The Power and the Pain of Adolescents' Digital Communication: Cyber Victimization and the Perils of Lurking

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Abstract

Many adolescents are heavily engaged with social media and text messaging (George & Odgers, 2016; Lenhart, 2015), yet few psychologists have studied what digital communication means for adolescents' relationships and adjustment. This paper proposes that psychologists should embrace the careful study of adolescents' digital communication. We discuss theoretical frameworks for understanding adolescents' involvement with social media, present less widely recognized perils of intense involvement with social media, and highlight positive features of digital communication. Co-construction theory suggests that adolescents help to create the content of digital communication that shapes their lives, and that there may be strong continuity between adolescents' offline and online lives (Subrahmanyam, Smahel, & Greenfield, 2006). However, psychological theories and research methods could further illuminate the power and the pain of adolescents' digital communication. Psychologists need to understand more about subtle but potentially serious risks that adolescents might face: the agony of victimization by even a single episode of cyberbullying and the pain of social exclusion and comparison resulting from vast amounts of time reading large social media feeds and seeing friends doing things without you and comparing your inner emotional experience to everyone else's highly groomed depictions of their seemingly marvelous lives. If we seek to understand developmental psychopathology and to help youth at risk, psychologists need to embrace careful study of the content of adolescents' online communication, parents need to talk with their children about their own online experiences and become familiar with social media themselves, and clinicians need to address adolescents' online social lives in prevention and treatment programs.

Keywords

Social Media; Text Messaging; Adolescents; Cyberbullying; Social Exclusion

One April morning the mother of a 18-year-old girl woke up to find Facebook open on the family computer, with her daughter's page displayed along with a private message that was open. The message was from a boy the girl thought was a friend, the Orchestra President at a large, affluent public school. Both the boy and the girl were excellent students, accomplished violinists, and they enjoyed high status in the same social circle. The Facebook message contained a link to an online document,

a two-page, single-spaced letter from the boy to the girl announcing that he would not be inviting her to the senior prom after all as he had said he would, because he and his friends had found her blog on tumblr. Amidst the quotes and pictures and memes about music and ballet and flowers, he and some of his friends had found a few personal posts they did not like. The letter outlined a detailed, cruel analysis of the girl's personality flaws, with examples from her blog and from their in-person interactions reaching back for two years. The letter was written on behalf of the entire peer group, as if everyone agreed with him. Although the girl found another way to go to the prom and had a strong start at an outstanding college far from home, one year later she remained traumatized. She found the onset of spring painful because it reminded her of this episode of cyber aggression.

(L.M. Liles, personal communication, April 4, 2014)

On July 17, 2013, Madison Holleran posted a beautiful, filtered picture of downtown Philadelphia on Instagram, one short hour before ending her life by leaping from the top of a parking garage. She was a first year student at the University of Pennsylvania, a distance runner, who was overwhelmed by the demands of her first year of college and not sure she wanted to continue running. Her family knew she was unhappy and she had started seeing a therapist at home over Thanksgiving vacation. Over the course of the fall before she died, Madison posted uplifting pictures on Instagram with captions implying that she was having a great time at Penn, but she was not. She felt great anguish looking at friend's posts, comparing her inner experience of pain and turmoil to the positive, filtered images her friends were posting on Instagram.

(Fagan, 2015)

Online social interactions loom large in the lives of many adolescents (George & Odgers, 2016; Lenhart, 2015). The time has come for developmental and clinical psychologists to pay attention to the hidden world of adolescent peer culture revealed by examining adolescents' digital communication. Investigating the power of digital communication in adolescents' ongoing daily lives is vitally important for understanding the impact of even a single episode of cyber aggression and the pain that could result from reading feeds of friends' filtered, curated social media posts and comparing those to your own experiences (an as yet largely unrecognized risk of adolescents' engagement with social media, see George and Odgers, 2015, for a list of seven fears related to adolescents' use of mobile technology). The goal of this paper is to motivate psychologists to study adolescents' engagement with digital communication and with social media. We suggest several possible theoretical frameworks from developmental psychology that could guide further research, highlight less widely recognized risks of intense involvement with social media, and discuss positive functions that social media may serve in adolescents' lives. The paper concludes with recommendations for how clinicians, prevention scientists, educators, and parents can guide youth to use digital communication and social media in the service of positive goals.

To these questions, we bring the perspective of developmental and clinical psychologists who have been studying the content of adolescents' digital communication since 2008 (references withheld for blind review), beginning with text messaging (reference withheld

for blind review), then expanding to Facebook (reference withheld for blind review), and more recently, Instagram and Twitter (reference withheld for blind review). Our methods and results are presented in detail elsewhere, though here we will cite findings from our ongoing analyses of our large digital archive to illustrate important points. An exhaustive review of this burgeoning literature is beyond the scope of this paper, thus here we will highlight the most recent research squarely focused on adolescents' use of digital communication, drawing when needed on a few studies of young adults.

Many youth with access to mobile devices or computers are fervently involved in text messaging and social media (George & Odgers, 2016; Lenhart, 2015). Adolescents in the United States send an average of 60 text messages per day (Lenhart, 2012) and prefer to communicate with friends via text messaging more than any other mode of communication, including face-to-face interaction (Lenhart, Ling, Campbell, & Purcell, 2010). The vast majority of teenagers engage with friends via digital communication: texting (88%), Instant Messaging (79%), social media (72%), and video chat (59%, Lenhart et al., 2015). Over 20 million minors globally use Facebook, 7.5 million of whom are under the age of 13 (Consumer Reports, 2011). Adolescents are moving onto Twitter in large numbers; 24% of online teens use Twitter, up from 16% in 2011 (Madden et al, 2013). Instagram is now the preferred social media platform for 76% of adolescents (CBS News, 2014). Not only are they posting, sharing, and tweeting often many times per day, adolescents are constantly reading giant feeds of their friends' online content; "Instagram is the homework girls always do" (Simmons, 2014). Adolescents may be motivated to spend vast amounts of time reading social media by Fear of Missing Out (FOMO), defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Przybylski, Murayama, DeHaan, & Gladwell, 2013, p. 1841).

