Growing Up Wired: Social Networking Sites and Adolescent Psychosocial Development

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Abstract Since the advent of social networking site (SNS) technologies, adolescents' use of these technologies has expanded and is now a primary way of communicating with and acquiring information about others in their social network. Overall, adolescents and young adults' stated motivations for using SNSs are quite similar to more traditional forms of communication—to stay in touch with friends, make plans, get to know people better, and present oneself to others. We begin with a summary of theories that describe the role of SNSs in adolescents' interpersonal relationships, as well as common methodologies used in this field of research thus far. Then, with the social changes that occur throughout adolescence as a backdrop, we address the ways in which SNSs intersect with key tasks of adolescent psychosocial development, specifically peer affiliation and friendship quality, as well as identity development. Evidence suggests that SNSs differentially relate to adolescents' social connectivity and identity development, with sociability, self-esteem, and nature of SNS feedback as important potential moderators. We synthesize current findings, highlight unanswered questions, and recommend both methodological and theoretical directions for future research.

Keywords Adolescent psychosocial development · Social networking sites · Friendships · Identity · Self-esteem

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Introduction

Although computers initially were developed for adults, adolescents have fully embraced these technologies for their own social purposes and typically are the family experts on how to use electronic media and social networking sites (SNSs). Adolescents and young adults initially dominated SNSs such as MySpace and Facebook, with parents often following their children into this youth-driven phenomenon. The preponderance of adolescents has access to and engages in use of SNSs: Based on relatively recent data, although perhaps presently an underestimate, 73 % use social networking sites (Lenhart 2009, 2012; Lenhart et al. 2010). Moreover, despite the terms of service of Facebook restricting its use to those age 13 or older, it is estimated that 7.5 million younger children also have accounts ("That Facebook Friend" 2011). The sheer amount of time that adolescents and young adults spend using electronic media is perhaps the most revealing: on average, 11–18 year olds spend over 11 h per day exposed to electronic media (Kaiser Family Foundation 2010). Late adolescents and emerging adults average approximately 30 min per day just on Facebook alone (Pempek et al. 2009). Many adolescents begin and end their day by checking SNS posts. Furthermore, SNS use commonly disrupts adolescents' solitary activities as well as their ongoing face-to-face interactions. The presence of SNS use in many adolescents' lives is thus indisputable; however, the impact on adolescents' individual development and social lives is only starting to be understood.

Scientific study of adolescence has long targeted the development of one's identity and the formation of friendships and peer relationships as important topics of study (Institute of Medicine 2010). Two of the key tasks in adolescence are "to stand out—to develop an identity and

pursue autonomy… and to fit in—to find comfortable affiliations and gain acceptance from peers" (Brown 2008). Although seemingly divergent goals, the interplay between the need for one's own personal identity and the need for close personal ties and strong group affiliations permeates all domains of adolescents' everyday lives (Crosnoe and Johnson 2011) and clearly intersects with SNS use. The literature on SNSs and adolescents' quest to fit in examines whether SNS use extends and deepens adolescents' ongoing relationships or expands their contacts in new directions. Whereas childhood friendships are rooted in shared interests and activities, close friendships in adolescence involve trust, self-disclosure, and loyalty (Collins and Steinberg 2006; Brown and Larson 2009). SNSs potentially offer additional avenues for support and communication—crucial to the development of age-appropriate adolescent relationships; yet, there are questions to be addressed about why adolescents might differentially benefit from SNSs.

Social networking sites offer adolescents new opportunities as well as new challenges to express to the world who one is. In one-on-one communications within SNSs (e.g., "Facebook messages"), adolescents can express their likes and dislikes as well as their worldviews and get immediate feedback. With SNSs, adolescents express their views and the recipients of this information include both known as well as unknown targets. Although there has been variability over time in the specific format of SNS profiles, adolescents have the option of choosing what self-identifying information to provide. Thus, with the advent of SNSs, most adolescents will widely share, with varying degrees of accuracy, honesty, and openness, information that previously would have been private or reserved for select individuals. Key questions include whether adolescents accurately portray their identities online, and whether use of SNSs might impact adolescents' identity development.

Straddling these two developmental tasks, adolescents also can join Internet "groups" reflecting the aspects of their identity that they wish to explore or deepen. Thus, SNSs may simultaneously amplify dimensions of self-identify and extend group identities. Moreover, SNSs create more publicly prominent avenues for adolescents to commit to preferred activities, groups, and, in some cases, beliefs.

Social comparison is another dimension of SNSs that is highly relevant to adolescents. Invitations to social gatherings, such as a spontaneous party, and good news, such as a won football game or a college acceptance, can be shared and congratulated but also serve as a point of comparison for one's own accomplishments. Similarly, distressing or objectionable information—including unflattering and compromising pictures, untrue information, or unfortunate news, for example, a car accident or an arrest—can spread throughout adolescents' social network and beyond in a nanosecond. Teens' tendencies to share information impulsively, coupled with the power of SNSs for rapid and widely distributed communications, can have important ramifications for teens' personal and interpersonal worlds.

Goals and Scope of the Present Paper

This literature review examines how SNSs intersect with and impact adolescents' social and identity development. After first summarizing theoretical perspectives that provide a framework for SNS use and implications for adolescents, we then review the extant literature on SNSs and (a) adolescent social relationships, as well as (b) identity development. Finally, we offer suggestions for future directions, which call for more nuanced investigations of SNSs that focus less on positive versus negative impacts and more on the mechanisms by which SNSs both reflect and shape varied dimensions of adolescents' lives.

Beyond the Scope Here

There are also several important topics in the SNS literature that deserves brief mention because of their relevance for adolescent development but are outside of the scope of this paper. Specifically, these topics include cyber-bullying, the Internet and parent–child relationships, Internet addiction, and the impact of SNSs on sleep and academic performance.

Cyber-Bullying

Considerable attention has been directed to the negative side of SNSs, namely online bullying, harassment, and humiliation, which have been extensively detailed in other reviews (Strom and Strom 2005; Tokunaga 2010). Beyond findings that the vast majority of adolescents encounter some degree of negative experience through SNSs, the viciousness of online bullying is exacerbated due to the depersonalized yet public nature of technology-based postings coupled with the pervasiveness of SNSs (Bazelon 2013).

SNSs and Parent–Child Relations

Social networking site use further complicates parent–child relationships during adolescence (Mesch 2003, 2006; Subrahmanyam and Greenfield 2008; Punamaki et al. 2009). As adolescents' preoccupation with SNSs potentially takes priority over and interferes with everyday family activities, SNS use among adolescents has been linked with greater parent–youth conflict (Subrahmanyam and Greenfield 2008; Mesch 2006) and less time with parents (Lee 2009). Although some parents are unaware of what their teens are

posting online, other parents utilize SNSs to maintain greater contact with their teens, requiring them to be connected to them through their SNS of choice (Kanter et al. 2012). It is worth noting that changes in the parent–child relationship associated with SNSs are likely to influence peer relations and vice versa. However, the extant literatures on how computer-mediated communications impact these two domains are relatively distinct with only a few exceptions (e.g., Punamaki et al. 2009; Subrahmanyam and Greenfield 2008).

