Growing up in the Web of Social Networking: Adolescent Development and Social Media

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Growing up in the Web of Social Networking: Adolescent Development and Social Media

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Abstract: *Background*: Social media use among the child and adolescent population is at an all-time high across the globe. This includes use of networking sites like Facebook and Twitter, online magazines, Internet forums, video sharing communities, and weblogs. It is of paramount importance to assess the impact that social media has on adolescent development. A growing body of research addresses social media's effects upon adolescent friendships, identities, cognitive growth, and health. Social media use has been demonstrated to have links with adolescent depression, anxiety, substance abuse, and personality disorders. However, studies also suggest that social media may be a useful vehicle for public health education and fostering creativity.

Method: We present a review of current literature up to 2012 dealing with social media's impact upon healthy adolescent development. We also describe various websites available for teenagers to help them deal with problems such as online bullying, and resources for parents and professionals to help educate them about how to guide young people's use of social media.

Conclusions: Through a careful examination of the current evidence, parents, physicians, and social policymakers may determine how to best equip adolescents to use social media as a tool rather than a handicap to becoming a fully functioning adult.

INTRODUCTION

With the advent of the digital age, social media has exploded as a major influence upon culture and society worldwide. In the United States, ninety-five percent of adolescents aged 12-17 report being online, with eighty percent of those using social media websites (Lenhart *et al.*, 2011). American teens spend an average of nine hours per week on social networking sites (National School Boards Association, 2007). Eighty-eight percent of Latin American Internet users use social networking, and half of the users of the most popular networking site Orkut are below age 25 (Arno, 2010; Fosk, 2011). Ninety percent of South Korean teens are on the social media network Cyworld (Ihlwan, 2005). A poll of 13 to 16 year olds across 25 European countries found that seventy-seven percent have a profile on a social networking site (Livingstone *et al.*, 2011).

Although a wide body of research exists concerning social media and immediate adolescent outcomes, there is a lack of longitudinal research examining its effects on adult functioning. It is of paramount importance to assess the impact that social media has on adolescent developmental processes and generate plausible hypotheses in the Digital Age. Despite many social changes, adolescence remains a critical period for development in terms of biological changes, cognitive development, social learning and formation of a consolidated self. The end point of development may be defined as successful adult functioning within society (Rutter & Sroufe, 2000). In order to examine current evidence, we conducted a literature search using PubMed and Google with search terms including "social media", "social networking", "online communities", "adolescence", and "development" in order to identify current research on this topic.

SOCIAL MEDIA AND SOCIAL DEVELOPMENT

Social media offers an opportunity for teenagers to become connected to a wide array of individuals. It allows unparalleled breadth of social exposure, while at the same time limiting communication through nonverbal cues such as body language and facial expression.

Social Cognition

The effect of social media's effect on social cognition varies according to age, gender, and degree of maturation. For example, it has been hypothesized that "the rich get richer": adolescents who already have rich face-to-face relationships can use social media to augment their social network (Valkenburg & Peter, 2007). On the other hand,

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lonely adolescents may use social media as a form of social "compensation"; teens who report being lonely are more likely to use online communication as a means of compensating for weaker social skills in order to meet people (Bonetti *et al.*, 2010). But adolescents with weaker face-to-face skills may be unable to correct maladaptive social patterns if their primary communication is through social media. In addition, while face-to-face communication is associated with social well being, electronic communication is not. Regression analyses of a recent survey of 3,461 North American girls between 8 and 12 years old indicated that use of social media and other types of media was associated with negative social well being. In contrast, face to face communication was positively associated with social well-being (Pea *et al.*, 2012).

Parent-Adolescent Relationships

Having parents who give advice about relationships is linked with successful social relationship formation in adolescents (Parke & Ladd, 1992). But parents' lack of familiarity with social media limits their ability to give advice on social conflicts and situations arising online (Subrahmanyam & Greenfield, 2008). This in turn may increase distance between parents and children. Richards *et al.* conducted standardized interviews of two cohorts (1988, 2004) from different time frames and established that more screen time is associated with poor attachment to parents (2010).

Intimacy

Development of secure and intimate relationships is an important step in adolescent development. Self-disclosure, or sharing of personal feelings and information, is a key way in which friendships develop intimacy. Intimacy is associated with social competence, decreased anxiety and depression, and higher self esteem (Buhrmester, 1990; Keefe & Berndt, 1996). Individuals often attempt to achieve such intimacy in online relationships. Social media plays an important role in established romantic relationships among adolescents. One study found that female bloggers who reported more self-disclosure reported more online relationship satisfaction (Bane *et al.*, 2010). However, there are pitfalls. Muise *et al.* have demonstrated a reciprocal relationship between ambiguous Facebook signals and jealousy among Facebook users in intimate relationships (2009). Furthermore, self-disclosure through the Internet may result in a false sense of intimacy and safety. Pollet *et al.* have concluded that having large online networks does not correlate with extensive offline social networks, nor does it correlate with the strength of emotional relationships (2011).

