



Trends in online social networking: adolescent use of MySpace over time

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Justin W. Patchin

University of Wisconsin-Eau Claire, USA

Sameer Hinduja

Florida Atlantic University, USA

Abstract

MySpace has received a significant amount of negative attention from the media and many concerned adults, who point to several isolated incidents where predators have contacted, become involved with and even assaulted adolescents whom they met through the popular social networking web site. Furthermore, concerned parents have expressed discontent with the amount and type of personal and private information youth seem to reveal on their profile pages. In 2006, the authors performed an extensive content analysis of approximately 2423 randomly sampled adolescent MySpace profiles, and found that the vast majority of youth were making responsible choices with the information they shared online. In this follow-up study, the authors revisited the profiles one year later to examine the extent to which the content had changed. Though exceptions occur, youth are increasingly exercising discretion in posting personal information on MySpace and more youth are limiting access to their profile. Moreover, a significant number of youth appear to be abandoning their profiles or MySpace altogether.

Key words

content analysis, Internet safety, MySpace, online communities, social networking, victimization, youth

I never realized how dangerous MySpace could be. ... It was foolish of me to put that suggestive picture of me in my bikini up. One day a guy sent me a message saying that he wanted to 'do it' with me, and if I didn't he would tell everyone at school that I'm a little whore. ... I called the police after crying all day and talking to my parents. (15-year-old girl from Canada)

Corresponding author:

Justin W. Patchin, Department of Political Science, University of Wisconsin-Eau Claire, 105 Garfield Avenue, Eau Claire, WI 54702-4004, USA.

Email: patchinj@uwec.edu

Internet-based social networking sites have exploded in number and popularity as they allow individuals to construct personal profile pages to represent themselves and easily interact with others. Youth have embraced the concept of creating these 'virtual presences', and are the driving force behind the success of MySpace (<http://www.myspace.com>) and similar online communities (boyd, 2006). In the summer of 2006, we performed an extensive content analysis of approximately 2423 randomly sampled adolescent MySpace profile pages to empirically ascertain the extent to which youth were posting personal information and publicly expressing or displaying participation in adult-like behaviors (such as swearing, drinking and using alcohol, tobacco or marijuana) (Hinduja and Patchin, 2008). With regard to the former, our results suggested that youth are largely demonstrating common sense when it comes to the personal content they include on their publicly accessible profile page – a finding contrary to conventional wisdom (Carlin, 2006; Hughes, 2006; Marvel and Churnin, 2006; Stafford, 2006; Williams, 2006). With regard to the latter, a relatively small but meaningful number of adolescents were using inappropriate language on their profile page and/or reporting experience with illicit substances.

Since the initial study, MySpace has introduced efforts to promote Internet safety, and various organizations (both online and offline) have stridently sought to inform and equip youth with the knowledge to stay out of harm's way when interacting in cyberspace (Jesdanum, 2006; Reuters, 2007). Actions are also being taken by parents and educators to encourage the responsible use of technology (Carvin, 2006; Fitzgerald, 2007; Magid, 2006; Ray, 2007; Smith, 2007). The current research sought to reanalyze the youth MySpace profile pages that were initially examined in 2006 to find out whether there have been any observable changes in the way adolescents are using that site. We sought to determine if the same random sample of youth studied in the summer of 2006 were exercising greater wisdom and discretion with respect to the content they had publicly posted on their profiles in the summer of 2007.

In this article, we first review statistics illustrating the embrace and growth of online connectivity and communication among youth. Next, we provide a basic discussion of social networking via MySpace, as well as the related risks and benefits of participation. Findings from recent research on MySpace are then summarized before leading into the methodology and analytic approach of the current work. Finally, the results and attendant implications are presented with the ultimate goal of further cultivating an ethos of safe and responsible Internet use among adolescents.

Adolescents and the Internet

It is clear that youth in America have embraced social interaction and communication in cyberspace, and a recent study by the Pew Internet and American Life Project aptly portrays this. This national random-digit-dial telephone survey of 700 teenagers between the ages of 12 and 17 in September, October and November 2007 found that 94 percent of teens in the US use the Internet, with 63 percent doing so daily as of late 2007 (35% of youth logged on multiple times each day) (Lenhart et al., 2008). In addition, two-thirds of youth have high-speed connections to the Internet at home, and 93 percent go online from more than one location (e.g. school, the library, a friend's house).

In another study in the USA by Pew conducted in October and November 2006, most of the 935 teenagers between the ages of 12 and 17 they surveyed reported having online profiles (55%), with many posting personal information such as school (49%), full name (29%), instant messaging screenname (40%) and email address (29%) (Lenhart and Madden, 2007). Interestingly, 40 percent of these youth believed it would be 'hard' and 36 percent believed it would be 'very difficult' for someone to find out who they are based on the information they post online. However, almost one-quarter of the youthful respondents (23%) perceived that such a task would be 'pretty easy'. In this study, 85 percent of those who had online social networking profiles were on MySpace, and it is to this specific online environment that we now turn our attention.

