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## Adolescent Internet use: What we expect, what teens report

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### Abstract

As adolescent Internet use grew exponentially in the last decade, with it emerged a number of correspondent expectations. Among them were the following: (1) that gender predicts usage, i.e., that boys spend more time online, surfing the web and playing violent games, while girls chat or shop online; (2) that Internet use causes social isolation and depression, especially for teens; and (3) that adolescents use the Internet for anonymous identity experimentation. These expectations were based on research with earlier technologies when the Internet was less diffused in the adolescent population. By means of highly detailed daily reports of adolescents' home Internet usage and peer-related adjustment, the present research sought to compare these expectations with the actual experiences of early and mid-adolescents in 2000 and 2001. Participants were 261 7th and 10th graders from suburban California public schools who completed four consecutive end-of-day reports on their school-based adjustment and Internet activity (including detailed logs of instant messages). Results challenge prevailing expectations regarding gender, well-being, and identity play. For the most part, adolescent boys' and girls' online activities have become more similar than different. On average, boys and girls alike described their online social interaction as (1) occurring in private settings such as e-mail and instant messages, (2) with friends who are also part of their daily, offline lives, and (3) devoted to fairly ordinary yet intimate topics (e.g., friends, gossip). No associations were found between Internet usage and well-being. Online pretending was reported to be motivated by a desire to play a joke on friends more often than to explore a desired or future identity, but participants reported a range of pretending content, contexts, and motives.

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## 1. Introduction

The increasing pervasiveness of the Internet in the lives of adolescents is by now well established (e.g., [Pew Internet and American Life Project, 2001](#); [Roberts, Foehr, Rideout, & Brodie, 1999](#)), but there remains a dearth of research on what exactly youth are doing when they are online, with whom, and why—and, moreover, how these aspects of Internet use may be related to young people's well-being and development. The present research seeks to fill the empirical gap with findings from Y2K Teens, a daily diary study that included time use assessments, psychological adjustment measures, and open-ended responses regarding online communication from 261 7th and 10th graders from suburban California public schools in late 2000 and early 2001. In particular, this paper examines the extent to which the experiences of participants in the Y2K Teens study correspond to three expectations prevailing at the time the data were collected regarding the forms and developmental significance of adolescent Internet use.

Among numerous intriguing characterizations of young people's uses of online media, three captured the attention of the popular media, research, and policy communities alike: first, the proposition that gender predicts usage amount and type; second, that Internet use causes social isolation and depression, especially for teens; and third, that adolescents use the Internet for anonymous identity experimentation. I will elaborate on the basis for each of these propositions in previous research and then discuss why further investigation was needed in 2000. In each case, the technology had changed since the early research, and adoption of the new technology was closely linked to different patterns of behavior (see also [Zehnder and O'Keefe, 2004](#), for a theoretical perspective on this topic). In addition, I will argue, the increased diffusion of Internet technology created new opportunities for communication.

### *1.1. Proposition no. 1: Boys' net use is from Mars, girls' is from Venus<sup>1</sup>*

This proposition was rooted in gender differences in adolescents' use of earlier forms of electronic media such as non-networked computers and video games. Numerous studies had documented that boys spend more time than girls playing computer and video games (for a review, see [Subrahmanyam, Greenfield, Kraut, & Gross, 2001](#)). Based on early home computer and video game use patterns, it was expected that boys also would spend more time online than girls. Even if girls and boys spent equivalent amounts of time online, previous research (both academic- and market-based) suggested that they might display gender-stereotypical preferences in their choices of Internet activity, i.e., boys might be more likely to spend their time online alone, playing violent online games, while girls might be more likely to spend their time online in social interaction ([Jupiter Communications, 2000](#); [Subrahmanyam et al., 2001](#)). For example, the HomeNet Project, which followed a sample of first-time Internet users from 1995 to 1997, reported that, among youth from ages 10 to 19, more boys than girls were active users of the Internet and spent more time with it ([Subrahmanyam et al., 2001](#)).

However, there were also indications as early as 1997 that the availability of a wide variety of applications was breaking down the gender differences that existed when games were the only popular computer technology with teenagers (see [Subrahmanyam et al., 2001](#)).

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<sup>1</sup> Gray, J. (1992). *Men are from Mars, women are from Venus: The definitive guide to relationships*. London: Element.

### 1.2. Proposition no. 2: Internet use causes adolescents to become socially isolated and depressed

A 1999 survey of over 1000 U.S. parents revealed widespread public concern about the Internet's impact on the social adjustment of youth: almost two-thirds of respondents expressed concern that "going online too often may lead children to become isolated from other people" (Turow, 1999). Early research provided widely publicized, though preliminary, empirical support for the public's apprehensions. The initial reports of the HomeNet study of first-time Internet users (Kraut et al., 1998) indicated that Internet use was associated with small but significant decreases in well-being and local social network size over 2 years. To explain their finding, which held mainly (if not *only*) for their adolescent participants, Kraut et al. speculated that adolescents' heavy usage of the Internet for online communication led them to forsake critical bonds with local friends and family for weak relations with strangers.

This assumption was critical to the popular conception of the Internet's depressing and isolating impact on youth, but may be outdated, given the rapid growth of both the online community and online communication applications. As more youth log on to the Internet, we can expect that more of their friends do too. Communication with close others is now also facilitated by applications such as instant messaging (IM), which allows users to know when friends are online and to engage in an unlimited number of real-time, private, dyadic chats<sup>2</sup>. Indeed, in 1995–1996, when the longitudinal HomeNet study was in its first year, the most popular communications applications were Multi-User Dungeons (MUDs) and Internet relay chat, both of which are public forums facilitating communication with multiple strangers simultaneously. Notably, popular instant messaging applications were first introduced in late 1996, after the longitudinal HomeNet study began (as Kraut et al. 1998 noted). By 1998, instant messaging applications such as AOL IM and ICQ had become the most popular real-time communication services (Subrahmanyam et al., 2001).

