



Full length article

# Unplugged: Exploring the costs and benefits of constant connection

Virginia Thomas<sup>\*</sup>, Margarita Azmitia, Steve Whittaker

University of California, Santa Cruz, Psychology Department, Social Sciences 2, 1156 High Street, Santa Cruz, CA 95064, United States

## ARTICLE INFO

### Article history:

Received 23 March 2016  
 Received in revised form  
 12 May 2016  
 Accepted 26 May 2016

### Keywords:

Computer-mediated-communication  
 Digital natives  
 Digital immigrants  
 Internet  
 Media refusal  
 Loneliness

## ABSTRACT

Computer-mediated-communication (CMC) is a ubiquitous part of people's lives, yet little research has investigated attitudes about unplugging, also known as media refusal. In this large-scale lifespan study we surveyed 446 participants ages 14–79 about their feelings and attitudes toward unplugging from CMC for 24 h. We also probed their actual recent experiences of unplugging. We were particularly interested in age differences. As predicted, younger people reported more negative feelings about unplugging, and people who reported higher scores on a loneliness survey also expressed more negative feelings. However, contrary to our hypothesis, there were no significant age differences in the length of time participants typically spent unplugged. Open-ended responses revealed that participants felt a mix of emotions about unplugging from CMC and were ambivalent about its use for connection; "connecting with family and friends" was listed as both a loss and a gain of unplugging. In addition, prior experience unplugging predicted less anxiety about a future anticipated unplugging experience. We discuss age-related themes that emerged about costs and benefits to unplugging, anticipated unplugging activities, reasons for unplugging, and the inherent complexity of retreating from the web of digital technology and its pull of readily available community, connection, and information.

© 2016 Elsevier Ltd. All rights reserved.

## 1. Introduction

Most of us are online much of the time. In developed countries the ubiquity of personal mobile devices offers constant access to email, text, and social media. In the U.S. for example, 81% of adults use the Internet or email (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015), and 64% of adults now own a smartphone; moreover, 19% are "smartphone dependent"—their phones are the only or the primary way they are able to access the Internet (Smith, 2015). Since the early days of the Internet, researchers have been interested in people's on-line behaviors, from participating in chat rooms and social networking sites to using more recent forms of computer-mediated communication (CMC) such as instant messaging and Facebook. Despite the growing literature on various aspects of people's relationship with digital technology, we know very little about people's attitudes about unplugging from such technology. Understanding this is important, as evidenced by the phenomenon of media refusal, or *pushback*, in which users periodically or permanently abstain from some or all social media usage

(Foot, 2014; Morrison & Gomez, 2014; Portwood-Stacer, 2012). In this lifespan study we investigated age-related behaviors and attitudes about unplugging from CMC for 24 h, including the perceived costs and benefits of abstaining from these media.

### 1.1. CMC: more harm than good?

Public concern about the current trend of constant connectivity has led to a glut of popular books advocating the merits of totally unplugging (e.g. Maushart, 2011; Sieberg, 2011), and the ushering in of a nascent unplugging movement. For example, the National Day of Unplugging during March of every year follows the Jewish tradition of a day of rest in which individuals pledge to spend 24 h completely unplugged from their devices ([www.sabbathmanifesto.org](http://www.sabbathmanifesto.org)). The organization Digital Detox organizes digital unplugging retreats at [Camp Grounded](http://Camp Grounded), where adults can "disconnect to reconnect" ([www.campgrounded.org](http://www.campgrounded.org)). Finally, the Bored and Brilliant Project organizes a structured week of daily challenges to help individuals unplug and embrace their creativity (Zomorodi, 2015); over 4600 people completed the challenge in the first month of the project. Clearly, these popular initiatives are tapping into a growing concern about the relationship individuals have with their mobile devices and the amount of time spent in front of a screen.

Research has been mixed on whether CMC causes more harm

<sup>\*</sup> Corresponding author.