In contrast to adolescents' enthusiasm for social media, developmental and child clinical psychologists have been reluctant to study digital communication. With the exception of notable pioneers who understood in the 1990's that studying the content of Internet communication provides "a window into the secret world of adolescent peer culture, even as it offers young people a new screen for the projection of adolescent developmental issues" (Greenfield & Yan, 2006, p. 392, Subrahmanyam & Greenfield, 2008), many developmental and child clinical psychologists have been hesitant to examine what digital communication means for adolescents' relationships and adjustment. Just as a few examples, the program for a recent preconference on children's and adolescents' peer relationships attended by over 200 scholars with a day-long schedule of events included not one mention of adolescents' digital communication. The volume devoted to socioemotional processes in the latest edition of the *Handbook of Child Psychology* (Lamb & Lerner, 2015) includes 23 chapters but none addressing anything about digital communication or the fact that adolescents are living their social lives online. As of this writing, *Developmental Psychology* has published one article on text messaging and two on social media, in addition to a 2006 special section (Greenfield & Yan, 2006) and a 2012 special section focused broadly on Interactive Media (including video games, interactions with robots, and many studies relying only on self-report questionnaires, Greenfield, Subrahmanyam, & Eccles, 2012). A content analysis of coverage of all media (including television and the telephone) found that only 2.88% of articles in *Developmental Psychology* covered any form of media from 2003 – 2012 (Okdie et al.,

2014). Although a literature on digital communication is flourishing in journals on media and communication, our understanding of what digital communication means for adolescents' lives could be further enhanced by theories and methods from the field of psychology.

Theoretical Frameworks for Understanding the Power of Digital Communication for Adolescents

Theories explaining adolescents' involvement with social media must acknowledge that passive effects models of social media are likely not appropriate, because adolescents are helping to construct the content of the digital communication that could be shaping their lives (Subrahmanyam, Smahel, & Greenfield, 2006). Co-construction theory proposes "adolescents are not at the mercy of an externally created environment; they are creating, and more to the point, co-creating their Internet environment through processes of social interactions" (Subrahmanyam et al., 2006, p. 396). On the basis of coding of adolescents' communication in unmonitored chatrooms, co-construction theory goes further and argues that adolescents grapple with the same developmental issues in their online social lives as they do in their offline worlds, basic developmental issues of identify and sexuality (Subrahmanyam, Smahel, & Greenfield, 2006). Co-construction theorists argue that for youth, "…physical and virtual worlds are psychologically connected" (Subrahmanyam et al., 2008, p. 124) and that online social lives may be "psychologically continuous" with their offline social worlds (Subrahmanyam, Reich, Waechter, & Espinoza, 2008, p. 421).

Co-construction theory in its current state is highly general, and could be further informed by basic developmental theories from the field of psychology. The original framers of co-construction theory argued that as youth explore basic developmental issues online, they take advantage of the affordances of digital communication (Subrahmanyam et al., 2006). We need to understand more about how particular features of social media shape its influences on young people's lives, for example, the opportunity to immediately share with hundreds of friends and followers and to almost constantly browse social media feeds to monitor the social activities of others, as well as their numbers of friends and followers and the amount and quality of peer feedback they receive in relation to you. Particular features of digital communication and social media may pose specific developmental challenges, and theories from psychology could be useful in understanding these.

First, adolescents' engagement with social media could be fueled by their basic developmental needs for peer connection in the service of self-exploration (Gottman & Mettetal, 1986). They may crave the opportunities for peer connection that social media affords: communicating privately with individuals or publicly with a larger audience and seeking affirmation by posting pictures or commentary and receiving likes or comments. Adolescents may turn to social media as a way of understanding where they stand and how they fit in with their peer groups. By posting and reading social media, adolescents can see how their numbers of friends and followers compare to those of their peers, they can see how many peers like and comment on their posts and compare the feedback they get to what others received, and they can monitor who is doing what with whom. Some of the

desperation to monitor social media may be fueled by FOMO, and it is clear this is a source of social pain to many young adolescents. In a recent study of how 13-year-olds use social media, when asked "what is the worst thing that has ever happened to you on social media?", responses included: "Being excluded to some parties," "My best friends hung out without me, and posted it on Instagram," and "Seeing pictures posted by my friends doing things where I wasn't included" (reference withheld for blind review).

Second, adolescents might be preoccupied with social media because it is the imaginary audience come-to-life (boyd, 2014). If one form of adolescent egocentrism is imagining that the whole world is watching you and scrutinizing your every move (Elkind, 1967), what better forum to engage with peers than social media, where hundreds of followers and friends can be instantly and strategically informed of your appearance and your activities, simply by pressing a button? The relation between imaginary audience ideation and adolescents' engagement with digital communication has not been studied extensively, but early results are promising. Imaginary audience ideation was related to Facebook self-disclosure for high school students but not for college students in the Netherlands, and number of Facebook friends was weakly correlated with imaginary audience ideation (Krcmar, van der Meer, & Cingel, 2015). Imaginary audience ideation was positively associated with Facebook use for 9–26-year-olds in the US, and this relationship was mediated by behavioral rehearsal (Cingel & Krcmar, 2014). Behavioral rehearsal is a process by which adolescents may see behaviors on Facebook that they wish to emulate, mentally rehearse steps by which they could add such behaviors to their own self-presentations, and then post content on Facebook depicting the new behaviors, all the while being highly cognizant of their audience of hundreds of friends and followers. For adolescents, social media is an ideal vehicle for the presentation of self as described by Erving Goffman (1957), in which individuals engage in impression management, strategically presenting particular types of information so as to influence others' impressions.