### 1.3. Proposition no. 3: Adolescents use the Internet as an anonymous identity playground

If, as Erikson (1963) theorized, the critical developmental task of adolescence is to explore and resolve the crisis of identity, might not the Internet, with its anonymity and cluelessness, provide adolescents with an ideal setting in which to explore their identity? This intriguing idea has been explored in case-based research (Turkle, 1995) as well as in the media. After observing teens communicating through chat rooms and instant messaging, one journalist proposed that "the Internet's greatest asset to teendom" may be "access, and the confidence to slip and out of personalities, the ability to try on identities, the adolescent equivalent of playing dress-up in the attic" (Sweeney, 1999). Empirical research on adults has similarly emphasized the opportunities for role experimentation, identity play, and online relationship development provided by the unique features of the Internet (e.g., anonymity, absence of geographic and temporal constraints; McKenna & Bargh, 2000); the question may therefore be whether there is any evidence for the proposition that adolescents' online identity experimentation and pretense is developmentally specific. More broadly, there is a need for more data on the extent and nature of adolescent identity play and pretense on the Internet.

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<sup>2</sup> This software facilitates private and real-time interaction through text windows that appear on the screens of the two parties involved. All commercial varieties of IMs include a feature called the "buddy list," which allows users to be informed when friends are online. The prevalence of IM use in our research is consistent with data from national probability samples; indeed, instant messaging is now so popular among American teenagers that the Pew Internet and American Life Project (2001) has dubbed them "the instant message generation."

#### *1.4. Methodological considerations: The need for detailed reports from teens themselves*

Not only were the three propositions based on particular Internet technologies and a particular state of diffusion (or lack thereof) of the Internet, they were also based on particular empirical methodologies. Previous research on the topic was often case-based (e.g., Turkle, 1995) or relied on participants to make their own causal claims about the Internet's effects (Nie & Erbring, 2000), an approach subject to considerable biases (Visser, Krosnick & Lavrakas, 2000).

In addition, previous research failed to adequately specify how much young people communicate with school-based friends vs. strangers. My colleagues and I have argued that from the perspective of intimacy theory (Reis & Shaver, 1988), Internet use could undermine or foster well-being, depending on whether it supplants or boosts opportunities for meaningful contact with close peers (Gross, Juvonen, & Gable, 2002). The notion of isolation, for example, suggested an image of a teenager alone in her (or, given gender expectations, more often his) bedroom and among strangers online. But today's youth may not only be communicating with known peers online, but they may also simultaneously be doing so offline, as when two friends sit together at a computer. According to intimacy theory, such experiences may be expected to have different implications for social well-being and development. We consider it vital, therefore, to understand both online and offline psychosocial contexts of adolescent Internet use.

The need to specify the social context of Internet use highlights a further limitation of prior research: reliance on coarse measures of online activity. Previous research has often relied on global measures of both activity and well-being, which are vulnerable to selective recall and forgetting (Reis & Gable, 2000). In addition, even if we know how many hours youth typically spend e-mailing, given our concern with the psychosocial context of use, it is important to know with whom and why they are e-mailing. Furthermore, since it is expected that much of teenagers' Internet activity, like their other media use, occurs in private (e.g., Larson, 1995) and may not be known or understood by adults (Livingstone, 2003), such detailed data may be best provided by youth themselves, reporting on events as they occur. The present research, therefore, is based on adolescents' own daily reports and employed the increasingly popular diary methodology (see Reis & Gable, 2000). I engaged participants in up to four consecutive days of nightly documentation of their experiences that day. This methodology allowed me to inquire about individual online sessions and conversations and retrieve more highly detailed information about specific activities and characteristics of communication than is possible with global or retrospective measures.

## **2. Method**

Participants provided demographic data (age, gender, ethnicity), background information on Internet use, and dispositional measures of psychological adjustment (social support, depression, social anxiety, and loneliness) in an in-school questionnaire. That night (8–14 h later), and up to three consecutive nights thereafter, participants provided daily reports on three types of variables: overall after-school activity, specific online activity, and psychological adjustment.<sup>3</sup>

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<sup>3</sup> Constraints on data collection resulted in 3 days of data collection for the 7th grade sample and 4 days for the 10th grade sample.

## 2.1. Participants

In order to examine adolescents' online activity in a peer context in which home Internet use is widespread, I sampled from a relatively homogenous mid- to high-socioeconomic status population. Participants were recruited from a public middle school and public high school in an upper middle-class community in suburban Los Angeles. All students enrolled in any of the middle school's 7th grade-level Science classes and the high school's 10th grade-level Social Studies classes were invited to participate; parental consent was received from 33% of boys and 47% of girls [ $\chi^2(1, N = 646) = 12.98, p < .001$ ], resulting in 100 male and 161 female participants, divided evenly across grades. The average age of participants in the 7th and 10th grade samples was 12 years old ( $SD = .40$ ) and 15 years old ( $SD = .57$ ), respectively. Of the 240 participants who reported their ethnicity, 62.0% identified themselves as European American, 19.2% as Asian American, 7.3% of mixed heritage, 5.3% Latino/a, 1.2% African American, and 4.9% as other.

## 2.2. Procedure

All participants completed a confidential self-report questionnaire in class. They were then instructed in completion of the daily reports. Participants were directed to complete the daily report just before going to sleep each night. To encourage timely and complete participation, researchers visited each classroom daily during the course of the study to collect the previous night's and distribute the current night's log. All complete and punctual daily report submissions were rewarded by the researchers with a piece of candy and a lottery ticket for two movie passes to be raffled in each classroom at the end of the study.