Internet Addiction

A note about extreme use of the Internet is in order, as distinctions often are blurred between Internet addiction and subthreshold, albeit heavy use, of SNSs. Extreme degrees of Internet and electronic media use are increasingly recognized as Internet addiction, a disorder with symptoms that are analogous to those of substance use and gambling disorders. Findings from epidemiological studies of Internet addiction in youth vary, with prevalence rates ranging widely from less than one percent to 38 % (Aboujaoude 2010; Leung 2004). Some adolescents may be more vulnerable to develop symptoms of Internet addiction than others, including those experiencing other psychological symptoms and disorders such as depression, ADHD symptoms, or hostility (Ha et al. 2007; Yen et al. 2007). Researchers recently proposed the concept of "Facebook addiction" and developed a scale to measure the symptoms of addiction related to Facebook use specifically (Andreassen et al. 2012).

Sleep Disturbance

Adolescents' use of the computer, including use of computer-mediated communication, has been related to disruptions in sleep. A study of computer use in relation to adolescents' sleep quality, perceived health, and tiredness upon awakening found that for young adolescent boys, intensive computer use was associated with less sleep and more irregular sleep, which in turn related to poorer perceived health (Punamaki et al. 2007). Similarly, a sample of high school seniors with Internet addiction and overuse reported greater daytime sleepiness (Choi et al. 2009). Research demonstrates that the use of computers before bed relates to sleep disruptions in adolescents (see Cain and Gradisar 2010 for review).

Academic Disturbance

There is recent evidence that SNS use can also hinder academic performance (Huang and Leung 2009; Jacobsen and Forste 2011; Kirschner and Karpinski 2010). Proposed mechanisms for the link between SNS use and lower academic performance include less total time studying as well as inefficient studying due to multitasking (Jacobsen and Forste 2011; Junco and Cotten 2012; Kirschner and Karpinski 2010) and could also reflect the sleep disturbance. College students who used Facebook had lower GPAs and spent less time studying than those who did not use Facebook (Kirschner and Karpinski 2010), despite no differences regarding total time spent online. Another study showed that two-thirds of students reported using electronic media during class, while studying, or while doing homework, with amount of electronic media use negatively associated with self-reported GPA (Jacobsen and Forste 2011). Some recent evidence shows that Facebook use specifically relates to lower college GPAs (Junco and Cotten 2012), whereas other studies indicate that computer use is detrimental to the academic performance of some, but not all adolescents (Hofferth and Moon 2011).

Theories Relating SNSs to Psychosocial Development

Theories examining SNSs and adolescent development address for whom and under what circumstances SNSs accord advantages versus disadvantages for adolescent development. Two theoretical questions in particular are examined here in order to conceptualize how SNSs impact adolescents' social connectivity as well as their identity development.

In What Ways Does SNS Use Advance the Goal of Establishing Close Interpersonal Ties for Adolescents?

Some theories contend that SNS use is generally beneficial for the enhancement of adolescents' social connections. For example, the *stimulation hypothesis* (McKenna and Bargh 2000) describes how adolescents in general have an easier time self-disclosing in online versus face-to-face communication, which is a less threatening format in which adolescents can share more freely. With self-disclosure facilitating relationship closeness, this theory also posits that online communications lead to closer, higher-quality friendships among adolescents. Second, the *rich-get-richer hypothesis* posits a stratified advantage for SNS use, that is, for highly sociable adolescents, there are added benefits from extending options for communication through electronic means (Kraut et al. 2002), and iterative effects such that more online communication relates to more cohesive relationships overall (Lee 2009). However, it is also hypothesized that individuals with limited offline social networks and poor social skills do not develop quality friendships through online connections and may spend time

engaging in low-quality connections in lieu of cultivating relationships in real life. It further has been suggested that spending excessive amounts of time on SNSs actually can lead to symptoms of depression, which then increase the risk for social isolation (O'Keeffe et al. 2011). Thus, these theoretical perspectives provide potential frameworks for hypotheses about who benefits most from SNS use and who might experience SNS use as detrimental.

Another perspective proposes differential impacts associated with SNS use but actually gives the advantage to those who are disenfranchised in face-to-face communications. The *social compensation hypothesis* (McKenna et al. 2002) proposes that adolescents who are uncomfortable interacting with peers in face-to-face contexts are better able to develop social networks and meet their social needs online where certain channels of communication, including voice tone, eye contact, and facial expressions, are not available. That is, the more limited number of communication channels of SNSs may offer unique benefits to those who are uncomfortable with face-to-face interaction, whereas others do not directly benefit (McKenna et al. 2002).

All three of the theories mentioned thus far focus on relationship benefits as contrasted with the earlier, and largely discredited *reduction hypothesis*, stating that forming friendships with strangers online that are low in quality detracts from time spent cultivating pre-existing offline friendships (Locke 1998). This earlier theory, however, emerged in response to Internet use more generally, before the advent of SNSs, and before large numbers of adolescents had access to the Internet.

In What Ways Can SNS Use Foster Identity Development for Adolescents?

There are two dimensions of SNS use that may contribute to adolescents' development of self-identity. First, SNS use provides opportunities for self-disclosure and, in some circumstances, demands self-disclosure, which plays a role in adolescents' identity development. Decisions about how adolescents identify themselves, the feedback received on these decisions, and how they view their own profile in comparison with others' profiles are potential factors in individual identity. The *hyperpersonal model* for computer-mediated communication, for example, posits that adolescents engage in selective self-presentations online; moreover, the feedback from these presentations may, in turn, alter individuals' self-perceptions (Walther et al. 2011). Second, the Internet makes it feasible for some adolescents to affiliate with other, likeminded individuals online when such opportunities may not be possible in face-to-face interaction. The Internet allows adolescents to

make connections with persons like themselves, that is, ethnic or sexual minority youth (Larson et al. 2002), particularly if such affiliations are not available through local peer networks. Adolescents can join "groups" reflecting aspects of their identity that they wish to explore or deepen and thereby foster a group identity. Relatedly, adolescents can explore and expand their ideas and interests into new arenas through the Internet, for example, communicating with others from more diverse backgrounds and expanding into new intellectual, political, and social networks that create opportunities for transnational and global connections (Markstrom 2010). Such connections can broaden as well as deepen self-identity while, at the same time, enhance feelings of belongingness and affiliation.

Literature Review

Method for Review

To examine the intersection of SNS use and adolescent development, we conducted a search on PsycInfo and Google Scholar using several inclusion criteria. First, we searched for articles examining the use of SNSs from 2006 to the present, as 2006 is the year that Facebook opened to any individual over 13 who had a valid email address (Abram 2006). Keywords searched included the combinations of "adolescent" with "Internet communication," "electronic communication," "social networking site," "computer-mediated communication," "Facebook," and "MySpace," in conjunction with search terms related to the key tasks of adolescent development, including "peer relationships," "friendship quality," "identity," "intimacy," and "autonomy." We also examined related articles from reference lists of the resulting studies from the above searches. In this literature review, we include articles that address the relationship between SNS use and tasks of adolescent development, focusing on peer relationship and identity development, specifically with an emphasis on studies including adolescent samples. In addition, select articles examining college samples were included that link SNS use to outcomes relevant to adolescent development. Because this literature is growing at an unusually rapid pace (Wilson et al. 2012), our review identifies and synthesizes representative articles of the present topics of review.

