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Review article

Online Communication Among Adolescents: An Integrated Model of Its Attraction, Opportunities, and Risks

Patti M. Valkenburg, Ph.D., M.Sc.* , Jochen Peter, Ph.D.

Faculty of Behavioral and Social Sciences, Amsterdam School of Communication Research ASCoR, University of Amsterdam, Amsterdam, The Netherlands

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A B S T R A C T

Adolescents far outnumber adults in their use of e-communication technologies, such as instant messaging and social network sites. In this article, we present an integrative model that helps us to understand both the appeal of these technologies and their risks and opportunities for the psychosocial development of adolescents. We first outline how the three features (anonymity, asynchronicity, and accessibility) of online communication stimulate controllability of online self-presentation and self-disclosure among adolescents. We then review research on the risks and opportunities of online self-presentation and self-disclosure for the three components of adolescents' psychosocial development, including identity (self-unity, self-esteem), intimacy (relationship formation, friendship quality, cyberbullying), and sexuality (sexual self-exploration, unwanted sexual solicitation). Existing research suggests several opportunities of online communication, such as enhanced self-esteem, relationship formation, friendship quality, and sexual self-exploration. It also yields evidence of several risks, including cyberbullying and unwanted sexual solicitation. We discuss the shortcomings of existing research, the possibilities for future research, and the implications for educators and health care professionals.

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Online communication has become a centerpiece in the social life of adolescents. Adolescents far outnumber adults in their use of communication technologies, such as instant messaging and social networking sites. For example, in America 68% of teenagers who are online use the Internet for instant messaging as compared with 32% of online adults. Similarly, only 35% of online

American adults have a profile on a social network site as compared with 65% of online adolescents [1].

The massive popularity of online communication among adolescents has elicited mixed reactions. Concerns have been voiced that adolescents develop shallow relationships with online strangers or may become victims of online solicitation and cyberbullying. In contrast, it has also been argued that the Internet provides them with many opportunities to explore their identity, find support and information about developmentally sensitive issues, and develop close and meaningful relationships [2].

Extensive use of the Internet by adolescents and the uncertainty about its consequences call for an integrative perspective that helps us to understand both the attraction of online communication as well as its risks and opportunities. The aim of this

* Address correspondence to: Patti M. Valkenburg, Ph.D., M.Sc., Amsterdam School of Communication Research ASCoR, University of Amsterdam, Kloveniersburgwal 48, 1012 CX, Amsterdam, the Netherlands.

E-mail address: p.m.valkenburg@uva.nl (P.M. Valkenburg).

This review study has its origins in a presentation in the plenary session "E-teens: wired for life" organized at the annual conference of the Society of Adolescent Medicine on March 17, 2009.

review is to outline how three features of online communication (anonymity, asynchronicity, and accessibility) can stimulate controllability of self-presentation and self-disclosure skills among adolescents. Additionally, we theorize and substantiate how Internet-stimulated self-presentation and self-disclosure explains both the appeal and the effects of online communication on the following three aspects of psychosocial development: identity, intimacy, and sexuality. In this article, we focus on online communication among adolescents in everyday life, that is, their typically voluntary (and intentional) online interactions with online individuals or groups through e-technologies, such as instant messaging and social network sites.

Online Communication and Psychosocial Development

Developmental researchers agree that the overarching goal for adolescents is to achieve psychosocial autonomy [3]. Within this overarching goal, three developmental tasks are important for psychosocial development [3]. First, adolescents have to develop a firm sense of their self or identity, that is, they need to achieve a secure feeling about who they are and what they wish to become. Second, they have to develop a sense of intimacy, that is, they need to acquire the abilities that are necessary to form, maintain, and terminate close, meaningful relationships with others. Third, they have to develop their sexuality, that is, they at least need to (a) become used to feelings of sexual desire, (b) define and accept their sexual orientation, and (c) learn how to engage in mutual, nonexploitative, honest, and safe sexual contacts and relationships [3].

To accomplish these three developmental tasks, adolescents need to develop two important skills, that is, self-presentation and self-disclosure. Self-presentation and self-disclosure are related but different skills. They both have to be learned, practiced, and rehearsed in adolescence, and they both are vital for the development of identity, intimacy, and sexuality. Self-presentation can best be understood as selectively presenting aspects of one's self to others. Self-disclosure can be defined as revealing intimate aspects of one's true self [4].