The seventh grade participants completed, on average, 2.12 of 3 possible daily reports. Tenth graders completed 2.65 of 4 possible days. At both grade levels, girls were more compliant, on average completing more logs than boys (7th grade  $M$ 's = 2.41, 1.63,  $t(130) = 4.23, p < .01$ ; 10th grade  $M$ s = 2.83, 2.35,  $t(131) = 2.01, p < .05$ ). The 32 participants who did not complete any daily reports did not differ from the rest of the sample on any measures of dispositional adjustment or typical after-school activity. Results are therefore based on the data of the 229 participants who submitted at least one daily report.

## 2.3. Measures

### 2.3.1. One-time measures

**2.3.1.1. Context of Internet use.** I asked a number of detailed questions to help us understand the context and conditions in which adolescents use the Internet. Specifically, I asked participants to indicate how long they had been using the Internet at home, using a four-point scale from less than 6 months to more than 2 years. In addition, participants were asked (1) the speed of their Internet connection, (2) if the line they use to connect to the Internet is ever needed for phone use, and (3) the extent to which parental rules restricted their weekday leisure time allocation (e.g., weeknight curfews, time limits on phone, TV, and/or Internet use).

**2.3.1.2. Online pretending activity.** The specific wording of questions regarding pretending was based on input from adolescent pilot participants. I asked, "How often do you pretend to not be yourself (or be

someone else) when you go online?” Participants were also asked to indicate if they had ever pretended to be any of the following: someone older, someone younger, and/or someone of another gender/sexual identity. They were also asked to describe who else they had pretended to be and to explain their reasons for pretending. In addition, participants were asked who, if anyone, was typically present with them at the computer when they pretended.

*2.3.1.3. Well-being and social adjustment.* The 10-item Short Form of the Child Depression Inventory (CDI; Kovacs, 1992) was administered with eight filler items, both to enable comparison with studies linking depression and media usage and to distinguish between the associated but distinct experiences of overall and peer-related well-being. For each item, participants select one of three statements that is “most true” for them in the past 2 weeks [e.g., “a) I feel like crying everyday, b) I often feel like crying, or c) I feel like crying once in a while”]. Filler items followed the same format but concerned experiences unrelated to mood states (e.g., their means of transportation to school). A higher index score indicates greater levels of depressed mood. The inter-item reliability (Cronbach’s  $\alpha$ ) for the CDI was .80.

Nine items from the 30-item UCLA Loneliness scale, Version 3 (Russell, 1996) were used to assess global feelings of isolation and alienation from school peers. The words “in school” were added to each item to enable assessment of loneliness in this specific domain. On five-point scales (1 = not at all true for me, 5 = all the time true for me), participants responded to such questions as “How often do you feel left out at school?” and “How often do you feel that you have a lot in common with others in school? (reverse coded).” Higher average scores indicate greater levels of loneliness; the internal consistency of this index (Cronbach’s  $\alpha$ ) was .86.

Social anxiety in school was measured by combining items from two subscales of the Social Anxiety Scale for Adolescents devised by La Greca and Lopez (1998), which distinguish between social distress experienced in response to *general* and *new* peer settings (e.g., “I feel shy even around people I know very well” versus “I feel shy around people I don’t know”). Students used a five-point scale to rate their agreement with each of a series of descriptive self-statements. The four-item general subscale and the six-item new subscale displayed acceptable interitem reliability separately (Cronbach’s  $\alpha$  coefficients = .85 and .75, respectively) and together ( $\alpha$  = .88) and were highly correlated ( $r$  = .68); the two subscales were therefore averaged to produce a total social anxiety index in which higher average scores indicate increased levels of social anxiety. Instructions were adapted to specify the school context.

Two quantitative measures of friendship (number of close friends at school and number of times per week each participant spent time with friends outside of school) were included to provide construct validity for the measures of school-based loneliness and social anxiety, as well as to serve as a proxy for the size of social circle size assessment used in previous studies (e.g., Kraut et al., 1998).

### *2.3.2. Daily measures*

*2.3.2.1. Daily after-school activity.* Each evening, participants were asked to estimate how much time they spent on six activities since returning home from school that day: homework, organized activity, hanging out with friends, talking on the phone, watching TV, and using the Internet. Next to each activity, participants marked one of five options (none, 30 min or less, 1 h, 2–3 h, 4 h or more) to indicate engagement for that day.

*2.3.2.2. Daily Internet usage.* Using the five-point time scale (none–4 h or more) described above, participants listed engagement in each of eight categories of online activity: e-mail, games, Multi-User Dimensions (MUDs), message boards, listserves/newsgroups, chat rooms, instant messages, and web or AOL sites. Within the broad category of websites, eight more specific categories were listed: music (i.e., Napster), homework/school, news or current events, shopping, entertainment (TV, movies), sports, lifestyles/relationships, and adult sites. In light of pilot participants' descriptions of simultaneous participation in several distinct online activities, or multitasking, it was not required that the sum of times on specific activities equal the time indicated for overall Internet use that day.

*2.3.2.3. Characteristics of online communication.* My assessment of online interaction was based on traditional communication records, such as the Rochester Interaction Record (Wheeler & Nezelek, 1977). In developing an online communication log, I strove to balance my interest in details of interaction with my concern for participant attrition and fatigue. For this reason, participants were asked to provide more extensive information for only their single lengthiest instant message interaction that day, as follows: length of the interaction (six possible categories, from 5 min or less to 2 h or more); whether or not they had initiated the IM; relational identity of instant message partner (stranger, acquaintance, friend, best friend, girlfriend/boyfriend, or family member); origin of contact with partner (online, offline in school, or offline outside of school); duration of relationship (six possible categories, from *this is the first time we've met* to over 2 years); gender of partner; relative age of partner; and perceived motives for instant messaging (e.g., to get information, to hang out with a friend, to flirt, to avoid being alone; based in part on Rubin, Perse, & Barbato, 1988). Participants were also asked to indicate how much they discussed each of 13 communication topics ranging from less intimate (e.g., politics, schoolwork/college, sports) to more intimate topics (e.g., gossip, boyfriend/girlfriend stuff, friends). Topics were selected based on observations of public teen chat conversations and feedback from pilot participants.

