123. Antronette Yancey, Judith Siegel, and Kimberly McDaniel, "Role Models, Ethnic Identity, and Health-Risk Behaviors in Urban Adolescents," *Archives of Pediatrics & Adolescent Medicine* 156 (2002): 55–61.

124. Huesmann, "Psychological Processes" (see note 80).

125. Otto and others, "Posttraumatic Stress Disorder Symptoms" (see note 41).

126. Singer and Singer, "Barney & Friends" (see note 105).

127. Joanne Cantor and Barbara Wilson, "Media and Violence: Intervention Strategies for Reducing Aggression," *Media Psychology* 5, no. 4 (2003): 363–403.

128. Amy Nathanson and Joanne Cantor, "Reducing the Aggression-Promoting Effect of Violent Cartoons by Increasing Children's Fictional Involvement with the Victim: A Study of Active Mediation," *Journal of Broadcasting & Electronic Media* 44 (2000): 125–42.

129. Joanne Cantor and Barbara Wilson, "Helping Children Cope with Frightening Media Presentations," *Current Psychological Research & Reviews* 7 (1988): 58–75.

130. Wilson and Weiss, "The Effects of Two Reality Explanations" (see note 121); Joanne Cantor and Barbara Wilson, "Modifying Fear Responses to Mass Media in Preschool and Elementary School Children," *Journal of Broadcasting* 28 (1984): 431–43.

131. Cantor and Wilson, "Modifying Fear Responses" (see note 130).

132. Wilson, Martins, and Marske, "Children's and Parents' Fright Reactions" (see note 58).

133. Deborah Phillips, Shantay Prince, and Laura Schiebelhut, "Elementary School Children's Responses Three Months after the September 11 Terrorist Attacks: A Study in Washington, DC," *American Journal of Orthopsychiatry* 74 (2004): 509–28.

Online Communication and Adolescent Relationships

Kaveri Subrahmanyam and Patricia Greenfield

Summary

Over the past decade, technology has become increasingly important in the lives of adolescents. As a group, adolescents are heavy users of newer electronic communication forms such as instant messaging, e-mail, and text messaging, as well as communication-oriented Internet sites such as blogs, social networking, and sites for sharing photos and videos. Kaveri Subrahmanyam and Patricia Greenfield examine adolescents' relationships with friends, romantic partners, strangers, and their families in the context of their online communication activities.

The authors show that adolescents are using these communication tools primarily to reinforce existing relationships, both with friends and romantic partners. More and more they are integrating these tools into their "offline" worlds, using, for example, social networking sites to get more information about new entrants into their offline world.

Subrahmanyam and Greenfield note that adolescents' online interactions with strangers, while not as common now as during the early years of the Internet, may have benefits, such as relieving social anxiety, as well as costs, such as sexual predation. Likewise, the authors demonstrate that online content itself can be both positive and negative. Although teens find valuable support and information on websites, they can also encounter racism and hate messages. Electronic communication may also be reinforcing peer communication at the expense of communication with parents, who may not be knowledgeable enough about their children's online activities on sites such as the enormously popular MySpace.

Although the Internet was once hailed as the savior of education, the authors say that schools today are trying to control the harmful and distracting uses of electronic media while children are at school. The challenge for schools is to eliminate the negative uses of the Internet and cell phones in educational settings while preserving their significant contributions to education and social connection.

www.futureofchildren.org

Kaveri Subrahmanyam is a professor of psychology at California State University–Los Angeles, and associate director of the Children's Digital Media Center, UCLA/CSULA. Patricia Greenfield is a Distinguished Professor of Psychology at the University of California–Los Angeles and director of the Children's Digital Media Center, UCLA/CSULA.

The communication functions of electronic media are especially popular among adolescents. Teens are heavy users of new communication forms such as instant messaging, e-mail, and text messaging, as well as communication-oriented Internet sites such as blogs, social networking, photo and video sharing sites such as YouTube, interactive video games, and virtual reality environments, such as Second Life. Questions abound as to how such online communication affects adolescents' social development, in particular their relationship to their peers, romantic partners, and strangers, as well as their identity development, a core adolescent developmental task.

In this article, we first describe how adolescents are using these new forms of electronic media to communicate and then present a theoretical framework for analyzing these uses. We discuss electronic media and relationships, analyzing, in turn, relationships with friends, romantic partners, strangers, and parents. We then explore how parents and schools are responding to adolescents' interactions with electronic media. Finally, we examine how adolescents are using electronic media in the service of identity construction.

Adolescents have a vast array of electronic tools for communication—among them, instant messaging, cell phones, and social networking sites. These tools are changing rapidly and are just as rapidly becoming independent of a particular hardware platform. Research shows that adolescents use these communication tools primarily to reinforce existing relationships, both friendships and romantic relationships, and to check out the potential of new entrants into their offline world.[1] But while the Internet allows teens to nourish existing friendships, it also expands their social networks to include strangers.

The newly expanded networks can be used for good (such as relieving social anxiety) or for ill (such as sexual predation). Although researchers have conducted no rigorous experiments into how adolescents' wide use of electronic communication may be affecting their relationships with their parents, indications are that it may be reinforcing peer communication at the expense of communication with parents. Meanwhile, parents are increasingly hard-pressed to stay aware of exactly what their children are doing, with newer forms of electronic communication such as social networking sites making it harder for them to control or even influence their children's online activities. Schools too are now, amidst controversy and with difficulty, trying to control the distracting uses of the Internet and other media such as cell phones while children are at school. The challenge for parents and schools alike is to eliminate the negative uses of electronic media while preserving their significant contributions to education and social connection.

Electronic Media in the Service of Adolescent Communication

To better understand how adolescents use electronic media for communication, we start by describing the many diverse ways in which such communication can take place. Among youth today, the popular communication forms include e-mail, instant messaging, text messaging, chat rooms, bulletin boards, blogs, social networking utilities such as MySpace and Facebook, video sharing such as YouTube, photo sharing such as Flickr, massively multiplayer online computer games such as *World of Warcraft*, and virtual worlds such as Second Life and Teen Second Life. Table 1 lists these communication forms, the electronic hardware that supports them, and the functions that they make possible.

Table 1. Online Communication Form, Electronic Hardware That Supports It, and Function of the Communication Form

Communication Form	Electronic Hardware That Supports It	Functions Enabled
E-mail	Computers, cell phones, Personal Digital Assistants (PDAs)	Write, store, send, and receive asynchronous messages electronically; can include attachments of word documents, pictures, audio, and other multimedia files
Instant messaging	Computers, cell phones, PDAs	Allows the synchronous exchange of private messages with another user; messages primarily are in text but can include attachments of word documents, pictures, audio, and other multimedia files
Text messaging	Cell phones, PDAs	Short text messages sent using cell phones and wireless hand-held devices such as the Sidekick and Personal Digital Assistants
Chat rooms	Computers	Synchronous conversations with more than one user that primarily involve text; can be either public or private
Bulletin boards	Computers	Online public spaces, typically centered on a topic (such as health, illnesses, religion), where people can post and read messages; many require registration, but only screen names are visible (such as www.collegeconfidential.com)
Blogs	Computers	Websites where entries are typically displayed in reverse chronological order (such as www.livejournal.com); entries can be either public or private only for users authorized by the blog owner/author
Social networking utilities	Computers	Online utilities that allow users to create profiles (public or private) and form a network of friends; allow users to interact with their friends via public and private means (such as messages, instant messaging); also allow the posting of user-generated content such as photos and videos (such as www.myspace.com)
Video sharing	Computers, cell phones, cameras with wireless	Allows users to upload, view, and share video clips (such as www.YouTube.com)
Photo sharing	Computers, cell phones, cameras with wireless	Allows users to upload, view, and share photos (such as www.Flickr.com); users can allow either public or private access
Massively multiplayer online computer games (MMOG)	Computers	Online games that can be played by large numbers of players simultaneously; the most popular type are the massively multiplayer role playing games (MMORPG) such as *World of Warcraft*
Virtual worlds	Computers	Online simulated 3-D environments inhabited by players who interact with each other via avatars (such as Teen Second Life)

Although table 1 lists the various forms of electronic hardware that support the different communication forms, these distinctions are getting blurred as the technology advances. For instance, e-mail, which was originally supported only by the computer, can now be accessed through cell phones and other portable devices, such as personal digital assistants (PDAs), Apple's iPhone, the Sidekick, and Helio's Ocean. The same is true for functions such as instant messaging and social networking sites such as MySpace.

Other communication forms such as YouTube and Flickr are similarly accessible on portable devices such as cell phones with cameras and cameras with wireless. Text messaging continues to be mostly the province of cell phones although one can use a wired computer to send a text message to a cell phone. As more phones add instant messaging service, instant messaging by cell phone is also growing in popularity.[2] Although teens use many of these types of electronic hardware to access the different online communication forms, most research on teens' use of electronic communication has targeted computers; where available, we will include

findings based on other technologies, such as cell phones.

