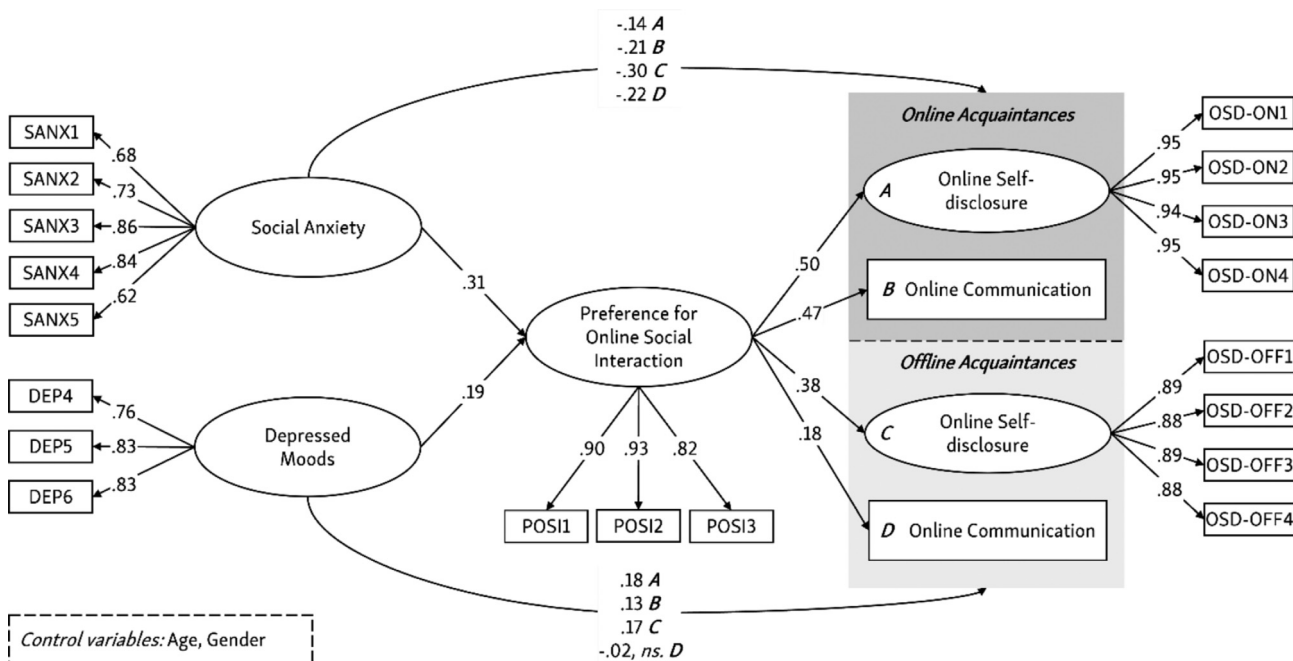
Figure 1. Standardized results of the tested model (N = 1,530). All presented effects are significant at $\alpha < .01$, except the one labeled *ns*. See Table 1 for exact p values and effects of control variables; see Supplementary Table 1 for covariances.

Depressed Moods

The direct effects of depressed moods on adolescents' online communication partly differed based on their communication partners (Figure 1). In the case of communication with online acquaintances, adolescents who experienced more depressed moods used online communication more frequently and self-disclosed more. In the case of communication with offline acquaintances, depressed moods were also related to higher self-disclosure, but the direct effect on the frequency of online communication was not significant.

The indirect effects of depressed moods on online communication through POSI support Hypothesis 3. Experiencing more depressed moods was indirectly associated with more frequent online communication and more self-disclosure. This applied to both types of communication partners. Notably, the indirect effects of depressed moods were small ($\beta < .10$). In particular, the indirect effect on the frequency of online communication with offline acquaintances was negligible ($\beta = .03$).

Discussion

Our study examined how adolescents' social anxiety and depressed moods related to their online communication and self-disclosure frequency. We focused on POSI as a possible mediator that could explain inconsistent findings in previous studies, and we explored these relationships for two groups of communication partners – offline and online acquaintances. Our findings demonstrated that social anxiety and depressed moods relate to adolescents' online communication directly and indirectly through higher POSI. Moreover, these associations are, to some extent, dependent on communication partners, suggesting that whom adolescents communicate with may also contribute to the varying results of previous studies.