For the development of identity, intimacy, and sexuality, adolescents need to learn to present themselves to others and adjust their self-presentation according to the reactions from others. By learning from the feedback they receive, they can rehearse and validate their social identities and eventually integrate them into their self [4]. To develop a sense of intimacy and, more specifically, close and meaningful relationships, they need to learn how to adequately disclose intimate information. Self-disclosure not only helps them to validate the appropriateness of their cognitions, emotions, and behaviors, but also elicits close, supportive friendships and romantic relationships through the norm of reciprocity [5].

Identity, Intimacy, Sexuality, and Three Features of Online Communication

Traditionally, adolescents learn and rehearse self-presentation and self-disclosure in face-to-face communication, often with peers and close friends. However, several studies suggest that self-presentation and self-disclosure—in particular to peers and close friends—increasingly take place on the Internet [6–8]. About one in three adolescents prefer online communication over face-to-face communication to talk about intimate topics, such as love, sex, and things they are ashamed about [8].

Why is online communication so attractive to adolescents? A plausible explanation, which received support in several studies [8–11], is that in comparison with face-to-face communication, online communication enhances the controllability of self-presentation and self-disclosure. This enhanced controllability, in turn, creates a sense of security in adolescents, allowing them to feel freer in their interpersonal interactions on the Internet than in face-to-face situations [11]. This is particularly important for adolescents, who may at times be shy and self-conscious in face-to-face settings [12,13]. The enhanced controllability of self-presentation and self-disclosure provides them with the opportunity to overcome the social hindrances that they typically encounter in offline communication settings [9].

Three features of online communication encourage this enhanced controllability of self-presentation and self-disclosure. These features may differ by Internet application, but they can often also be selectively adjusted by the adolescent. These features include (1) anonymity, (2) asynchronization, (3) and accessibility.

Anonymity

On the Internet, adolescents can experience and explore several forms of anonymity. The most extreme form is source anonymity [14]. It refers to the situation wherein online communication, for example in a chat room or online support network, cannot be attributed to a specific individual (i.e., source). Another common form of anonymity is audiovisual anonymity, which refers to either the lack, or the reduction, of nonverbal (visual or auditory) cues conveyed in online communication. In some Internet applications, such as instant messaging and social network sites, it is uncommon to retain source anonymity. However, these applications give adolescents ample opportunity to control the richness of the cues they wish to convey. Adolescents can easily decide whether they present only verbal information or whether they enrich this information with visual and/or audio cues.

Anonymity affects the controllability of self-presentation and self-disclosure. For a long time, it has been assumed that anonymity simulates deindividuation effects, defined as the loss of one's sense of individuality and personal responsibility [15]. Recent studies on computer-mediated communication still acknowledge that anonymous online communication has some deindividuating effects [16]. For example, it can lead to a reduced tendency to worry about what others think about one's self-presentation, and also to react on the spur of the moment, primarily on the basis of one's present emotional state [17].

The anonymity-induced control of self-presentation and self-disclosure can affect adolescents' psychosocial development in positive and negative ways. Online anonymity may lead to less concern about their physical appearance (e.g., pimples, blushes), which may facilitate adolescents' online self-disclosure and self-presentation, and, as a result, their opportunities for approval and social acceptance [18]. In contrast, online anonymity may also stimulate impulsive reactions, which may result in disinhibited, aggressive, and insulting comments, as well as in cyberbullying and online harassment of peers.

Asynchronicity

Most online communication is asynchronous, that is, it allows adolescents to change and reflect on what they write before they

send their messages. Even in applications, such as instant messaging, adolescents first have to press the “send button” before they can transmit a message to a communication partner. Therefore, in most types of online communication, the level of editability is higher than that in face-to-face communication, in which communication can only be adjusted afterward rather than before it is transmitted [19]. Asynchronicity appears particularly beneficial for adolescents who are shy and self-consciousness, those who feel physically unattractive, those who are easily embarrassed, and those who have a tendency to be quiet and timid at offline social gatherings [20].

The high level of editability of online communication can be used or misused. Asynchronicity and the resulting editing possibilities have been shown to allow adolescents to carefully think about and edit information, and by doing so, optimize their self-presentation and self-disclosure [19]. Conversely, it also allows them to tailor information meticulously such that it may become particularly painful for a target or online victim.