Last, and we acknowledge that this claim is highly speculative, part of the power of digital communication for adolescents and adults alike may be that it operates via an intermittent reinforcement schedule. Behavioral psychologists have long understood that intermittent schedules of reinforcement—when behavior is only occasionally and sporadically reinforced —are powerfully rewarding and highly resistant to extinction (Ferster & Skinner, 1957). So often when adolescents and adults hear their smartphones buzz or the ping of an incoming email message, the communication received is of no consequence: a mundane text from a parent, a reminder message from a teacher about an upcoming exam, the same old pictures of cute animals being re-tweeted in the Twitter feed, or the usual parade of selfies in Instagram. However, every once in a while the incoming message is intensely rewarding: a hoped for text message from a possible romantic interest, a notice that your Tweet is being favorited and retweeted by dozens of your followers, or for an adult, the longed for message from a child away at college or the rare treat of encouragement from a former student or even a manuscript being accepted for publication. It is that rare, intensely rewarding communication that keeps adolescents and adults constantly reaching for our mobile devices. This leads some to claim that adolescents are addicted to technology. We concur with boyd (2014), "Most teens are not addicted to social media, if anything, they're addicted to each other" (p. 80). Adolescents crave the peer affirmation and connection afforded to

them by text messaging and social media, and the power of this positive reinforcement is enhanced by the fact that it is delivered via an intermittent schedule.

How Cyber Aggression Happens and Why It Hurts So Much

These same features that make digital communication so enticing for children and adolescents may also set the stage for these platforms to be a source of great pain and distress. A large and growing body of work addresses cyberbullying (for a comprehensive, meta-analytic review, see Kowalski, Guimetti, Schroeder, & Lattanner, 2014). This work has been conducted mostly using surveys on which adolescents report on how often they themselves engage in digital bullying behaviors and the extent to which they are victimized by peers (Bauman, Cross, & Walker, 2013). Questions remain about the validity of self-reports of cyberbullying (Underwood & Card, 2013); just because this is the most convenient form of assessment does not mean that it is the most accurate. Relying on surveys about frequency may keep us from understanding that although cyber aggression may be an extremely low base rate event, it hurts terribly even if it only happens once. The impact of even a single episode is potentially extremely serious because the behavior is immediately viewed by hundreds of friends and followers and is preserved forever in digital form. This section will highlight recent research on cyber aggression among adolescents: definitions, prevalence and predictors and outcomes, the relation between perpetration and victimization, whether perpetrators are unfamiliar or acquainted with victims, on which platforms cyber aggression is most likely to occur, whether peers intervene, and how our understanding of cyber aggression could be informed by research and theory on traditional aggression.

Definitions

Scholars have struggled with how to define bullying in digital contexts (see Smith, 2015, for a thoughtful discussion). Some have argued for invoking traditional criteria for bullying: the negative behavior must occur between the same individuals chronically over time and there must be an imbalance of power between the perpetrator and the victim (Olweus, 1993; Olweus, 2012). Experts who advocate these criteria conclude that cyberbullying occurs at low base rates, is an "overrated phenomenon," and does not involve any youth who do not also bully face-to-face (Olweus, 2012). Others have proposed a broader definition for cyberbullying, "aggression that is intentionally and repeatedly carried out in an electronic context (e.g., e-mail, blogs, instant messages, text messages) against a person who cannot easily defend him- or herself (Kowalski, Limber, & Agatston, 2012; Patchin & Hinduja, 2012).

Given the disagreement about whether traditional bullying definitions make sense in the digital context and the conceptual dangers of confusing aggression with bullying (Hawley, Stump, & Ratliff, 2011), we advocate the use of the term cyber aggression (Bauman, Underwood, & Card, 2013). Cyber aggression is defined as behavior aimed at harming another person using electronic communications, and perceived by the target as aversive (Schoffstall & Cohen, 2011). In the discussion below, we frame our arguments in terms of

cyber aggression, but for scholarly accuracy, use the term used by the original investigators when discussing previous research.

Cyber aggression, cyber victimization, and adjustment

In a meta-analysis of evidence to date about cyberbullying, Kowalski et al. (2014) found prevalence rates for perpetrating cyberbullying ranging from 1% to 79%, with most self-reported rates hovering around 10%. Consistent with co-construction theory, engaging in cyberbullying was strongly associated with involvement in traditional bullying. Perpetrating cyberbullying was also most clearly associated with cyber victimization, traditional victimization, age, frequency of Internet use, and moral disengagement. Protective factors for perpetrating cyberbullying were parental monitoring and perceived support from peers and others. Perpetrating cyberbullying was found to be associated with multiple forms of maladjustment: depression, low self-esteem, anxiety, loneliness, substance use, low academic achievement, and low life satisfaction. From 10–40% of adolescents reported having been the victims of cyberbullying (Kowalski et al., 2014). Cyber victimization was associated with several risk factors, including traditional victimization, traditional bullying, age, frequency of Internet use, and risky online behavior. Several protective factors emerged for cyber victimization: social intelligence, parental monitoring, parental control of technology, and perceived support from peers and others. Cyber victimization was found to be related to depression, low self-esteem, anxiety, low academic achievement, loneliness, poor life satisfaction, substance use, somatic symptoms, stress, and suicidal ideation. This meta-analysis did not find gender differences in bullying or victimization, nor did a more recent large-scale survey using a new measure of online and offline victimization (Sumter et al., 2015). A recent meta-analysis of gender differences in cyberbullying found a slight difference favoring boys, but this was moderated by age (girls reported more cyberbullying more in early adolescence, boys more in late adolescence, Barlett & Coyne, 2014).

New methods and approaches

Studies since this meta-analysis have suggested new methods and approaches for understanding exactly how cyber aggression unfolds among children and adolescents. A recent study with over 6,000 adolescents from six European countries suggested an important difference between cyberbullying and traditional bullying; for cyberbullying, there may not be a group that is only victimized (Schultze-Krumbholz et al., 2015). Latent class analyses for involvement with cyberbullying found only three classes: non-involved (70%), bully-victims (26%) and perpetrators with mild victimization (4%). As the authors sugest, perhaps no victim-only class emerged because of the online disinhibition effect (Suler, 2004); it may be easier for victims of cyber aggression to retaliate in the digital context because of anonymity, invisibility, and less concern about differences in physical size. If it is the case that most victims of cyber aggression lash back, this will have important implications for prevention and intervention programs.