Adolescents are using these different communication forms for many different purposes and to interact with friends, acquaintances, and strangers alike. Teens use instant messaging mainly to communicate with offline friends.[3] Likewise they use social networking sites to keep in contact with their peers from their offline lives, both to make plans with friends whom they see often and to keep in touch with friends whom they see rarely.[4] They use blogs to share details of everyday happenings in their life.[5]

Cell phones and text messaging have also become an important communication tool for teens. Virgin Mobile USA reports that more than nine of ten teens with cell phones have text messaging capability; two-thirds use text messaging daily. Indeed, more than half of Virgin's customers aged fifteen to twenty send or receive at least eleven text messages a day, while nearly a fifth text twenty-one times a day or more. From October through December 2006, Verizon Wireless hosted 17.7 billion text messages, more than double the total from the same period in 2005. Adolescents use cell phones, text messaging, and instant messaging to communicate with existing friends and family.[6] Using these tools to keep in touch with friends is a departure from the early days of the Internet, when contact with strangers was more frequent. But the trend is not surprising given that youth are more likely to find their friends and family online or with cell phones today than they were even five or ten years ago.[7]

Although teens are increasingly using these electronic communication forms to contact friends and family, the digital landscape continues to be populated with anonymous online contexts such as bulletin boards, massively multiplayer online games (MMOG), massively multiplayer online role playing games (MMORPG), and chat rooms where users can look for information, find support, play games, role play, or simply engage in conversations. Investigating how technology use affects adolescent online communication requires taking into account both the activities and the extent of anonymity afforded by an online context, as well as the probability of communicating with strangers compared with friends in that context.

Privacy measures have given adolescent users a great deal of control over who views their profiles, who views the content that they upload, and with whom they interact on these online forums.

Electronic communication forms also differ both in the extent to which their content is public or private and in the extent to which users can keep content private. Public chat rooms and bulletin boards are perhaps the least private. Screen names of users are publicly available, although users choose their screen names and also whether their profile is public or private. Of course, private conversations between users are not publicly available, and such private messages are typically restricted to other users who have also registered. This restriction precludes lurkers and others not registered with the site from privately contacting a user. Communication through e-mail, instant messaging, and text messaging is ostensibly the most private.

Although e-mails and transcripts of instant messaging conversations can be forwarded to third parties, they still remain among the more private spaces of the Internet.

For communication forms such as blogs and social networking utilities, users have complete control over the extent to which their entries or profiles are public or private. Blog entries and MySpace profiles, for instance, can be either freely accessed on the Web by anyone or restricted to friends of the author. Recently, MySpace has restricted the ability of users over age eighteen to become friends with younger users. Facebook gives users a variety of privacy options to control the profile information that others, such as friends and other people in their network, can see. For example, users can block particular people from seeing their profile or can allow specific people to see only their limited profile. Searches on the Facebook network or on search engines reveal only a user's name, the networks they belong to, and their profile picture thumbnail. Facebook used to be somewhat "exclusive," in that members had to have an ".edu" suffix on their e-mail address; the idea was to limit the site to college and university students. That requirement, however, has recently changed, making Facebook less "private" and more public. Most photo sharing sites allow users to control who views the pictures that they upload; pictures can be uploaded for public or private storage and users can control who views pictures marked private. YouTube, a very public communication forum, allows registered users to upload videos and unregistered users to view most videos; only registered viewers can post comments and subscribe to video feeds.

Finally, although online games and virtual worlds are public spaces, users must be registered and often must pay a subscription fee to access them; users create avatars or online identities to interact in these worlds and have the freedom to make them resemble or differ from their physical identities. Some virtual worlds such as Second Life are restricted to people older than eighteen; Teen Second Life is restricted to users between thirteen and seventeen. Several controls have been put in place to protect youth in these online contexts. One such control for Teen Second Life is the verification of users, which requires a credit card or Paypal account. Another control is the threat of losing one's privileges in the site; for instance, underage users found in the main area are transferred to the teen area and overage users found in the teen area are banned from both the teen and main areas.

These privacy measures have given adolescent users a great deal of control over who views their profiles, who views the content that they upload, and with whom they interact on these online forums. And young users appear to be using these controls. A recent study of approximately 9,000 profiles on MySpace found that users do not disclose personal information as widely as many fear: 40 percent of profiles were private. In fact only 8.8 percent of users revealed their name, 4 percent revealed their instant messaging screen name, 1 percent included an e-mail address, and 0.3 percent revealed their telephone number.[8] As dana boyd points out, however, an intrinsic limitation of privacy in electronic communication is that words can be copied or altered and shared with others who were not the intended audience.[9] Further research is needed to learn how this feature affects social relationships.

Privacy controls on networking sites also mean that adolescents can restrict parental

access to their pictures, profiles, and writings. In fact, on Facebook, even if teens give their parents access to their profiles, they can limit the areas of their profile that their parents can view. We recently conducted a focus group study that revealed that some teens may go as far as to have multiple MySpace profiles, some of which their parents can access, others of which they cannot, and still others that they do not know exist. Monitoring and controlling youth access to these communication forms is growing ever more challenging, and it is important for parents to inform themselves about these online forms so they can have meaningful discussions about them with their adolescents.

One key question for research is whether these new online communication forms have altered traditional patterns of interaction among adolescents. Is time spent in online communication coming at the expense of time spent in face-to-face communication? Or is time spent online simply substituting for time that would have been spent on the telephone in earlier eras? Research has shown that over the past century adolescence has become more and more separated from adult life; most adolescents today spend much of their time with their peers.[10] An equally important question is whether adolescents' online communication is changing the amount and nature of interactions with families and relatives. Research has not yet even consistently documented the time spent by adolescents in different online communication venues. One difficulty in that effort is that the multitasking nature of most online communication makes it hard for subjects to provide a realistic estimate of the time they spend on different activities. Recall errors and biases can further distort estimates. Researchers have tried to sidestep this problem by using diary studies and experience-sampling methods in which subjects are beeped at various points throughout the day to record and study their activities and moods. But current diary studies of teen media consumption do not address the questions of interest here. The rapidly shifting nature of adolescent online behavior also complicates time-use studies. For instance, on the blogging site Xanga, an average user spent an hour and thirty-nine minutes in October 2002, but only eleven minutes in September 2006. Similarly, recent media reports suggest that the once-popular Friendster and MySpace sites have been supplanted by Facebook among adolescents.[11] These shifts in popularity mean that data on time usage quickly get outdated; clearly new paradigms are needed to study these issues.

Theoretical Framework

Our theoretical framework draws on John Hill's claim that adolescent behavior is best understood in terms of the key developmental tasks of adolescence—identity, autonomy, intimacy, and sexuality—and the factors, such as pubertal and cognitive changes, and the variables, such as gender and social class, that influence them.[12] Extending his ideas, we propose that for today's youth, media technologies are an important social variable and that physical and virtual worlds are psychologically connected; consequently, the virtual world serves as a playing ground for developmental issues from the physical world, such as identity and sexuality.[13] Thus understanding how online communication affects adolescents' relationships requires us to examine how technology shapes two important tasks of adolescence—establishing interpersonal connections and constructing identity.

Electronic Media and Relationships

Establishing interpersonal connections—both those with peers, such as friendships and romantic relationships, and those with parents, siblings, and other adults outside the family—is one of the most important developmental tasks of adolescence.[14] As electronic media technologies have become important means of communicating with others, it is important to consider them in the context of the interpersonal relationships in adolescents' lives. Two themes have framed discussions of adolescent online communication and relationships. One is concern about the nature and quality of online and offline relationships. The other is how online communication affects adolescents' relationships and well-being and whether the effects are positive or negative. We next address these issues. Although research on adolescence has historically not considered relationships with strangers, we include that relationship here, as the Internet has opened up a world beyond one's physical setting.

Electronic Media and Relationships with Friends

We first examine the role of electronic media in youth's existing friendships. One study of detailed daily reports of home Internet use found that adolescents used instant messaging and e-mail for much of their online interactions; they communicated mostly with friends from offline lives about everyday issues such as friends and gossip.[15] Another study found that teens use instant messaging in particular as a substitute for face-to-face talk with friends from their physical lives.[16] According to this study, conducted in 2001–02, teens feel less psychologically close to their instant messaging partners than to their partners in phone and face-to-face interactions. Teens also find instant messaging less enjoyable than, but as supportive as, phone or face-to-face interactions. They find instant messaging especially useful to talk freely to members of the opposite gender. The authors of the study speculate that teens have so wholly embraced instant messaging despite its perceived limitations because it satisfies two important developmental needs of adolescence—connecting with peers and enhancing their group identity by enabling them to join offline cliques or crowds without their more formal rules.