A sense of online intimacy may lull teens into sharing private information. In the Common Sense Media national poll, 28% of teenagers reported sharing personal information on social media that they normally would not have shared in public. A study investigating college freshman Facebook profiles found that 302 out of 333 had status updates and personal information that was publicly available (Egan & Moreno, 2011b). Teens with fully public profiles were found to be more likely than teens who limit access to report bad experiences on social networking sites (Lenhart*, et al.*, 2011). Burgess surveyed 404 middle school students and

found that social media use is associated with high risk-taking behavior. She found that although just fifteen percent of all students surveyed communicated with older adult strangers, eighty-four percent of those actually met face-to-face with this stranger (2011).

Sexual harassment through the medium of social media and "sexting" cases has generated considerable public concern, as Hua has reported (Hua, 2012). In the Growing Up with Media Survey, fifteen percent of all youth reported unwanted sexual solicitation online in the past year. Four percent reported the activity taking place specifically on a social media site (Ybarra *et al.*, 2005). A survey given at a college found that twenty-seven percent of undergraduate girls had been threatened, blackmailed, or coerced into sending nude photos (Snell & Englander, 2010). Another study involving an ethnically diverse population found that girls were more likely than boys to be sent harassing sexual texts or photos, or to be propositioned online (Mishna *et al.*, 2010). A study by Moreno, Swanson, Royer, and Roberts (2011) found that heterosexual males report having increased sexual expectations of females who reveal sexual preferences on social media.

Identity

Social media affects how adolescents establish moral values, pursue specific interests and hobbies, and develop a cohesive self. It also serves as a platform for social comparison and information-seeking. We know that identity formation is influenced by relationships with family, educators, and peers (Culbertson *et al.*, 2003), but the impact of social media use on this crucial aspect of development is not yet clear. One theory proposes that adolescents use the Internet in an attempt to further elucidate their identities. Adolescents may be able to explore their ideal identities, expand their knowledge of the world, or find new role models or attachment figures (Jensen, 2003). As support for this theory, one study found that adolescents with low levels of self concept clarity were more likely engage in heavy Internet use (Israelashvili *et al.*, 2011). Haferkamp *et al.* examined gender differences in online self-presentation and found that women on social media sites tended to compare themselves with others more than men did (2012). An online survey of 400 teenagers revealed that increased screen time was associated with lower self-esteem and greater psychological distress (O'Dea & Campbell, 2011).

Online, one may post misleading personal information or assume the identity of someone else. A national poll released by Common Sense Media (2009) found that twenty-six percent of teens have pretended to be someone else online. While trying on an alternate identity can be normative for adolescents, there is some evidence that the use of fictional on-line identity is associated with high risk behavior. Dowdell *et al.* conducted an interesting survey comparing the responses of 3,765 middle school, high school, and college-going students with 466 adults who had committed a sexual offense. They found that over half of offenders disguised their identity online, and that both students and adult sexual offenders used avatar sites like Second Life as well as other forms of social media (2011). Marketing to teenagers is not new, but with social media its

intensity and level of sophistication has increased, along with its identity-molding effects, as adolescents are encouraged to espouse values of consumerism, superficial appearance, and commercial goods (Kunkel *et al.*, 2004). Targeted advertisements, which are tailored to individual teens based on demographic information and hobbies provided in online profiles, are prevalent on social media sites. These may include advertisements for designer accessories, cosmetic procedures, and luxury cars. Such ads are designed to convince adolescents that they need various consumer products to be attractive and popular. Brands and businesses also have Facebook pages on which they post advertisements and promotions for their fans. In 2012, fifty-six percent of consumers reported that they were more likely to recommend a brand after becoming a Facebook fan of the page (Mediabistro, 2012).

Autonomy

Adolescents enjoy a sense of increased autonomy on social media websites. They may create websites, blogs, and videos expressing their interests and further developing their identities. Chau describes YouTube as a "participatory culture", where young people enjoy strong support, including informal mentorship, for creating and sharing their creative projects (2010).