*2.3.2.4. Daily well-being and social adjustment.* The measures of loneliness and social anxiety described above were adapted for daily use. Seven items from the UCLA Loneliness scale (mean Cronbach's  $\alpha = .86$ ) and four items each from the general social distress subscale (mean Cronbach's  $\alpha = .77$ ) and the new social distress subscale (mean Cronbach's  $\alpha = .70$ ) were used. Participants indicated the degree to which each statement was true for them "today at school." In addition, the Student's Life Satisfaction Scale (SLSS; Huebner, 1991) was adapted for use as a daily assessment of student's global life satisfaction beyond such specific domains as school peer relations. Participants rated their agreement on a five-point scale (1 = strongly disagree to 5 = strongly agree) for each of seven statements according to how they felt that day. Examples include, "My life was just right today," and "Today, I wish I had a different kind of life." Higher average scores indicate greater daily subjective well-being; the mean internal consistency for this index was .88.

### *2.3.3. Psychometric properties of the adjustment variables*

To establish construct validity for the adapted daily measures, I computed correlations between the dispositional and aggregated daily measures of social functioning. All dispositional and daily loneliness and social anxiety measures were positively correlated at the  $p < .001$  level and ranged from .35 to .68. In addition, daily measures of subjective well-being were negatively correlated with the dispositional measure of depressed mood,  $r(228) = -.50$  ( $p = .01$ ).

Effects of grade, gender, and ethnicity were also tested on all measures. Group differences were tested in contingency table or *t*-test formats, as appropriate. As expected, there were no differences observed among ethnic groups on any measures. As a result, this factor was subsequently dropped from further analyses. A gender effect was found in both loneliness and social anxiety: boys reported experiencing more daily loneliness and social anxiety,  $p$ 's < .05. In addition, greater depressed mood and lower subjective well-being were reported by 10th versus 7th graders of both genders ( $p$ 's < .01). These findings are consistent with the patterns reported in previous research (e.g., Koenig, Isaacs, & Schwartz, 1994).

### 3. Results and discussion

#### 3.1. Proposition no. 1: Gender predicts usage

##### 3.1.1. How much time do adolescent boys and girls spend online?

The simplest approach to examining gender differences concerns overall usage: is there a gendered pattern of overall usage? The empirical answer to this question may depend on how participants are asked. In the present sample, 91% of participants reported occasional or regular home Internet use on their in-school survey; however, on a single day within our study, between 40% and 65% of participants reported actually going online. No gender differences were observed in either measure of usage. However, when participants were asked how long they had been using the Internet at home, a cohort effect emerged: among 10th graders, boys reported that they had been online significantly longer than girls ( $M$ s = 1.87 years vs. 1.63 years,  $SD$ s = .38, .64,  $t$  (94) = 2.03,  $p$  < .05). Eighty-eight percent of boys reported that they had been online more than 2 years, compared to 72% of girls. The fact that seventh-grade boys and girls did not reliably differ in how long they had been using the Internet ( $M$ s = 1.48 years vs. 1.45 years,  $SD$ s = .78 and .66, respectively,  $p$  > .5) suggests that the gender gap in overall usage reported in earlier research (see Subrahmanyam et al., 2001) had narrowed enough to be indiscernible in the younger cohort. Among both boys and girls in the seventh grade, 59% of participants had been online at home for more than 2 years.

##### 3.1.2. An influential minority: Heavy gamers

Examination of outliers in the data revealed a small but influential subgroup of heavy game players. This group ( $n$  = 14) consisted almost exclusively of males (12 boys vs. 2 girls) but was equally distributed between 7th and 10th graders. Although this group represents only 5% of the sample, they are important because not only do they epitomize the expectation that boys play more games, but they also exert a strong statistical influence: analyses that included this group suggested that boys spend more time online overall [ $M$ s = 62.06 vs. 44.13 min per day,  $SD$ s = 63.0 and 55.5, respectively,  $F$ (1, 228) = 4.93,  $p$  < .03] and, in particular, playing games [ $M$ s = 17.70 vs. 4.51 min per day,  $SD$ s = 37.94 and 12.47,  $F$ (1, 261) = 16.55,  $p$  < .001] and multi-user dimensions (MUDs) [ $M$ s = 8.75 vs. 1.22 min per day,  $SD$ s = 23.7 and 8.2,  $F$ (1, 173) = 10.15,  $p$  < .001]; analyses excluding this group showed no gender differences in these or any other activities. Boys and girls did not reliably differ in their daily Internet use [ $M$ s = 54.10 vs. 43.30 min per day,  $SD$ s = 59.7 and 54.4, respectively;  $F$ (1, 214) = 1.64,  $p$  > .2]. Perhaps most notably, among heavy gamers, the median average daily game play was 82.5

min; among boys in the rest of the sample (as well as among girls), the median average daily game play was 0 min.

### 3.1.3. *How do boys and girls in the rest of the sample spend their time online?*

Among boys and girls alike, participants reported devoting most of their online time to private communication.<sup>4</sup> The most commonly reported and time-consuming activity among participants was instant messaging; on average, participants IMed for 40.0 min ( $SD = 46.9$ ) daily. Participants also reported spending much of their time online visiting websites ( $M = 33.5$  min,  $SD = 41.3$ ), largely to download music ( $M = 31.4$ ,  $SD = 45.4$ ). E-mail activity was also popular, consuming 22.2 min ( $SD = 18.2$ ) of the average participant's daily time online. On average, participants spent relatively less time using other forms of online communication such as chat ( $M = 7.51$  min,  $SD = 19.8$ ) and message board posting ( $M = 6.58$  min,  $SD = 19.0$ ). Regardless of whether the heavy gamers' subgroup was included in analyses, one significant group difference in online activity was consistently observed: 7th grade girls reported chatting more than 10th grade girls, [ $M$ s = 13.04 vs. 1.42 min per day,  $SD$ s = 22.8 and 5.9,  $F(1, 159) = 3.96$ ,  $p < .05$ ].<sup>5</sup> It is hard to know whether this is a historical difference or a developmental difference. No other group differences reached statistical significance.