MySpace

In late 2007, MySpace.com accounted for 80 percent of visits to any social networking web site on the Internet (Reuters, 2006), with its population having increased significantly between 2004 and 2007 (Lenhart and Madden, 2007; Sellers, 2006; Suh, 2007). While new growth numbers are not available, estimates in 2006 pointed to the creation of 230,000 new accounts each day. Also, most reports suggest that about one-quarter of user profiles are of individuals under the age of 18 (Granneman, 2006), and that this population appears to fuel its growth (boyd, 2006). Given its widespread popularity among most age-groups and particularly the younger generation, it is important to identify the reasons for such widespread appeal – as well as the purported benefits and potential risks of MySpace participation.

MySpace became more popular than its competitors (e.g. Friendster, LiveJournal, Xanga) in part because it integrated many of the online activities that other sites had popularized – blogging, synchronous and asynchronous messaging, the sharing of multi-media content (pictures, music, videos, etc.) and of course networking (the ability to connect with friends and others with similar interests) – in a very user-friendly, unrestricted and self-expressive way (boyd, 2007; Livingstone, 2008; Magid and Collier, 2007). At a basic level, MySpace enables individuals to create digital representations of themselves by posting biographical information, personal diary entries, affiliations, likes and dislikes, interests and multi-media artifacts (pictures, video and audio). Creating an online persona through customized textual, visual and aural electronic content allows youth to 'display the selves they are, the selves they wish to become, and the selves they wish others to see' (Stern, 2002: 266; Tynes, 2007). It then allows connectivity between these profiles so that an individual can include another as a 'friend' to view the contents of their page, leave public comments, or send private messages. Cumulatively, online social networking sites allow a person to participate in a full-time, always-on, intimate community in which they can feel emotionally close and connected to others even when they are physically apart from them (boyd, 2007).

If used responsibly, participation in social networking web sites provides a number of potential benefits for adolescents. For instance, these sites introduce users to differing viewpoints and perspectives and therefore encourage youth to appreciate and respond to opinions and assertions in a prosocial and harmonious manner (Berson et al., 2002). In addition, they are at a stage where they are negotiating beliefs, boundaries, roles and

goals as they discover, develop and refine their self-identity (Calvert, 2002; Erikson, 1950; Turkle, 1995), and online socialization, interaction and presentation of self can assist tremendously in that regard. Finally, youth in the 21st century lack a real-world venue in which they can 'hang out' like youth of the previous generation did (at the bowling alley, malt shop, skating rink, neighborhood basketball court or local shopping mall) (boyd, 2006). They have therefore turned to cyberspace to meet and interact with others in a relatively adult-free environment.

Several school districts across the USA are even embracing social networking websites as instructional tools. For example, some teachers have created virtual classrooms that include supplementary information about the topics discussed in the brick-and-mortar environment (Carvin, 2006). Other teachers require English students to post their writings online for other students to read and critique. Photography and art students, too, have benefited from posting their work on sites that allow visitors to review, evaluate and make suggestions for improvement. It has been suggested that administrators might also use MySpace to increase student access to course activities or very quickly send messages, newsletters or other important information to all members of the school community (Appel, 2007; New Media Consortium, 2007).

While research has noted these and other clear benefits to online social networking (see Hinduja and Patchin, 2008, 2009; Tynes, 2007), the media and many adults have issued a hue-and-cry concerning the danger and potential risks that surround youth in cyberspace, and have singled out MySpace as a particularly perilous online environment (Carlin, 2006; Marvel and Churnin, 2006; Williams, 2006). To be sure, the largest concern revolves around the sentiment that online sexual predators scour the public profiles of unassuming youth in order to identify, befriend, groom and then assault their next victim (Bowker and Gray, 2004; Conte et al., 1989; Young, 1997). The problem is aggravated as this population may seek and accept validation, affirmation, attention and affection from the wrong sources (Baumeister and Leary, 1995; Beebe et al., 2004; Dombrowski et al., 2004). Isolated cases occurring across the USA have been broadcast far and wide by the popular media, further exacerbating and reifying this fear (Angwin and Steinberg, 2006; Associated Press, 2006; Poulsen, 2006). For example, adult males have befriended underage girls on MySpace and then molested or had sex with them in California (Poulsen, 2006), New York (Angwin and Steinberg, 2006) and Connecticut (Associated Press, 2006). Aside from these incidents, controversial estimates allude that over 50,000 sexual predators are on the Internet every minute each day (Thomas, 2006). Collectively, this highlights the real risks inherent in cyberspace, but tells only a partial story. Additional data-driven perspectives are necessary to distinguish between fear and fact.