Accessibility

Adolescents have always turned to the media for information related to identity, intimacy, and sexuality [21]. However, never before did they have such abundant opportunities to find, create, and distribute identity-, intimacy-, and sex-related information. They can easily choose their audience and communication partners and share ideas with like-minded people. The easy accessibility of persons, for example on social network sites, allows adolescents to interact with peers whom they may not have seen for a long time or whom they cannot meet easily in their lives. Similarly, adolescents can conveniently spread information about themselves among a wide variety of people. This enables them to control their self-presentation and self-disclosure far more easily and efficiently than in offline communication.

Similar to other Internet features, the high accessibility of the Internet creates opportunities and risks. It allows adolescents to form close friendships with teenagers whom they would not easily meet in their offline lives, and to find support from peers with similar experiences (e.g., in health-related online support groups). Conversely, they can easily interact with individuals who many adults may not consider appropriate company for adolescents, and become the target of unwanted online solicitation [22].

Opportunities and Risks of Online Communication: Empirical Evidence

Anonymity, asynchronicity, and accessibility enhance adolescents' control over self-presentation and self-disclosure. This enhanced controllability, in turn, explains why the Internet is so attractive to adolescents. At the same time, it explains why it may be beneficial or risky for their psychosocial development. In the following sections of this review, we discuss the published studies on the effects of online communication on the following three aspects of psychosocial development: identity, intimacy, and sexuality. In preparing this review, we collected all relevant references up to July 2010 from Psychinfo, Web of Science, and Science Direct. Search terms included adolescents or teenagers or youth and Internet, and identity or sexuality or intimacy or self-concept or self-esteem or friendship formation or quality of friendships, or social support, or cyberbullying, or harassment. In addition, references from these publications were examined to

trace articles and published reports that were not recorded in these databases.

Identity Development

Internet researchers have focused on the following two aspects of identity development: self-concept-clarity and self-esteem. Self-concept clarity refers to the extent to which beliefs and opinions about one's self are clearly and confidently defined, internally consistent, and stable [23]. Self-esteem is the evaluative aspect of the self, and it usually refers to how adolescents value their self-worth [13,24].

Self-concept clarity

The risks of online communication on self-concept clarity are outlined in two opposite hypotheses: the self-concept fragmentation and the self-concept unity hypothesis. The fragmentation hypothesis states that the ease with which possible identities can be crafted online may fragment adolescents' personalities. Moreover, the many possibilities for new relationships may confront them with people and ideas that may further disintegrate their already fragile personalities [25,26]. The self-concept unity hypothesis states that the Internet gives adolescents more opportunities than ever to interact with people from different backgrounds. As a result, adolescents can validate their identities against a vastly expanded social sounding board, which in turn may stimulate their self-concept clarity [27].

To our knowledge, three survey studies have investigated the effect of the Internet on the self-concept clarity among adolescents [28–30]. These studies have yielded indecisive results. Two studies have shown that frequent Internet use or online identity experiments (i.e., pretending to be someone else) was associated with a less stable self-concept [29,30]. However, more rigorous, multivariate analyses demonstrated the spuriousness of this association as soon as other variables, such as loneliness and social anxiety, were included in the model [28]. Therefore, current research does not permit the conclusion that the use of the Internet improves or hinders adolescents' self-concept clarity. Other factors, such as loneliness—and thus the lacking opportunity to learn about one's self in an offline social context—seem to influence adolescents' self-concept more strongly than use of Internet [28,30].

Self-esteem

All theories on self-esteem agree that there is a universal desire among human beings to maintain, protect, and enhance their self-esteem [31]. Two important predictors of self-esteem are the control over one's environment and approval and acceptance from others [13,32,33]. Online communication may provide adolescents with both. As discussed in the previous section, online communication enables adolescents to control what they want others to know about them. They can create or modify the presentation of themselves, and they can choose the pace, breadth, and depth of self-disclosure. By experimenting with their self-presentation and self-disclosure, they can optimize the reactions and feedback from their peers and thus enhance their self-esteem.