The Dual Role of Social Anxiety

Our study illuminates the varying ways in which adolescents' social anxiety relates to their online communication. In support of Hypothesis 1, social anxiety is directly related to a lower frequency of online communication and less online self-disclosure. These results align with research that shows that social anxiety inhibits adolescents' offline communication (Biggs et al., 2012; Miers et al., 2009) and indicates that the same inhibitions are also at play in online environments. However, our results further imply that social anxiety indirectly relates to more online communication through its association with higher POSI. These results support Hypothesis 2 and corroborate previous research in which socially anxious people preferred online interactions over face-to-face interactions (Akhter et al., 2022; Caplan, 2007; Chen, 2019) and those with this stronger preference

Table 1. Direct, indirect, and total effects in the tested model (N = 1,530)

Relationships	Direct effects B (SE)	β	p	Indirect effects β	99% CI	Total effects β	99% CI	R^2
POSI ←								.18
Social anxiety	0.41 (0.05)	**.31**	< .001					
Depressed moods	0.22 (0.04)	**.19**	< .001					
Age	0.01 (0.02)	.02	.417					
Gender[a]	0.20 (0.11)	**.11**	.001					
Online acquaintances								
Online self-disclosure ←								.29
POSI	0.52 (0.03)	**.50**	< .001					
Social anxiety	−0.19 (0.06)	**−.14**	.001	**.16**	[.10, .21]	.02	[−.09, .12]	
Depressed moods	0.22 (0.05)	**.18**	< .001	**.09**	[.05, .15]	**.27**	[.16, .38]	
Age	0.04 (0.02)	.06	.041					
Gender[a]	0.02 (0.08)	.01	.776					
Online communication ←								.24
POSI	0.52 (0.04)	**.47**	< .001					
Social anxiety	−0.30 (0.06)	**−.21**	< .001	**.15**	[.10, .21]	−.06	[−.16, .04]	
Depressed moods	0.17 (0.06)	**.13**	.005	**.09**	[.04, .14]	**.22**	[.10, .33]	
Age	0.06 (0.02)	**.10**	.008					
Gender[a]	0.00 (0.10)	.00	.983					
Offline acquaintances								
Online self-disclosure ←								.26
POSI	0.38 (0.04)	**.38**	< .001					
Social anxiety	−0.39 (0.05)	**−.30**	< .001	**.12**	[.08, .18]	**−.18**	[−.28, −.09]	
Depressed moods	0.20 (0.06)	**.17**	.001	**.07**	[.04, .12]	**.24**	[.13, .34]	
Age	0.07 (0.02)	**.13**	< .001					
Gender[a]	−0.44 (0.22)	**−.25**	< .001					
Online communication ←								.07
POSI	0.20 (0.04)	**.18**	< .001					
Social anxiety	−0.32 (0.06)	**−.22**	< .001	**.06**	[.03, .10]	**−.16**	[−.25, −.07]	
Depressed moods	−0.02 (0.06)	−.02	.715	**.03**	[.01, .06]	.02	[−.01, .12]	
Age	0.04 (0.02)	.07	.035					
Gender[a]	−0.32 (0.18)	**−.16**	< .001					

Note. POSI = preference for online social interaction. Standardized estimates significant at α < .01 are in bold. [a]Coded female = 1, male = 2.

used online communication more extensively (Schouten et al., 2007; Valkenburg & Peter, 2007a). Thus, it seems that while social anxiety directly inhibits adolescents' online communication, it indirectly stimulates it. This helps explain why some previous studies failed to detect a relationship between social anxiety and online communication (Prizant-Passal et al., 2016). Since the direct effect of social anxiety on adolescents' online communication is negative, and the indirect effect is positive, studies that do not account for the mediating role of POSI (or conceptually related factors) are likely to produce null results.

Theoretically, the evidence for the two mechanisms (i.e., direct and indirect) offers a new perspective on the relationship between two commonly invoked hypotheses – the rich-get-richer and the social-compensation hypotheses. The first presumes that similar to offline environments, more socially apt (i.e., less anxious) adolescents will also more extensively use online communication (Kraut et al., 2002). The second considers social anxiety to be one of the *gating features* (next to, e.g., introversion and stuttering) that can make it difficult for adolescents to establish new relationships (McKenna et al., 2002). The reduced cues and controllability of online communication may help overcome the limitations posed by these gating features. While these two perspectives are often understood as opposing (e.g., Poley & Luo, 2012), our results show they are compatible. On the one hand, adolescents whose social anxiety inhibits interaction offline are also inhibited online, supporting the rich-get-richer hypothesis. On the other hand, adolescents who perceive online communication as easier or safer can compensate for their social inhibitions and communicate and self-disclose more online. Thus, adolescents'

perception of online communication seems to play a crucial role – when socially anxious adolescents see it as an opportunity, it may foster their online communication. When they do not, their anxiety may keep them from interacting with others just as it does offline. Future research should focus on what differentiates between these two groups of anxious adolescents. It is possible, for instance, that despite having higher social anxiety, adolescents may still have a satisfying network of offline friendships and might not see online communication as a worthy opportunity. In other words, while social anxiety can predispose adolescents to experience insufficiencies in social interactions (thus prompting the social compensation mechanism via POSI), this might not apply to all of them. However, more research is necessary to test this conjecture.