Research continues to suggest strong overlap between traditional and cyberbullying, in keeping with co-construction theory, and that adolescents are most often hurt by peers they know. On the basis of surveys with over 28,000 adolescents in the United States, Waasdorp and Bradshaw (2015) found that 23% of youth reported being the victim of any type of

bullying in the last month (physical, verbal, relational, and cyberbullying). Of those who had been bullied, 50% reported having been victims of all four types of bullying, whereas only 4.6 reported having been only been the victim of cyberbullying. Still, having been the victim of cyberbullying conferred additional risk for internalizing and externalizing problems. Sadly, 32.7% of youth reported that the harmful digital communication came from someone they thought was a friend, and 27.7% said it was from someone in their school.

Because adolescents are constantly attracted to changing digital platforms and 71% use more than one social networking platform (Lenhart, 2015), it is important to continue to examine in what digital contexts cyber aggression is mostly likely to occur. Recent evidence suggests that the most frequent contexts for cyber aggression are social media and text or Facebook messaging. US Middle schoolers reported that cyberbullying occurs mostly often on Facebook (60%), other technology platforms (31.5%), and text messaging (25.7%, Rice at al., 2015). High school students in the US report that they most frequently experienced cyber victimization on social networking sites (62%) but also via text or other types of messaging (40%, Waasdorp & Bradshaw, 2015). A large sample of 16–19 year-olds from New Zealand reported that harassment via mobile phone was more common and distressing than Internet harassment and that the most hurtful form of harassment was receiving mean messages (Fenaughty & Harre, 2013). For a sample of US 8 – 13-year-olds, involvement with multiple social network sites predicted involvement in cyberbullying over one year's time (Meter & Bauman, 2015).

Because cyber aggression can be subtle and difficult for adults to detect even if they are able to monitor adolescents' digital communication, it is important to understand when and how adolescents intervene with each other. Thirty five percent of 9–16-year-olds from Belgium reported having witnessed cyberbullying (Van Cleemput, Vandebosch, & Pabian, 2014). Of these witnesses, 59% reported that they remained passive and did nothing, 45% said that they had helped the victim, and 5% said they had joined the bully. Remaining passive when witnessing cyberbullying was related to older age, lower levels of empathy, having been the victim of traditional bullying, and moral disengagement.

On the basis of observing adolescents' digital communication since 2008 (reference withheld for blind review), we argue that cyber aggression both occurs at low base rates and is extremely hurtful. Cyber aggression is used, even only occasionally, by high status youth who would never sully their hands with physical violence and would never be so mean to someone's face. Although this could be viewed as counter-evidence for co-construction theory, it supports the proposition that the affordances of social media allow adolescents to explore new behaviors (Subrahmanyam et al., 2006). Via social media, youth may engage in cyber aggression with few negative consequences from adults and perhaps even reinforcement from the peer group, in the form of likes, comments, and retweets. Cyber aggression moves across digital platforms, reaches outside of schools and into homes, cannot be forgotten and is repetitive even in the form of a single episode because the victim and throngs of bystanders can read and reread the hurtful communication. Even if cyberbullying base rates are low (Olweus, 2012), the impact of this behavior could be enormous. As in the example at the beginning of this article, if an adolescent experiences cyber aggression even once, she is a victim, because she chronically re-experiences the harm

by rereading the cyber aggression and experiencing the humiliation of the peer group having witnessed it.

Fully appreciating the psychological impact of cyber aggression requires examining how adolescents use digital communication in their daily lives and why it means so much to them. Co-construction theory supports that cyber aggression should hurt at least as much as face-to-face aggression because of the continuity between adolescents' online and offline social lives, but it does not go quite far enough in explaining why cyber aggression might hurt differently. If adolescents crave digital communication because it is a venue for connecting with peers and exploring identity and sexuality, if they are keenly aware that all of their friends and followers in their large digital (and no longer so imaginary) audience are observing and even scrutinizing their every digital communication, and if this communication is highly reinforcing on an intermittent schedule, then no wonder adolescents are so devastated by cyber aggression, even one experience.

Although our focus here is cyber aggression in keeping with the theme of digital communication, it is important to remember that much remains to be understood about face-to-face forms of aggression and bullying. Experts have suggested that cyber aggression is not a distinct form of aggression, but instead, simply a different context in which aggression can be expressed, thus understanding of cyber aggression must be guided by theory and research on aggression (Mehari, Farrell, & Le, 2014). Noting the serious theoretical fragmentation in research on cyberbullying, Kowalski et al. (2014) proposed the general aggression model (Anderson & Bushman, 2002) as a useful conceptual framework for future research on cyberbullying. Research on cyber aggression will continue to be informed and stimulated by research on traditional aggression. A recent special issue of the *American Psychologist* on School Bullying and Victimization focused on traditional bullying, but noted several important points about cyberbullying. Whereas physical bullying may be declining, cyberbullying may be on the rise (Hymel & Swearer, 2015; Smith, 2015). Cyberbullying may be more distinct from traditional bullying than previously thought (Hymel & Swearer, 2015). Cyberbullying may be more of a new modality for verbal and social aggression rather than a qualitatively different behavior from traditional bullying (Cornell & Limber, 2015). Legal definitions of bullying include cyberbullying (Cornell & Limber, 2015). All of these points raise important empirical questions that must be answered as we move forward in understanding cyber aggression, and each of these questions would be informed by examining the content of adolescents' digital communication.