CYBERBULLYING

Developing self-esteem and confidence in the social arena is integral for adolescents. Social rejection in the Internet setting can have far-reaching effects. Peer rejection has been linked to loneliness, academic difficulties, increased school dropout rates, and psychological disorders (Kupersmidt *et al.*, 1990; Parker & Asher, 1987). The term "cyberbullying" was coined to describe harassment and aggression taking place online and in social communities settings. Eighty-eight percent of teenagers using social networking sites report witnessing cruel behavior on these platforms. Fifteen percent report being the target of such harassment. Notably, this percentage was similar across gender, race, and socioeconomic status (Lenhart*, et al.*, 2011). In a 2011 report by the National Center on Addiction and Substance Abuse at Columbia University, one in five teens admitted to having had aggressive or hurtful content posted about themselves on Facebook, MySpace, or other social networking sites. Girls were twice as likely as boys to be victims of such behavior (National Center on Addiction and Substance Abuse at Columbia University, 2011). Another study found lifetime cyberbullying victimization rates to range from twenty-one to forty-one percent (Hinduja & Patchin, 2010b).

When compared to in-person bullying, cyberbullying is unique due to its blurring of roles. Online, a victim can easily become an aggressor. Through the medium of the Internet, victims are more comfortable with retaliating against their aggressors, becoming the bullies. Additionally, passive bystanders can readily join in cyberbullying. For example, through social media bystanders can easily share or repost hurtful content posted by a bully, contributing to the bullying (Law *et al.*, 2011). Sixty-seven percent of teens using social media report witnessing others joining in online harassment,

while twenty-one percent report joining in themselves (Lenhart*, et al.*, 2011).

Cyberbullying may also be unique due to its relative anonymity. One study found that almost half of victims did not know the identity of their perpetrators (Kowalski & Limber, 2007). Through anonymous identities, cyberbullies are shielded from punishment and direct emotional confrontation. This may contribute to the increased intensity of humiliating or threatening remarks. The perpetrator is unknown, untraceable, and may be either one individual or a group of peers. This may contribute to victims experiencing a greater degree of fear.

Teens victimized through cyberbullying are at higher risk of substance abuse than their peers. A nation-wide study found that they were more than twice as likely to have used tobacco, alcohol, and marijuana (National Center on Addiction and Substance Abuse at Columbia University, 2011).

Cyberbullying has also been found to affect teens' self esteem. Notably, both victims and offenders of cyberbullying were found to have significantly lower self esteem than their peers (Patchin & Hinduja, 2010). Cyberbullying has a particularly detrimental effect on adolescents with preexisting emotional, psychological, or environmental stressors. In these individuals it may amplify feelings of isolation and hopelessness (Hinduja & Patchin, 2011).

Such feelings of hopelessness may contribute to the poor mental health outcomes associated with cyberbullying such as depression and suicide. Teens who reported depressive symptoms were over three times more likely to report being harassed over the Internet in the past year (Ybarra, 2004). Victims of cyberbullying are twice as likely to make suicide attempts compared to their peers (Hinduja & Patchin, 2010a). This is so prevalent that the term "cyberbullicide" was coined to describe cyberbullying when linked to suicide (Luxton *et al.*, 2012).

COGNITION

During adolescence, teens develop hypothetico-deductive reasoning and hone information processing skills (Piaget, 1952). Attention, working and long-term memory, and processing speed improve (Keating, 1990; Steinberg, 2005). Cognitive development has been described as a combination of the maturation of brain wiring and a dynamic learning process integrating experiences and memories. These processes result in the development of a set of problem-solving abilities which adolescents take into adulthood (Case, 1992; Chi & Koeske, 1983).

The effect of social media upon such cognitive functions has been debated. Teens using social media are constantly surrounded by online activity. With online social networks, it is possible for a teen to have YouTube open in one window, browse a forum in another, and check Facebook updates on a smartphone, all while seemingly working on homework. One theory proposes that children growing up with modern technology develop the ability to successfully multitask (Prensky, 2003). This theory has not been supported by studies. The American Psychological Association concluded that rapid switching between tasks leads to poorer learning re-

sults and poor task performance (2006). Juggling was found to lead to greater inefficiency. Multitaskers make more mistakes and take longer to complete tasks (Ophira *et al.*, 2009).

Evidence suggests that the dizzying array of social media websites may lead to decreased academic performance. Studies have found that Facebook users have a lower mean GPA and spend fewer hours per week studying. A majority of those reporting a negative impact of Facebook on academics cited procrastination and poor time management (Kirschner & Karpinski, 2010). A recent article from Nottingham Trent University reviewed social networking site use and correlated it with decreased social involvement and academic achievement which may lead to problems with internet addiction (Kuss & Griffiths, 2011).

A factor analysis of 1715 college students' responses to a survey categorized four types of reasons for using social media: socializing, entertainment, self-status seeking, and information gathering (Park *et al.*, 2009). The way in which social media is used may be key in how it affects academic performance. A study of 1839 college students found that time spent on Facebook was significantly related to lower overall GPA. Using Facebook for socializing was negatively predictive of high GPA, though using it for collecting and sharing information was positively predictive of high GPA (Junco, 2011).