Review of previous MySpace research

In the last three years, an incipient body of research concerning adolescents' experiences with social networking web sites has emerged (see e.g. Livingstone, 2008; Pierce, 2006, 2007; Thelwall, 2008a, 2008b; Tynes, 2007). These studies have been primarily descriptive, conducted with the intent of illuminating the demographic characteristics of individuals on a particular social networking site, and the ways in which youth customize and use them as a

digital representation of themselves. A brief review of the primary empirical findings is useful in laying a foundation for the current work.

To begin, two recent content analyses illuminated the gender distribution in practices of swearing and friending in MySpace. Thelwall (2008a) examined 8609 American and 767 British MySpace profile pages from a sampling frame of 40,000 created around the same time.¹ Results showed that American males are more likely to engage in strong and moderate swearing on their profile pages, while in the UK there was no gender difference. In another work, Thelwall (2008b) sought to identify the factors that affect the formal connections between MySpace profiles. He studied three samples: one with 15,043 profiles, another with 7627 profiles and the third with 403 profiles.² Overall, females tended to be more interested in friendship while males largely sought dating and romantic connections. Females also tended to have more friends and were more likely to set their profile page to 'private' (thereby limiting its accessibility to friends).

Another recent quantitative analysis of 700 MySpace profile pages involved both adults and youth purposively selected from the various regions (Northeast, Northwest, South, Southeast, Midwest, West and Hawaii) of the USA (Pierce, 2007). The researcher collected information on the extent that individuals were posting personal data and sexually suggestive pictures. Findings revealed that a small percentage of youth posted their full name (12%), phone number (4%), email address or instant messaging name (3%), or postal address (1%) (Pierce, 2007). Furthermore, a meaningful number included pictures of revealing sexual poses (59%), partial frontal male nudity (28%), partial frontal female nudity (17%), full male nudity (2%) and full female nudity (6%) (Pierce, 2007). The main concern is that posting these forms of sexual content may endanger individuals by attracting unwanted attention from strangers online (Angwin and Steinberg, 2006; Associated Press, 2006; Poulsen, 2006). Indeed, Mitchell et al. (2001) found that such behavior by female youth entices sexual solicitations by strangers, thereby putting them at risk.

In another exploratory study, Pierce (2006) surveyed 301 high school students to learn more about their MySpace participation, and found that 59 percent posted their real name and 38 percent posted other personal information including where they worked, the name of their school and their cell phone number.³ More recently, Ybarra et al. (2007) collected data from 1500 youth between the ages of 10 and 17 who had used the Internet at least once a month over the last six months through the Second Youth Internet Safety Survey – a cross-sectional random-digit-dial telephone survey of youth in the USA. They found that sharing personal information on the Internet is not in and of itself significantly related to online victimization, but when considered in conjunction with other risky behaviors (such as harassing others through rude or embarrassing postings or messages, meeting individuals online in multiple ways, talking about sex with unknown individuals and having multiple unknown individuals in one's instant messaging 'Buddy List') does appear to significantly increase experiences of victimization.

As mentioned earlier, in the summer of 2006 we performed a comprehensive content analysis of 2423 randomly selected youth MySpace profiles (Hinduja and Patchin, 2008). Approximately 39 percent (948 out of 2423) of the youth profiles were set to private and as a result viewable only by friends and therefore not included in our subsequent analysis. Thus, we focused on a subsample of publicly accessible profiles ($n = 1475$) and found that about 54 percent ($n = 795$) were created by females, and more than 8 percent

($n = 123$) of the profiles included some evidence of age inflation. Almost 57 percent of these profiles ($n = 839$) included at least one picture of the youth (median = 2; maximum = 16). While including a picture or descriptive details potentially places a youth at risk, of particular concern were those who included pictures of themselves (5.4%) or others (15.5%) posing in swimsuits or underwear (see also Mitchell et al., 2001). Moreover, almost 40 percent of the public profiles included the youth's first name and approximately 9 percent included their full name. In conjunction with their current city (81%) and school (28%), this personal information may also assist those seeking to identify profile owners offline (Hinduja and Patchin, 2008).

In addition to the personal and identifying information contained in the profiles, many youth indicated they had recently consumed alcohol (18%), while others noted that they had smoked cigarettes (8%) or used marijuana (2%) (Hinduja and Patchin, 2008). While often common during adolescence (Centers for Disease Control and Prevention, 2006), posting evidence of such behavior on MySpace may be unwise because educators, law enforcement officers and prospective employers or college admissions coordinators now routinely search through MySpace and other online venues (Bahrapour and Aratani, 2006; Finder, 2006; Kharif, 2006; Marshall, 2007). The prevalence of problematic content betraying bad behaviors or portraying bad judgment has tarnished the reputation of social networking sites in some circles of politicians, media and youth-serving adults. This has largely prompted the sites – as well as third-party watchdog organizations – to construct and implement strategies to safeguard youth while they participate in these environments.