Less Obvious Forms of Digital Harm: The Potential Pain of Lurking, Social Comparison, and Constantly Being Able to Quantify Social Status and Peer Regard

As painful as being the victim of even one episode of cyber aggression might be, there may be a much harder to measure risk of adolescents' intense engagement with digital communication, the potential for stress and negative moods caused by constantly reading social media feeds. Adolescents not only post on social media, they report spending vast amounts of time lurking, reading social media feeds of their hundreds of friends and

followers (Lenhart, 2015; reference withheld for blind review, 2015). Although very little research has specifically examined possible consequences of adolescents lurking online, this section will marshal the evidence available to consider the risks: why reading social media feeds appeals to adolescents, frequency of this behavior, what they might observe, implications for adjustment, possible mechanisms such as social comparison and the correspondence bias, and individual differences in the impact of reading social media feeds.

Adolescents' interest in scrolling through social media feeds is consistent with co-construction theory in two ways. First, given the connectedness of their online and offline social lives, it certainly seems understandable that adolescents would use what social media provides, an always available window into everyone else's social worlds. Second, scrolling social media feeds allows adolescents a means of working on key developmental processes of adolescence: formulating an identity, gossip in the service of self-exploration, and negotiation of social norms (Gottman & Mettetal, 1986).

Here again, though, co-construction theory does not go far enough in predicting or explaining the impact of particular features of social media platforms. For example, Instagram is a social media platform popular among younger teens that is based entirely on posting images, which can be edited and altered with a number of filters, in which friends can be tagged (but only 10), to which followers can respond with likes and comments. The etiquette of Instagram seems to be to post pictures only once per day, and to post pictures that are highly curated, filtered to be beautiful or selected carefully to present oneself in a positive light. Constantly reading a social media feed full of friends' highly groomed, sanitized, positive representations of their lives and social activities could pose risks for adolescents, due to the stress of constantly monitoring for signs of status and exclusion and the very real possibility of social comparison that could make vulnerable adolescents feel worse about their own lives. In a recent national survey in the US, 53% of adolescents reported having seen social media posts about social events involving friends to which they had not been invited, and 21% acknowledged feeling worse about themselves because of what they had seen friends post on social media (Lenhart et al., 2015). Reading social media feeds could also breed relationship jealousy. In a qualitative study with Mexican American adolescents, use of digital communication was associated with jealousy in romantic relationships and with mistrust due to online surveillance of partners' activities (Rueda, Lindsay & Williams, 2015).

Little empirical research has examined what adolescents call "lurking", reading social media feeds without posting. The scant evidence available suggest that adolescents frequently check social media without posting anything themselves. Twenty four percent of teens report going online almost constantly, which is facilitated by the fact that almost three quarters of adolescents own smart phones (Lenhart, 2015). When adolescents read their social media feeds, they are likely seeing highly groomed pictures on Instagram and taking note of how many likes and comments others' posts get in comparison to theirs, monitoring all social media for who is doing what with whom and likely seeing evidence of close friends getting together without them, and comparing their experience of their own emotional and social lives to what they see of others on social media.

Psychologists need to understand much more about what this constant reading of social media feeds means for adolescents' adjustment. At the least, the time spent scrolling through social media content may be at the expense of other developmentally important activities, not only face-to-face interactions, but also homework, reading, self-reflection, planning, problem-solving, and day dreaming. Intense engagement with social media also interferes with sleep, which is related to lower satisfaction with school (Vernon, Barber, & Modecki, 2015). At the worst, spending vast amounts of time viewing others' highly curated depictions of their social lives could make vulnerable adolescents feel terrible about their own lives. A tragic example is a highly publicized account of first year college student named Madison Holleran, who took her own life after struggling to adjust to her first semester of college, during which she posted upbeat pictures of her social world on Instagram while telling close friends how pained she was by viewing others' positive pictures of their social lives (Fagan, 2015). In one of the few empirical studies to date to focus on Instagram, Instagram use by young adults was marginally, positively associated with depressive symptoms, especially for those who followed large numbers of strangers (Lup, Trub, & Rosenthal, 2015).

Only a few studies with adolescents have examined risks associated with spending vast amounts of time online. The American Academy of Pediatrics Council on Communications and Media released a report in 2011 raising the possibility of Facebook Depression, defined as "depression that develops when preteens and teens spend a great deal of time on social media sites…" (O'Keefe, Clarke-Pearson, and Council on Communications and Media, 2011, p. 802), but the report cited little empirical evidence. Daily Internet use was related to compulsive Internet use for a Dutch sample of 11–12-year-olds, defined as the inability to regulate online activity including an inability to stop using the Internet, adolescents' thoughts and behaviors being focused on Internet use, feeling distressed when prevented from using the Internet, using the Internet to avoid unpleasant emotions, and using the Internet in ways that causes conflicts with others (van der Aa et al., 2009). Compulsive Internet use was related to loneliness, depressive symptoms, and low self-esteem. The relation between compulsive Internet use and loneliness was stronger for adolescents who were higher on introversion and lower on emotional stability and agreeableness. Only one prior study has investigated specifically how time spent viewing social media feeds may relate to psychological adjustment for adolescents. In a study with Belgian high school students, Frisson and Eggermont (2015) assessed active Facebook use (updating one's own status and Facebook messaging) and passive Facebook use (viewing others' social media profiles to obtain information about their lives). There were no gender differences in passive Facebook use, but passive Facebook use related to symptoms of depression for girls only. For boys only, public Facebook use related to depressive symptoms. The measure used in this study probably underestimated what adolescents define as lurking, reading your social media feed without posting, because it assessed only how often they visited a friend's Facebook profiles or viewed the profile of a non-friend.

Intense involvement with Facebook may be related to poor psychological health. Focus groups of adults identified five types of stress related to Facebook: dealing with annoying content, lack of privacy, social comparison and jealousy, and relationship conflict (Fox & Moreland, 2015). A survey study with US college students found that self-reports of

frequency of using Facebook were related to elevated levels of psychological distress both directly and via increased communication overload and decreased self-esteem (Chen & Lee, 2013). In a time sampling study in which investigators texted young adults in the US five times per day to assess their Facebook use and mood, Facebook use predicted decreases in life satisfaction and loneliness predicted Facebook use (Kross et al., 2013). Another survey study of first year university students in the US also found that young adults who are already vulnerable may be especially attracted to Facebook; anxiousness, alcohol use, and marijuana use predicted emotional attachment to Facebook (Clayton, Osborne, Miller, & Oberle, 2013). However, another study using experience sampling techniques to assess Facebook use did not find associations between use of the social networking site and clinical levels of depression (Jelencheck, Eickhoff, & Moreno, 2013), which suggests that some of the significant relations may only be for symptoms in the subclinical range and may also depend on how Facebook use is assessed.