Although social networking sites are also used in the context of offline friendships, this is true mostly for girls. The 2006 Pew survey study on social networking sites and teens found that girls use such sites to reinforce pre-existing friendships whereas boys use them to flirt and make new friends.[17] Text messaging on cell phones has recently become popular among U.S. teens; they are now following youth in the United Kingdom, Europe, and Asia who have widely adopted it and enmeshed it in their lives. Adolescents exchange most of their text messages with their peers.[18] To study the communicative purposes of text messaging, one study asked ten adolescents (five boys and five girls) to keep a detailed log of the text messages that they sent and received for seven consecutive days. Analysis of the message logs revealed three primary conversation threads: chatting (discussing activities and events, gossip, and homework help), planning (coordinating meeting arrangements), and coordinating communication (having conversations about having conversations). The teens ended most text conversations by switching to another setting such as phone, instant messaging, or face-to-face.[19]

Effects of electronic communication on friendships. How does adolescents' electronic communication with their friends affect their friendship networks and, in turn, their well-being? According to a 2001 survey by the Pew Internet and American Life Project,

48 percent of online teens believe that the Internet has improved their relationships with friends; the more frequently they use the Internet, the more strongly they voice this belief. Interestingly, 61 percent feel that time online does not take away from time spent with friends.[20]

One recent study appears to support adolescents' self-reported beliefs about how the Internet affects their friendships. A survey study of preadolescent and adolescent youth in the Netherlands examined the link between online communication and relationship strength.[21] Eighty percent of those surveyed reported using the Internet to maintain existing friendship networks. Participants who communicated more often on the Internet felt closer to existing friends than those who did not, but only if they were using the Internet to communicate with friends rather than strangers. Participants who felt that online communication was more effective for self-disclosure also reported feeling closer to their offline friends than adolescents who did not view online communication as allowing for more intimate self-disclosure.

Whereas survey participants who used instant messaging communicated primarily with existing, offline friends, those who visited chat rooms communicated with existing friends less often. This pattern makes sense because chat is generally a public venue providing wide access to strangers and little access to friends, whereas instant messaging is primarily a private medium. But the research leaves unanswered the question of whether chat decreases communication with existing friends or whether teens with weaker friendship networks use chat more. The authors completed their survey before social networking sites had become popular in the Netherlands; only 8 percent of their respondents used the most popular Dutch social networking site. The study did not assess the relationship between the use of social networking sites and existing friendships.

Researchers have uncovered some evidence that the feedback that teens receive in social networking may be related to their feelings about themselves. A recent survey of 881 Dutch adolescents assessed how using a friend networking site (CU2) affected their self-esteem and well-being.[22] The study's authors concluded that feedback from the site influenced self-esteem, with positive feedback enhancing it and negative tone decreasing it. Although most adolescents (78 percent) reported receiving positive feedback always or predominantly, a small minority (7 percent) reported receiving negative feedback always or predominantly. The study, however, was based entirely on participants' self-assessments as to the kind of feedback they received; there was no independent assessment of whether it was positive or negative. It is impossible to tell whether negative feedback per se reduced self-esteem or whether participants with lower self-esteem typically perceived the feedback they received as more negative, which in turn caused a further dip in their self-esteem. Nor did the analysis take into account whether friends or strangers provided the feedback.

Even when adolescents are communicating with their friends, social networking sites such as MySpace may by their very nature be transforming their peer relations. These sites make communication with friends public and visible. Through potentially infinite electronic lists of friends and "friends of friends," they bring the meaning of choosing one's social relationships to a new extreme. They have thus become an essential part of adolescent peer social life while leading to a redefinition of the word "friend." A recent focus group study of MySpace on a college campus found that most participants had between 150 and 300 "friends" on their MySpace site.[23] Friends' photos and names are displayed on users' profiles, and each profile includes a list of "top" friends, ranging from a "top four" to a "top twenty-four." Such public display of best friends seems a potentially transformative characteristic of a social networking site. But how does making (and not making) someone's "top" friends list affect adolescent relationships and self-esteem? This is an important question for future research in the area of adolescent peer relations.

Initial qualitative evidence is that the ease of electronic communication may be making teens less interested in face-to-face communication with their friends.

Other technologies clearly form barriers against all face-to-face communication. Walking through an unfamiliar university campus recently, one of us had difficulty getting the attention of students hooked up to iPods to get directions to a particular building. Initial qualitative evidence is that the ease of electronic communication may be making teens less interested in face-to-face communication with their friends.[24] More research is needed to see how widespread this phenomenon is and what it does to the emotional quality of a relationship.

Electronic media and bullying. The news media are increasingly reporting that adolescents are using electronic technologies such as cell phones, text messages, instant messages, and e-mail to bully and victimize their peers. In a 2005 survey conducted in the United Kingdom, 20 percent of the 770 respondents, aged eleven to nineteen, reported being bullied or receiving a threat via e-mail, Internet, chat room, or text, and 11 percent reported sending a bullying or threatening message to someone else. Text bullying was most commonly reported, with 14 percent reporting being bullied by mobile text messaging. Bullying in Internet chat rooms and through e-mails was reported by 5 percent and 4 percent of the sample, respectively. A new form of harassment appears to be emerging through cell phone cameras: 10 percent reported feeling embarrassed, uncomfortable, or threatened by a picture that someone took of them with a cell phone camera. The majority of the respondents reported knowing the person who bullied or threatened them.[25]

Similar trends have been found in the United States. The second Youth Internet Safety Survey (YISS-2) conducted in 2005 found that 9 percent of young Internet users reported being harassed online in the previous year. Harassment included being bothered online as well as having someone post or send messages about them to others. Both girls and boys were targets, although girls were more likely to receive distressing harassment. Instant messaging elicited the most reports of harassment (47 percent), followed by e-mails (13 percent), chat rooms (11 percent), and blogs (3 percent).[26]

A large-scale online survey conducted at a popular teen Internet site in 2005 found a much higher rate of harassment—72 percent—using two different methods of estimating prevalence for the previous year.[27]

The online recruitment probably yielded relatively heavy Internet users for whom the risk of cyberbullying would be greater. The online anonymity of the questionnaire may also have fostered greater honesty. The discrepancy, however, is so large that it warrants further investigation.

Research on cyberbullying has tried to create profiles both of youth who are likely to perpetrate harassment and of those who are likely to be the victims of harassment. Cyberbullies are more likely to report poor parent-child relationships, substance use, and delinquency.[28] Youth (aged ten to seventeen) with symptoms of depression are more likely to report being harassed. Among boys, those reporting major depression were three times more likely to be harassed than those reporting mild to no depression.[29] As with other correlational studies, it is impossible to know the direction of causality. The authors suggest that "future studies should focus on establishing the temporality of events, that is, whether young people report depressive symptoms in response to the negative Internet experience, or whether symptomatology confers risks for later negative online incidents."

Cyberbullying illustrates how traditional offline adolescent issues are moving to the electronic stage. A questionnaire study of eighty-four thirteen- to eighteen-year-old teens found that text messages were the most common form of electronic bullying. Most important, the findings suggest that students' role as victim and perpetrator of bullying in the offline world predicted their role in electronic bullying. Although a subset of traditional bullies were victims in the virtual world, there was no indication that victims of bullying in the real world retaliated by becoming bullies on the Internet or in text messages. Nor was there any indication that bullying began electronically and was thence transferred to the real world.[30] This general pattern was confirmed by the large-scale Internet-based survey in 2005 mentioned earlier, which included more than 1,400 respondents between twelve and seventeen years of age.[31] The study found that respondents who had experienced repeated school-based bullying were seven times more likely to be subjected to repeated online bullying. Heavy use of the Internet also increased the risk, as did the use of particular Internet tools, specifically, instant messaging and webcams. These latter factors, however, were much less powerful than was school-based bullying. The study found that instant messaging was the most common tool for bullying, whereas the U.K. study noted earlier found that text messaging (which is more popular in the United Kingdom) was the most common. Clearly the particular tool is a function of its availability and cannot be considered a causal factor. Another finding is that Internet bullies include both unknown others and acquaintances. About two-thirds of the cyberbully victims knew the perpetrator; one-third did not.

Electronic Media and Relationships with Romantic Partners

Given that adolescents are using electronic media to interact with peers, it is important to see how they use them in the area of romantic relationships. Finding a romantic partner and establishing a romantic relationship are important adolescent developmental tasks. Related to these tasks are adolescents' developing sexuality and their construction of their sexual selves.

Adolescents appear to use electronic media to reinforce existing romantic relationships, just as they do friendships. According to a recent online survey by Teenage Research Unlimited, nearly a quarter of teens in a

romantic relationship have communicated with a boyfriend or girlfriend hourly between midnight and 5 a.m. using a cell phone or texting. One in six communicated ten or more times an hour through the night. Concern about sleep deprivation has been one response to these data.[32]

Online communication forms that allow for anonymity offer adolescents a new avenue to practice partner selection. Using a sample of 12,000 utterances from adolescent chat rooms, researchers have found that the search for partners was ubiquitous online, with approximately two partner requests each minute.[33] In almost one-third of cases, a participant asked interested parties, often of the opposite sex, to provide a string of numbers (for example, *Ladies If Ya Sexy Press 11* or press 234567 if you want to chat) that stood out visually to indicate a desire to chat. Participants who declared they were older searched more actively for a partner and were also more likely to specify the gender of the partner they were seeking. Also participants who stated that they were females were more likely to make partner requests. The gender difference indicates that the online environment provides a safe space for females to initiate romantic relationships. While pairing up with a romantic partner has always been a central task of adolescent development, this study shows how teens address this need more freely and frequently in a virtual communication environment than has been heretofore possible in the "real" world.