Initiatives to promote safer social networking

While there have been some efforts to inform adolescents about the potential risks of posting too much personal or identifying information, much of these have been of a broad, general nature (Caverlee and Webb, 2008; Livingstone, 2008; Thelwall, 2008a, 2008b). Within the USA, efforts have been launched by the National Crime Prevention Council, the Ophelia Project, the Federal Bureau of Investigation, iSafe and iKeepSafe. Formally, school districts around the nation and world are ramping up efforts to teach Internet safety (to varying depths) to students in elementary, middle and high school (Carvin, 2006; CNN.com, 2007a, 2007b; Rosenthal, 2007; Urban, 2007). Informally, parents are increasingly broaching the subject of risks and dangers in cyberspace when talking with their children (Fitzgerald, 2007; Magid, 2006; Ray, 2007; Smith, 2007). To note, research has shown that younger Internet participants (13–14 years of age) and those whose parents had discussed online safety with them tend to be more aware and active in protecting themselves online (Berson et al., 2002; Fleming and Rickwood, 2004; Fleming et al., 2006).

MySpace has also adopted a number of safety measures in an effort to protect their users. For example, they began airing public-service announcements promoting safe social networking, as well as rotating web banner ads within their pages in 2006. They hired a chief security officer and have buttressed their staff to more capably screen and remove problematic personal profiles and to more effectively work with law enforcement on complaints of criminal behavior (Olsen, 2006). In addition, MySpace has implemented technological restrictions to help keep known sex offenders in the USA from creating profiles, and deleted

29,000 profiles belonging to registered sex offenders in July 2007 (Reuters, 2007). With regard to problematic content, millions of images and video are uploaded daily, and MySpace utilizes both algorithms and people to identify if any of these violate their Terms of Service. To help reduce the likelihood that minors will be contacted by adults they do not know, MySpace automatically restricts access to (i.e. sets to private) any profiles created by individuals who are aged 13, 14 or 15. The profiles of users who are 16 or older are set to public but can be changed to private if the user desires (users who state they are younger than 13 are not allowed to set up a profile page) (Jesdanum, 2006). Finally, MySpace users who list their age as 18 or older are not allowed to add friends who list their age as under 16 unless the adult knows the teen's full name or email address (Jesdanum, 2006).

Cumulatively, these initiatives serve to pique the consciences of youth and ideally induce them to carefully consider what they say and do online. That said, no empirical research to date has examined a cohort of MySpace profiles over time to determine whether the safety messages are being heard or the new strategies being employed are affecting the way youth are using MySpace. The current study seeks to further enhance our understanding of how adolescents are using MySpace by examining the extent to which the content of their profiles has changed over time.

Methodology

The present work involves a re-analysis of the adolescent profile pages previously examined in the summer of 2006. That initial study (see Hinduja and Patchin, 2008) randomly selected 2423 adolescent⁴ profiles but focused on the 1475 that were publicly viewable. The original profiles were selected using a random number generator, since each profile is uniquely assigned a numeric identifier upon creation. As a result of this sampling strategy, we were able to make generalizations about the broader population of MySpace profiles based on a relatively small sample. At the time of the initial study there were approximately 100 million profiles on the MySpace network. By the summer of 2007, the time of this follow-up study, this number had nearly doubled to approximately 199 million profiles.

Since the sample was selected randomly, identified profiles included youth from all over the world. While over 60 countries were represented, the vast majority were from the USA (over 70%) or other English-speaking countries (UK: 4%; Australia: 1.4%; Canada: 1.3%). Any information that was written in a language other than English was not included in the analysis.⁵ Future studies should attempt to glean information from youth profiles that originate across the world and in multiple languages, as a broader international context may lend additional insight into cultural differences in online social networking.

The current work revisited the initially chosen 2423 adolescent profiles from the summer of 2006 approximately one year later to see if any of the information contained therein had significantly changed. We were interested in the extent to which adolescents had become more or less private with the information they posted. We used a paired-samples *t*-test to determine whether differences observed were statistically significant. Trained coders examined the content of public MySpace profiles and noted particular pieces of information (see Results section). Coders were instructed to examine any portion of the profile that was publicly viewable (including pictures, comments, surveys and blogs).

Since anywhere from 10 to 18 months had elapsed between coding (mean = 457 days), some of the youth who were 16 or 17 years of age in 2006 were 18 or 19 years of age at the time of the follow-up analysis. Nonetheless, we chose to include all of the profiles from the 2006 study in the current analysis to ascertain trends and patterns in online social networking practices among this panel of youth. In the Results section, we first describe the content of these profiles as observed in the summer of 2007, and then discuss how these profiles have changed over the last year.