## 3.2. *Online multitasking*

A final point concerning time use is worthy of note: participants may spend more time on one online activity than another, but the present data also indicate that young Internet users spend time on many activities at once. A comparison of time spent on the Internet overall vs. in specific domains suggests online multitasking: the whole, in this case, is less than the sum of its parts. For example, if the average participant reported spending 46 min online, she or he might spend 36 of those minutes IMing, 30 min downloading music from a favorite website, and, during this activity, visit a chat room for 5 min (all the while ostensibly conducting research for her social studies homework). Notably, both quantitative and qualitative data suggest that multitasking often combines nonsocial activities (e.g., downloading music or doing homework-related activity) with interpersonal communication. Explained one 17-year-old female pilot participant, "I prefer to communicate with my friends online because that way, I can talk to them while doing other stuff online. When you're talking to them in person or on the phone, it seems rude to be doing something else because they notice and you get distracted."

### 3.3. *Proposition no. 2: Internet use predicts social isolation and depression*

Embedded in this proposition is the assumption that the Internet serves mainly to connect teens to strangers because it is from this assumption that two additional propositions follow: (1) if Internet use and social isolation are associated, *use predicts isolation* rather than vice versa; and (2) contact with strangers rather than close others is by definition less beneficial for adolescents. Here, I focus my discussion on examining the assumption that the Internet serves mainly to connect adolescents to

<sup>4</sup> The descriptive statistics in this section exclude the 14 heavy gaming outliers described in the preceding section.

<sup>5</sup> Analyses reported here were run without the heavy gamers, but means, standard deviations, and test statistics were almost identical when these participants were included [ $M$ 's = 13.04 vs. 1.37 min per day,  $SD$ s = 22.8 and 5.8,  $F(1, 159) = 5.6$ ,  $p < .02$ ].

strangers, as well as the fundamental question: are Internet use (by various measures of time and/or type) and well-being associated among adolescents?

### 3.3.1. *With whom do adolescents spend their time online?*

As noted above, a majority of online time for participants of both ages and genders was devoted to private communication (i.e., IM or e-mail vs. message boards or chat). But with whom did adolescents communicate? In the present data, communication with strangers was relatively infrequent. Across the present sample, the proportion of people met online was inversely proportional to the amount of time youth reported spending in each online communication domain. That is, they met the most people online using message boards, the next most in chat rooms, less in e-mail, and the fewest in the instant message mode. That is, 84% of IMing, which teens spent the most time doing, occurred with people met off the Internet. This ranking corresponds to the nature of these modalities with bulletin boards and chat set up as public spaces at one extreme, the private medium of instant messages at the other extreme, and e-mail in the middle. Moreover, IM partners were not only people met offline, they were also typically members of participants' close, local social networks: 82% of IM partners were friends or best friends from school. This pattern was similar for boys and girls and for 7th and 10th graders alike.

These findings indicate that youth in our sample spent a majority of their time online interacting with close, offline friends. Analyses of IM communication motives and discussion topics further depict participants' online communication as largely casual but intimate: the most frequently cited reasons for instant messaging were to hang out with a friend and relieve boredom, and the most common topics discussed in IMs were friends and gossip.

### 3.3.2. *Is Internet usage associated with isolation and maladjustment?*

Given the social, intimate nature of the Internet use reported by our participants, it is not surprising that I found no associations between time online (overall or by domain) and psychosocial adjustment. Correlational and regression analyses (controlling for online tenure, gender, age, and connection speed) failed to detect a reliable association between usage (i.e., average daily time online overall, in each domain, or even lifetime exposure to the medium) and any of our global or daily measures of well-being (i.e., loneliness, social anxiety, depression, or daily life satisfaction; all  $p$ 's > .1).

### 3.4. *Proposition no. 3: The Internet is an identity playground*

The third proposition I address depicts the Internet as a space for anonymous identity play and exploration. The above results indicate that, in the present sample, adolescent Internet use did not typically involve interactions with strangers. Instead, it appears to serve social functions similar to those provided by the telephone (i.e., facilitating the maintenance of preexisting relationships). But can this communication medium also serve the identity play functions of (as Sweeney, 1999 put it) a game of dress-up? To answer this question, I examined participants' reports of the frequency, motivation, content, and social context of their online pretending.

Although the questions regarding the frequency and social context of pretending required participants to select from among fixed response options, questions concerning the content of and motivations for pretending allowed participants to respond in their own words. These responses were categorized by a team of two researchers using an inductive content analysis approach. For each response, the main topic

was grouped according to similarity to other responses, and both researchers categorized all responses. This approach resulted in seven categories for motivation to pretend.<sup>6</sup>

#### 3.4.1. Frequency of pretending

Of the 175 participants who provided responses to questions regarding typical Internet use, 49% ( $n = 86$ ) reported that they had never pretended to “not be yourself (or be someone else).” Another 41% of participants ( $n = 71$ ) reported they had pretended “a couple of times” before, and 10% reported pretending occasionally ( $n = 9$ ), pretty often ( $n = 7$ ), or all the time ( $n = 2$ ).

#### 3.4.2. Who have teens pretended to be?

Not surprisingly, 82 of 89 respondents with pretending experience had pretended to be older (in contrast to 7 reports of pretending to be someone younger). Other personas were less common: 19% ( $n = 17$ ) had pretended to be someone of another gender or sexual identity, and pretending to be a celebrity or one’s sibling were each reported by two participants.