E-mail addresses: [vdthomas@ucsc.edu](mailto:vdthomas@ucsc.edu) (V. Thomas), [azmitia@ucc.edu](mailto:azmitia@ucc.edu) (M. Azmitia), [swhattak@ucsc.edu](mailto:swhattak@ucsc.edu) (S. Whittaker).

than good for users, with benefits such as increased social support (Amichai-Hamburger & Hayat, 2011; Parks, 2011), social capital (Ellison, Steinfield, & Lampe, 2011), self-disclosure and intimacy (Valkenburg & Peter, 2009) contrasting with negative effects such as addictive behaviors (LaRose, Kim, & Peng, 2011), loneliness (Hu, 2009), and distraction (Strayer & Cooper, 2010). Concerns exist specifically for children and adolescents, with claims that constant CMC access disrupts family interactions and hinders the development of social skills (Turkle, 2011), reduces physical activity and exposure to nature (Louv, 2008), and introduces the risk of cyber-bullying (Smith et al., 2008). Research is also mixed on whether frequent digital communication is related to loneliness. On the one hand, some studies have shown that people who regularly access social networking sites are lonelier than those who do not (Brandtzaeg, 2012) and that, unlike face-to-face communication, CMC usage is ineffective for alleviating loneliness and in fact can actually increase it (Hu, 2009). On the other hand, research indicates that because CMC is generally used to maintain existing friendships and social networks (Burke & Kraut, 2014), communicating with close social ties on CMC stimulates rather than inhibits social connectedness by facilitating self-disclosure and intimacy (Valkenburg & Peter, 2009). In particular, for emerging adults, using the social networking site Facebook encourages emotional disclosure and results in higher levels of perceived social support (Manago, Taylor, & Greenfield, 2012). Research has also indicated that for college students, using CMC facilitates face-to-face social interaction (Jacobsen & Forste, 2011), likely because they use such platforms as an effective mechanism for both initiating social contact with new friends and maintaining close connection with current friends and family.

## 1.2. Previous studies of unplugging

Whereas research exploring the uses, effects, and potential benefits of CMC are rapidly multiplying, (for a review, see Coyne, Padilla-Walker, & Howard, 2013), empirical studies investigating the phenomenon of unplugging from such media are scarce. Our review of the research located three such studies, each focused on a specific population. In one study, 56 adults spent several days backpacking in remote wilderness, disconnected from all digital technology. After four days immersed in nature and away from CMC, these adults experienced a 50% increase in creative thinking and problem solving (Atchley, Strayer, & Atchley, 2012). A second study asked 51 pre-teens to withdraw from all screen time, including television, computers, and phones. After five days, this group experienced significant increases in emotion recognition compared with a control group—the unplugged pre-teens were significantly better at correctly inferring emotions from facial cues in person and on video (Tehrani, 2013). These two studies indicate that unplugging from media, including the Internet and CMC, for a moderate duration of time can lead to enhanced cognitive and emotional functioning.

However, unplugging from CMC may simply not be a realistic option for many people. For example, in a third unplugging study, 891 university students from 10 countries were asked to unplug from all media for 24 h and then blog about their experiences (Roberts & Koliska, 2014). Only half of the sample was able to abstain for the full 24 h. The two most frequent themes that emerged from the blog entries were feeling anxious during the abstention and feeling addicted to media technology; however the third most common response was a feeling of relief at being disconnected. These findings are in keeping with research on Internet addiction; for example, it has long been established that people are unable to control their habitual access of applications such as email (Whittaker & Sidner, 1996; Mark, Vaida, & Cardello,

2012); people constantly check email even when it decreases productivity and increases stress (Dabbish & Kraut, 2006). Additional research indicates that social media use can become habitual, a form of automaticity lacking self-control and self-awareness (LaRose et al., 2011).