Reliability

Reliability is an issue of paramount concern in any content analyses. Two research assistants involved in this follow-up project were individually trained in a manner consistent with the initial 2006 study. To assess reliability, we recoded a random subsample of approximately 20 percent of the profiles ($n = 515$). Cohen's kappa statistic was employed to evaluate the extent to which there was agreement in the coding. Generally, kappa values between .41 and .60 are considered 'moderate', those between .61 and .80 are considered 'substantial' and those that are greater than .81 are considered 'almost perfect' (Landis and Koch, 1977: 165). Consistent with the 2006 coding, the vast majority of kappa values were greater than .61 (see Table A1 in Appendix). The one exception to this was the variable 'swear words in comments', which produced a kappa value of .53.

Results

As described earlier, there were originally a total of 2423 youth profiles randomly selected from all of the available profiles in 2006. Table 1 presents the content observed in these profiles approximately one year later – in 2007. First, it bears mentioning that approximately 10 percent ($n = 239$) of the sample profiles had been deleted sometime during the previous year and were no longer active. Among those that were still active, 42 percent were set to private. This compares to 39 percent of profiles set to private in 2006. Approximately 48 percent of the profiles list users as under 18 years of age, and almost 5 percent included clear evidence of age inflation. Evidence of age inflation was identified when some profiles revealed the youth's birthdate (7.9%), (e.g. 'I was born on March 14th, 1990') or the user acknowledged somewhere else in the profile that he or she was younger than the officially listed age (e.g. 'I'm 14 and a freshman at North'). Over 21 percent of the profiles were customized and included features not available in the standard MySpace design structure (HTML coding enhancements, streaming music and video clips, graphics and thematic designs).⁶

Inappropriate content and personal information revealed on MySpace

A common concern leveled by adults is that youth are including inappropriate content or pictures in their MySpace profiles (Carlin, 2006; Marvel and Churnin, 2006; Mitchell et al., 2001). Over half of the profiles (56.5%) included a picture of the youth, though only a small

Table 1 Adolescent personal information on MySpace in 2007 (*N* = 2423)

	Number	%
Male	959	39.6
Female	1223	50.5
17 or younger (as listed)	1170	48.3
Evidence that age is inflated	118	4.9
Birthdate	191	7.9
Profile set to private	1017	42.0
Customized page	515	21.3
Photo on profile	1369	56.5
Photo in swimsuit/underwear	73	3.0
Photo of friends in swimsuit/underwear	40	1.7
Swear words on profile	185	7.6
Swear word in comments	381	15.7
Evidence of alcohol use	209	8.6
Evidence of tobacco use	72	3.0
Evidence of marijuana use	29	1.2
First name	771	31.8
Full name	163	6.7
Current city	1686	69.6
School	269	11.1
Instant messaging name	53	2.2
Email address	15	0.6
Phone number	6	0.2
Invalid or deleted profiles	239	9.9
Abandoned profiles (not visited since 2006 coding)	906	37.4
Occasional profiles (visited since 2006, but not in last 7 days)	412	17.0
Active profiles (visited within previous 7 days)	863	35.6

Percentages may not add up to 100 due to rounding and missing data. The largest source of missing data were those profiles (*n* = 239; 9.9%) that were invalid or deleted.

proportion included pictures of the youth (3%) or his or her friends (1.7%) in a swimsuit or their underwear. Moreover, a relatively small proportion of the profiles included swear words in the profile itself (7.6%) or in the comments left by visitors (15.7%). Finally, few of the profiles included evidence of alcohol (8.6%), tobacco (3.0%), or marijuana (1.2%) use. As noted, these behaviors were observed with relative infrequency, especially when likened to research reporting the proportion of youth in the general public involved in these activities. As a point of comparison, the Centers for Disease Control and Prevention's Youth Risk

Behavior Survey notes that among 9th–12th graders, 43 percent reported having a drink of alcohol, 23 percent reported using tobacco and 20 percent had smoked marijuana in the previous 30 days (Centers for Disease Control and Prevention, 2006).

Another aspect of the current work is the extent to which youth are revealing personal or identifying information that could be used to contact them in real life. As noted in Table 1, less than one-third of youth included their first name while fewer than 7 percent included their full name. Almost 70 percent of profiles included information about the user's current city while about 11 percent listed his or her school. Finally, relatively few of the profiles contained the user's instant messaging name (2.2%, $n = 53$) and very few profiles included his or her email address (0.6%, $n = 15$) or phone number (0.2%, $n = 6$).

Extent of MySpace participation

While coding the profiles, it was observed that a significant number had not been updated for an extended period of time. MySpace lists the date that the user last 'logged on' to his or her profile and many users had not done so for many months. Specifically, 906 profiles (37.4%) were 'abandoned' – that is, not logged onto since before the initial 2006 study. When including those that had been deleted since the first study ($n = 239$), approximately 47 percent of the profiles examined in 2006 are no longer used. This finding can mean one of two things: either youth are abandoning MySpace, or they are creating new profiles using a different email address or profile name. To be sure, there was more than one occasion where we observed evidence of migration to a different profile. For example, one user left a hyperlink to his new profile on his old profile which read: 'I don't use this profile anymore go to my new one the link is: [removed].' That said, it is impossible from the data collected in the current study to determine whether more youth are abandoning a particular profile or MySpace altogether.