The tendency for participants to inflate their age may indeed be developmentally specific (see Montepare & Lachman, 1989). It would be hard, for example, to imagine people in their 40s going online and lying about their age so they can pass for 70 or even 50. But does a teenager’s age inflation constitute identity exploration in the Eriksonian sense of the term? It could be argued that pretending to be older indeed constitutes exploration of a future self and identity; the critical difference between the identity exploration reported here and described in case studies and the media is that in the present study, as discussed below, participants were unlikely to pretend in a truly anonymous setting, disconnected from offline life.

#### 3.4.3. With whom and why did participants pretend?

A majority of participants who reported pretending to be someone else often did so in the physical company of others; friends were the most frequently reported companion for pretending: 51 of 89 participants who had pretended usually did so in the company of a friend. Five participants reported usually pretending in the company of a sibling or another family member. A chi-square test revealed that 10th graders were more likely than 7th graders to pretend with a friend [ $\chi^2(1, N = 88) = 4.37, p < .04$ ]. Clearly, online pretending is generally a social and not a solitary act.

When asked why they pretended online, 48% of respondents ( $n = 38$ ) reported that they pretended to be someone else as a joke. A typical response in this category was, “Me and my friends thought it would be fun to play a prank on our other friends.” Another 16% of those who pretended explained that they hid their identity to protect themselves and their privacy (e.g., “so no one can like stalk me or anything”) or to evade online age restrictions (e.g., “so I could do the Eat and Earn contest for Kellogg’s I pretended to be 13 and I’m only 12 ½”).

A minority of participants’ reported motivations for pretending is suggestive of identity exploration as Erikson conceptualized it. Eleven percent of participants explained that they feigned their age or another aspect of their identity to be more interesting to another person (e.g., “because mature 20 year old guys don’t like to talk to 15 year old girls”). Only 2% of youth who pretended explicitly mentioned wanting to

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<sup>6</sup> The seven categories for motivation to pretend were as follows: (1) to evade age restrictions, (2) to increase another person’s liking/interest in general and (3) by appearing older, (4) to gain information or spy on others, (5) to explore a new identity or role play, (6) for fun or as a joke, and (7) to ensure one’s privacy or safety. Interrater reliability (Cohen’s kappa) scores exceeded .80.

explore a new self or identity. For example, one 10th grade girl explained that pretending allowed her to experience being “someone else different personality someone I wish I could be.”

#### 3.4.4. *Is pretending activity associated with adolescent well-being?*

From an Eriksonian perspective, it might be expected that use of the Internet for identity experimentation would be related to adolescent well-being. Although the frequency and type of pretending (e.g., feigning one’s age or sexual identity) was unrelated to psychosocial adjustment, associations were found between adjustment and the social context of pretending. I examined whether participants who pretended alone vs. with a friend differed in their psychosocial adjustment. In order to control for the possibility that the relationship between social distress and pretending alone vs. with friends was actually explained by some other variable (e.g., the availability of friends), I conducted hierarchical linear regressions (see [Tables 1 and 2](#)).

Analyses revealed that, controlling for the number of close friends in school and the number of times per week participants reported seeing friends outside school, seventh graders who pretended with friends vs. alone were less socially anxious (see [Table 2](#)). Specifically, pretending with friends vs. alone predicted an additional 15% of the total variance in social anxiety, above and beyond that explained by the availability of friends ( $\Delta R^2 = .15$ ,  $\Delta F = 10.19$ ,  $p < .01$ ). The social context of pretending also

Table 1  
Zero-order Correlations among friendship, dispositional adjustment, and pretending variables

Variables	Mean	SD	1	2	3	4	5
<i>Friendship measures</i>							
1. Number of close friends in school	3.66	.7					
2. Number of times seeing friends outside school	1.82	1.1	.15				
<i>Dispositional adjustment measures</i>							
3. Social anxiety	1.80	.7	-.16	-.51***			
4. Loneliness	2.25	.8	-.36*	-.50***	.72***		
5. Depression	.34	.4	-.13	-.27	.60***	.61***	
<i>Social context of pretending measure</i>							
6. Mostly pretend with a friend	.52	.5	.36*	.05	-.42**	-.38*	-.22
<i>Friendship measures</i>							
1. Number of close friends in school	3.43	.9					
2. Number of times seeing friends outside school	1.65	1.2	.28				
<i>Dispositional adjustment measures</i>							
3. Social anxiety	2.19	.6	-.29	-.22			
4. Loneliness	2.58	.8	-.24	-.21	.65***		
5. Depression	.44	.3	-.16	.08	.36*	.41*	
<i>Social context of pretending measure</i>							
6. Mostly pretend with a friend	.76	.4	-.08	.10	-.13	.02	-.13

Variable 9 is dummy coded, such that pretending alone=0, pretending with a friend=1.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . Two-tailed tests.

Table 2  
Hierarchical regressions predicting social anxiety and loneliness

Predictors	Outcome: social anxiety				Outcome: loneliness			
	<i>B</i>	SE <i>B</i>	$\beta$	Total $R^2$	<i>B</i>	SE <i>B</i>	$\beta$	Total $R^2$
<i>Seventh graders (n = 44)</i>								
Step 1				.26**				.34***
Number of close friends at school	-.09	.13	-.10		-.32	.14	-.30*	
Frequency of seeing friends outside school	-.31	.08	-.49**		-.33	.09	-.46**	
Step 2				.41***				.41***
Number of close friends at school	-.05	.12	-.06		-.21	.14	-.19	
Frequency of seeing friends outside school	-.31	.08	-.50***		-.33	.09	-.46**	
Pretending alone vs. with a friend	-.58	.18	-.41**		-.47	.21	-.29*	
<i>Tenth graders (n = 37)</i>								
Step 1				.11				.08
Number of close friends at school	-.17	.12	-.25		-.18	.16	-.20	
Frequency of seeing friends outside school	-.08	.09	-.15		-.11	.12	-.15	
Step 2				.12				.08
Number of close friends at school	-.18	.12	-.26		-.18	.16	-.19	
Frequency of seeing friends outside school	-.07	.09	-.14		-.11	.12	-.16	
					-.19	.24	-.13	

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

contributed significantly to the prediction of loneliness among seventh graders ( $\Delta R^2 = .07$ ,  $\Delta F = 5.04$ ,  $p < .04$ ). However, no such associations were observed in the 10th grade sample (all  $p$ 's  $> .1$ ).