With the frequent introduction of new technology and applications, characteristics of SNSs also change rapidly. Whereas "MySpace" was once the SNS of choice and the subject of early research (Kujath 2011), this SNS is rarely used today. Facebook is now the SNS of choice (Chubb 2010), but this, too, is potentially losing popularity (Guynn

and Faughnder 2012) with other SNSs briefly taking hold, for example, Formspring, an innovative, more anonymous SNS that originated in 2009 and then shut down in spring 2013. In particular for this research domain, the rapidly evolving modifications in technology and consequent alterations in adolescents' use of the technology present challenges when designing, conducting, and comparing studies on SNS use (Wilson et al. 2012). Different findings not only are attributable to different research methods but also to changes in SNSs and their functionality.

Measurement of Adolescents' Use of and Response to SNSs

Self-Report

The majority of studies to date examining adolescents' use of SNSs are based on investigator-developed questions to elicit respondents' self-report of SNS behaviors. Behaviors most commonly assessed include frequency of use, with questions typically inquiring about general use on average (e.g., Pempek et al. 2009; Reich et al. 2012), duration of use (e.g., Chou and Edge 2012), and, less frequently, time of use, for example, "after lights out" (Van den Bulck 2007). Internet use and related behaviors are sometimes measured with the Internet Addiction Test, a 20-item scale assessing compulsive use, mood changes, and impairment of functioning due to Internet use (IAT; Young 1998, for example, "Do you feel depressed, moody, or nervous when you are offline, which goes away once you are back online?"). Shorter self-report questionnaires also are available including Morahan-Martin and Shumacher's (2000) 13-item scale that assesses similar issues, including distress, academic decline, and interpersonal problems related to Internet use. Of note, these measures assess Internet use in general and do not single out SNS use.

Several investigators (e.g., Kirschner and Karpinski 2010; Punamaki et al. 2009) acknowledge potential limitations associated with possible self-report biases. For example, questions assessing adolescents' number of Facebook friends may inadvertently pull for inflated answers because of adolescents' desire to appear more popular. Adolescents also might underestimate the degree to which SNS use interferes with their daily activities, similar to the underreporting of other problem behaviors. Furthermore, it may be difficult for adolescents to report how much time they spend on SNSs, particularly if they are multitasking with homework, watching television, or even eating dinner with their family; yet, self-report questionnaires do not always assess the context in which SNS use is taking place. Adolescents also may keep their profile page open throughout the day even though their activities on SNSs may occur in bursts.

Experimental Studies

Other studies used experimental conditions that manipulate some feature of SNSs to investigate the impacts of that feature. In a study designed to capture the public nature of SNS use, Gonzales and Hancock (2011) asked participants to complete questionnaires either in front of a mirror or in front of their Facebook profile page. Thomaes et al. (2010) manipulated the feedback participants received (positive versus negative) in response to a personal profile they created on the Internet as part of a game, and self-esteem was measured at three points during the laboratory procedure. After creating a profile, participants were exposed to feedback from confederates judging their profiles. Haferkamp and Kramer (2011), in contrast, highlighted the social comparison aspect of SNSs by testing the effects of viewing others' SNS profile pages on individuals' body image and career satisfaction; these investigators presented participants with online profiles depicting those who were either attractive or unattractive and those with either high or low occupational success. These standardized, simulated online interactions are informative in isolating precise features of SNSs, although perhaps fall short on ecological validity, particularly compared to research that examines actual records of adolescents' SNS use (Forest and Wood 2012; Tynes et al. 2008).

Objective Assessments of SNS Use

A small but growing number of SNS studies objectively examine the specific content of SNS interactions, including content from adolescents' Facebook postings. A study that utilized individuals' ten most recent Facebook posts (as reported by the participant, not obtained from the profile page) involved systematic coding of the posts for positivity, negativity, and the amount of "likes" that the posts received (Forest and Wood 2012). In general, public profiles on Facebook allow for the observation of certain dimensions related to teen communication. Nonetheless, questions can be raised about the accuracy of information and the influence of self-presentational guidelines on Facebook content. Moreover, teens are increasingly encouraged to use privacy settings to restrict the information that is publicly available.

Summary of Findings: SNS Use, "Fitting in," Acceptance and Affiliation

Table 1 presents the empirical research examining the association between SNS use and adolescent peer relationships. We include 13 representative studies that describe the nature of adolescents' SNS use and answer questions about ways in which SNS use is associated with

Table 1 Social networking site use, fitting in, acceptance, and affiliation

Authors (year)	Sample characteristics	Measures	Primary results
Ellison et al. (2007)	N = 286 Undergraduate students	*Affiliation measures* Adapted measures of bonding, bridging, and maintained social capital (self-report) *SNS measures* Facebook usage intensity, Facebook profile elements, purpose of Facebook use (self-report)	Intensity of Facebook use relates to greater perceived bridging social capital after adjusting for demographic factors, $\beta = .34$, $p < .0001$, as well as to greater bonding social capital, $\beta = .37$, $p < .001$. Students with lower self-esteem, $\beta = .34$, $p < .0001$, and general life satisfaction, $\beta = .31$, $p < .0001$, perceived greater bridging social capital with greater intensity of Facebook use. Analogous results were found for bonding social capital, $\beta = .34$, $p < .001$ (life satisfaction), $\beta = .37$, $p < .0001$ (self-esteem).
Ellison et al. (2011)	N = 450 Undergraduate students	*Affiliation measures* Measures of bridging social capital (6-item self-report questionnaire) and bonding social capital (5-item self-report questionnaire) *SNS measures* Facebook use, number of Facebook friends ("total" vs. "actual"), Facebook connection strategies measure (self-report)	Greater social information-seeking behaviors on Facebook related to greater perceived bridging social capital, $\beta = .22$, $p < .0001$, and bonding social capital, $\beta = .18$, $p = .0006$. There were diminishing returns for those with high numbers of actual friends on Facebook, demonstrating a curvilinear relationship between actual Facebook friends (>500) and types of social capital.
Forest and Wood (2012)	N = 80 (Study 1) N = 177 (Study 2) N = 98 (Study 3) Undergraduate Facebook users	*Affiliation measures* Likeability of Facebook user Positivity and negativity of status updates (coded) Self-esteem (self-report) *SNS measures* 10 most recent status updates (self-report) Number of "likes" and comments on status updates (self-report)	Youth with low self-esteem viewed Facebook as a safer place for self-expression than did youth with high self-esteem, $\beta = -.31$, $p = .005$. Youth with low self-esteem had higher coded negativity, $\beta = -.31$, $p = .001$, and lower positivity, $\beta = .26$, $p = .004$, in their Facebook status updates in comparison with youth with high self-esteem. Youth with low self-esteem were rated as less likeable by coders than those with high self-esteem, $\beta = .22$, $t(71) = 2.01$, $p = .048$.
Grieve et al. (2013)	N = 344 (Study 1) N = 274 (Study 2) Australian university Facebook users Age M = 28.12	*Affiliation measures* Social Connectedness Scale-revised (20-item self-report questionnaire). *SNS measures* Facebook social connectedness (20-item self-report questionnaire)	A factor analysis revealed that Facebook connectedness is distinct from social connectedness. Facebook facilitates social connections and relates to lower depression, $r = -.22$, $p < .001$ and anxiety, $r = -.17$, $p < .001$, and greater life satisfaction, $r = .26$, $p < .001$.
Kwon and Wen (2010)	N = 229 Users of Korean SNSs Age: 66.2 % in their 20s, 21.0 % in their 30s	*Affiliation measures* Social identity (self-report) *SNS measures* Perceived ease of use, perceived encouragement, and perceived usefulness of SNSs (self-report)	Social identity was positively related to perceived SNS usefulness, $\beta = 6.03$, $p < .01$, which in turn related to greater SNS use, $\beta = 3.95$, $p < .01$. Social identity related positively to perceived encouragement via SNSs, $\beta = 2.81$, $p < .01$.
Lenhart and Madden (2007)	N = 487 Teens with household telephones and a SNS profile Age 12–17	*Affiliation measures* Interview questions related to social connectivity online *SNS measures* Interview questions assessing use of SNSs, including motivations for use	82 % of teens reported using SNSs to send private messages to friends. 91 % of teens reported using SNSs to stay in touch with friends they see frequently. 72 % of teens reported using SNSs to make plans with friends.
McMillan and Morrison (2006)	N = 72 College students Age 19–25	*Affiliation measures* Autobiographical narratives coded for building and forming social relationships online *SNS measures* Autobiographical narratives coded for use of computer-mediated communication and feelings toward computer-mediated communication	The coded narratives revealed that participants viewed computer-mediated communication as something that helped them form bonds with others. The narratives also underlined the view of computer-mediated communication as something that facilitates participation in various activities, including special interest groups.