Several studies have investigated the relationship between (different forms of) online communication and self-esteem among adolescents [7,18,34,35]. Most of these studies, especially

those that focused on blogs and social network sites, have shown that online communication increases adolescents' self-esteem. For example, in a study that combined a survey of adolescents in the United States with the analyses of their personal homepages and blogs, Schmitt et al. [7] found that adolescents indeed experienced a sense of mastery and control through the creation of homepages and blogs. This sense of mastery and control, in turn, was associated with higher self-esteem.

Focusing on the use of social network sites by Dutch adolescents, Valkenburg et al. [18] also reported positive effects on their self-esteem. They found that the more often adolescents used social network sites, the more often they received reactions; and the more reactions they received, the more positive these reactions became. Eventually, these positive reactions led to a higher self-esteem. Because the majority of reactions to the online profiles were positive, most adolescents benefited from the use of social network sites. However, among 7% of the adolescents, the reactions on their profile were mostly negative and their online self-presentation decreased their self-esteem.

The aforementioned studies point to a positive relation between adolescents' communication-oriented Internet activities and their self-esteem. However, none of these studies dealt with compulsive forms of Internet use such as an unhealthy attachment to Internet applications [36]. There is consistent evidence that compulsive Internet use—for instance, an inability to regulate the time spent online or the replacement of face-to-face activities with online activities—is negatively related to self-esteem [37,38]. In summary, online communication seems to be beneficial for self-esteem unless it is compulsive.

Intimacy Development

Research has focused on the opportunities of online communication for the following two aspects of intimacy development: friendship formation and the quality of existing friendships. It has dealt with a potential downside of online communication for intimacy development, that is, cyberbullying.

Formation of friendships

Research on the effects of the Internet on friendship formation has revolved around two hypotheses. The rich-get-richer hypothesis proposes that especially adolescents who already have strong social skills will benefit from the Internet when it comes to formation of friendships [39,40]. The social compensation hypothesis states that the Internet is particularly beneficial for lonely and socially anxious adolescents. Because of the controllability of online communication, these adolescents more easily disclose themselves while being online, which eventually facilitates the formation of friendships [39–41].

The rich-get-richer hypothesis generally received more support than the social compensation hypothesis. There is evidence that, overall, socially anxious and lonely adolescents turn to the Internet for online communication less often than nonsocially anxious and nonlonely adolescents [42,43]. However, as predicted by the social compensation hypothesis, lonely and socially anxious adolescents do seem to prefer online communication to face-to-face communication [40,44]. They also more strongly value the controllability of online communication than nonsocially anxious and nonlonely adolescent respondents [45]. This suggests that although socially anxious and lonely adolescents

favor online communication over face-to-face communication, this preference does not necessarily lead to new friendships.

Quality of existing friendships

Research on the effects of online communication on the quality of adolescents' existing friendships has also revolved around two hypotheses. The displacement hypothesis states that online communication impairs adolescents' quality of existing friends, because it displaces the time that could be spent in more meaningful interactions with offline friends [46–48]. Because online contacts are seen as superficially weak-tie relationships that lack feelings of affection and commitment, the Internet is believed to reduce the quality of existing friendships among adolescents.

In contrast, the stimulation hypothesis emphasizes that more recent Internet-based communication technologies are designed to encourage communication with existing friends. As a result, much of the time spent on online communication is used to maintain and deepen existing friendships, which eventually enhances their closeness [49,50].

Overall, the stimulation hypothesis has received more support than the displacement hypothesis [9]. However, the positive effects on the quality of friendships are conditional. They have been found only when online communication is not anonymous, and when adolescents use the Internet primarily to communicate with their existing friends [51,52]. Its use primarily for entertainment goals (e.g., playing online games, surfing) and communication with strangers seems to hinder the quality of friendships [43,53,54].

In a longitudinal study, Valkenburg and Peter demonstrated that the positive effects of Internet can be explained by enhanced online self-disclosure. Their Internet-enhanced self-disclosure hypothesis is based on three assumptions. First, online communication creates a safe space that facilitates online self-disclosure. Second, higher online self-disclosure stimulates the quality of friendship among adolescents. Third, online self-disclosure mediates the direct relationship between online communication and the quality of friendship. These three assumptions received support in the study [2].