What can account for the moderating role of age in the association between well-being and the social context of online pretense? One intriguing possibility that awaits further investigation is that the extent to which the social context is related to well-being wanes as it becomes more socially normative to experiment with identity in mid-adolescence (see Arnett, 2000; Erikson, 1963). Further research is needed to replicate and explain the present results; meanwhile, they serve to underscore the importance of examining the social context of identity play, whether it occurs online or offline. These findings also suggest that the social context needs to be made more explicit in theories of adolescent identity exploration, taking into account, for example, what is accomplished in familiar versus anonymous social settings and for whom one or the other type of setting might be especially beneficial.

#### 4. Discussion

In a 2003 critique of extant research on youth Internet use, Livingstone (2003, p. 13) argued that "research on children and the Internet must go beyond access to examine the nature of Internet use—its nature and quality, social conditions, cultural practices and personal meanings." In particular, she noted that research that combines qualitative and quantitative data is sorely needed, but rarely published. The present research was aimed at filling this need, by collecting detailed, daily data on usage and adjustment from a school-based sample of youth. Qualitative data (e.g., regarding participants' pretending activity) served not only to illustrate findings, but also to illuminate critical, subjective aspects of adolescent Internet use (e.g., motives) that may be difficult to capture in fixed-response measures at such a

preliminary point in this domain of investigation. At the same time, quantitative analyses provided a context for the examination of online behaviors of particular interest or concern, enabling us to determine the frequency of such behaviors in a school-based sample.

How do the actualities of adolescents' experiences, as reported in the Y2K Teens study, match the three propositions I first presented? First, the data reviewed here suggest that, over time, adolescent boys' and girls' online activities have become more similar than different. Of particular note is the extent to which boys in the present sample resembled girls in their heavy use of the Internet for social communication. The presence of a small but consistent group of male heavy online game players provides consistency with gender differences observed in computer use before the Internet.

In addition, conceptions of adolescent Internet activity as consumed mainly by solitary explorations or anonymous interactions among strangers (each experimenting with new or feigned identities) appear outdated in light of the present findings. While I dispute neither the existence nor importance of such uses of the Internet, my research suggests that we must not assume them to be the norm among teenagers. Instead, the majority of youth in the present sample reported daily online behaviors more easily compared to a telephone call than a game of dress-up. Most participants reported using the Internet for both social and nonsocial purposes—often simultaneously. On average, they described their online social interaction as (1) occurring in private settings such as e-mail and instant messages, (2) with friends who are also part of their daily, offline lives, and (3) devoted to fairly ordinary yet intimate topics (e.g., friends, gossip).

This finding is consistent with findings from a U.S. national sample, in which 14% of 10- to 17-year-old respondents had formed close relationships with people met online (Wolak, Mitchell, & Finkelhor, 2003), as well as with the follow-up to the original HomeNet study, in which more Internet use began to be associated with declines in loneliness and other positive social effects (Kraut et al., 2002). This pattern of results likely reflects the effects of changing Internet technologies and diffusion upon young people's online activities (for an in-depth discussion of such effects, see O'Keefe and Zehnder, 2004 [this issue]).

I noted above that the proposition that Internet use is associated with well-being typically includes two assumptions: (1) that when teens are online, they are primarily interacting with strangers, and (2) that such interactions constitute weak ties (e.g., Kraut et al., 1998) and, as such, are not (as) beneficial. Although the present data suggest that the first assumption may no longer hold, research is needed to address the second assumption: what *are* the effects of adolescents' communication with strangers? Amid the heightened risk of exposure to predators (see Wolak et al., 2003), may there also be adaptive functions served by contact with strangers?

In spite of the growing role of online communication in the lives of teenagers, even regular Internet users appear to continue to engage in and appreciate the value of traditional social interaction. Explained one participant in the present study who uses the Internet regularly to chat with friends, "I really prefer talking to the person face to face. I like to see them laugh and make faces and make me laugh." Furthermore, we must exercise caution in inferring preference from usage in youth, whose options tend to be considerably more restricted than adults'. In the everyday lives of early adolescents, the available alternatives to weeknight online or phone communication do not tend to be face-to-face interaction with peers, but instead solitary pursuits such as homework or listening to music (Larson, 1995, 1999).

Online multitasking was suggested in both quantitative and qualitative findings and is a domain worthy of attention in both research and education. For example, if youth are increasingly assigned

homework that involves going online, and going online means ready, continuous access to one's peers, they will face new time (and attention) management challenges—and so will their parents, who may not be as savvy as their son or daughter at managing (or even identifying) online multitasking.

Findings concerning online pretense suggest that adolescents are flexible in their online self-presentation and conceal or feign their identity in multiple social and psychological contexts; such activity appears to be more often motivated by a desire to play a joke on friends than to explore a desired or future identity, but participants' qualitative responses reveal a range of pretending content, contexts, and motives. As such, this identity play represents just one of many ways adolescents are making use of the Internet as a tool—or rather, through IM, e-mail, and chat, a *number* of tools—in their growing communication repertoire. Indeed, the earlier focus on identity play and multiple identities may have been partly a result of the MUD technology, which was developed for role-playing games.

The present study also points to a potentially worrisome pattern of solitary pretending that may be practiced by a small minority of psychologically vulnerable early adolescents. But given the correlational nature of these findings, it is equally plausible that this pattern represents a potentially beneficial activity for youth in need of the identity exploration and social interactions on which their well-being depends and which may be denied them in school.