Notably, the overall association between social anxiety and online interactions depends on the type of communication partner. More socially anxious adolescents communicate online less frequently and self-disclose online less with their offline acquaintances. However, with online acquaintances, adolescents communicate and self-disclose online to a comparable extent regardless of their social anxiety (i.e., its total effect is not statistically significant). Thus, on average, socially anxious adolescents seem inhibited in online communication with offline acquaintances but not with people they meet online. The dynamics between social anxiety and peer relationships may explain these differences. Socially anxious adolescents have lower-quality friendships, experience more peer rejection, and are more often victimized by their peers (Chiu et al., 2021). Thus, they may have fewer friends to disclose to. Moreover, the lower quality of relationships might make them less comfortable self-disclosing to their offline acquaintances. Having too few quality friendships in their offline environment can motivate adolescents to disclose to online acquaintances, who may represent new opportunities for more quality relationships. Self-disclosure serves a vital purpose in adolescence (e.g., Vijayakumar & Pfeifer, 2020). Hence, when adolescents do not have a trustworthy companion offline, they might turn to the Internet to find one.

Coping With Depressed Moods by Talking Online

Meta-analytical results show a positive relationship between depression and online communication or SNS use (Keles et al., 2020; Liu et al., 2019; Piteo & Ward, 2020). Similarly, our results suggest that experiencing more depressed moods is directly associated with more online-self disclosure with both online and offline acquaintances, lending support to Stiles's fever model (Stiles, 1987). Given that our measure of self-disclosure asked about sharing emotional content (e.g., "How I really feel," about "My joys and sorrows"), we can infer that adolescents use online communication to vent their emotional experiences, likely to cope with them. Nevertheless, we did not assess clinical depression, and our results should not be generalized to the effects of this disorder. It remains possible that more severe depression leads to emotion suppression and lower self-disclosure, as suggested by the alternative theoretical perspective mentioned in the Introduction (Campbell-Sills et al., 2006).

In the case of the frequency of online communication, the results are mixed. While adolescents who experienced more depressed moods also more frequently communicated with their online acquaintances, we did not detect such relationship for offline acquaintances. This is in line with a study where experiencing more emotional symptoms increased adolescents' likelihood of interacting with people met online (Mýlek et al., 2020). It also points to additional possible reasons for previous inconsistent findings; it seems that the effects differ based on how the communication is measured (whether we focus solely on its frequency or also on the content, i.e., self-disclosure) and who are the communication partners. Other variables may moderate the effects of depressed moods on online communication. Since online communication can work as a coping mechanism, the associations could depend on adolescents' dominant coping styles. For instance, those with higher avoidant tendencies might use online self-disclosure less (i.e., have a weaker association between their depressed moods and self-disclosure; Kahn & Garrison, 2009) while still engaging in online communication to the same extent to distract themselves.

Consistent with previous research (Caplan, 2003; Ye & Lin, 2015), adolescents who experience more depressed moods also more strongly prefer online social interactions. Thus, in line with Hypothesis 3, depressed moods relate to more frequent online communication (though the effect is very small for offline acquaintances) and self-disclosure indirectly through POSI. There are two complementary explanations for why adolescents who experience depressed moods might prefer online communication. First, they may see themselves as less socially competent (Segrin, 2000), and the less threatening and more controllable online communication appeals to them. Second, they may want to discuss the issues that bother them. A qualitative study shows that adolescents may find it difficult to discuss sensitive topics face-to-face and prefer doing so online, where they have more control (Davis, 2012). Again, adolescents' perceptions matter – the overall positive association between depressed moods and the frequency of online communication (with online acquaintances) and self-disclosure (with both online and offline acquaintances) seems to be partly driven by adolescents' seeing the Internet as a place where feelings are more easily shared.