Social media's potential for information gathering and sharing cannot be overlooked. Various forms of social media can have uses in the academic setting. Online forums linked to educational lessons allow students to actively engage in discussions. Students may also post academic and creative material online, sharing their ideas with the outside world. Some educators suggest that students can create a digital footprint, an online resume of materials that may be useful when applying to college or jobs (Careless, 2012).

MENTAL HEALTH OUTCOMES AND EFFECTS ON GLOBAL FUNCTIONING

It is vital to assess the impact of social media upon adolescents' overall functioning and productivity in society. The end goal of development has been described as a "coherence of functioning" (Rutter & Sroufe, 2000). This functioning includes mental health, physical health, and career productivity.

Depression

Growing evidence suggests that social media may be associated with "Facebook depression" (O'Keeffe *et al.*, 2011). A recent Serbian study showed a statistically significant correlation between Beck Depression Inventory-II scores and time spent social networking (Pantic *et al.*, 2012). As mentioned previously, cyberbullying contributes to depression (Ybarra, 2004). Youth reporting depressive symptoms were more likely to talk to strangers online, use the Internet frequently to email others, and have a high intensity of Internet use (Ybarra*, et al.*, 2005).

Online photographs, Facebook friend tallies, and status updates can present a skewed view of teens' social world. A recent survey was conducted of 425 undergraduate students at State University of Utah who were long-term users of so-

cial media about perceptions of others' lives. Data analysis demonstrated that compared to their peers, long-term users of social media perceived that other people were happier and had better lives than themselves (Chou & Edge, 2012).

Suicide

Social media is a medium through which suicide may be both normalized and completed. "Cybersuicide" describes suicidal attempts or acts that have been influenced by the internet (Rajagopal, 2004). A 2011 survey of YouTube found many videos featuring explicit self-injury, with the top 100 having over 2 million viewers and over fifty percent having no warnings or viewer restrictions (Lewis *et al.*, 2011). Linkletter *et al.* has suggested that this high viewership of self-injurious videos may normalize such behavior (Linkletter *et al.*, 2010).

Chat rooms and discussion forums featuring suicide may further encourage those considering suicide and provide instruction on suicidal acts. Online "extreme communities" may play a role in destigmatizing the act of suicide and providing social encouragement for adolescents to commit suicide (Bell, 2007). A study found a connection between suicidal ideation and suicide-related content found on online forums, but no link between social networking sites in general and suicidal ideation (Dunlop *et al.*, 2011).

Online pro-suicide networks have led to the rise of "cybersuicide pacts". Traditional suicide pacts are face-to-face agreements between two individuals who have a close relationship to each other. In contrast cybersuicide pacts are formed between two strangers online and facilitated through online pro-suicide communities. In South Korea, cybersuicide pacts account for almost a third of suicides in the country (Rajagopal, 2004). The impact of cybersuicide pacts is growing with time. In Japan, completed suicides due to known cybersuicide pacts rose from 34 individuals including 2 teenagers in 2003 to 91 individuals including 8 teenagers in 2005 (Hitosugi *et al.*, 2007).

Substance Abuse

References to substance abuse are prevalent on social media sites. A 2009 survey of MySpace profiles found that forty-one percent reference substance use (Moreno *et al.*, 2009). A 2011 analysis of undergraduate males' Facebook profiles found alcohol references on eighty-five percent of the profiles. This may influence the culture of acceptance regarding alcohol use among youth (Egan & Moreno, 2011a). Ridout *et al.* have further confirmed this in their survey which suggests a role of social media in normalizing binge drinking (2012). In a study at the University of Pittsburgh comparing cigarette and hookah-related Youtube videos, it was evident that there were no public safety warnings on hookah-related videos (Carroll *et al.*, 2012). Liang and Mackey have reported the presence of non-corporate electronic direct-to-consumer advertising of illegal substances which are not sanctioned by authorities (2011).

A 2011 nationwide survey found that forty-nine percent of teens reported seeing photos of other teens getting drunk, passed out, or using drugs on Facebook, MySpace, and other social networking sites. These teenagers were three to four

times more likely to use alcohol and marijuana, respectively. In general, teens who spend time on social networking sites in a typical day were found to be more likely to use marijuana, alcohol, and tobacco (National Center on Addiction and Substance Abuse at Columbia University, 2011). The recent increase in the use of designer drugs like spice, K-2, and bath salts may be linked to more widespread availability on the web. These drugs are both cheap and legal due to the lack of clear legislation to control them (Corazza *et al.*, 2011; Schmidt *et al.*, 2011).

Social Anxiety

Adolescents who self-reported being lonely are significantly more motivated to use online communication more frequently to meet people (Bonetti*, et al.*, 2010). Teenagers with social anxiety may use social networking websites and online communities as an alternate way to develop friendships. Such settings allow adolescents to communicate in a low pressure setting with relative anonymity. However, this "social compensation" can be problematic when it results in decreased efforts to socialize face-to-face (Kuss & Griffiths, 2011). Decreased exposure may worsen social anxiety. Mastery of fear and anxiety is an important developmental task, and exposure of adolescents to new challenges is a key step in the development of adult confidence (Culbertson*, et al.*, 2003).