Table 1 continued

Authors (year)	Sample characteristics	Measures	Primary results
Pempek et al. (2009)	$N = 92$ Undergraduate students Age $M = 20.6$ (1.07)	*Affiliation measures* Diary and questionnaire (54 items) assessing social activities (e.g., getting to know people better) on Facebook *SNS measures* 7-day diary measure assessing Facebook use frequency and duration Self-report measure assessing Facebook activities (54 items)	Participants reported using Facebook for 27.9 min on average per day. Coded diary entries revealed that 85 % of students reported using Facebook to communicate with friends. Participants reported viewing others' profiles and pictures more often than posting information or updating their own profiles.
Quinn and Oldmeadow (2013)	$N = 443$ Age 9–13 Primary and secondary school students north of England	*Affiliation measures* Belonging measure (10-item self-report questionnaire) *SNS measures* Intensity of SNS use (6-item self-report questionnaire)	Intensity of SNS use was positively associated with feelings of belonging for boys, $\beta = .37$, $p < .001$, but not girls. Older boys who do not use SNSs (vs. SNS users) report lower perceptions of belonging to their group of friends, $\beta = -.30$, $p = .004$.
Reich et al. (2012)	$N = 251$ High school students in Los Angeles Age 13–19 $M = 16.3$ (1.2)	*Affiliation measures* Lists of top 10 friends through SNS, IM, and face-to-face interactions *SNS measures* Experimenter-developed self-report survey assessing use of and attitudes toward SNSs	43 % of adolescents felt that SNS use made their friendships closer. 17 % of adolescents listed SNS friends that had no overlap with their face-to-face and IM friends. Girls used IM and SNSs more than boys, $X^2(1, N = 67) = 9.3$, $p = .002$.
Ross et al. (2009)	$N = 97$ Canadian university students Age $M = 21.69$	*Affiliation measures* NEO-PI-R to measure personality (including extroversion and openness to experience) and group affiliations on Facebook *SNS measures* The Facebook Questionnaire (basic use, attitudes toward Facebook, and posting of identifying information; 28-item self-report questionnaire) CMC competence measure (motivation, knowledge, and efficacy; 13-item self-report questionnaire)	Extroversion related to greater numbers of group affiliations on Facebook, $t(42) = 2.44$, $p = .019$. Individuals with high motivation to use computer-mediated communication spent more time on Facebook, $t(36) = 4.45$, $p < .001$, and checked their Facebook wall more frequently, $t(36) = 3.77$, $p = .001$.
Subrahmanyam et al. (2008)	$N = 131$ Undergraduate students in Los Angeles	*Affiliation measures* Perceptions of SNS use on relationships List of top 10 offline friends List of top 10 online friends *SNS measures* Typical Internet activities, motivation for Internet use, and SNS activities (self-report questions developed by research team)	20 % of participants reported that SNSs bring them closer to their friends. A small number of participants indicated that SNSs cause them problems (2.5 %). 73 % of participants reported that SNSs did not impact their relationships. Youth utilize SNSs to keep in touch with friends they do not see often (reported by 81 % of youth) 49 % of students listed the same names for their closest online friends and offline friends.
Valkenburg et al. (2006)	$N = 881$ Age 10–19 Dutch users of SNS	*Affiliation measures* Social self-esteem (12-item self-report questionnaire). *SNS measures* Use of SNSs (3-item self-report questionnaire) Frequency and tone of reactions to profiles (4-item self-report questionnaire)	Adolescents' social self-esteem related to the tone of profile feedback they received, with positive feedback relating to enhanced self-esteem, and negative feedback relating to deflated self-esteem, $\beta = .48$, $p < .01$ Adolescents who consistently received negative feedback from their profile reported lower close friendship self-esteem, $r(881) = .40$, $p < .001$.

relationship quality with friends. Eight studies are based on undergraduate students (Ellison et al. 2007, 2011; Forest and Wood 2012; Grieve et al. 2013; McMillan and Morrison 2006; Pempek et al. 2009; Ross et al. 2009; Subrahmanyam et al. 2008), two are based on adolescents (Lenhart and Madden 2007; Reich et al. 2012), two also

include younger children (Quinn and Oldmeadow 2013; Valkenburg et al. 2006), and one includes a broader range of ages from adolescents to 30 year olds (Kwon and Wen 2010). Measurements of SNS use assess frequency, intensity, and duration of SNS use, in addition to more detailed measures of specific SNS content shared.

SNSs and Friendship Quality

Although SNSs have provided notable structural changes to adolescents' social relations, adolescents and young adults' stated motivations for using SNSs are quite similar to more traditional forms of communication—to stay in touch with friends, make plans, and get to know people better (Lenhart and Madden 2007; Pempek et al. 2009). That said, evidence suggests that connectedness through SNSs may be slightly different from general social connectedness. A factor analysis indicated "Facebook connectedness" as a distinct construct from general connectedness that was uniquely related to general well-being and negatively related to depression and anxiety (Grieve et al. 2013). Nonetheless, the most common use of SNSs is to maintain and extend existing offline friendships (McMillan and Morrison 2006; Reich et al. 2012; Subrahmanyam et al. 2008). On average, in a college sample, 49 % of respondents' top face-to-face friends were also their SNS friends (Subrahmanyam et al. 2008). In addition, the content of most SNS communication focuses on everyday events related to school, mutual friends, and upcoming activities. Only 29 % reported using SNSs to "look for new people." The online–offline friend overlap findings were replicated in a study of high school students, with only 17 % of adolescents listing SNS friends that had no overlap with their face-to-face and IM friends (Reich et al. 2012). Thus, although young people might list hundreds of "friends" on SNS sites, the majority of their SNS time involves extensions of their offline relationships.