How Facebook use relates to adjustment may depend on the individuals' motives. Although posting status updates was negatively associated with positive social adjustment and positively related to loneliness for a sample of US college students, these relations did not hold for those who reported using Facebook for the purpose of maintaining relationships (Yang & Brown, 2013). A study with a community sample of adults from Australia found that feeling a sense of connectedness via Facebook was related to reporting fewer symptoms of anxiety and depression and greater life satisfaction (Grieve, Indian, Witteveen, Tolan, & Marrington, 2013).

Taken together, these studies provide support for a classic hypothesis about online relationships, "the rich get richer and the poor get poorer" (Kraut et al., 1998), which is consistent with co-construction theory. Adolescents with positive offline social relationships may show social competence in their use of social media and receive a lot of peer affirmation in return, whereas those who are lonely or introverted or less well-regulated may experience more negative consequences of intense involvement. For a sample of 10–15-year-olds in the Netherlands, adolescents with peer difficulties were more likely to receive negative feedback on social media (Koutamis, Vossen, & Valkenburg, 2015).

If social media use is associated with poor psychological adjustment perhaps especially for those who are lonely or disconnected, why might that be? Research with college students suggests that using Facebook may breed the type of social comparisons associated with depression (Feinstein et al., 2013). Facebook provides many opportunities to observe others' lives and social activities, and when provided with this type of information about other people, we tend it to compare it to information about ourselves (Mussweiler, Ruter, & Epstude, 2006). If we see others as better off in some way, this can lead to negative self-evaluations (Festinger, 1954).

Another possible explanation for why excessive viewing of Facebook might relate to negative adjustment is the correspondence bias, viewing others' behaviors as indicating stable personality traits rather than situational factors (Jones, 1979; 1990). When viewing others' highly curated depictions of their happy lives on Instagram or Facebook, adolescents and adults alike may tend to assume that their friends are happy all of the time, rather than in

response to a particular context or situation. College students who reported spending more time on Facebook perceived that others were happier than they are and had better lives (Chou & Edge, 2012).

Both co-construction theory and empirical evidence provide support for the inverse of the rich get richer hypothesis for lurking, the poor get poorer. Two groups may be particularly vulnerable to negative effects of lurking, those with peer problems in their offline lives, and perhaps also, girls. For US adolescents, using social media for social comparison and feedback seeking predicted depressive symptoms over one year's time, but this relation was stronger for adolescents lower in popularity, and for girls (Nesi & Prinstein, 2015). Girls are heavier consumers of visually oriented forms of social media than boys are (Lenhart, 2015). Girls are also more prone to rumination (Jose & Brown, 2008) and co-rumination (Rose, 2002), than boys are, thus if they feel distress about what they see on social media, they may be more likely to go dwell on it or discuss feelings of inadequacy or exclusion with friends, which might contribute to increased feelings of sadness. Given the vast amounts of time that adolescents spend reading social media feeds, psychologists need to understand much more about the perils of lurking.

What Can Psychologists Learn by Examining the Content of Digital Communication?

Directly observing the content of digital communication will allow researchers and clinicians to better understand the importance of these social environments for adolescents' peer relations and adjustment. Our research team has used direct observation to investigate how digital communication relates to internalizing symptoms, externalizing symptoms, and the development of substance use (references withheld for blind review). Furthermore, examining the actual content digital communication has allowed us to test whether existing psychological theories apply in these new contexts.

Directly observing adolescents' Facebook content has helped us better understand the relation between internalizing symptoms and digital communication. Although frequently discussing one's problems with peers, called co-rumination, increases a sense of closeness between friends, it also exacerbates both adolescents' and their peers' depression and anxiety symptoms over time, particularly among girls (Rose, 2002; Schwartz-Mette & Rose, 2012). Co-construction theory would suggest that social processes such as co-rumination might also occur in digital communication. Adolescents who experience internalizing symptoms such as anxiety, depression and sadness may use social media as a forum for discussing these problems and seeking peer feedback and encouragement. Although posting about one's problems may allow adolescents to seek solace from their peer network, it may also reinforce these internalizing symptoms, and even cause negativity to spread throughout the social network (Kramer, Guillory & Hancock, 2014). Directly observing the Facebook statuses of 125 adolescents (and subsequent comments received from peers) over two months revealed numerous examples of adolescents expressing their sadness and depression (and subsequent peer responses, reference withheld for blind review). The example below

illustrates the participant using Facebook to discuss her problems and sadness, which is met with support from the peer:

| Status: | Stephanie | I'm seriously so depressed. With 2 weeks of no improvements with my knee and being unable to run, it looks like I'm going to be walking the half marathon. One year of blood, sweat, and tears... All wasted. |
| Comment: | Ana | Not wasted- you raised money to help people who wish they could walk a half marathon. Keep in mind, this race is bigger than you- there will be other half marathons in your future! :) |

Girls who exhibit internalizing symptoms were more likely to post about somatic complaints, request support from their peers, and express negative affect than their peers with low internalizing symptoms (internalizing symptoms were unrelated or negatively related to boys' posting behaviors; reference withheld for blind review, 2016). Furthermore, girls with internalizing symptoms also received more comments from their peers than other girls, and these comments contained both negative affect and offers of support more often. Although receiving support from peers when discussing depression and sadness as in the example above may be immediately helpful, it may actually contribute to increases in these symptoms over time (Rose, 2002; Schwartz-Mette & Rose, 2012). These findings suggest that adolescent girls' pre-existing internalizing symptoms are displayed in their social media communication, and these girls received differential responses from their peers. Further research is needed to understand if these interactions predict subsequent increases in internalizing symptoms, but examining the content of these posts provides preliminary evidence that consistent with co-construction theory, something akin to the co-rumination process occurs via social media platforms.