Research also suggests that anonymous online contexts provide a forum for sexual exploration, another major task of adolescence. Of the 12,000 utterances in the chat study just noted, 5 percent were sexual ones (about one sexual remark a minute).[34] Participants who self-presented as older were more likely than younger ones to make explicit sexual utterances. Gender was also related to modes of sexual expression: utterances by users with masculine screen names were more sexually explicit; those by feminine screen names, more sexually implicit. Adolescents also use online bulletin boards to learn about sexuality.[35] Finally, they use the Internet to engage in cybersex. In one study of 692 Czech secondary school students, 16 percent of twelve- to twenty-year-olds reported having tried virtual sex. A significant number reported having their first sexual experience online.[36] The study also found that 43 percent of the boys and 8 percent of the girls admitted to viewing pornographic materials. Although adolescents' exposure to online sexual content can be either intentional or unsolicited, more research is necessary to assess how this early exposure may affect sexual identity and intimacy during emerging adulthood.[37] Studies have found that inadvertent exposure to sexual media in childhood and adolescence often has negative emotional effects, such as shock, disgust, or embarrassment, and that these effects can be enduring.[38] Online forums may also provide sexual minority adolescents with a safe haven for sexual exploration without the prejudice and harassment that gay, lesbian, and bisexual adolescents sometimes face at the hands of peers and adults.[39]

Much less is known about adolescents' use of electronic communication for romantic relationship formation. The 2001 Pew survey on teenagers and instant messaging reported that among teens who used instant messaging, 17 percent used it to ask someone out and 13 percent, to break up with someone.[40] One recent study of romantic relationships among college students explored the use of Facebook, a social networking site, among 1,440 first-year students at Michigan State

University.[41] According to the study, the lowest-ranked use was finding casual sex partners; the next-lowest was finding people to date. The students may, however, have been using Facebook to check out people they had met as prospective dates. Uses such as checking out people they have met socially or in class or others who live in their dorm are all ranked relatively highly. Another study of relationship formation asked a sample of Facebook users about an instance when they had met someone socially and then reviewed his or her profile. Compared with light users, heavier users of Facebook reported feeling more confident in the information they had gleaned from the profile. They also reported being more attracted and feeling more similar to the profile they reviewed.[42] One way in which online communication may affect romantic relationships may be subtle: getting more information about people one has met to screen potential dates. This possible function is worth pursuing in future research.

Relationships with Strangers and Acquaintances

Because online interactions lack important features of face-to-face communication, such as gestures and eye contact, they are believed to be less rich than offline ones. When the communication is with strangers or individuals not part of one's offline life, it is believed to represent weak ties, which have been characterized as relationships that have superficial and easily broken bonds, infrequent contact, and narrow focus.[43] Questions about the relative richness of online communication have raised concerns about the extent of adolescents' online interactions with strangers and about the social impact of such weaker interactions and relationships.

Trends in relationships with strangers. The potential for online stranger contact varies depending both on the particular technology used and the time period under consideration. In the earlier years of the Internet, when chat rooms were the rage, teens were more likely to be in contact with strangers; once instant messaging became popular, teens seemed to be using it to connect mostly with offline friends.[44] With the advent of today's popular social networking sites, video and photo sharing sites, and blogs, adolescents may again connect and interact with people who are not a part of their offline lives.

Communication frequency and self-disclosure play a role in computer-mediated communication and the formation of online friendships just as they do in face-to-face interactions and offline friendships.

An earlier national survey of adolescents aged ten to seventeen published in 2002 revealed that in the year before they were surveyed, 25 percent of Internet users had formed casual online friendships and 14 percent had formed close friendships or even romantic relationships.[45] A national survey conducted in 2006 found that 40 percent of fourteen- to twenty-two-year-olds who use social networking sites such as MySpace had been contacted online by a stranger whom they did not know before.[46] Yet another survey, conducted in 2007, reported that an overwhelming majority of teens who use social networking sites do so to keep in touch either with friends whom they see frequently (91 percent) or with friends they see rarely (82 percent).[47] These shifting trends suggest that although adolescents may be using online communication forms as a way of extending their interaction with peers from their offline lives, the potential for interactions with strangers is high and therefore merits further exploration.

Quality of online relationships with strangers. The scant research on the topic suggests that adolescents' relationships with strangers that begin online may indeed differ from their offline ones. One study of 987 Israeli adolescents found that teens knew such online friends for a shorter period of time than they knew face-to-face friends and that the relationships were not as close: the topics discussed were less personal and shared activities were fewer.[48] It is possible, however, that online relationships may become more similar to offline ones over time. Another study, whose participants ranged in age from sixteen to twenty-nine (median age was 20.67), found that offline relationships were higher in quality initially but not when both types of relationships lasted more than a year.[49] Participants in this study, Hong Kong Internet users who were recruited from an online newsgroup, were asked about the quality of one offline and one online relationship of similar duration. Duration of relationships was likely important because the longer a relationship, the more opportunities for information exchange and greater self-disclosure. Self-disclosure appears to be important for relationship quality in computer-mediated communication. In fact, a study with college students found that participants who self-disclosed more in such communication also reported higher relationship quality.[50] Although it appears that online relationships with strangers can develop in quality over time, it is not clear how many last long enough to become higher-quality relationships offering more intimacy and support.

Do online relationships move offline? Another question is whether relationships with strangers that begin online move offline. In a national survey of 1,501 youth, 256 respondents reported close online relationships and 41 percent of them reported face-to-face meetings with their online friend.[51] It appears that relationships move from online to offline only occasionally; however, given that the newer friendship forms of networking center on making "friends," this issue needs further exploration.

Who forms online relationships with strangers? It is also important to consider the characteristics of adolescents who are more likely to interact with strangers and to form relationships with them. Such interactions can compromise the safety and well-being of the adolescent if the strangers are not peers but, rather, older, unscrupulous adults. Early research on this question found that more troubled adolescents were more likely to have formed close online relationships. Girls who had high levels of conflict with their parents and boys who had low levels of communication were more likely to have formed close relationships.[52] Troubled adolescents have similarly been found to be more likely to visit chat rooms, where users usually encounter strangers rather than friends or family.[53]

Personality variables also seem to play a role in how youth form relationships with strangers online. In a questionnaire study of 600 Dutch adolescents, both extroverts and introverts reported that they formed online friendships, but they did so for different reasons.[54] Extroverts formed online friendships so that they could self-disclose more and engage in more frequent online communication. Introverts formed online friendships to compensate for their poorer social skills; the social compensation motive also led to greater self-

disclosure and frequency of communication and consequently facilitated online friendship formation. Again we see that communication frequency and self-disclosure play a role in computer-mediated communication and the formation of online friendships just as they do in face-to-face interactions and offline friendships.

With the newer generation of online communication forms and the greater privacy controls they offer, youth now have the choice to interact online both with strangers and with people from their offline lives. Researchers have compared adolescents who primarily talk online with strangers and those who talk online both with strangers and with friends; they surveyed 412 Dutch adolescents between twelve and eighteen years of age.[55] Only 5 percent talked exclusively with strangers, 43 percent talked exclusively to people they knew in person, and 10 percent talked as often to strangers as to people they knew. The study found that younger adolescents were especially prone to communicate with strangers. Participants who communicated more frequently were less likely to communicate with a stranger, whereas those who communicated at more length were more likely to talk with strangers. Adolescents were also more likely to talk to strangers if they communicated online to meet people to assuage boredom and to compensate for their lack of social skills. Those who communicated online to maintain relationships were less likely to talk to strangers.

Benefits of talking to strangers. Online communication with strangers may offer some benefits for adolescents. One study using detailed daily diaries found that adolescents who reported feeling lonely or socially anxious on a given day were more likely to communicate that day via instant messaging with people whom they did not know well.[56] Another study showed that online interactions with unknown peers help adolescents recover from the sting of social rejection. In perhaps the only experimental study on this topic, a cyberball task (the computer equivalent of playing catch) to simulate social inclusion or exclusion was followed by either an instant message conversation with an unknown opposite-sex peer or by solitary computer game play.[57] Adolescents who experienced social exclusion reported greater negative affect (for example, lower self-esteem, shame, and anger) than those who were included. Among the participants who were excluded, online communication with an unknown peer facilitated recovery from negative affect better than solitary computer game play. The author suggests that the contact with unknown peers in forums such as chat rooms and social networking sites might help adolescents cope with threats to "belonging" in their offline lives. She goes on to write that "policies are needed to promote the creation and maintenance of safe spaces for youth to interact online."

Positive content in online stranger interaction. The Internet is filled with anonymous discussion groups and bulletin boards devoted to all kinds of topics of interest to youth, from music groups and bands, television shows, and fan fiction to sports, health, sexuality, and even college admissions. Despite the large number and variety of such online interest and support groups frequented by youth, existing research has mostly focused on adolescents' interactions with strangers in the context of health information and support.