These three exceptions to the dearth of research on unplugging are important contributions; however, each study's sample was restricted to one age group (adolescents, college students, or adults) and therefore could not compare results by age. Unplugging attitudes and behaviors may vary across generations; *digital natives* who grew up with the Internet may use connective devices in radically different ways than *digital immigrants*, those who were introduced to the Internet when older (Prensky, 2001). For example, digital natives, and in particular adolescents and emerging adults, use CMC for other key developmental tasks, such as identity development (Mäntymäki & Riemer, 2014). In addition, digital natives may expect to be always connected, with much of their social life taking place through digital media (Pfeil, Arjan, & Panayiotis, 2009). In contrast, digital immigrants may not rely on CMC as much as digital natives for social interaction, or may perceive this form of social interaction differently from face-to-face interactions (Turkle, 2011). In an attempt to address this gap in the literature, we utilized a cross-sectional design to discern age differences in attitudes and behaviors about unplugging from digital media. In addition, research has not examined in any systematic way the perceived costs and benefits of unplugging. It has also not explored the reasons why people would choose to unplug—or not to unplug (for an exception on motivations for media resistance, see Morrison & Gomez, 2014). Our study attempted to address these missing pieces to the puzzle.

## 1.3. The present study

In this mixed-methods study we used qualitative and quantitative survey methods to explore people's attitudes, thoughts, and feelings about the prospect of unplugging from CMC for 24 h, and we also inquired about their recent actual experiences of unplugging. In addition, we were interested in the roles of age, experience with unplugging, and loneliness on unplugging attitudes and behaviors. We defined unplugging from CMC as refraining from reading or sending emails, instant messages and texts, neither viewing nor posting on social media sites such as Facebook or Twitter, and refraining from using video chat such as Skype.

### 1.3.1. Age differences

Given the differences between digital natives and digital immigrants in lifetime exposure to CMC (Turkle, 2011), we anticipated that younger participants (ages 14–29; adolescents and emerging adults) would spend less time unplugged on a daily basis than older participants (age 30 and older; middle and older adults) (H1). We also predicted age differences in emotional responses to the prospect of being unplugged, with younger participants reporting more negative emotions, such as anxiety, boredom, loneliness and irritation (H2). This prediction is consistent with other research indicating that the prospect of unplugging induced anxiety in adolescents and emerging adults, possibly because they have less experience of being unplugged or are more dependent on CMC for their social lives (Roberts & Koliska, 2014; Turkle, 2011).

### 1.3.2. Attitudes about unplugging

We wanted to know how people felt about unplugging, what costs and benefits they perceived to being unplugged, and what alternative activities they would undertake if they were to unplug for 24 h. We anticipated that this information would deepen our understanding of the role of CMC in people's lives and empirically

address the concerns about whether their high reliance on CMC impacts digital natives' development negatively. Given the paucity of previous research on these issues, we did not make predictions and instead chose to analyze the narrative responses qualitatively using thematic analysis to see what themes emerged (for a review of the methodology of thematic analysis, see [Braun & Clarke, 2006](#)).

### 1.3.3. Prior unplugging experience

Based on the results of [Atchley, Strayer and Atchley's \(2012\)](#) study showing reported benefits of unplugging from CMC, we predicted that those who could recount a recent example of unplugging voluntarily would be significantly less likely to report feeling anxious about the prospect of unplugging in the future than individuals who experienced unexpected and unwanted breaks in connectivity (H3).

### 1.3.4. Loneliness

Although findings on the association between CMC usage and loneliness are mixed, there is greater support for a positive correlation between the two variables ([Brandtzaeg, 2012](#); [Hu, 2009](#)); therefore we predicted that participants with higher scores on the UCLA Loneliness Scale ([Hays & DiMatteo, 1987](#)) would express more negative emotions around unplugging (H4).