Cross-sectional studies examining the relationship between frequency of SNS use and friendship quality, specifically, show that SNS use is associated with enhanced relationship quality and intimacy (Ellison et al. 2007; Grieve et al. 2013; McMillan and Morrison 2006; Reich et al. 2012), suggesting some support for the concept that SNSs enhance social connections, i.e., the stimulation hypothesis. To investigate how SNS connectedness is linked to relationship quality, McMillan and Morrison (2006) coded emerging adults' narratives about computer-mediated communication. Findings demonstrated that participants viewed this type of communication as something that facilitates planning social activities, maintaining ties with friends, and feeling part of a community. Interestingly, Korean SNS users with a high (versus low) sense of social identity, in particular, found SNSs to be a useful

and good resource for social support (Kwon and Wen 2010). In a study of younger participants, Reich and colleagues (2012) reported that 43 % of their high school student participants believed that SNS use made them feel closer to their friends. Similarly, 20 % of college students indicated that SNSs brought them closer to their friends, whereas only 2.5 % indicated that it had a negative impact; however, the majority (73 %) indicated SNS use did not have an effect on their relationships (Subrahmanyam et al. 2008).

Despite overall support for SNSs enhancing friendship quality, interactive effects suggest that some individuals may benefit more than others. For example, in support of the "rich-get-richer" hypothesis, Canadian undergraduates scoring high on extroversion who likely have more offline friends reported more affiliations on Facebook than undergraduates scoring low on extroversion (Ross et al. 2009). Examining closeness to friends more thoroughly, Ellison et al. (2007) reported that those who use Facebook intensely (i.e., actively engage in Facebook activities frequently and feel emotionally connected to the use of Facebook) perceive greater bonding social capital, or strong social ties and closeness to others who can provide emotional support. Interestingly, in support of the social compensation hypothesis, an interaction effect revealed that those with low self-esteem and low life satisfaction particularly benefitted from Facebook use in terms of more emotional support. However, a later study indicated a ceiling related to social capital benefits; after individuals report having more than 500 "actual" (vs. online only) Facebook friends, there are diminishing returns on social capital gains. Focusing on early adolescents' sense of belongingness, a highly salient social construct for adolescents, Quinn and Oldmeadow (2013) demonstrated that SNS use is related to a greater sense of belongingness for boys, but not girls in a sample of young students north of England. Older boys who did not use SNSs reported a lower sense of belongingness than SNS users, which may be indicative that this sample of boys also had poorer social skills or other personality differences impacting their social connections both online and offline.

Research incorporating objective SNS content to examine the role of self-esteem in SNS use and social connectedness supports the "rich-get-richer" hypothesis. Facebook users with low, compared to high, self-esteem posted status updates that were rated as lower in positivity and higher in negativity by trained undergraduate coders (Forest and Wood 2012). Based on the recently posted status updates and the number of "likes" and comments received by those posts, Facebook users with low self-esteem also were not as "likable" to the trained coders. In a related vein, Dutch adolescents who frequently received negative feedback from their SNS profiles also reported

lower social self-esteem (Valkenburg et al. 2006). In general, the direction of effects is unclear and may indeed be reciprocal, with low self-esteem individuals posting more negative messages and receiving less positive feedback, which then fuels the low self-esteem. It is worth noting, however, that even the Facebook users with low self-esteem reported that Facebook was a safe way for them to self-disclose. Thus, although individuals with low self-esteem may view SNSs as a useful way to feel connected to others, supporting the social compensation hypothesis (McKenna et al. 2002), those with poor social skills may be at risk for opening themselves up to harmful feedback from others.

Summary

Generally, SNS use appears to benefit and not detract from adolescents' sense of peer affiliation, but adolescents' offline level of social functioning is a consideration in the overall impact. Those adolescents who have strong offline social skills also appear to have more online connections and contacts. Whether online communication actually improves the overall quality of their relationships or simply resembles their already strong relationships is difficult to tease apart without longitudinal studies. On the other hand, some adolescents who have more limited social success offline appear to derive enhanced relationship satisfaction online, particularly if they find online communications more comfortable than offline social interaction. The Internet may provide a leveling effect in relationship satisfaction for certain individuals, as described in the social compensation hypothesis (McKenna et al. 2002). There are, however, some caveats to the ameliorating influences of online communication, that is, adolescents who post more negative messages, which may include those with low self-esteem or poor social skills, open themselves up to negative feedback from others. Thus, there is evidence for an overall positive association between SNS use and adolescents' sense of social connectivity. While those who are less socially inclined may report feeling more socially connected through SNSs, as described in the social compensation hypothesis, those who are less socially inclined may also be likely to receive less positive input from others via SNSs. It remains unclear whether this translates into fewer social benefits from SNSs, or whether SNSs actually are detrimental to less socially skilled adolescents.

Review of Findings: SNS Use and Identity

Table 2 displays 14 studies that examine the link between SNS use and constructs related to identity. Five of these studies examined adolescent samples (Hillier and Harrison 2007; Tynes et al. 2008; Valkenburg and Peter 2007;

Valkenburg et al. 2011; Yu et al. 2011), four included adolescents as well as older participants (Back et al. 2010; Haferkamp and Kramer 2011; McLaughlin et al. 2012; Silenzio et al. 2009), and five are based on college samples (Chou and Edge 2012; Christofides et al. 2009; Grasmuck et al. 2009; Walther 2007; Walther et al. 2011).

SNSs, Self-Disclosure, and Self-Presentation

Self-disclosure, which involves an iterative process of sharing personally relevant information and receiving feedback, is central to identity formation. SNSs bring both sides of this information-sharing into a highly public arena. Based on Canadian participants' self-reports, Facebook disclosures are "likely" or "very likely" to include information about salient recent or upcoming happenings—by sharing pictures with friends, information about relationship status, and mention of their birthday (Christofides, Muise, and Desmarais 2009). Some adolescents report that online interactions are more conducive to self-disclosure than face-to-face interactions (Valkenburg and Peter 2007). Valkenburg, Sumter and Peter (2011) indicated that online self-disclosure may be a "rehearsal" for other types of self-disclosure, that is, online self-disclosure to known friends in early adolescent years was associated with greater offline self-disclosure at the next wave of data collection, one-half year later; yet, offline self-disclosure did not lead to greater online self-disclosure.

With adolescents controlling what information and photographs they wish to share to a broad audience through SNS profiles, there is considerable speculation that some adolescents may post misinformation or at least idealized versions of themselves. To examine this possibility, researchers asked individuals to report on themselves as they are and as they ideally would like to be. Additionally, several close friends also completed personality measures about the participant, and objective research assistants coded individuals' actual SNS profiles. Results demonstrated that adolescents did not portray their "ideal selves" through their SNS profiles, and that certain personality characteristics, such as extroversion and openness, came across accurately through SNS profiles (Back et al. 2010).