Given the rapidly evolving landscape of young people's digital media use, it is impossible to make any hard and fast claims regarding such complex aspects of use as gender, adjustment, and identity; rather, it is hoped that the findings discussed above provide evidence of that complexity. In addition, researchers, journalists, and policymakers are urged to differentiate activity patterns of behavioral subgroups from the normative patterns reported by the majority of youth Internet users. Finally, the present research underscores the utility of conceptualizing and measuring the Internet as a social context for adolescent development which, like other social environments (e.g., school), can be analyzed in terms of its constraints and affordances for both adaptive and maladaptive social interaction and peer relationships.

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## References

- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55, 469–480.
- Erikson, E. (1963). *Childhood and society*. (2nd ed.). New York: Norton.

- Gray, J. (1992). *Men are from Mars, women are from Venus: A practical guide for improving communication and getting what you want in your relationships*. New York: Harper Collins.
- Gross, E. F., Juvonen, J., & Gable, S. L. (2002). Internet use and well-being in adolescence. *Journal of Social Issues*, 58, 75–90 (Special Issue: Consequences of the Internet for Self and Society: Is Social Life Being Transformed?).
- Huebner, E. S. (1991). Correlates of life satisfaction in children. *School Psychology Quarterly*, 6, 103–111.
- Jupiter Communications (2000, September). *Targeting Teens is a Gender Game*.
- Koenig, L. J., Isaacs, A. M., & Schwartz, J. A. J. (1994). Sex differences in adolescent depression and loneliness: Why are boys lonelier if girls are more depressed? *Journal of Research in Personality*, 28, 27–43.
- Kovacs, M. (1992). *Children's depression inventory*. North Tonawanda, NY: Multi-Health Systems.
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues*, 58, 49–74.
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53, 1017–1031.
- La Greca, A. M., & Lopez, N. (1998). Social anxiety among adolescents: Linkages with peer relations and friendships. *Journal of Abnormal Child Psychology*, 26, 83–94.
- Larson, R. W. (1995). Secrets in the bedroom: Adolescents' private use of media. *Journal of Youth and Adolescence*, 24, 535–550.
- Larson, R. W. (1999). The uses of loneliness in adolescence. In K. J. Rotenberg, & S. Hymel (Eds.), *Loneliness in childhood and adolescence* (pp. 244–262). New York: Cambridge Univ. Press.
- Livingstone, S. (2003). Children's use of the Internet: Reflections on the emerging research agenda. *New Media and Society*, 5, 147–166.
- McKenna, K. Y. A., & Bargh, J. A. (2000). Plan 9 from cyberspace: The implications of the Internet for personality and social psychology. *Personality and Social Psychology Review*, 4, 57–75.
- Montepare, J. M., & Lachman, M. E. (1989). You're only as old as you feel: Self-perceptions of age, fears of aging, and life satisfaction from adolescence to old age. *Psychology and Aging*, 4, 73–78.
- Nie, N. H., & Erbring, L. (2000). Internet and Society: A preliminary report. *Stanford Institute for the Quantitative Study of Society*. Retrieved September 24, 2004, [http://www.stanford.edu/group/siqss/Press\\_Release/Preliminary\\_Report.pdf](http://www.stanford.edu/group/siqss/Press_Release/Preliminary_Report.pdf)
- O'Keefe, B.J., & Zehnder, S. (2004). Understanding media development: A framework and case study. *Journal of Applied Developmental Psychology*, 25, 729–740.
- Pew Internet and American Life Project, 2001. *Teenage life online: The rise of the instant message generation and the Internet's impact on friendships and family relationships*. Retrieved July 19, 2001, [http://www.pewInternet.org/reports/pdfs/PIP\\_Teens\\_Report.pdf](http://www.pewInternet.org/reports/pdfs/PIP_Teens_Report.pdf)
- Reis, H. T., & Gable, S. L. (2000). Event-sampling and other methods for studying everyday experience. In H. T. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 190–222). New York: Cambridge Univ. Press.
- Reis, H. T., & Shaver, P. (1988). Intimacy as an interpersonal process. In S. Duck (Ed.), *Handbook of personal relationships* (pp. 367–389). Chichester, UK: Wiley.
- Roberts, D. F., Foehr, U. G., Rideout, V. J., & Brodie, M. (1999). *Kids and media at the new millennium: A comprehensive national analysis of children's media use*. A Kaiser Family Foundation Report, Menlo Park, CA.
- Rubin, R. R., Perse, E. M., & Barbato, C. A. (1988). Conceptualization and measurement of interpersonal communication motives. *Human Communication Research*, 14, 602–628.
- Russell, D. W. (1996). UCLA loneliness scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, 66, 20–40.
- Subrahmanyam, K., Kraut, R., Greenfield, P. M., & Gross, E. F. (2001). New forms of electronic media: The impact of interactive games and the Internet on cognition, socialization, and behavior. In D.L. Singer, & J.L. Singer (Eds.), *Handbook of children and the media* (pp. 73–99). Thousand Oaks, CA: Sage Publications.
- Sweeney, C. (1999, October 17). *A chat room you can be NEI* (pp. 66–68). New York: New York Times Magazine.
- Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. New York: Simon and Schuster.
- Turow, J. (1999, May 4). *The Internet and the family: The view from the family, the view from the press*. The Annenberg Public Policy Center of the University of Pennsylvania. Retrieved July 19, 2001, <http://www.appcpenn.org/Internet/family/rep27.pdf>

- Visser, P. S., Krosnick, J. A., & Lavrakas, P. J. (2000). Survey research. In H. T. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 223–252). New York: Cambridge Univ. Press.
- Wheeler, L., & Nezlek, J. (1977). Sex differences in social participation. *Journal of Personality and Social Psychology*, *35*, 742–754.
- Wolak, J., Mitchell, K. J., & Finkelhor, D. (2003). Escaping or connecting? Characteristics of youth who form close online relationships. *Journal of Adolescence*, *26*(1), 105–119.