On the other hand, we also noted a significant proportion of profiles that were seemingly logged onto quite frequently. For example, over one-third of the profiles (35.6%) had been logged onto within seven days of analysis, termed 'active' profiles. The remaining 412 profiles were termed 'occasional' because youth had logged onto them since the previous analysis but not within the seven days preceding the coding. In comparing profile content, we used these three categories (abandoned, occasional and active) to help understand adolescent MySpace behaviors based on frequency of use.

Comparing MySpace profile content from 2006 to 2007

The next stage of the analysis involved comparing the profiles from 2006 to 2007 to determine if youthful MySpace users have changed the extent to which they are including personal or identifying information on their profiles. We chose to disaggregate the sample based on activity level and primarily focus on the most active users of MySpace. Because those profiles ($n = 906$) that were abandoned had not changed since the initial analysis, they were excluded from the longitudinal phase. Table 2 presents the findings of the analysis comparing 2006 content with what was observed in 2007 by activity level.

Table 2 Adolescent personal information on MySpace over time by level of activity (N = 2181^a)

	Abandoned (n = 906) (41.5%)	Occasional (n = 412) (18.9%)		Active (n = 863) (39.6%)	
	2006	2006	2007	2006	2007
Male	44.2	44.2	45.4	41.7	42.3
Female	54.5	54.1	54.4	56.5	57.7
17 or younger (as listed)	98.6	98.1	58.0*	97.8	57.4*
Evidence that age is inflated	3.2	3.6	8.5*	6.3	6.0
Birthdate	1.5	6.6	10.9*	16.2	15.2
Profile set to private	36.2	43.0	45.6	39.4	58.3*
Customized page	9.6	28.6	27.9	42.9	34.8*
Photo on profile	24.0	64.8	69.7*	77.9	88.4*
Photo in swimsuit/underwear	1.0	2.4	3.6	5.7	5.8
Photo of friends in swimsuit/ underwear	1.1	9.7	1.5	16.3	3.9*
Swear words on profile	4.5	11.4	10.9	20.0	12.9*
Swear word in comments	2.6	20.4	22.3	35.1	29.9*
Evidence of alcohol use	5.6	10.0	11.7	16.3	13.8
Evidence of tobacco use	2.4	5.1	4.6	5.9	4.3
Evidence of marijuana use	0.3	1.0	2.7	1.6	2.0
First name	10.0	21.1	36.7*	37.7	49.6*
Full name	1.2	6.1	9.0*	9.3	12.5*
Current city	78.0	74.5	73.1	80.5	78.2
School	5.0	14.8	12.6	28.6	20.9*
Instant messaging name	0.6	1.5	2.2	5.2	4.4
Email address	0.2	1.0	0.7	1.0	1.4
Phone number	0.1	0.5	0.2	0.1	0.6
Mean number of photos on profile	0.7	3.7	6.7*	6.0	29.1*
Mean number of friends	5.4	56.6	74.0*	123.4	237.8*
Mean number of comments	3.3	63.2	137.0*	154.5	569.4*
Mean number of days since logging on	177.6	37.4	171.4*	8.5	0.5*

*Significant difference between 2006 and 2007 ($p < .01$).

^aSample does not include profiles that were deleted in 2007 ($n = 239$) or those with last login data missing ($n = 3$).

First (and as expected), significantly fewer youth in both the occasional and active groups are 17 or under as listed on MySpace. About 40 percent of the sample had turned 18 years old since the first analysis. It is interesting to note that occasional users were significantly more likely to inflate their age than active users. Moreover, even though more active users include their birth date on their profile (15%), the number of occasional users that included this information increased significantly between 2006 and 2007 (from 6.6% to 10.9%).

One of the more noteworthy findings from the current analysis is that more youth are setting their profile to private. In 2006, only 39.4 percent of the sample restricted access to their profile to friends; in 2007, 45.6 percent of occasional users and 58.3 percent of active users did so. The statistically significant increase from 39.4 to 58.3 percent among active users suggests that these adolescents have learned to be more responsible and guarded with their information. Moreover, additional analysis (not presented here) found that over 66 percent of active users who were under 18 years old in 2007 restricted access to their site by setting it to private.

Another expected finding was that users included significantly more pictures on their profiles in 2007. MySpace had instituted a new policy since the initial 2006 study which allowed users to upload additional pictures and enabled the capability of users to create 'albums' of pictures. As a result, significantly more profiles included a personal photo and those that did so included significantly more pictures (from 3.7 to 6.7 for occasional users and from 6.0 to 29.1 for active users).