Personality Traits and Disorders

In a study of 100 Facebook users at York University, Mehdizadeh concluded that users with high narcissistic traits and poor self-esteem were involved in more online activity and self-promotion (2010). Another study by Buffardi has supported these views (2008). A study by Orr has showed that shyness is negatively related to number of Facebook friends and positively related to increased time on Facebook and positive attitudes regarding the site (2009).

Physical Health

Social networking use accounts for a significant amount of time individuals spend online (Radwanick, 2011). Large amounts of time spent online may contribute to a sedentary lifestyle and the growing problem of child obesity. A study by Cui *et al.* of adolescents in China found that screen time, measured by computer and television use, has significantly increased in all adolescents from 1997 to 2006 (2011). Granich *et al.* found that youths with no rules limiting computer time and those with media devices in their bedroom were at higher risk of engaging in these sedentary activities (2011). Additionally large amounts of social media use may be associated with sleep deprivation, particularly in students who spend late nights using social media (Kirschner & Karpinski, 2010).

Online communities centered on specific medical conditions may provide support for adolescents with these conditions. However, at times these may be a vehicle for incorrect medical information. A study of MySpace asthma groups found that these groups contained questions, advice, and links to commercial websites, but lacked referenced clinical information. Many of the posts contained substantial medical misinformation (Versteeg *et al.*, 2009). Guide-lines ensuring that accurate health information is posted online would help curb sharing of inaccurate health advice. Ransom *et al.* in their survey of 60 eating disorder forum members found that both maladaptive and adaptive behaviors were encouraged on these forums (2010). It is important to realize that such communities have both risks and benefits for adolescents.

Effects on Education and Careers

Electronic skills gained by developing adolescents can be an important asset in today's job market. Yet studies have found that college students' knowledge of technology is mainly limited to emailing, surfing the internet and Facebook, and basic office suite skills (Kennedy *et al.*, 2007). In a learning environment, technology use has been said to be mainly limited to passive consumption of sources such as Wikipedia and downloading lecture notes (Kirschner & Karpinski, 2010). One study found that most youths do not have a deeper understanding of the applications that they use (Kvavik, 2005).

Responsible social media use depends upon an individual's judgment to make informed decisions on which content to keep private. Posting private information online has the potential to jeopardize college admissions and jobs (O'Keeffe*, et al.*, 2011). To some extent, adolescents are aware of this; 55% of all online teens report deciding not to post online content that might reflect poorly upon them in the future (Lenhart*, et al.*, 2011). Of course this means that 45 % do not take this precaution.

"Workblogging" has become prevalent online. Workblogs are internet-based employee diaries where individuals write about their jobs and coworkers. This may not only jeopardize a person's career, but may negatively impact business agreements and patient privacy (Hader & Brown, 2010). With the advent of Twitter and Facebook, former blogs have turned into publicly available tweets and status updates. These updates may be posted from handheld devices during company time, impacting workplace productivity (Schoneboom, 2011). Social media use can have adverse effects on productivity, as multitasking can also carry over to school or the workplace. Eighty-four percent of college students and young professionals report being interrupted by social media at least once while trying to complete a project (Mediabistro, 2012).

SOCIAL MEDIA AND MENTAL HEALTH PROMOTION

A variety of resources designed to intervene in mental health crises are available through social media sites, especially in the area of suicide prevention. For example Facebook teamed up with the UK mental health association Samaritans to institute a suicide alert page. Facebook users may be able to send alerts about individuals who they believe are expressing suicidal thoughts or intent. However, this form is difficult to locate on the site (McHugh, 2011). There is also a button through which users can report bullying and objectionable content. Organizations such as the American Foundation for Suicide Prevention and the National Suicide Prevention Lifeline also have Facebook pages (http://www.facebook.com/AFSPnational;

Table 1.   Potential Effects of Social Media on Adolescent Development.