There is also evidence, however, that while individuals may not express idealized versions of themselves via SNSs, they may alter or highlight different aspects of themselves. Walther (2007) created several conditions in which undergraduate students were told that an online message would be received by different individuals who varied by age, status, and relevance to their own life (e.g., professor from their university, high school student from another state, or college student from another university). Time spent on the message, as well as number of edits and level of message complexity, were all objectively measured

Table 2 SNS use and identity

Authors (year)	Sample characteristics	Measures	Primary results
Back et al. (2010)	$N = 236$ SNS users from the United States and Germany Age 17–22	*Identity measures* Ten-item Personality Inventory Big Five Inventory NEO Five-Factor Inventory (Ideal self-perceptions and actual perceptions) *SNS measures* Observer ratings of participants' personalities based on viewing their SNS profiles	Observers accurately rated participants' personalities based on viewing their SNS profile, particularly for extroversion, $r = .39$, $p < .001$, and openness, $r = .41$, $p < .001$. There was no evidence of self-idealization on SNS profiles.
Chou and Edge (2012)	$N = 425$ Undergraduate students	*Identity measures* Two-item self-report measure asking how much participants agree that 1) Their friends are happier and 2) Life is fair. *SNS measures* Self-reported years using Facebook Self-reported hours per week using Facebook	Participants who spend more hours per week on Facebook tended to agree that others are happier, $\beta = .13$, $p < .05$. Participants who used Facebook for a greater number of years agreed that others are happier, $\beta = .16$, $p < .01$.
Christofides et al. (2009)	$N = 343$ Canadian undergraduate students Age 17–24	*Identity measures* Personal information shared in general settings *SNS measures* Information control on SNSs (7-item self-report questionnaire) Information disclosed on Facebook as well as types of pictures posted (self-report)	Participants spend an average of 38.86 min/day on Facebook and were "likely" or "very likely" to share pictures, relationship status, their hometown, and their birthday. Participants were more likely to share personal information on Facebook than in general, $t(341) = 2.80$, $p = .01$. General disclosure tendencies related to disclosure on Facebook, $\beta = .57$, $p < .01$, as did need for popularity, $\beta = .12$, $p = .02$.
Grasmuck et al. (2009)	$N = 83$ University students	*Identity measures* Coded Facebook profile pages for ethnic identity expression *SNS measures* Coded Facebook profile pages for social networks, self-description, and user's profile	African American, Latino, and Indian students expressed their ethnic identity to a greater extent through expressed preferences, quotes, and a more elaborate "about me" section.
Haferkamp and Kramer (2011)	$N = 91$ Age $M = 23(1.01)$	*Identity measures* Dresden body image scale (15 self-report items) Proximity to ideal career status (self-reported status on 10-level career ladder) *SNS measures* Experimental conditions utilizing SNS profiles	Females who saw profile pictures of beautiful people subsequently had lower body image, $F(1,89) = 32.11$, $p = .000$. Males who viewed successful individuals' profiles felt further from their ideal career status, $F(1,41) = 3.09$, $p < .05$.
Hillier and Harrison (2007)	$N = 749$ Same-sex-attracted youth Age 14–21 $N = 209$ Australian youth from website designed for research project Age 14–21	*Identity measures* Self-report questionnaires assessing discrimination and abuse, sexual behaviors, and sense of support. Open-ended, autobiographical stories were also collected. *SNS measures* Self-report questionnaires assessing good and bad Internet experiences, real-life meetings resulting from Internet contacts, and importance of Internet use.	Homosexual youth reported that the Internet is a useful context in which to explore their feelings, gain confidence, and prepare them for negotiating their sexuality in the real world.
McLaughlin et al. (2012)	$N = 14$ Age 18–29 Cancer survivors	*Identity measures* Bridging social capital (11-item self-report measure) Bonding social capital (7-item self-report measure) Survivorship self-efficacy (16-item self-report measure) *SNS measures* Use of study's mobile and web-based social networking site (e.g., number of log-in times, blog posts, and comments made)	Young adults who were most active on the site reported lower support from family and friends, $R^2 = .60$, $F(1,12) = 17.9$, $p < .01$, and felt "different," $\beta = .79$, $t(12) = -4.42$, $p < .001$.

Table 2 continued

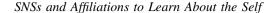| Authors (year)	Sample characteristics	Measures	Primary results
Silenzio et al. (2009)	$N = 100{,}014$ Age16–24 MySpace users with publicly available profiles	*Identity measures* Publicly available SNS profiles coded for sexual orientation *SNS measures* Network mapping of SNS sites	SNS network mapping demonstrated that a potential online intervention could reach 100,014 LGBT youth between 16 and 24 years of age.
Tynes et al. (2008)	$N = 228$ Age 13–18	*Identity measures* Self-reported race and ethnicity Multi-Ethnic Identity Measure (12-item self-report measure) *SNS measures* Online Interethnic Communication Questionnaire (31-item IM interview)	Ethnic minority Internet users reported higher ethnic identity than did Caucasian Internet users, $F(1, 202) = 9.91$, $p = .001$. Experiences of online racial prejudice for ethnic minorities related to greater ethnic identity, $r(36) = .38$, $p < .05$. European Americans with more opportunities to interact with ethnic minorities reported higher outgroup orientation, $r(26) = .46$, $p < .05$ (cohort 1), $r(60) = .30$, $p < .05$ (cohort 2).
Valkenburg and Peter (2007)	$N = 690$ Dutch adolescents Age 10–17	*Identity and SNS measures* Online and offline self-reported self-disclosure to friends (5-item self-report measure)	26 % of adolescents in the sample reported that online self-disclosure is easier than offline self-disclosure, and the preference for online self-disclosure is higher for boys, $X^2(2, N = 690) = 6.34$, $p < .05$. Both online and offline self-disclosures were higher for girls than for boys, $F(1,682) = 50.84$, $p < .001$.
Valkenburg et al. (2011)	$N = 690$ 10–17 year olds	*Identity and SNS measures* Online and offline self-reported self-disclosure to friends (5-item self-report measure)	Online and offline self-disclosures were higher for female adolescents, $F(1, 682) = 50.84$, $p < .001$. Crossed-lagged analyses revealed that online self-disclosure predicted subsequent offline self-disclosure, but not vice versa, $X^2(31, N = 690) = 153.57$, $p < .001$, CFI $= .986$, RMSEA $= .046$ (90 % CI .037–.058).
Walther (2007)	$N = 54$ Age 18–23 Undergraduate students	*Identity measure* Coded self-presentation online through computer-mediated communication. *SNS measure* Messages "sent" were coded for degree of editing, time spent composing, and language characteristics	Language complexity was greater for those who believed they were communicating with professors, $F(2, 50) = 4.36$, $p = .018$, $g^2 = .16$. Males edited their messages more when they were aimed at female targets, and males edited least when addressing high status (e.g., professor) or unspecified individuals, $F(2, 42) = 4.34$, $p = .02$. Females edited their messages more when they were aimed at high status targets, editing least for same-sex targets, $F(2, 42) = 4.34$, $p = .02$.
Walther et al. (2011)	$N = 212$ Midwestern university students	*Identity measures* Experimental manipulation; participants self-presented as introverted or extroverted Introversion/Extroversion scale (11-item self-report questionnaire) *SNS measures* Experimental manipulation: students were told that their comments would be either public (online) or private. Participants received feedback (vs. no feedback) reflecting either the introverted or extroverted content.	Participants displayed greater identity shifts when they received feedback congruent with their assigned condition (introverted vs. extroverted) in the public condition, $t(204) = 1.93$, $p = .028$.
Yu et al. (2011)	$N = 13$ Adolescent focus group	*Identity measure* Sharing health-related stories with a group *SNS measures* Discussion of disclosing health information on the Internet	Participants valued sharing health-related stories on the Internet. Participants reported concerns about embarrassment and safety online.

through a program that captured keystroking (number of backspaces, etc.) in addition to video footage of the participants as they completed the tasks. In general, students crafted messages of higher language complexity when they believed a professor was receiving the message. Sex differences emerged for number of edits, with males editing their messages most when aimed at female targets, and females editing most when they believed a professor would see the message (Walther 2007). In a later experimental study that incorporated a feedback component, university students were told to portray either an introverted or extroverted individual (Walther et al. 2011). When students received feedback that was congruent with the personality trait they were asked to portray, they later reported higher levels of that trait on a personality measure. These two studies highlight not only the potential for SNSs users to engage in selective self-presentation depending on the audience, but also the influence that feedback may have on individuals' actual sense of self, in support of the hyperpersonal model.