Also noteworthy is that active users included significantly fewer swear words on their profiles and in their comments. This suggests that active users have attempted to 'clean up' their profiles. This change was not noted among occasional users. While it appeared that active users included slightly less evidence of alcohol or tobacco use, this finding was not statistically significant. With respect to identifying information, about the same number of profiles included the youth's current city while significantly fewer active youth revealed the school they attend. When considering these variables overall, there appears to be a general trend toward safer and smarter online social networking. That said, two pieces of data – first name and full name – were disclosed more often among both occasional and active users in their 2007 profiles when compared to their 2006 profiles. As noted in our earlier study (Hinduja and Patchin, 2008), simply having a teenager's name, current city, picture and school is all that someone would need to easily locate the individual.

Comparing public vs private MySpace profiles in 2006 and 2007

Finally, we sought to identify the number of adolescents who have changed the state of their profile at the two time points of data collection. As noted in Table 3, approximately 81 percent of the profiles did not change from public to private or from private to public between 2006 and 2007. One-third of the profiles were private and 48 percent were public both times they were reviewed. Suggesting that some youth desired an additional level of privacy for their information, 13 percent of the youth switched their profile from public to private. Only about 5 percent of youths changed their profile from private to public. Males were more likely to have their profiles viewable to the public, while females were more likely to restrict access to their profiles (see also Thelwall, 2008b). In fact, using logistic regression analysis (not shown), we found that females are

Table 3 Public/private matrix ($N = 2104$)

	2006 Private 2007 Private	2006 Private 2007 Public	2006 Public 2007 Private	2006 Public 2007 Public	Total
Percent of total	33.3	5.4	13.3	48.0	100.0
Percent male	38.5	51.4	40.1	48.3	44.2
2006 age	14.8	15.0	16.2	16.5	15.8
2007 age	16.0	16.3	17.2	17.7	17.0

Age outliers (profiles reporting age greater than 19 in 2007; $n = 77$) have been removed.

1.5 times more likely than males to have their profile set to private. Finally, age did not significantly differentiate whether profiles were public or private in our sample.

Discussion

The purpose of the current work was to examine the extent to which youth are modifying the type of information they are including in their MySpace profiles. Efforts by school districts, non-profit organizations and MySpace itself over the last year to educate youth about online safety have received significant attention by the media. The question is whether these efforts have led to observable changes in the nature of content posted to MySpace by adolescents. The current study examined this question by focusing on a randomly sampled panel of youth with MySpace profiles over time. These profiles were initially analyzed in the summer of 2006 and subsequently analyzed in the summer of 2007. Amid the clamor related to MySpace being a haven for predators and pedophiles (Angwin and Steinberg, 2006; Hughes, 2006; Marvel and Churnin, 2006; Poulsen, 2006; Williams, 2006) it appears that youth users are hearing the underlying message and modifying their online social networking practices accordingly. That said, the results of this study do not suggest or infer that MySpace or any other online environment is a completely risk-free venue in which youth can hang out. There are a number of potential hazards when interacting online; however, most can be minimized with proper guidance and supervision that allows adults to clearly explain to youth why it is unwise to post inappropriate content or personally identifying information.

Limitations

The current study has shed light on the evolving nature of online social networking among adolescents, but it is not without limitations. One concerns the fact that online identities are malleable (Hafner, 2001; Turkle, 1995), meaning that youth may not represent themselves online in full truth and candor. That said, it may not be reasonable to believe that adolescents misrepresent themselves more frequently or prominently online than in real life when revealing information about themselves.

Second, while the study focused on a random sample of adolescent MySpace profiles, the results only represent content viewable to the public. For example, as noted in Table 1, 31.8 percent of the profiles included the user's first name. Because the profiles were randomly selected, we are able to say that approximately 32 percent of adolescent MySpace profiles include a user's first name *that is viewable by anyone in the public*. Undoubtedly, some of the profiles that were set to private also include this content, but are not analyzed here. Even though when a profile is set to private this information is not open to the public, it does not necessarily preclude someone from potentially using the information to cause harm. Adolescent MySpace users who set their profile to private may have a false sense of security because they feel the information they include on their profiles is only accessible by those they include in their friend network. As a result, they may include more detailed information about themselves than they would if it were open to the public. Since youth are more likely to be victimized by friends and acquaintances rather than strangers (Finkelhor et al., 2005; Hotaling and Finkelhor, 1990; Magid and Collier, 2007), and because they may include as friends individuals they don't necessarily know that well, they may still open themselves to potential victimization by what they include on their private profiles. It is important to stress that this analysis only reports information open to the public and future studies should explore profiles that are set to private to ascertain any differences that may exist.

Third, the different ways in which youth used MySpace in 2006 and 2007 cannot be solely attributed to MySpace security implementations and the clarion call for safe online practices. Varied content and manner of participation may reflect developmental changes brought about by increased familiarity with the social networking site, as well as increasing overall maturity of the population. They may also reflect cultural changes that are affecting Internet-based interpersonal interaction on a broader scale. We cannot say with much certainty *why* these profiles changed – only that they have. Any possible explanations that we have suggested are speculation and merit further empirical scrutiny.