Development	Adolescent Tasks	Potential Positive Effects of Social Media	Potential Negative Effects of Social Media
Biological Theorists: Stanley Hall, James Tanner	Self Image: Youth cope with anxieties about pubertal changes and self-criticism of appearance. Individuals are preoccupied with comparing their bodily changes with those of their peers. They end by becoming more comfortable with their body image. (Hall, 1905) (Tanner, 2010)	1. Youths may be connected with peers also going through puberty, sharing their experiences.	1. A cycle of peer comparison of idealized body image can intensify self-scrutiny. 2. Youths are at increased vulnerability to targeted advertisements. 3. Increased screen time is linked to a sedentary lifestyle and obesity-related health problems.
Cognitive Cognition as "meaning-making", or assigning affective and personal connotations to events (Kegan, 1982) Theorists: Jean Piaget, Robert Kegan, J.R. Anderson, Robbie Case, Michelle Chi	1. Hypothetico-deductive reasoning (Piaget, 1952) 2. Information processing: Acquiring higher and sophisticated knowledge through faster processing of information (Anderson, 1995) 3. Neo-Piagetian theories of cognition: Cognitive development is an amalgamation of hard brain wiring and a learning-based model which integrates new experiences, information, and memories. This equips adolescents with problem-solving abilities. (Case, 1992) (Chi & Koeske, 1983)	1. Social media may provide an opportunity for youths to develop marketable skills to use electronic networks in school and the workforce. 2. Educators may use social media appropriately to augment classroom activities.	1. Virtual social interactions lack the processes of relationship encoding and thereby impair complex mature relationship formation. 2. Failure to develop cognitive architecture through real life experiences may impair understanding of cause and effect relationships. 3. Distancing of emotions and personal consequences online may result in problems assigning meaning to events.

Social
 	
Theorists: Martin Hoffman, Robert Selman, Lawrence Kohlberg, Ellen Nannis, Lev Vygotsky, Carol Gilligan
	1. Social cognition:
	  a. Empathy (Hoffman, 2001)
	  b. Social perspective-taking (Selman, 1980)
	  c. Emotional understanding (Nannis, 1988)
	  d. Moral reasoning (Kohlberg, 1969)
	2. Interpersonal relationships:
	  a. Intimate same sex relationships and opposite sex relationships and dating
	  b. Family and role models
	3. Culture:
	  a. Youths begin with experimentation and concrete thought. They develop their own identities and morals and successfully explore social institutions or cultural values. By the end of this process, internalization of cultural signs and symbols may occur. (Gilligan, 1977) (Vygotsky, 1986)
		1. "Rich become richer" hypothesis – youths with a rich social network may use social media to build upon their current relationships (Valkenburg & Peter, 2007)	1. Lack of social experimentation may lead to safe and superficial poor quality virtual interactions.
			
			2. Poor understanding of social constructs which are the building blocks of stable, secure and committed relationships.
			
			3. Distancing from family interactions could impair social learning and development of moral dissonance. Youths may spend less time participating in cultural events and developing cultural values.
			
			5. Enmeshed virtual networking may generate insecure and unstable friendships.
			
			6. Direct observational learning from poor role models due to lack of supervision

Identity Focal point of mental abilities, inner drives, and core values which defines a unique individuality and goals. Theorists: Erik Erikson, Anna Freud, David Elkind, James Marcia	1. Recognizing a distinct and unique meaning about oneself 2. Reorganization of object relations with family, peers, and romantic interests (Freud, 1969) 3. Interpretation of one's role in the society 4. Transition from a self-centered egocentric view of the world to a more future-oriented, philosophical view (Elkind, 1978)	1. Youths may explore varied interests online which may not be readily available in the physical community. 2. Adolescents have the opportunity to share their own and comment on others' portfolio of online works.	1. Lack of active struggle to resolve one's identity crisis and role confusion. 2. Exposure to unedited resources causes narrowing of the knowledge base used to understand multiple viewpoints. 3. Addictive nature of online behavior may lead to loss of control and impulsive decision-making without futuristic vision.

http://www.facebook.com/800273TALK), although users must specifically search for these pages in order to use them. The National Suicide Prevention Lifeline also uses YouTube to share protective videos. (http://www.youtube.com/watch?v=VIKdsCUSBt4&feature=youtube_gdata_player).

Facebook and Myspace have online forms through which users can report inappropriate content including hate speech and personal attacks (http://www.facebook.com/help/? page =204546626249212;http://www.myspace.com/help/ report-abuse). In the UK, Facebook has collaborated with the UK Child exploitation and online protection center to create the ClickCEOP application (http://www.facebook.com/clickceop) which links users to the Child Exploitation and Online Protection Centre (CEOP).

Social media itself may help address cyberbullying. For example, Cyberbully411 was developed by Internet Solutions for Kids (2012) and is a site where adolescents can share stories and join in discussion forums about bullying. It also contains information and resources on cyberbullying.

Focus groups found that students were not very aware of ways to report cruel behavior online and respond as helpful bystanders. Solutions that teens were familiar with were ignoring or blocking the sender of aggressive messages (Agatston*, et al.*, 2007). Given these potential protective resources online, social media managers should focus on how to increase the user-friendliness of resources. Easier to find alerts and flagging systems as well as active and involved moderators on these platforms would greatly increase the safety of these sites.