Although the bulk of evidence points to a stimulation effect, some studies have yielded no significant relationship between online communication and the quality of friendships [55–57]. Finally, there is research available in support of the displacement hypothesis. However, these latter studies were typically conducted in the early days of the Internet [46,50,55]. At that time, it was still hard to maintain one's existing social network on the Internet because the greater part of this network was not yet online. At present, the vast majority of adolescents in Western countries have access to the Internet. At such high access rates, a negative effect of the Internet on the quality of friendships is less likely because adolescents have far more opportunities to maintain their existing friendships through the Internet.

Cyberbullying

An important risk on online communication is the increasing number of cyberbullying incidents among adolescents, with victimization rates being as high as 53% in some studies [58–60]. Cyberbullying occurs when Internet-based applications are used to systematically intimidate or insult a person so as to humiliate, embarrass, or hurt that person. Similar to offline bullying, cyberbullying involves intentional repetitive actions and psychologi-

cal violence. Cyberbullying is likely to be enhanced by the following three features of online communication: anonymity, asynchronicity, and accessibility. Together, these features may stimulate (a) disinhibited behavior; (b) diminished confrontation of the cyberbully with the immediate effect of the act; and (c) the easy accessibility and long-term retrievability of digital manifestations of cyberbullying [61].

Correlational studies among teenagers in the United States have shown that being the victim of cyberbullying is associated with many psychosocial attributes, such as increased social anxiety [62], psychological distress [63], and symptoms of depression [64]. Other studies suggested that victimization in cyberbullying is related to aggressive tendencies, poor anger management, and problems at school [65,66]. However, none of the available studies has decisively demonstrated whether the various psychosocial problems are the cause or result of cyberbullying. There is a vital need for experimental and longitudinal research into the antecedents and consequences of cyberbullying [59,60].

Sexual Development

Research on the effects of the Internet on the sexual development adolescents has been burgeoning in the past years. We focus on the following two aspects of sexual development: sexual self-exploration and online sexual solicitation.

Sexual self-exploration

Research on the opportunities of online communication for the sexual development of adolescents has shown that it facilitates their sexual self-exploration. Because of the possibility of anonymous communication on the Internet, adolescents can address sensitive sexual issues more easily than in face-to-face communication. For example, adolescents frequently use the Internet to obtain advice about sexual health issues [67] and to discuss moral, emotional, and social issues related to teenage sex [68]. Online communication as a relatively safe means of exploring sensitive issues is particularly important for gay and lesbian youth. Because same-sex attraction is still associated with considerable repercussions and distress, many gay and lesbian adolescents use the Internet for discussing problems surrounding their sexual orientation, to come out, and to practice the public acknowledgment of their sexual orientation [69–71].

Online sexual solicitation

Online communication, especially about sexual issues, may present adolescents with the risk of unwanted sexual online solicitation and harassment. Although, according to a U.S. study, incidences of unwanted sexual solicitation have declined in comparison with the early years of the Internet, 4% of adolescents still report aggressive sexual solicitation [72]. Adolescents who are most at risk for unwanted sexual solicitation are boys who are gay or those who are uncertain about their sexual orientation; adolescents who have been sexually or physically abused; teenagers who also engage in other risky offline or online behavior; and youth who frequently visit chat rooms and talk online with strangers about sex [22]. Therefore, researchers agree that prevention and programs that will increase awareness have to be targeted at these particular groups of adolescents.

Conclusions, Shortcomings, and Future Research

Existing research suggests several opportunities of online communication, such as enhancement of self-esteem, increased opportunities for formation of friendships, enhanced quality of existing friendships, and enhanced opportunities for sexual self-exploration. It has also clearly revealed some risks including cyberbullying and sexual online solicitation. Research has also shown that the Internet is neither a place where adolescents are exclusively confronted with risks that they cannot handle, nor a place that, in itself and automatically, creates opportunities for positive psychosocial development. The nature of effects of online communication on identity, intimacy, and sexuality are associated with at least five of the following factors: (1) the predominant use of online communication (i.e., whether it is anonymous); (2) the communication partner (friend or stranger); (3) the type of use (compulsive or noncompulsive); (4) the timeline of data collection (i.e., the effects were more negative in the early stages of the Internet); and (5) motivation of adolescents to use a particular technology (e.g., for communication or entertainment).