## 2. Methods

### 2.1. Participants

In total, 446 individuals responded to our survey. They were diverse in gender (61% female) and ethnicity (59% Latino/a, 20% Caucasian/White, 9% mixed race, 6% Asian-American, 6% other). Participants were coded into developmentally relevant age groups: adolescents aged 14–17 years old ( $n = 156$ ); emerging adults aged 18–29 years old ( $n = 174$ ); middle age adults aged 30–49 years old ( $n = 86$ ); and older adults, aged 50–79 ( $n = 30$ ). These age groups correspond to the conceptual framework of digital natives and digital immigrants ([Prensky, 2001](#)). The adolescents and emerging adults who took our survey were born between 1984 and 1999. This generation can be classified as digital natives, having grown up surrounded by computers and digital devices at home and at school. Our sample of middle age adults was born between 1964 and 1983, a time period that preceded the influx of personal computers and hand-held devices in day-to-day life. This group, along with our older adult sample, all but five of whom were born after the end of World War II, can be classified as digital immigrants. Overall, the sample was composed of participants who currently had high access to computer-mediated communication; 84% ( $n = 375$ ) had Internet connection in their homes and 65% ( $n = 290$ ) could get on-line at work or school. In addition, 73% ( $n = 326$ ) had Internet capabilities on their mobile phones and 79% ( $n = 352$ ) had texting capabilities.

### 2.2. Procedure

We first carried out a pilot study by surveying college students ( $n = 48$ ) about their unplugging attitudes and behaviors, which helped develop the wording for questions used in the on-line survey for the full study. For example, we conducted frequency counts on the emotions about unplugging reported by these pilot participants, and incorporated them as response choices to the question: If you faced the prospect of going without these communication technologies for 24 h, how would you feel? See section 2.3, below, for a complete list of final survey questions.

For the full study, participants completed an on-line survey containing nine closed- and open-ended questions, and a

psychometric questionnaire measuring loneliness, the UCLA Loneliness Scale ([Hays & DiMatteo, 1987](#)). The survey took approximately 20 min to complete. Three waves of participants were recruited: an adult sample recruited using Facebook, a college student sample, and an adolescent sample.

### 2.2.1. Adult sample

A link to the survey (hosted by SurveyMonkey) was posted on two of the authors' Facebook timelines. Facebook friends who discovered the survey had the option of sharing the survey link with their own Facebook friends or posting it on their own timelines, thus creating a snowball effect. Although this convenience method has its limitations, including the risk of recruiting a homogenous sample, demographic results showed that the sample was diverse in age (ages 18–79), gender, and ethnicity, and included participants from three countries across two continents. Finally, this method of recruitment avoided the over-used method of sampling college undergraduates, an acknowledged bias in social science research ([Henrich, Heine, & Norenzayan, 2010](#)). Although we did eventually decide to sample college undergraduates, they comprised only 18% ( $n = 79$ ) of the total analytic sample.

### 2.2.2. College sample

College students were recruited from the undergraduate psychology participant pool of a public university on the West Coast of the United States. Students completed the unplugging survey on-line at the research team's lab on campus.

### 2.2.3. High school sample

Adolescents were recruited from two public high schools in northern California and southwestern Michigan. Each participating high school teacher proctored the on-line survey in his or her classroom. Students were provided with a web link to log in and take the survey.

### 2.3. Survey

The survey asked participants about their connection habits for the following CMC technologies: e-mail, text, instant messaging, video chat, and social media (such as Facebook and Twitter<sup>1</sup>). Four questions were close-ended and asked:

- 1) When you are awake, how long do you typically go without accessing the following communication technologies: email, text, instant messaging, video chat and social media (such as Facebook and Twitter)? Response choices were: less than 1 h, 1–3 h, 3–6 h, 6–12 h, a day or longer, a week or longer. These response choices were generated based on responses from a pilot study.
- 2) When you are awake, what amount of time is the longest you would feel comfortable without accessing these communication technologies? Response choices were the same as for question 1.
- 3) If you faced the prospect of going without these communication technologies for 24 h, how would you feel? Responses choices were: bored, relieved, anxious, relaxed, irritated, free, lonely, happy, disconnected. Participants could check as many responses as they wished. Once again, these response choices were generated based on open-ended responses from a pilot study. A follow-up open-ended question asked: Why would you feel this way?