SNSs and Social Comparison

Adolescents are particularly likely to engage in social comparison, be it upward or downward, and these types of comparisons can have a strong impact on their self-esteem (Krayer et al. 2008). SNSs in particular make it especially easy for adolescents to compare themselves to peers simply by looking through a Facebook newsfeed or pictures and posts on a profile page. For example, in a study of 425 undergraduates, self-report surveys revealed that their amount of Facebook use related to the extent to which they believed others were better or happier. Even after adjusting for hours spent going out with friends, those who reported using Facebook for more years and more hours per week were more likely to agree with statements that others were "happier" than they were (Chou and Edge 2012). Another type of online comparison is physical attractiveness, with female adolescents reporting a more negative body image after looking at beautiful versus less attractive pictures on a SNS profile (Haferkamp and Kramer 2011). Accomplishment is another point of comparison, and males who viewed successful male profiles felt further from their ideal career status than those who viewed profiles of less successful individuals (Haferkamp and Kramer 2011).

Relatively little is known about real-time impacts on adolescents as they learn about others' social activities and social connections, especially being privy to pictures on SNSs of events to which they were not invited. With adolescents likely to post interesting, upbeat, and attention-grabbing details of their lives, online comparisons may be harsher than warranted (Boyd and Ellison 2008).

SNSs and Affiliations to Learn About the Self

Adolescents develop a sense of themselves through their relationships with others and some may seek those connections via SNSs. Some adolescents may wish to learn about people and relationships beyond the comfort zone of their daily interactions. Other youth may feel socially disenfranchised in their face-to-face experiences or may seek the anonymity of peer support among individuals whom they do not see on an everyday basis. SNS groups aimed at adolescents who share a specific defining characteristic may be particularly empowering in terms of information shared and support received.

Adolescents with chronic illnesses For adolescents with chronic illnesses, support groups can be important resources to share experiences and make meaning out of their suffering and challenges. Particularly for adolescents who cannot leave their homes or live in communities without such resources, the Internet might be an ideal context for such support groups (Davison et al. 2000). McLaughlin et al. (2012) developed a SNS, modeled after Facebook, where young cancer survivors created profiles, posted pictures, stories, and other personal information; the young adults who were most active on the site were those reporting lower support from family and friends, and who felt "different." Another study that involved both ill and healthy adolescents together in an online focus group (Yu et al. 2011) revealed benefits for the ill adolescents associated with sharing stories online and receiving instrumental support; sharing stories also served an educational purpose for healthy adolescents by building empathy for those who were ill. According to these authors, adolescents who shared their stories about illness had the chance to express themselves and be heard, whereas those who read the stories online had the opportunity to learn from others (Yu et al. 2011).

Ethnic minority adolescents SNSs also play a role in the expression of ethnic identity and tolerance for ethnic diversity. In general, the Internet can reinforce ethnic identity by providing bridges beyond the local community. Markstrom (2010), for example, argues that the Internet can provide information and prompt action to address common concerns among American Indian adolescents, as well as involve the adolescents in e-commerce of culturally based craft products. Some individuals use Facebook to express ethnic identity. In coded Facebook profiles of African American, Latino, Indian, Vietnamese, and Caucasian college students, ethnic minorities included more elaborate "about me" sections in their profiles, with ethnic identity a salient part of their Facebook activities (Grasmuck et al. 2009). In this study, ethnic minority individuals tended to highlight their culture in their self-narratives, often including historic quotes of prominent figures of the

same ethnicity. The authors posit that SNSs provide the opportunity for minorities to express positive self-portraits with a strong emphasis on their ethno-racial identity, which in turn may contribute to a more positive self-concept (Grasmuck et al. 2009). Tynes et al. (2008) similarly reported stronger ethnic identity among ethnic minority SNS users compared to European American SNS users as measured by a self-report ethnic identity measure; yet, for European Americans, more opportunity to interact with diverse groups online was associated with greater openness to minority peers. Although the direction of this link was not known, the Internet may provide a context in which youth can interact with and be receptive to others who are different from them.

Sexual minority adolescents LGBT (lesbian, gay, bisexual, and transgendered) adolescents also use SNSs as a means of self-expression. LGBT adolescents report that the Internet is a useful context in which to express their sexual orientation more comfortably than in-person and to connect with their LGBT peers (e.g., Hillier and Harrison 2007). A more recent study examined the utility of SNSs as a tool for reaching LGBT youth who might be at risk for suicide. Specifically, SNS network mapping demonstrated that a potential online intervention could reach over 100,000 LGBT youth between 16 and 24 years of age (Silenzio et al. 2009). To our knowledge, research to date has not explicitly examined whether adolescents who utilize SNSs to connect with other sexual minority adolescents find this helpful, and if so, in what ways this is helpful.

Summary

Evidence points to SNSs not only as a context in which to exhibit one's developing identity, but also a place where youth can get feedback that may alter their own self-perceptions. While SNSs seem to facilitate self-disclosure, research does not suggest that youth disclose information to just anyone. In contrast, youth seem to craft the information that they share, sometimes in subtle ways, in order to appeal to different audiences. Furthermore, SNS use appears to be a dynamic process by which individuals' self-perceptions are influenced by their SNS experiences. Similar to SNSs' role in the adolescent task of affiliation, SNSs potentially intensify adolescents' experience of identity development, allowing them to express themselves in broader ways and to receive feedback from others; this could potentially lead to subtle changes and more rapid shifts in their identity that go beyond alterations that would already take place through face-to-face feedback. Preliminary findings also suggest that SNSs might provide a context for adolescents to interact with peers who are different from themselves (e.g., chronically ill youth, adolescents from different ethnic or racial backgrounds) and

thereby build understanding, empathy, and openness. Moreover, adolescents have the opportunity to join groups that reflect different aspects of their identity, both affirming something that they wish to be a part of and connecting them with others who have common interests. Some ethnic, racial, and sexual minority adolescents use SNSs to explore identity issues and to seek information, support, and social connections beyond face-to-face friends and acquaintances.

The interplay between individual expressions of identity (e.g., through a Facebook profile) and adolescents' group affiliations online is a potentially dynamic aspect of identity development that has thus far not been linked together in the literature. Furthermore, social comparisons online can have a powerful impact on adolescents' self-perceptions; likewise, positive and negative feedback related to one's profile seems to relate to adolescents' self-esteem. What adolescents decide to disclose online, to whom, and how they are impacted by the feedback they receive are all highly relevant to understanding adolescents' social–emotional development.