One reason why teens might like to get their health-related information online is the anonymity of such communication. Young people may feel more comfortable asking strangers sensitive health-related questions than they would asking a parent or physician in person. Another advantage of online bulletin boards and discussion groups is their full-time availability. They also make it possible to get information passively (by looking at other people's questions and the responses they received) and to get advice and suggestions from far more sources than would be possible from one's circle of face-to-face friends.[58]

The interpersonal connections with strangers made possible by electronic media may be particularly valuable for youth suffering from illnesses, such as AIDS, eating disorders, and self-injurious behavior, about which they may not feel comfortable talking with their friends in person. Online bulletin boards and chat rooms allow youth to form such connections. A study of the personal Web pages of adolescent cancer patients found that they often expressed a strong desire to help other young cancer patients through providing information, sharing personal experiences, and giving advice. The guest books found on most of the Web pages (which are analogous to electronic bulletin boards) indicated that the pages were producing cyber communities providing patient-to-patient support for cancer victims.[59]

Even generally healthy adolescents may have embarrassing or difficult questions concerning health and sexuality. Lalita Suzuki and Jerel Calzo investigated a popular health support website that used a peer-generated bulletin board format to facilitate the discussion of adolescent health and social issues. Their analyses of two health bulletin boards —one on teen issues and one on sexual health —concluded that bulletin boards were a valuable forum of personal opinions, actionable suggestions, concrete information, and emotional support, and that they allowed teens to candidly discuss sensitive topics, such as sexuality and interpersonal relations.[60] In developing nations where access to health care is much less available than in countries such as the United States, Internet communication may be an especially valuable resource.[61]

One extensive study of the posts and responses on self-injury message boards found that such forums provide emotional support to youth struggling with extremes of behavior.[62] A study of an electronic support group for individuals with eating disorders, a common affliction of adolescents, particularly females, made a similar finding.[63] Although such online forums may provide support, they could also be problematic, particularly for vulnerable adolescents, because they normalize and thereby encourage such injurious behavior.[64]

Negative content in online stranger interaction. Although the anonymous and public natures of these online forums may provide benefits to youth, they may also disinhibit users and lead to negative content in their online interactions. Racial slurs and comments were much more common, for example, in unmonitored chat rooms frequented by older adolescents than in the monitored chat rooms frequented by younger adolescents.[65] Moreover, although chat participants frequently use race to identify themselves and other in-group members, they nonetheless stay in the chat room with everyone, rather than self-segregating, as in school lunchrooms. Race and ethnicity were often mentioned in the chat conversations: thirty-seven out of thirty-eight half-hour transcripts had at least one reference to race or ethnicity. As the authors observed, "While most references had a neutral or positive valence in both monitored and unmonitored chat rooms, chat participants nonetheless had a 19 percent

chance of being exposed to negative remarks about a racial or ethnic group (potentially their own) in a session of monitored chat and a 59 percent chance in unmonitored chat."[66] These findings suggest that racist attitudes are lurking under the surface and, in the absence of social controls, such as a monitor, may be overtly expressed in online venues. But the monitor is a relatively weak social control: even a frequency of one in five Internet sessions seems an extremely high rate of racist remarks; it is hard to imagine such a high rate offline. It is also hard to imagine the extent of the psychological damage that such remarks do. These findings were validated by a study that interviewed adolescents recruited by instant messaging from a teen chat room. Participants reported exposure to negative stereotypes and racial prejudice against their own and other ethnic groups online.[67]

The most dramatic instances of young people engaging in racist behavior online occur on hate sites targeted to children and teens.[68] Websites, chat rooms, multi-user domains, discussion boards, music, audio- and videotapes, games, and literature are some of the most common tools used to disseminate online hate. Hate groups reach out to young people online by a number of means, including the creation of Web pages specifically geared to children and teens. Ideas may be worded to be more understandable to young people. The sites may even feature messages by youth directed to other youth.

Online stranger contact and sexual solicitation. Online contact with strangers also puts adolescents at risk for sexual solicitation and sexual exploitation by predators, though such risks were far higher in the earlier days of the Internet before the widespread recognition of the potential dangers inherent to online stranger contact. Most online communication forms today have privacy controls that, if used, can greatly reduce the risks for sexual victimization. Indeed, a recent study has found that over a five-year period, reports of unwanted sexual solicitation and harassment have declined, a trend that the authors speculate is a result of better education and more effective law enforcement.[69] The second Youth Internet Safety Survey (YISS-2), conducted in 2005, also found that only 4 percent of respondents had experienced aggressive sexual solicitations.[70]

Concern is growing that adolescents' extensive use of electronic communication to interact with their peers may impair their relations with their parents, siblings, and other family members.

Again, despite these small numbers, it is important to understand which youth may be at risk for such victimization. The YISS-2 survey showed that youth who engaged in a pattern of risky online behaviors in their interactions with strangers were more at risk for unwanted sexual solicitation or harassment. These behaviors included aggressive behavior in the form of rude or nasty comments, embarrassing others, meeting people in multiple ways (for example, on an online dating site or when instant messaging), and talking about sex with strangers.[71] Youth who are victims of unwanted sexual solicitation also report emotional distress, depressive symptoms, and offline victimization.[72] Because the Internet allows individuals to misrepresent their identity, even less is known about the characteristics of online predators.[73] Thus there continues to be a need for more current data on the extent of sexual solicitation in the newer communication forms such as social networking sites where adolescents are more likely to interact with strangers.

Electronic Media and Family Relations

Two major questions on the topic of electronic media and family relations warrant further study. First, to what extent do youth use electronic media to communicate with their parents, siblings, and other family members? Second, how has adolescents' use of electronic communication affected their relations with their parents and other family members? Numerous media reports, as well as anecdotal observation, suggest that more and more parents are turning to text messaging and instant messaging to communicate with their adolescents; text messaging in particular can be very useful to parents trying to keep tabs on their teen. There is as yet little systematic research on the question.

Concern is growing that adolescents' extensive use of electronic communication to interact with their peers may impair their relations with their parents, siblings, and other family members. There is some evidence that electronic media may enhance peer relations at the expense of family, especially parent-child relations. An intense four-year video study of thirty dual-earner families with children provides a glimpse of the role of technology in modern family life.[74] When the working spouse, usually the father, came through the door at the end of the day, the other spouse and children were often so absorbed in what they were doing that they greeted him only about one-third of the time, usually with a perfunctory "hi." About half the time, children ignored him and continued multitasking and monitoring their various electronic gadgets. Parents had a hard time penetrating their children's world and often retreated. Electronic multitasking has become pervasive, sometimes at the expense of face-to-face family interaction, among siblings as well as with parents.

Larry Rosen points out that the advent of social networking sites such as MySpace has made most research findings on how Internet use affects social relations obsolete.[75] In one study Rosen found that nearly one in three parents felt that the time their teen spent on MySpace interfered with family life. For parents of teens who spent more than two hours a day on MySpace, the share rose to one-half. A study by Gustavo Mesch found that family time was not affected when adolescents used the computer for educational purposes; only when they used it for social purposes was family interaction negatively affected.[76] Rosen and his colleagues also found that teens who spent a great deal of time on MySpace felt that they were getting less support from their parents. This last finding, especially, makes clear how important it is to do further research establishing the direction or directions of causality.[77]

The role of cell phones in adolescent life and family relations is also worthy of attention. A series of focus groups with teenagers, young adults, and parents in Norway found that teens used the cell phone to establish generational boundaries (for example, screening calls from parents into voice mail) and also that cell phone use undermined family rituals, such as mealtimes and vacations.[78] Perhaps the most powerful way in which the mobile telephone undermined family interaction in favor of peer communication was through the individualization of communication.[79] When peers called one another through a

mobile telephone, they knew that they could talk directly with their friends, without any filtering or monitoring from parents or others in the household. In the words of the authors of the study, "Adolescents control the people with whom they talk and have more room into which they can share thoughts and messages that might not be [socially] acceptable. This plays on the peer group's ethos that their inner communications be shielded from nonmembers, and particularly parents." One of the authors found further qualitative evidence of such undermining in a focus group in which one participant told about a girl whose boyfriend had secretly given her a cell phone so she could stay in touch with him against her parents' wishes.

Qualitative evidence is starting to accumulate that social networking sites such as MySpace are causing serious parent-child conflicts and loss of parental control.

Research has not systematically examined how technology has changed parent-child relations. At the moment, researchers are limited to pointing to new phenomena in the use of technology that impinge on parent-child communication without yet being able to understand their developmental and psychological significance.

Have Social Relationships Been Altered by Electronic Media?

To assess rigorously whether technology has altered a relationship, researchers must be able to compare the relationship before and after a technology is introduced. For many kinds of important electronic communications media, it is too late to do such studies in technologically advanced environments. The best design for assessing how technology affects relationships would probably be a historical one, in which social patterns were documented before the advent of the technology; there are undoubtedly parts of the world in which this is still possible, but the United States is not one of them.

Our analysis, however, has also shown that the characteristics of electronic communication intrinsically change social relations. We may never know the changes in absolute frequency of face-to-face and voice-to-voice communication that various types of electronic communication have brought about. But we do know that teens now conduct a higher *proportion* of their communication through writing in an electronic medium rather than face-to-face or voice-to-voice—in effect, relatively depersonalizing the process of interpersonal communication. It is also clear that electronic communication expands adolescent social networks. For example, for a teen to have 150–300 "friends" would have been unheard of before social networking. It is also evident that electronic communication brings together—for both good and ill—common-interest groups whose uniting characteristic, such as adolescent cancer or self-mutilation, may be rare in anyone's group of friends or family. The quasi-experimental monitoring studies in teen chat have also indicated that the anonymity of the Internet produces a disinhibiting effect on both sexual and racist behavior. The daughter of an *L.A. Times* reporter told her mother that MySpace had become necessary for her social life.[80] If that feeling is widely shared among teens, it would represent a major change in the processes by which peer relationships are constructed. When the processes are so different, it would be astonishing if the products were not different too. But this remains for future research.