Adolescents are open to obtaining mental health information through social media. One in four adolescents and young adults has searched for information about depression online, with a similar percentage searching for information about violence, drugs, and alcohol (Rideout, 2001).

Social networking profiles may be a useful venue to identify students at risk for substance abuse, depression, and suicide. References to stress (thirty-seven percent), alcohol (seventy-three percent), depressive symptoms (twenty-four percent), and weight concerns (six percent) were found to be prevalent on Facebook profiles of college freshmen. Additionally a positive association between Facebook profiles referencing stress and depressive symptoms was found (Egan & Moreno, 2011b). Moreno *et al.* (2011) found a high frequency of status updates revealing depressive symptomatology which could be useful to screen for and develop awareness for treatment. References to violence, substance use, and sexual behaviors were also prevalent in MySpace profiles (Moreno *et al.*, 2009).

PARENT, EDUCATOR, AND PHYSICIAN ROLES

Parents

Parents play an integral role in adolescents' attitudes towards social media. Fifty-eight percent of teen Internet and cell phone users say that parents have been the strongest influence on what they think is appropriate or inappropriate online. Eighty-six percent of these users say that their parents have given them general advice on safe Internet use (Lenhart*, et al.*, 2011).

In order to knowledgeably counsel teenagers on how to critically navigate online content, parents and health professionals must be aware of how these sites work. Many parents may have inadequate familiarity with social media to counsel adolescents. In addition to gaining familiarity with online platforms and social networks, parents should be aware of hazards associated with use. Eighty-seven percent of parents say that they do not think that social networking use makes it more likely that adolescents will drink alcohol, and eighty-nine percent do not think that it makes it more likely that their child will use drugs. (National Center on Addiction and Substance Abuse at Columbia University, 2011).

Setting limits regarding social media use may be an effective tool to decrease screen time. Ramirez *et al.* have concluded from a multicentric survey that clear rules and limit-setting on screen time and avoiding screen-based media in adolescents' bedrooms were associated with fewer hours of screen time (2011). Carlson *et al.* also found that children of parents who set rules on screen time were less likely to exceed a recommended screen time limit of 120 minutes per day, after a telephone survey of 7,415 youth aged 9 to 15 (2010).

Teens are more likely to report cyberbullying to parents than to adults at school (Agatston *et al.*, 2007). Three basic strategies for cyberbullying education for parents have been proposed. These include nurturing children by providing open lines of communication, providing structure by enforcing limits on computer use, and joining children in their world in appropriate ways while respecting privacy (Hannah, 2010).

Parents may find filtering and blocking software useful. One study found youth exposure to sexual material in twenty-five percent of homes with filtering software compared to forty-three percent of households without preventive software (Ybarra*, et al.*, 2005). Fifty-four percent of parents of internet users report using parental controls or filtering software for their child's online activities (Lenhart*, et al.*, 2011).

It is important to teach adolescents good judgment and critical thinking with regards to social media and Internet use. This is more important than simply restricting access. Filtering and blocking software do not block all objectionable content, nor do they prevent future exposure to it. Additionally, restricting sites may not be sufficient to prevent adolescent use. Forty-four percent of online teenagers report lying about their age in order to access a website or sign up for an online account (Lenhart*, et al.*, 2011).

Resources for Parents. In order to learn more about social media, parents can take advantage of resources tailored to them explaining social media. Websites designed for parents can explain the nuts and bolts of social media, as well as summarizing the risks and benefits of use. For example, the website iKeepSafe offers an electronic booklet called "A Parent's Guide to Facebook" written by ConnectSafety.org. It covers guidelines on how to manage privacy and risk, as well as educating parents on how to report problems and parent adolescent Facebook users (Magid & Collier, 2012). CommonSense Media's website offers a section containing handouts and videos for parents to learn

more about social media. These include tip sheets and videos covering topics such as cyberbullying and online gaming. Tips for parents include teaching children about privacy settings, exhibiting caution about meeting up with online friends, and keeping an eye on how many hours children spend online (Educate Parents About Social Networking and Community, 2013). Parents may also learn more about social media in person or through books. Westlake City Schools' Health & Safety Committee in Ohio has offered a free in-person workshop introducing social media that is geared towards parents with school age children (Short, 2013). The book *Facebook for Parents*, written in cooperation with the Persuasive Technology lab at Stanford University, covers common questions parents have about social media (Fogg, 2010).