Future Directions for Research: Adolescents and SNSs

Mining SNS Content as a Window into Adolescent Development

The potential of SNS sites to provide rich, ecologically valid data about the nature of adolescents' computer-mediated communications remains largely untapped. Transcripts from Facebook posts are potentially fruitful avenues to pursue, as demonstrated by a small number of studies examining forms of computer-mediated communication (Underwood et al. 2012; Huffaker and Calvert 2005; Subrahmanyam et al. 2006; Forest and Wood 2012). Important directions for research include coding SNSs for peer support, co-rumination, and criticism or invalidation, which have long been important foci of research examining adolescent peer interaction (e.g., Zeldin et al. 1982). A unique benefit of SNS interactions is that they are actually documented and could provide a previously untold account of how adolescents talk to each other.

Whereas most of the published research has focused on frequency and duration of SNS use, the actual content of SNS exchanges, which has been largely ignored with few exceptions (Grasmuck et al. 2009; Forest and Wood 2012), could be an invaluable asset to the study of adolescence. Importantly, adolescents with publicly available Facebook profiles largely reported being comfortable with the use of their profile for research purposes (Moreno et al. 2012). Other studies, some still in the development phase, incorporate Facebook applications that allow researchers to download and analyze teens' online social exchanges (e.g.,

Mikami et al. 2010). These types of studies offer ecological validity, but pose ethical challenges, particularly if adolescents are interacting with other identifiable individuals. Methods increasingly are being developed to immediately de-identify the participant and "scrub" the data of certain content, although those procedures then restrict the investigator's ability to link the SNS data with other known data about participants. Another method that has been used is to request that participants "friend" an SNS account created specifically for the study (Moore and McElroy 2012). Changing technologies create increasingly sophisticated procedures for collecting SNS data but, thus far, the majority of objective SNS research has emerged from publicly available information.

Social networking site data also can illuminate developmental change across adolescence and into early adulthood. With the same SNS sites available to persons across these developmental stages, investigating their content can reveal important differences in self-presentation, interests, likes, and motivations for SNS use across these ages. With longitudinal comparisons for the same individuals likely to be confounded by the evolution in SNS regulations, formatting, and options, as well as rapidly changing security and access controls (Wilson et al. 2012), cohort comparisons can identify developmentally relevant similarities and differences in the ways individuals connect and communicate.

Immediate and Bidirectional Effects Between SNS Use and Mood, Behavior, and Social Relations

The global measures of SNS use, for example, "in general, how often do you use…" and global measures of friendship quality and well-being fail to demonstrate time-linked connections between SNS use and ongoing mood, cognition, or behavior. Methods such as Ecological Momentary Assessment (Shiffman et al. 2008) and daily report data (e.g., Pempek et al. 2009) can examine within-person covariation between SNS use and relevant adolescent outcomes, and would better demonstrate the role of SNS use in adolescents' daily lives. Such data could explore how these sites affect ongoing mood and adolescents' sense of peer support. Likewise and importantly, such data could explore bidirectional effects such as the extent to which adolescents turn to SNSs when in a negative or positive mood. For example, there is some evidence for "Facebook depression," suggesting that Facebook use can lead to depressive symptoms in adolescents (O'Keeffe et al. 2011), although not all studies examining SNS use and depression find this association (Jelenchick et al. 2013). Taking initial individual differences into account, a study of young adults indicated that for those using SNSs who had initially low levels of social acceptance at age 21 reported fewer internalizing symptoms at age 22. In contrast, SNS users with high levels of social acceptance at 21 reported increases in internalizing symptoms at age 22 (Szwedo et al. 2012). It is also possible that certain adolescents generate and amplify stress for themselves through rapid-fire exchanges in an emotionally volatile state. More generally, it would be helpful to know about within-day spillover of interpersonal stress and support between SNS use and face-to-face communications.

SNS Use and Alone Time

It has been suggested that it is optimal for adolescents to have at least some alone time; those who spend a moderate amount of time alone show better adjustment than those who never spent time alone or who spend a lot of time alone (Larson and Csikszentmihalyi 1978). Little attention has been paid to the consequences of SNSs' encroachment upon adolescents' alone time. Although many adolescents do not necessarily like alone time and thus prefer having constant contact with friends, alone time can help adolescents develop emotion regulation skills and a sense of self-efficacy when faced with stressful psychosocial experiences. Adolescents previously spent a portion of their day unable to be in contact with friends, when they would rely on their own thoughts and individual resources to sift through the events of the day and to prepare for the next day. Frequent use of the Internet to seek support and feedback from friends has been shown to be inversely related to internal locus of control (Chak and Leung 2004) and potentially also affects adolescents' development of emotion regulation and autonomy, all of which are important for identity development and can influence later adjustment (Caprara et al. 2010).

A related issue is whether SNS use creates its own form of peer pressure to be in constant contact, akin to the more commonly recognized peer pressures to engage in risk-taking behaviors (McIntosh et al. 2006). Expectations to be constantly available to friends and fear of offending a friend by not responding quickly enough can distract adolescents from other activities. Future investigations should examine the extent to which adolescents engage in SNS use because of genuine interest and desire versus peer pressure, and identify which adolescents feel most pressured to be online.

SNSs to Identify Risk and Disseminate Interventions

Harnessing the Internet as a tool to enhance awareness of adolescents at risk as well as to intervene online are important new directions. The public nature of adolescents' SNS activities could help identify adolescents who are risk for harm to themselves or others. Important information has been found in the post hoc examination of SNSs of

adolescents who attempted suicide; better documentation and understanding of such messages could be used to improve both public and professional awareness about early warnings of harmful behavior. Likewise, there may be specific SNS behaviors that help identify youth who are at an increased risk for a variety of psychosocial challenges, including social isolation, deviant behavior, and psychopathology. Learning to recognize "cries for help" via SNS communications could facilitate the early identification of deteriorating conditions.

Conclusions

Adolescence is a time of struggle to find a balance between autonomy and connectedness. The Internet and SNSs provide new contexts for reflecting upon and trying out new identities, for learning and attempting new social skills, and for establishing affiliations. Although representing a significant shift in the ways that adolescents communicate and spend time, Internet use and SNSs dovetail with, facilitate, and perhaps intensify the tasks of adolescent psychosocial development. The literature points to several positive influences of SNSs on adolescents' psychosocial development, including enhanced peer relationships, broadened opportunities to affiliate, including with groups that are less accessible within traditional social contexts, and increased occasions for self-disclosure—all of which can enhance well-being. Importantly, evidence suggests that socially skilled adolescents, in particular, benefit from SNS use. Several potential costs of SNS use also emerged, including pressure for self-disclosure, potential for a disproportionate amount of negative feedback, and the possibility of unhealthy social comparisons. As with the advent of television, another powerful technological innovation that transformed society and changed the way that children and adolescents spent time and received information, the initial wave of research on SNS use has focused mostly on identifying positive and negative impacts. With some of the concerns abating related to dangers inherent in SNS use, the next wave of research can further investigate ways to harness the potential of SNSs for adolescents' adaptive psychosocial development.

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