Electronic Media and Parental Influence

In this section we examine parents' role in their adolescents' use of electronic media to communicate with friends and strangers. To start, what do parents know about the various communication forms and their teens' use of them? Although hard data on this question are limited, both adolescents and their parents agree that youth know more about the Internet than their parents do. In the 2001 Pew Report, 64 percent of teens believed that they knew more than their parents about communicating online and 66 percent of their parents agreed. Since that report was issued, the press has reported extensively about the potential dangers of interacting on the Internet, and we suspect parents today are better informed about electronic communication, but they are probably still not as knowledgeable as their teens.

Similarly little research exists about what parents know about their own teens' use of electronic media for communication, including whom they talk to and what information they have on their profiles. One recent survey of parent and teen pairs suggested that the parents were largely in the dark about their teens' MySpace behaviors. Nearly half the parents almost never looked at their teens' MySpace profile and a third had never seen it.[81] On a similar note, a large-scale Internet-based survey of teens revealed that 90 percent of the sample did not tell an adult, including parents, about cyberbullying.[82] This silence of course makes it impossible for parents to take action against cyberbullying.

Parents can influence their adolescents' use of electronic communication forms in two ways: by monitoring and by limiting access. Monitoring is probably best done by using Internet software that monitors, filters, and blocks access to different kinds of content. Again, no research documents either the extent of parental use of such software or its effectiveness. Limiting access would involve restrictions on where teens go online, the time they spend online, the electronic forms they use (for example, MySpace), and how they use those forms (for example, keeping blogs private, not posting provocative pictures).

One study of parent and teen pairs has revealed that almost half the parents allow their teens to access the Internet in their bedrooms; only a third put limits on MySpace use and a quarter put limits on computer use. Interestingly, parent and teen perceptions about limits did not coincide: fewer teens than parents thought that their parents set limits on their use. Parenting styles were related to their teen's MySpace use. Not only were authoritative parents (parents who are warm, consistently apply standards, and are willing to reason with their children) more likely to have seen their teen's MySpace page, they were also more likely to have set limits on MySpace use and less likely to allow a computer in the bedroom. Their teens, along with those with authoritarian parents (parents who show little warmth, have high standards, and expect strict obedience), were least likely to give out personal information on MySpace.[83]

Qualitative evidence is starting to accumulate that social networking sites such as MySpace are causing serious parent-child conflicts and loss of parental control.[84] Rosen's interviews with parents revealed several typical problems. For example, a boy who failed to do his homework before midnight because he was

on MySpace reacted to his parents' efforts to curtail his use of MySpace by sneaking back online. And a girl posted information about her sweet sixteen party on MySpace, leading so many teens to crash the party and cause so many problems that her father had to call the police.[85]

Overall it appears that despite their concerns about their teen's online activities, parents may not know much about them and may not be effective at setting limits and monitoring their activities. More research is needed to determine whether the problem is parents' lack of knowledge about these communication forms or their lack of parenting skills. It would be interesting to find out whether parents are similarly uninformed about their teens' offline activities, particularly their offline social interactions.

Parent-child conflict about adolescents' media use is another topic needing further research. What is the extent of such conflict? Are these conflicts similar to conflicts in other areas such as sex, alcohol, and curfews? Are they similar to or different from conflicts of earlier generations? Although evidence is starting to accumulate that social networking is causing parent-child conflict and perceived loss of parental control, no research has been done on how to reduce the conflict and restore parental influence. In this void, Rosen's analysis of parenting research in other situations, as well as his list of Internet sites offering advice to parents on this topic, can be of value to parents seeking guidance.[86] Most important, we urge researchers to fill this void both with rigorous studies about whether social networking impairs parent-child relations and with intervention studies designed to restore a healthy balance between peer and family interaction.

Electronic Media and Schools

How have schools responded to the increasing presence of electronic media in the lives of today's youth? News reports suggest that some schools and school districts have responded by blocking the use of electronic media in schools, in particular text messaging, cell phones, iPods, and video games. Many school computer systems also block access to websites popular among teens such as those that provide access to instant messaging, e-mail, blogs, and social networking utilities. School authorities argue that these media are distracting, isolating, and disruptive and that they facilitate cheating (as when cell phone cameras are used to copy exams) and other illegal activity (as when cell phones and pagers are used in drug and gang activity).

But what are the effects of such bans? A questionnaire study of middle and high school teachers and support and administrative staff investigated Internet filtering and restricted Internet access for junior high schools and high schools in an entire school system.[87] Most felt that the limits unduly restricted Internet access. Out of 120 respondents, 117 felt that legitimate sites had been blocked. Some school personnel felt that students were not always punished for downloading offensive material. Others admitted that they themselves used techniques to get around the filter or block to complete their tasks. Many respondents felt that the "filtering" system hampered their performance of their duties, created an inconvenience, reduced student autonomy, lowered morale, and made it less likely that they would create lessons that would integrate technology.

The ban against cell phones in high schools is perhaps the most controversial restriction. Parents and youth alike favor cell phones as invaluable tools for everyday planning and coordinating that can be critical in the event of emergency. But in a case brought by parents, the New York State Supreme Justice ruled in favor of New York City's ban on cell phones in the schools. Partial or complete cell phone bans have now been put in place in Toronto, Los Angeles, Detroit, and Milwaukee.[88] It remains unclear how effective such bans are in preventing the behaviors they are designed to target. Researchers need a better understanding of what teachers and school administrators know about adolescent use of electronic media and how such technologies might be integrated in school settings.

Electronic Communication and Identity Development

According to Erik Erikson, the German developmental psychologist, establishing a coherent identity is the fundamental psychosocial task of adolescence.[89] Adolescents must establish a clear sense of who they are, what they believe in, and where they are headed. Early on, some observers saw the Internet, with its potential for anonymity and disembodied interaction, as a perfect venue for such identity exploration and experimentation.[90] Online, it was thought, people could be whoever they chose to be and could slip in and out of various identities. But over time concerns were raised that such identity play may hinder, not help, adolescent development.

In fact, the evidence is mixed as to whether adolescents engage in extensive pretense and identity play online. In one study of twelve- to fifteen-year-olds, of the 175 participants who responded to questions about online pretense, 49 percent had never pretended to "not be yourself," and 41 percent reported pretending a couple of times.[91] Seven participants reported pretending often and two reported that they pretended all the time. Most common was pretending to be older, and was often done in the company of a friend and as a joke. Only 2 percent reported that they pretended to explore a new self or identity.

By contrast, in a study of Dutch adolescents, 246 out of a total of 600 participants reported having experimented online with their identity at least sometimes.[92] Pretending to be someone older was most commonly reported, especially among girls. The most common motives for identity experiments were self-exploration (to observe others' reaction), social compensation (to make up for shyness), and social facilitation (to form relationships). The study does not make it possible to assess exactly what share of the sample pretended often to be someone else. Taken together, the findings of both studies suggest that although youth do pretend to be someone else online, they do not do so frequently, and when they do, they may simply pretend to be older. Given that many online sites have age restrictions, it is quite possible that such pretense is not a true form of identity exploration but more a way to sidestep age-related restrictions. Although youth do not seem to be using electronic media to experiment with different roles and identities in the manner envisioned by Erikson, nonetheless these media afford them opportunities to explore as well as to practice self-disclosure and self-presentation, which are both important steps toward constructing a coherent identity. Anonymous forums such as chat rooms, in particular, enable such exploration and self-presentation.

Conclusions

Society's traditional adolescent issues—intimacy, sexuality, and identity—have all been transferred to and transformed by the electronic stage. Among the hallmarks of the transformation are greater teen autonomy,

the decline of face-to-face communication, enhancement of peer group relations at the possible expense of family relations, and greater teen choice. Given the connectedness between the physical and virtual worlds, the challenge is to keep adolescents safe (both physically and psychologically) while at the same time allowing for the explorations and interactions that are crucial for healthy psychosocial development. This conflict is nicely illustrated by instant messaging, which helps teens stay in touch with friends, but is also widely used for electronic bullying.[93] Meeting strangers on social networking sites such as MySpace offers another example. Although such virtual contacts can endanger adolescents, research has found that interactions with strangers may also help alleviate the negative effects of social rejection in the physical world. The benefits of exploring identity and intimacy online must also be weighed against the harmful effects of viewing sexual content and being bullied online. One challenge for research is to understand how to enhance the benefits offered by electronic media while mitigating some of the dangers that they present. Another challenge is to design research that examines how online communication affects real-world communication and relationships. The thrust of the research at present suggests that real-world relationships and adolescent issues influence adolescents' electronic communication at least as much as electronic communication influences their real-world relationships and developmental outcomes.