New View on Preference for Online Social Interaction

Our study provides different perspectives on the concept of POSI, which is commonly viewed as a risk factor that predicts problematic Internet use (e.g., Caplan, 2003, 2007; Casale et al., 2013). While this can be true, our results demonstrate that a preference for online interaction can also be viewed positively. As in previous research (Schouten et al., 2007; Valkenburg & Peter, 2007a), this preference was associated with more frequent online communication and online self-disclosure to both offline and online acquaintances. Thus, it can pave the way to deeper friendships and social support. Since online communication and self-disclosure positively impact adolescents' friendship quality and well-being (Valkenburg & Peter, 2007b, 2009), researchers should move toward a more balanced understanding of POSI. Our results further demonstrate that POSI can help explain the opposing ways in which social anxiety relates to online communication. Perhaps, opposing results regarding other characteristics that function as gating features can be clarified using POSI, making the concept useful in online communication research.

Our findings also highlight that the accessibility of new communication partners is an important feature of online communication that affects POSI. The original conceptualization emphasizes two features of online communication that underlie POSI: controllability, which makes the communication more manageable, and invisibility (or reduced cues), which makes it less demanding (Caplan, 2003). In our study, the positive relationships between POSI and adolescents' online communication are stronger for communication with online acquaintances. Thus, POSI is likely underpinned by another feature of online communication: the accessibility of new communication partners (Valkenburg & Peter, 2011). Our findings emphasize that adolescents may be drawn to online communication because it enables them to meet people outside their offline social circle. In sum, the conceptualization of POSI should reflect not only controllability and reduced cues but also the accessibility of communication partners.

Limitations and Future Directions

Several limitations must be considered when interpreting our findings. First, our study relies on cross-sectional data, which does not allow for testing causality. Although we use theoretical arguments to support our interpretations, we would welcome longitudinal or experimental studies that test the causal directions of the examined relationships. Second, we did not measure the total time adolescents spent communicating or self-disclosing online. Since adolescents reported the frequency of these interactions over the past few months, an inaccurate recall may have affected their responses. Future research should corroborate our findings by examining the time spent communicating online using objective data or ecological momentary assessment. Third, the data collection occurred during the COVID-19 pandemic, which may have caused an increase in adolescents' depressed moods and a stronger reliance on online communication to alleviate these moods. Moreover, related governmental restrictions, self-isolation, and online education may have increased adolescents' online communication. Although these changes should not affect the relationships between the studied factors, it is necessary to consider the ongoing pandemic. Fourth, our study shows that social anxiety and depressed moods may relate differently to online communication based on whom adolescents interact with. While we focused on two groups of communication partners (i.e., offline and online acquaintances), we encourage future studies to consider other groups, for example, romantic partners or family members. Lastly, we examined the adolescent population. Since people in different life stages may vary in their online communication patterns and perceptions of online communication, further research is necessary to examine whether our findings generalize beyond adolescence.

Conclusion

Our study demonstrates that personal traits and moods relate to adolescents' online communication in complex ways. Socially anxious adolescents seem to be inhibited in online communication similarly to offline communication; yet, they also show higher appreciation of the benefits of online communication, which is linked to more online communication and self-disclosure. This dual role of social anxiety supports both the rich-get-richer and social-compensation hypotheses, which likely capture two parallel ways social anxiety influences online communication. Experiencing depressed moods is linked to more online self-disclosure and more frequent communication with online acquaintances directly and via increased POSI. Adolescents seem to use online communication to alleviate their emotions, especially when they perceive this communication mode favorably. POSI should not be understood solely as a risk factor for problematic Internet use but also as an important predictor of adolescents' online communication. Notably, POSI more closely connects to communication with people outside adolescents' offline social circle. On a theoretical level, this implies that POSI reflects not just the perceived benefits of the controllability of online communication and its reduced cues but also the benefits of the accessibility of communication partners.

Our findings support the notion that adolescents use online communication to overcome social inhibitions or

cope with difficult feelings. This has important implications for parents and educators – online communication with offline and online acquaintances should not be vilified as it can facilitate critical psychosocial processes. Instead, adolescents should be instructed on how to use the Internet to connect with others in the safest possible way.

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Conflict of Interest
The authors report there are no competing interests to declare.

Publication Ethics

Informed consent was obtained from all participants included in the study. The data collection was approved by the Ethics Board of Masaryk University. All researchers who contributed to this study are listed as authors and agreed with the submission to this journal. This original study has not been published elsewhere and is not currently under consideration in any other journal.

Authorship

Vojtěch Mýlek, conceptualization, methodology, formal analysis, writing – original draft, visualization; Lenka Dedkova, conceptualization, methodology, writing – review and editing, supervision, project administration, funding acquisition; Alexander Peter Schouten, writing – review and editing. All authors approved the final version of the article.

Open Data

The authors agree to share their data, analytics methods, and study materials with other researchers. The information needed to reproduce all of the reported results and methodology is available at https://osf.io/b9kwy/ (Mýlek et al., 2023).

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