In addition to internalizing symptoms, we have also examined whether digital communication relates to externalizing problems. Specifically, we were interested in whether deviancy training operates in digital contexts. Deviancy training is the process in which communication about antisocial topics is reinforced and encouraged. This in turn conveys instrumental information about how to engage in antisocial behavior and also encourages this behavior as appropriate within the social group, which in turn predicts increases in antisocial behavior (Dishion, Spracklen, Andrews & Patterson, 1996). Here again, co-construction theory would suggest that deviancy training may occur in digital communication as well as in face-to-face interactions.

When we examined the content of text messaging, we saw clear examples of deviancy training. The example below highlights both the informative and encouraging nature of these conversations, in this case about smoking marijuana.

Saturday:

(11:23:21 AM) Michelle says to Griffin (P):

Have you seen {the Pixar movie "Ratatouille"} while flying {getting high}? You need to.

(11:23:23 AM) Griffin (P) says to Michelle:

I should, but i dont feel like flying right now. Im waiting until the mall tonight.

(11:23:25 AM) Michelle says to Griffin (P):

Haha wow dude. How many wings {how much marijuana} do you have? Its like a freaking endless supply

(11:23:27 AM) Griffin (P) says to Michelle:

Lol i have bought 85 dollars worth in all my weed life. It lasted for a long time. Still lasting.

(11:23:29 AM) Michelle says to Griffin (P):

Dang son.

(11:23:31 AM) Griffin (P) says to Michelle:

I didnt buy it all at once! And i use a pipe which conserves weed. Its amazing shit what pipes can do.

(11:34:11 AM) Michelle says to Griffin (P):

Yeah dude I see that now

(11:34:14 AM) Griffin (P) says to Michelle:

Lol hey i always get my shit from my guy in {town}. He gets me lots for cheap, like $20 for 5 grams.

(11:34:17 AM) Michelle says to Griffin (P):

Haha you've gotten the connections

(11:34:20 AM) Griffin (P) says to Michelle:

Yeah i only buy from Nick if i want that A-1 shit. That is the best shit ever.

(11:34:22 AM) Michelle says to Griffin (P):

Haha. Alright. I don't wanna get hooked.

(11:34:26 AM) Griffin (P) says to Michelle:

Lol dont! Its expensive. But yeah dont buy from Nick its too expensive and it would ruin other types of weed cause they wont get you as high as A-1. (reference withheld for blind review, 2012)

Note: "P" indicates the target participant in our longitudinal study. Participants' names have been changed.

Although deviancy training had been well established in face-to-face settings (Dishion, McCord & Poulin, 1999; Dishion et al., 1996), only by directly observing text messaging could we identify that this process also occurs digitally. More importantly, exchanging these messages is associated with similar increases in rule-breaking and aggressive behavior (reference withheld for blind review). Direct observation allowed us to watch this process unfold. By examining the actual content of this communication, we are able to move beyond simple associations and begin to understand the actual processes by which digital communication bears on adolescents' adjustment.

Although examining the content of adolescents' digital communication is truly a window into their social worlds, using these methods poses practical and ethical challenges. A practical challenge for researchers studying digital content can be the difficulty in interpreting what the communication actually means, because of the creative ways that youth use language, especially in texting and other types of dyadic messaging, but also because information about context could be lacking. Ethical challenges include the risk that getting fully informed consent could alter the way adolescents use digital communication (though empirical evidence suggests that it does not), how to handle content that comes into a digital archive from those who did not give consent (friends or family members of the target participant), and how to respond to disclosures or suicide or abuse, or detailed information about illegal activities (for a discussion of solutions to these challenges, see reference withheld for blind review).

Potential Positive Features of Engagement with Social Media

As psychologists investigate the importance of digital communication in adolescents' lives, it will be important to acknowledge that digital communication may be positive and have developmental benefits for adolescents (George & Odgers, 2016). Co-construction theory would suggest that youth who have positive social interactions in their online lives would also use social media in the service of positive goals. Youth may use digital communication for microsocial planning, discussing school work, and exchanging important information with peers and parents, in addition to working through fundamental developmental challenges such as identity formation and sexual exploration (Subrahmanyam et al., 2008). Youth report that social media is a positive force in their lives (Lenhart, 2015): 83% report that social media makes them feel more knowledgeable about their friends' lives, 70% say that social media helps them understand their friends' feelings, and 68% report that they have received social support from people on social media at difficult times in their lives. In one of our studies with 13-year olds, the great majority said that social media makes them feel good about themselves (40% sometimes, 40% often, and 4% very often, reference withheld for blind review). Although few studies have investigated prosocial behavior via social media, the evidence available suggests that consistent with co-construction theory, young adults who are high on prosocial behavior in face-to-face interactions are more likely to engage in prosocial behavior online: saying nice things, offering help, cheering others up, and letting others know they care (Wright & Li, 2015). Understanding more about how adolescents use digital media in the service of positive goals will be important for developing better recommendations for adults who wish to guide adolescents in their use of text messaging and social media.

Implications for Parents, Educators, Clinicians, and Prevention Scientists

Psychologists need to work to motivate parents, teachers, and policy makers to teach digital citizenship in a way that is respectful and effective. Clinicians working with adolescents in distress need to be sensitized to the importance of social media in adolescents' lives, trained to assess social media use in assessment and to address negative online behaviors and experiences in treatment. All adults working to guide adolescents in positive use of digital communication must acknowledge the psychological continuity between adolescents online

and offline lives (Subrahmanyam et al., 2008); online social experiences matter deeply to may adolescents.