Endnotes

1. Cliff Lampe, Nicole Ellison, and Charles Steinfeld, "A Face(book) in the Crowd: Social Searching vs. Social Browsing," *Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work* (New York: ACM Press, 2006), pp. 167–70.
2. Stephanie Dunnewind, "R U Still Up? Teens Are Text-Messaging Friends into the Wee Hours," *Seattle Times,* Living section, March 31, 2007 (http://seattletimes.nwsource.com/html/living/2003644903_textsleep31.html [accessed August 9, 2007]).
3. Elisheva F. Gross, "Adolescent Internet Use: What We Expect, What Teens Report," *Journal of Applied Developmental Psychology* 25, no. 6 (2004): 633–49.
4. Amanda Lenhart and Mary Madden, "Social Networking Websites and Teens: An Overview" (Washington, D.C.: Pew Internet and American Life Project, 2007) (www.pewinternet.org/pdfs/PIP_SNS_Data_Memo_Jan_2007.pdf [accessed August 9, 2007]).
5. Kaveri Subrahmanyam and others, *In Their Words: Connecting Online Weblogs to Developmental Processes,* California State University–Los Angeles, November 2007.
6. Dunnewind, "R U Still Up?" (see note 2).
7. Janis Wolak, Kimberly J. Mitchell, and David Finkelhor, "Escaping or Connecting? Characteristics of Youth Who Form Close Online Relationships," *Journal of Adolescence* 26, no. 1 (2003): 105–19.
8. Sameer Hinduja and Justin W. Patchin, "Personal Information of Adolescents on the Internet. A Quantitative Content Analysis of MySpace," *Journal of Adolescence,* forthcoming.
9. dana boyd, "Social Network Sites: Public, Private, or What?" *Knowledge Tree 13* (http://kt.flexiblelearning.net.au/tkt2007/?page_id=28 [June 26, 2007]).
10. Laurence Steinberg, *Adolescence* (New York: McGraw Hill, 2005).
11. *Washington Post,* "In Teens' Web World, MySpace Is So Last Year," (http://www.washingtonpost.com/wp-dyn/content/article/2006/10/28/AR2006102800803.html [August 9, 2007]).
12. John Hill, "Early Adolescence: A Framework," *Journal of Early Adolescence* 3, no.1 (1983): 1–21.
13. Kaveri Subrahmanyam, Patricia M. Greenfield, and Brendesha Tynes, "Constructing Sexuality and Identity in an Online Teen Chatroom," *Journal of Applied Developmental Psychology 25,* no. 6 (2004): 651–66.
14. Steinberg, *Adolescence* (see note 10).
15. Gross, "Adolescent Internet Use" (see note 3).
16. Bonka S. Boneva and others, "Teenage Communication in the Instant Messaging Era," in *Information Technology at Home,* edited by Robert E. Kraut and others (Oxford University Press, 2006), pp. 612–72.
17. Lenhart and Madden, "Social Networking Websites and Teens" (see note 4).
18. Rebecca E. Grinter and Margery A Eldridge, "y do tngrs luv 2 txt msg?" *Proceedings of Seventh European Conference on Computer-Supported Cooperative Work ECSCW '01* (Dordrecht, Netherlands: Kluwer Academic Publishers, 2001), pp. 219–38.

19. Rebecca E. Grinter and Margery A Eldridge, "Wan2tlk?: Everyday Text Messaging," *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (New York: ACM Press, 2003), pp. 441–48.

20. Amanda Lenhart, Lee Rainie, and Oliver Lewis, "Teenage Life Online: The Rise of the Instant-Message Generation and the Internet's Impact on Friendships and Family Relationships" (Washington, D.C.: Pew Internet and American Life Project, 2001) (http://www.pewinternet.org/pdfs/PIP_Teens_Report.pdf/ [August 9, 2007]).

21. Patti Valkenburg and Jochen Peter, "Preadolescents' and Adolescents' Online Communication and Their Closeness to Friends," *Developmental Psychology* 43, no. 2 (2007): 267–77.

22. Patti Valkenburg, Jochen Peter, and Alexander Schouten, "Friend Networking Sites and Their Relationship to Adolescents' Well-Being and Social Self-Esteem," *CyberPsychology & Behavior* 9, no. 5 (2006): 584–90.

23. Adriana A. Manago and others, "Self-Presentation and Gender Differences on the MySpace Network," Department of Psychology, UCLA, 2007.

24. Larry Rosen, *Me, MySpace, and I: Parenting the Net Generation* (New York: Palgrave, Macmillan, forthcoming).

25. NCH, "Putting U in the Picture: Mobile Bullying Survey 2005" (http://www.nch.org.uk/uploads/documents/Mobile_bullying_%20report.pdf [August 9, 2007]).

26. Janis Wolak, Kimberly J. Mitchell, and David Finkelhor, "Online Victimization of Youth: Five Years Later," National Center for Missing and Exploited Children Bulletin (2006) (http://www.unh.edu/ccrc/pdf/CV138.pdf [August 9, 2007]).

27. Jaana Juvonen and Elisheva F. Gross, "Extending the School Grounds? Bullying Experiences in Cyberspace," University of California–Los Angeles, 2007.

28. Michelle L. Ybarra and Kimberly J. Mitchell, "Youth Engaging in Online Harassment: Associations with Caregiver-Child Relationships, Internet Use, and Personal Characteristics," *Journal of Adolescence* 27, no. 3 (2004): 319–36.

29. Michelle L. Ybarra, "Linkages between Youth Depressive Symptomatology and Online Harassment," *Cyberpsychology and Behavior* 7, no. 2 (2004): 247–57.

30. Juliana Raskauskas and Ann D. Stoltz, "Involvement in Traditional and Electronic Bullying among Adolescents," *Developmental Psychology* 43, no. 3 (2007): 564–75.

31. Juvonen and Gross, "Extending the School Grounds?" (see note 27).

32. Dunnewind, "R U Still Up?" (see note 2).

33. David Šmahel and Kaveri Subrahmanyam, "Any Girls Want to Chat Press 911: Partner Selection in Monitored and Unmonitored Teen Chat Rooms," *CyberPsychology and Behavior* 10, no. 3 (2007): 346–53.

34. Kaveri Subrahmanyam, David Šmahel, and Patricia M. Greenfield, "Connecting Developmental Processes to the Internet: Identity Presentation and Sexual Exploration in Online Teen Chatrooms," *Developmental*

Psychology 42, no. 3 (2006): 395–406.

35. Lalita K. Suzuki and Jerel P. Calzo, "The Search for Peer Advice in Cyberspace: An Examination of Online Teen Health Bulletin Boards," *Journal of Applied Developmental Psychology* 25, no. 6 (2004): 685–98.

36. Zbynek Vybíral, David Smahel, and Radana Divínová, "Growing Up in Virtual Reality: Adolescents and the Internet," in *Society, Reproduction, and Contemporary Challenges*, edited by Petr Mares (Brno: Barrister & Principal, 2004), pp.169–88.

37. Kenzie A. Cameron and others, "Adolescents' Experience with Sex on the Web: Results from Online Focus Groups, *Journal of Adolescence* 28, no. 4 (2004): 535–40.

38. Joanne Cantor and Marie-Louise Mares, "Autobiographical Memories of Exposure to Sexual Media Content," *Media Psychology* 5, no. 1 (2003): 1–31.

39. Stephen T. Russell, Brian T. Franz, and Anne K. Driscoll, "Same-Sex Romantic Attraction and Experiences of Violence in Adolescence," *American Journal of Public Health* 91, no. 6 (2001): 903–06.

40. Lenhart, Rainie, and Lewis, "Teenage Life Online" (see note 20).

41. Lampe, Ellison, and Steinfeld, "A Face(book) in the Crowd: Social Searching vs. Social Browsing" (see note 1).

42. Stephen P. Andon, "Evaluating Computer-Mediated Communication on the University Campus: The Impact of Facebook.com on the Development of Romantic Relationships," Florida State University, 2007.

43. Robert E. Kraut and others, "Internet Paradox: A Social Technology That Reduces Social Involvement and Psychological Well-Being?" *American Psychologist* 53, no. 9 (1998): 1017–31.

44. Boneva and others, "Teenage Communication in the Instant Messaging Era" (see note 16).

45. Janis Wolak, Kimberly Mitchell, and David Finkelhor, "Close Online Relationships in a National Sample of Adolescents," *Adolescence* 37, no. 147 (2002): 441–55.

46. Annenberg Public Policy Center, "Stranger Contact in Adolescent Online Social Networks" (Philadelphia: Annenberg Public Policy Center, University of Pennsylvania, September 2006) (http://www.annenbergpublicpolicycenter.org/Releases/Release_HC20060920/Report_HC20060920.pdf [August 10, 2007]).

47. Lenhart and Madden, "Social Networking Websites" (see note 4).

48. Gustavo Mesch and Ilan Talmud, "The Quality of Online and Offline Relationships, the Role of Multiplexity and Duration," *Information Society* 22, no. 3 (2006): 137–49.

49. Darius K. S. Chan and Grand H. L. Cheng, "A Comparison of Offline and Online Friendship Qualities at Different Stages of Relationship Development," *Journal of Social and Personal Relationships* 21, no. 3 (2004): 305–20.