Educators

Educators play a major role in adolescent social media use. Many educators are integrating social media into their curriculums. For example, Twitter has been used for posting last-minute classroom assignments, and the use of Pinterest is on the rise for classrooms to share art projects and ideas. Integrating social media safely into classroom curriculum can teach students valuable lessons. Teachers can serve as models for children in the responsible use of social media by exhibiting responsible and private use if they have their own accounts, as well as leading class discussion on digital citizenship (Vartan, 2012). CommonSense Media's website provides curriculum toolkits which educators can use to facilitate conversations with their students, as well as learn more about issues such as cyberbullying themselves. It also offers an introduction to E-rate, a federal program giving schools discounts to obtain more affordable Internet access and telecommunications resources, as well as a toolkit showing schools how students can responsibly use such technologies. (Curriculum toolkits, 2013) The North Carolina's Winston-Salem/Forsyth County Schools school district presented social media guidelines for educators. Teachers can institute rules that should be used online by students such as protecting privacy, being honest, and thinking about consequences

(Fisher, 2012). The Teacher's Guide to Facebook presents guidelines for teachers on using social media, using it to promote school initiatives, and setting boundaries (Petronzio, 2012).

Health Care Providers

Pediatricians and family physicians are in an excellent position to encourage healthy use of social media and advise parents. A randomized controlled trial found that a brief physician e-mail concerning social networking websites reduced sexual references in the online profiles of at-risk adolescents (M. A. Moreno *et al.*, 2009). Since evidence suggests that social media plays a role in mental health, sleep hygiene, and obesity, it is logical for doctors to ask about the involvement of social media in their patients' complaints. Physicians should keep in mind the importance of questioning adolescents and parents about social media use when adolescents with such complaints are under their care.

DISCUSSION

Social media is here to stay and its impact on adolescent development cannot be denied. It is therefore wise to increase awareness of how to safely use social media and take advantage of it as a resource to promote healthy development.

Social media use has important effects upon the normal process of adolescent development. A growing body of research addresses social media's effects upon adolescent friendships, identities, cognitive growth, and health. One question that is raised is how social media may affect the traditional family. Do youths continue to consider parents as primary role models, or are they influenced by the online presence of peers? Additionally, how has social media affected the process of friendship formation and conflict resolution?

We also propose further investigation of the association between social media use and psychiatric illnesses. Negative status updates have been associated with depressive symptoms and can be used to identify at-risk adolescents. How can this be further developed to decrease suicide risk and identify budding psychiatric disorders?

Table 2.   Summary of Recommendations for Healthy Use of Social Media

1.	Education about the safe use of social media should start before age 8.
2.	Schools should be encouraged to institute programs and workshops for parents and students to learn the basics of social media and how to be an ethical online "netizen".
3.	Social media platforms should make bullying and suicide alerts and flags clearly visible and easy to use.
4.	Parents should consider instituting rules limiting screen time and online content.
5.	Parents should provide consent to social media accounts of adolescents under the age of 16 after reading the recent research.
6.	Legislation should restrict targeted advertisements on child and adolescent accounts.
7.	Educators and health care providers should encourage healthy social media use by encouraging discussions and instituting rules regarding privacy and responsible use.
8.	Health care providers should be alert to the role of social media when counseling adolescent patients and their parents. They should be prepared to give recommendations concerning screen time and healthy social media use.
9.	Increased funding can support systematic, long-term research to elucidate preliminary findings about social media use in adolescents.

As the Internet generation born in the 80s to 90s enters adulthood, we will begin to see social media's impact on adult functioning. Longitudinal studies will be useful to follow teens into adulthood. How may social media alter adolescents' future family and romantic relationships? Does adolescent social media use impact adult rates of substance abuse, obesity, suicide, depression, and anxiety? We can also measure the associations between adolescent social media use and career productivity. Exploring these questions may provide important insights.

SUMMARY

A growing body of evidence implicates social media in all aspects of adolescent development. It has resulted in adolescent exposure to a more complex world of social interactions. Social development can be challenged and stretched as young adults navigate relationships with an added online dimension. Teens have been found to engage in risk-taking activities online such as sharing personal information, meeting with online strangers, and cyberbullying. Social media has been found to play an integral role in identity formation, as youths use these networks as a platform for social comparison and information seeking. Cognitive effects of social media include multitasking and procrastination. Social media can also be used in a positive way to increase creativity and group engagement in online discussions.

In this article we have presented the results of our review of the literature on the impact of social media on adolescent development, with the goal of increasing understanding of how social media may impede or enhance healthy development as well as how it might be a factor in the development of mental illness. With a better understanding of the role of social media in adolescent development, parents, physicians, and social policymakers will be better equipped to help adolescents to use social media as a tool rather than a handicap to becoming a fully functioning adult.

The diversity of social media's effects illustrates the importance of teaching adolescents about privacy, safety, and using social networks ethically. Parents and educators can make use of resources with which to learn about the basics of social media and engage in discussions with their children. Adolescents can thereby learn how to be ethical and responsible participants in social media. Health care providers should be proactive about seeking information about social media's involvement in the mental and physical health of their adolescent patients.

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DISCLOSURE

None.

CONFLICT OF INTEREST

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