Directions for future research

The findings and limitations from this study also pave the way for future research on the way adolescents use and misuse social networking web sites. For example, the current analyses focused solely on MySpace, one of many social networking web sites. New studies ought to examine the extent to which participants on other social networking sites (such as Facebook, Bebo and Orkut) reveal personal, private or provocative information in their profiles. In addition, efforts should also be made to analyze the content of private profiles as well. This will involve methodological obstacles, but would yield valuable information about the way adolescents present themselves when they feel that access to their profile is restricted to friends only.

The current study is the first of its kind to examine a random sample of MySpace profiles over time, identifying increased vigilance on the part of youth in disclosing personal information and finding that more adolescents are setting their profile page to private. While it could be argued that the broad-based educational efforts of several non-profit organizations have contributed to these modifications, it is impossible to attribute the changes observed to any particular policy or program. Future studies should also evaluate the

efficacy of specific educational programs at a more local level to learn more about ‘what works’ with regard to these efforts. In addition, a meaningful number of youth are not logging on to profiles they initially created, which means they are either abandoning them for new ones they create, or they are abandoning MySpace altogether. We recommend empirically determining whether youth are gravitating away from this particular online social networking site and toward another, or away from online social networking altogether.

Finally, one of the major benefits of online social networking concerns the self-expression, self-actualization and identity development that can take place in these environments (boyd, 2006; Greenfield et al., 2006; Livingstone, 2008; Tynes, 2007). Adolescents often seek to present themselves through their profiles in a way that attracts attention and thereby meets their inherent needs for affirmation and validation (Baumeister and Leary, 1995; Hinduja and Patchin, 2008). Through the initial presentation and subsequent reformulations of their profile content, teenagers can figure out what best achieves this end. Additional theoretically grounded inquiry – ideally through qualitative research such as interviews and focus groups – may clarify the cognitive, psychological and socioemotional reasons why private, personal and sometimes inappropriate content, pictures and videos are uploaded and shared by youth. This is important as it conflicts with traditional and historical notions of children and teens in the real world vigilantly safeguarding personal diaries and journals and abiding by dictums such as ‘don’t talk to strangers’. Further empirical examination stemming from multiple disciplines and perspectives must increasingly occur in order to broaden and deepen our understanding of the nuances, value and risks related to use of social networking sites by youth.

Appendix

Table A.1 Inter-rater reliability in 2007 – κ coefficients ($N = 515$)

	Value
Evidence of tobacco use	1.000
Evidence of alcohol use	.979
Profile set to private	.967
Gender	.942
Birthday	.900
Full name	.895
Customized page	.870
Evidence of marijuana use	.814
Photo on profile	.728
School	.720
Photo in swimsuit/underwear	.657
Swear words on profile	.626
Evidence that age is inflated	.617
First name	.615
Swear word in comments	.526
Instant messaging name ^a	–
Email address ^a	–
Phone number ^a	–

^a Because this information was statistically rare, it was not evident in the random sample selected for recoding.

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Notes

- 1 This study involved an analysis of MySpace profiles with unique ID numbers ranging from 90306349 to 90346348 in July and August 2007.
- 2 The data collection process in this particular study was somewhat complex. The first group involved the selection of every 10,227th ID starting at 1939 (a random starting point) until the last ID issued by MySpace on 3 July 2007 (initial $n = 20,064$; final $n = 15,043$). The second group involved the 10,000 profile pages created on 3 July 2006 (IDs 90,306,349 through 90,316,348) (initial $n = 10,000$; final $n = 7627$). The third group was a random sample of 403 public, valid, non-music profiles from the second group where the user had at least two friends.
- 3 No breakdown of these individual pieces of content was provided.
- 4 In the current work, 'adolescent' equates to youth 17 years of age and younger at the time the profile was first randomly selected (summer of 2006). When creating a MySpace profile page, users must state their age. Of course, some might misstate their age for various reasons, but the vast majority appear to be telling the truth about this piece of personal information.
- 5 Twenty-nine profiles (1.1%) included content that was written in a language other than English.
- 6 This number is a bit misleading considering over 40 percent of the profiles are private and therefore not available to be examined for customization (over 42% of the public profiles were customized).

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Justin W. Patchin is an associate professor of criminal justice in the Department of Political Science at the University of Wisconsin-Eau Claire. His research areas focus on policy and program evaluation, juvenile delinquency prevention and school violence. For the past several years he has been studying adolescent Internet use, including social networking and cyberbullying.

Sameer Hinduja is an associate professor in the Department of Criminology and Criminal Justice at Florida Atlantic University. He studies various forms of computer-related deviance and crime from both social and technological perspectives, and works nationally and internationally with school districts, law enforcement and the private sector toward their understanding and response.

Address: Department of Criminology and Criminal Justice, Florida Atlantic University, 5353 Parkside Drive, Jupiter, FL 33458-2906, USA. [email hinduja@fau.edu]