50. Young-Ok Yum and Kazuya Hara, "Computer-Mediated Relationship Development: A Cross-Cultural Comparison," *Journal of Computer-Mediated Communication* 11, no.1 (2005): 133–52.

51. Wolak, Mitchell, and Finkelhor, "Close Online Relationships" (see note 45).

52. Wolak, Mitchell, and Finkelhor, "Escaping or Connecting" (see note 7).

53. Timothy J. Beebe and others, "Heightened Vulnerability and Increased Risk-Taking among Adolescent Chat Room Users: Results from a Statewide School Survey," *Journal of Adolescent Health* 35, no. 2 (2004): 116–23.

54. Jochen Peter, Patti M. Valkenburg, and Alexander P. Schouten, "Developing a Model of Adolescent Friendship Formation on the Internet," *CyberPsychology & Behavior* 8, no. 5 (2005): 423–30.

55. Jochen Peter, Patti M. Valkenburg, and Alexander P. Schouten, "Characteristics and Motives of Adolescents Talking with Strangers on the Internet," *CyberPsychology & Behavior* 9, no. 5 (2006): 526–30.

56. Elisheva F. Gross, Jaana Juvonen, and Shelley Gable, "Internet Use and Well-Being in Adolescence," *Journal of Social Issues* 58, no. 1 (2002): 75–90.

57. Elisheva Gross, "Logging on, Bouncing Back: An Experimental Investigation of Online Communication Following Social Exclusion," University of California–Los Angeles (2007).

58. Suzuki and Calzo, "The Search for Peer Advice in Cyberspace" (see note 35).

59. Lalita K. Suzuki and Ivan I. Beale, "Personal Home Web Pages of Adolescents with Cancer: Self-Presentation, Information Dissemination, and Interpersonal Connection," *Journal of Oncology Nursing* 23, no. 3 (2006): 152–61.

60. Suzuki and Calzo, "The Search for Peer Advice in Cyberspace" (see note 35).

61. Dina L. G. Borzekowski, Julius N. Fobil, and Kofi O. Asante, "Online Access by Accra's Adolescents: Ghanaian Teens' Use of the Internet for Health Information," *Developmental Psychology* 42, no. 3 (2006): 450–58.

62. Janis L. Whitlock, Jane L. Powers, and John Eckenrode, "The Virtual Cutting Edge: The Internet and Adolescent Self-Injury," *Developmental Psychology* 42, no. 3 (2006): 407–17.

63. Andrew J. Winzelberg, "The Analysis of an Electronic Support Group for Individuals with Eating Disorders," *Computers in Human Behavior* 13, no. 3 (1997): 393–407.

64. Whitlock, Powers, and Eckenrode, "The Virtual Cutting Edge" (see note 62).

65. Brendesha Tynes, Lindsay Reynolds, and Patricia Greenfield, "Adolescence, Race, and Ethnicity on the Internet: A Comparison of Discourse in Monitored vs. Unmonitored Chat Rooms," *Journal of Applied Developmental Psychology* 25, no. 6 (2004): 667–84.

66. Ibid, p. 667.

67. Brendesha Tynes, "Role-Taking in Online 'Classrooms': What Adolescents Are Learning about Race and Ethnicity," *Developmental Psychology*, forthcoming.

68. Brendesha Tynes, "Children, Adolescents and the Culture of Online Hate," in *Handbook of Children, Culture and Violence,* edited by Nancy E. Dowd, Dorothy G. Singer, and Robin F. Wilson (Thousand Oaks, Calif.: Sage Publications, 2005), pp. 267–89.

69. Kimberly J. Mitchell, Janis Wolak, and David Finkelhor, "Trends in Youth Reports of Sexual Solicitations, Harassment and Unwanted Exposure to Pornography on the Internet," *Journal of Adolescent Health* 40, no. 2 (2007): 116–26.

70. Wolak, Mitchell, and Finkelhor, "Online Victimization of Youth" (see note 26).

71. Michele L. Ybarra, Kimberly J. Mitchell, and David Finkelhor, "Internet Prevention Messages: Targeting the Right Online Behaviors," *Archives of Pediatrics and Adolescent Medicine* 161, no. 2 (2007): 138–45.

72. David Finkelhor, Kimberly J. Mitchell, and Janis Wolak, "Online Victimization: A Report on the Nations' Young People" (Alexandria, Va.: National Center for Missing & Exploited Children, 2000).

73. Stefan C. Dombrowski and others, "Protecting Children from Online Sexual Predators: Technological, Psychoeducational, and Legal Considerations," *Professional Psychology: Research and Practice* 35, no. 1 (2004): 65–73.

74. Elinor Ochs and others, "Video Ethnography and Ethnoarcheological Tracking," University of California–Los Angeles, 2007.

75. Larry Rosen, *Me, MySpace, and I* (see note 24).

76. Gustavo S. Mesch, "Family Relations and the Internet: Exploring a Family Boundaries Approach," *Journal of Family Communication* 6, no. 2 (2006): 119–38.

77. Larry Rosen, Nancy A. Cheever, and L. Mark Carrier, "The Impact of Parental Attachment Style, Limit Setting, and Monitoring on Teen MySpace Behavior," California State University, Dominguez Hills, 2007 (http://www.csudh.edu/psych/The%20Impact%20of%20Parental%20Attachment%20Style%20Rosen-Cheever-Ca.pdf).

78. Rich Ling and Brigitte Yttri, "Control, Emancipation, and Status: The Mobile Telephone in Teens' Parental and Peer Relationships," in *Computers, Phones, and the Internet: Domesticating Information Technology,* edited by Robert Kraut, Malcolm Brynin, and Sara Kiesler (Oxford University Press, 2006), pp. 219–34.

79. Ibid.

80. Catherine Saillant, "Testing the Bounds of MySpace," *Los Angeles Times*, April 8, 2006, p.1 ff.

81. Rosen, Cheever, and Carrier, "The Impact of Parental Attachment Style" (see note 77).

82. Juvonen and Gross, "Extending the School Grounds?" (see note 27).

83. Rosen, Cheever, and Carrier, "The Impact of Parental Attachment Style" (see note 77).

84. Saillant, "Testing the Bounds of MySpace," (see note 80).

85. Larry Rosen, *Me, MySpace, and I* (see note 24).

86. Ibid.

87. Deborah G. Simmons, "Internet Filtering: The Effects in a Middle and High School Setting," Georgia College and State University (http://info.gcsu.edu/intranet/school_ed/ResearchsofDrSmoothstudents/Simmons%20Research%20Filter%20Study.pdf [August 3, 2007]).

88. CityNews, "Cellphone Use Banned in all Toronto Public Schools" (www.citynews.ca/news/news_9977.aspx [August 3, 2007]).

89. Erik Erikson, *Identity and the Life Cycle* (New York: W. W. Norton, 1959).

90. Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon & Schuster, 1995).

91. Gross, "Adolescent Internet Use" (see note 3).

92. Patti M. Valkenburg, Alexander Schouten, and Jochen Peter, "Adolescents' Identity Experiments on the Internet," *New Media & Society* 7, no. 3 (2005): 383–402.

93. Juvonen and Gross, "Extending the School Grounds?" (see note 27).

Media and Risky Behaviors

Soledad Liliana Escobar-Chaves and Craig A. Anderson

Summary

Liliana Escobar-Chaves and Craig Anderson investigate two important trends among American youth and examine the extent to which the two trends might be related. First, the authors note that U.S. youth are spending increasing amounts of time using electronic media, with the average American youngster now spending one-third of each day with some form of electronic media. Second, the authors demonstrate that American adolescents are engaging in a number of unhealthful behaviors that impose huge societal costs.

Escobar-Chaves and Anderson detail the extent of five critical types of adolescent health risk behaviors identified by the Centers for Disease Control and Prevention—obesity, smoking, drinking, sexual risk taking, and violence. Obesity, the authors note, has become an epidemic among America's young people. Cigarette smoking among adolescents is one of the ten leading health indicators of greatest government concern. Alcohol abuse and alcohol dependence are widespread problems among the nation's youth and are the source of the three leading causes of death among youth. More than 20 percent of American high school students have sexual intercourse for the first time before they reach the age of fourteen. And twelve- to twenty-year-olds perpetrated 28 percent of the single-offender and 41 percent of multiple-offender violent crimes in the United States in 2005.

Escobar-Chaves and Anderson present and evaluate research findings on the influence of electronic media on these five risk behaviors among adolescents. Researchers, they say, have found modest evidence that media consumption contributes to the problem of obesity, modest to strong evidence that it contributes to drinking and smoking, and strong evidence that it contributes to violence. Research has been insufficient to find links between heavy media exposure and early sexual initiation.

The authors note the need for more large-scale longitudinal studies that specifically examine the cumulative effects of electronic media on risky health behavior.

www.futureofchildren.org

Soledad Liliana Escobar-Chaves is assistant professor of health promotion and behavioral sciences at the University of Texas Health Science Center at Houston. Craig A. Anderson is director of the Center for the Study of Violence and distinguished professor of liberal arts and sciences in the Department of Psychology at Iowa State University.