Although the effect of online communication on psychosocial development thus depends on technological, situational, and personal factors, our review suggests that an adequate understanding of the psychosocial development of present-day adolescents can no longer ignore their online communication. The thesis that media increase the possibilities for self-socialization among adolescents is not new [73]. However, never before did adolescents have such a chance to explore their identities with such a multiplicity of means and without supervision by traditional socialization agents, such as parents and schools. Overall, our review suggests that this does not necessarily have to be a cause of concern, but it certainly raises important questions about the future role of parents and schools in the psychosocial development of adolescents.

The research we reviewed has debunked several myths about the relation between adolescents' online communication and their psychosocial development. At the same time, the reviewed research has led to many new insights that enrich our knowledge on this issue. We have reviewed a rather new line of research. The first studies appeared only in the second half of the 1990s. There are several challenges in this new line of research that should be addressed in future studies. First, several existing studies have not paid sufficient attention to adequate sampling procedures and sample constitution. In particular, online surveys are often based on self-selected samples. The lack of truly random samples endangers the generalizability of the results. Moreover, there is a tendency to generalize from samples of college students, that is, emerging adults to adolescents. From a developmental perspective, this is problematic, especially when adolescent-specific processes, such as identity, intimacy, and sexuality are investigated.

Second, many studies were based on cross-sectional designs. This calls into question whether the effect of online communication on psychosocial development of adolescents has been studied rigorously enough. For the further development of the field, it is essential that more internally valid designs be chosen. Although several studies that are based on longitudinal designs have already emerged recently [2,42,74], there is a vital need for experimental research as well.

Third, existing research sometimes tends to conflate different types of Internet use. As our review has shown, it is crucial that

different types of Internet use and online communication should be conceptually distinguished and assessed separately in their operational translation. For the valid assessment of different types of Internet use and online communication, it may be necessary to go beyond traditional self-reported frequency estimates in surveys. These estimates are prone to several distortions, ranging from memory errors to social-desirability biases. Alternative methods, such as the media diary method, have elicited promising results [75], but are still rarely applied.

Fourth, much of the existing research has focused on rather simple main effects of Internet communication on the psychosocial development of adolescents. Although this focus may be understandable given the novelty of the field, it keeps us from a more nuanced view on the processes that underlie these effects. Moreover, it obstructs our view on individual differences in these effects. It will be important to design future research that will help us determine which teens will benefit from online communication, and which may be harmed. Only if we understand individual differences in the use and effects of online communication will we be able to design interventions that target different (subgroups of) adolescents.

This article discussed the effects of the use of online communication technologies on three aspects of the psychosocial development of adolescents: identity, intimacy, and sexuality. We did not include the studies on the effects of the Internet on other variables that are potentially related to the psychosocial development of adolescents, such as their physical health behavior. A simple reason for this omission is that, to our knowledge, such studies have not yet been published. The past years have witnessed a wealth of studies on the effects of web-based interventions on health behavior [76–78]. Although reviewing this line of studies was beyond the scope of our review, future research on the effects of online communication among adolescents should benefit from the insights developed in these intervention studies, and should be used in future theories and research on the psychosocial effects of adolescents' voluntary online communication.

In conclusion, the empirical research to date has shown that adolescents can use the same technologies, both in a positive as well as in a negative way. For example, instant messaging can help them exchange intimate information with their close friends, thereby stimulating the quality of these friendships. However, it is also widely used for cyberbullying and online harassment. Likewise, online social support groups can help adolescents with social or health problems, but at the same time they can also result in dangerous interactions with strangers [79].

An important challenge both for future Internet researchers, health care professionals, and parents is to understand how to enhance the opportunities of online communication while managing its risks. However, research on this topic has not yet been developed enough to provide us with clear-cut answers. Moreover, there is reason to believe that attempts to intervene into adolescents' online communication may backfire because adolescents may consider such attempts to be an intrusion into their autonomy and privacy. For example, a recent study has shown that two-thirds of adolescents (12- to 19-years-olds) hide their online activities from their parents. About the same percentage of adolescents report that they mind their parents monitoring their use of the Internet [80]. Thus, if professionals and parents want to help their teenagers to deal with the opportunities and risks of online communication, a

good start may be to realize that psychosocial problems that originate through online communication often resemble those found in the offline lives (e.g., frustration resulting from romantic relationships, disappointing friendships, social exclusion). As a result, it is advisable that strategies against potentially adverse consequences of online communication be developed similar to those that have proven to be successful in solving the problems that adolescents encounter offline.

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