Parents

Many parents feel overwhelmed by their children's engrossment with social media, as if they cannot possibly keep up, for understandable reasons. First, adolescents are constantly embracing new digital platforms (Lenhart, 2015) and to understand them all is daunting to digital non-natives. Second, even if parents buy monitoring software, it may not be that helpful. Teenagers are adept at creating new accounts to avoid monitoring and at disabling or working around monitoring applications and software. In an online survey conducted by McAfee (a security technology firm), 70% of teens reported avoiding parental monitoring of their online communication and 45% said they had hidden their online behaviors from parents by hiding or deleting messages, clearing browser histories, or relying on smart phones for digital communication that are harder for parents to check (McAfee Security, 2012). Third, even if a parent has access to passwords, the massive quantity of most adolescents' social media feeds outstrips even the most vigilant parents' efforts to monitor. Last and perhaps most worrisome of all, hurtful online social experiences such as social exclusion may be so subtle that they are difficult to detect, even for parents who are vigilant and care deeply about adolescents' social lives.

Even if parents cannot possibly keep up with everything their adolescent children do on social media, there are several steps parents can and do take (Anderson, 2016). First, parents can join social media platforms and be friends or followers of their adolescent children. If youth are posting photographs and messages to the public to attract followers, parents need to be able to see what they are putting out to the world. Also, using social media occasionally will quickly help parents to understand the reinforcing properties of social media, especially how good it feels when friends like and share what you post. Being the child's friend or follower will make it easier to monitor who is following your child and to quickly get information if conflicts arise. Viewing what adolescents post on social media is a valuable window into their social worlds, though parents should not assume that sunny posts indicate the absence of depression or anxiety given that some teens prefer to post positive, highly groomed content. Second, parents can structure their homes and their children's time to guard against excessive involvement with social media. All family members' phones can be charged overnight outside of everyone's bedrooms, to prevent sleep from being interrupted by digital communication throughout the night. Parents can insist that no one has mobile devices nearby during meals or other family gatherings. Parents can point out to their children the power of intermittent reinforcement, remind them that a lot of what they see and receive may not be vitally important, and encourage them to put phones aside from time to time. Last and perhaps most importantly, parents can talk with their adolescents about their online social lives, from the beginning, so that children might feel more comfortable turning to parents when problems arise. Adolescents seem unlikely to share hurtful online experiences with parents; of high school students who said they had been victimized, only 32% told a parent (Waasdorp & Bradshaw, 2015). Perhaps this is because they do not know how to bring it up, or because they believe their parents would not be interested.

Clinicians and prevention scientists

Family physicians and pediatricians could do much to promote healthy media use for adolescents. They could initiate parent education about social media early, ideally prior to age 8, and encourage parents to limit screen time and direct parents to online resources supporting health media use (Hur & Gupta, 2013). In a randomized control trial, just one email from a pediatrician outlining potential perils of social media use led to at-risk adolescents posting fewer sexual references in their online profiles (Moreno et al., 2009). Counselors working with adolescents need to understand the potential power and pain of digital communication for their clients and to acknowledge the psychological continuity between adolescents online and offline social lives. Intake interviews should include questions assessing involvement in text messaging and social media, as well as how digital communication makes young people feel. For those who are experiencing distress related to digital communication, therapy should address adolescents' online lives and guidance in healthy media use.

Last, given that digital communication is here to stay and adolescents are entranced with so many of its features, psychologists' expertise could be helpful in harnessing the power of digital communication for prevention and intervention programs. If co-construction theory is correct that there is great psychological continuity between adolescents online and offline social worlds, then digital communication should have the power to influence behavior in both spheres. Experts in education and public health have used text messaging with some success for prevention and intervention with adolescents: promoting interaction in the classroom (Scornavacca, Huff, & Marshall, 2009), delivering academic content (Librero, Ramos, Ranga, Trinona, & Lambert, 2007), supporting students in the transition to university life (Harley, Winn, Pemberton, & Wilcox, 2007), and providing sexual health information to at risk youth (Levine, McCright, Dobkin, Woodruff, & Klausner, 2008). Given that adolescents spend vast amounts of time reading social media feeds, social media could be a powerful way to promote mental health among adolescents (see Hur & Gupta, 2013, for a review). Just as a few examples, Facebook collaborated with a British mental health organization called Samaritans to launch a suicide alert page (McHugh, 2011), Facebook and Myspace have online mechanisms for reporting negative online behavior including harassment and hate speech, and Internet Solutions for Kids (2013) developed an online forum called Cyberbully411 where adolescents can discuss cyberbullying. Twitter accounts could be created with catchy names, fun pictures, and clever memes to promote small pieces of content to promote physical and mental health. Psychologists' expertise in persuasion could be powerfully helpful in harnessing the power of text messaging and social media to change social norms in positive ways for typically developing youth as well as youth at risk. Psychologists' expertise in persuasion could also be useful in convincing those in charge of social media platforms to take responsibility for making privacy controls more straightforward, promoting awareness of potential perils of overuse of social media, and structuring platforms to encourage positive use of social media, as Facebook has done by having a button for "like" but not for "dislike."

Conclusion

Because adolescents are so intensely involved in digital communication, the odds are great that some will be hurt by their online experiences, but not in the ways many adults might expect. Adolescents may be deeply wounded by even a single experience of cyber victimization, which will most often happen at the hands of a friend. Vulnerable adolescents may suffer the pain of social exclusion by constantly seeing pictures of friends gathering without them, or photographs of parties to which they were not invited. Constantly reading social media feeds full of highly filtered, curated pictures of friends and followers having a wonderful time could make youth feel worse about their own lives, to the point of being depressed.

Psychologists need to rise to the challenge of systematically studying the content of adolescents' digital communication, testing established theories in this context and developing new ones if needed, and bringing our methodological expertise to understanding adolescents' online lives. As boyd (2014, p.127) suggests, "What makes the digital street safe is when teens and adults collectively agree to open their eyes and pay attention, communicate and collaboratively negotiate difficult situations. Teens need the freedom to wander the digital street, but they also need to know that caring adults are behind them and supporting them wherever they go."

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