<sup>1</sup> This survey was developed before the rise in popularity of apps such as Instagram and Snapchat.

- 4) If you had to go without the following communication technologies, which one would you miss the most? Response choices were: text, email, Twitter, instant message, video chat (such as Skype), Facebook, I would miss none of them.

Open-ended questions asked about the costs and benefits of unplugging for 24 h:

- 5) What would you do with your time instead?
- 6) What would you lose by unplugging?
- 7) What would you gain by unplugging?
- 8) Do you ever feel like it's time to take a break from these technologies? Participants could check Yes or No, and then answer the follow-up question, Why or why not?
- 9) Think back to the last time you spent a day without these communication technologies. Indicate whether this experience was: voluntary or involuntary; and positive, negative, neutral, easy or difficult (check all that apply). Briefly describe the experience.

Participants also completed the short form of the UCLA Loneliness Scale (Hays & DiMatteo, 1987). They were asked to indicate how often (never, rarely, sometimes, often) they felt the way described in eight statements, for example, "I feel isolated from others" and "I can find companionship when I want it" (reverse coded). Responses from this four-point scale were summed and converted into a mean score for each participant.

#### 2.4. Analysis

Our study employed a mixed-methods design. We used quantitative data analysis to answer age-related research questions (H1 and H2) and to test whether a positive correlation existed between CMC usage and loneliness (H4), and we used qualitative data analysis to discover themes in the narrative responses to the open-ended questions on the survey about unplugging attitudes (H3). Using both quantitative and qualitative methods yielded a richer, more complete picture of the phenomena we were exploring, because themes emerging from the narrative data served not only as important illustrations of the quantitative results, but were also essential in characterizing phenomena that have not yet been investigated by researchers. All quotes from participants that appear in this paper were selected as typical responses showcasing a particular theme, and we refrained from selecting quotes that represented rare and infrequent themes. We also present frequency data on the most typical themes generated from the narrative responses.

To test hypotheses that compared the four age groups (adolescents ages 14–17; emerging adults ages 18–29; middle age adults ages 30–49; older adults ages 50–79) we used chi square tests of independence to analyze the differences in the proportions of daily CMC use (H1) and feelings about unplugging (H2) among age groups, and differences in the proportions of reported anxiety among those who reported a voluntary, involuntary, or no recent unplugging experience (H3). We used correlations (Pearson's  $r$ ) to test the association between age and the number of negative feelings reported (H2), and the association between loneliness scores and the number of negative feelings reported (H4).

Open-ended questions were analyzed using thematic analysis, an inductive technique in which themes that emerge directly from the data form the basis of coding (Braun & Clarke, 2006). Two of the authors of this paper together read through a random selection of twenty transcripts to identify recurring themes and create a set of preliminary codes for each of the open-ended questions. This set of codes was applied to an additional randomly selected twenty

transcripts, and were coded independently by the two authors to establish reliability. Inter-rater reliability was calculated using Cohen's kappa, and with the exception of one question, *Reasons to take a break from technology*, ( $k = 0.67$ ) all coding categories ranged from 0.76 to 0.94 agreement, which is an acceptable level of agreement. Any discrepancies in coding were discussed by the two coders; discrepancies were resolved by discussion. The remainder of the transcripts was then divided between the two coders and coded independently.

### 3. Results

#### 3.1. Age differences

##### 3.1.1. Daily CMC usage (H1)

We anticipated that younger participants would spend less time unplugged (H1), but this hypothesis was not supported; chi square analyses indicated no significant differences among the four age groups in the length of time spent typically unplugged nor in the length of time feeling comfortable unplugging. The majority of all participants (65%;  $n = 292$ ) spent three consecutive hours or fewer unplugged from CMC during a typical day, and only four percent ( $n = 20$ ) regularly unplugged for a day or longer. However, this overall trend reversed when participants reported how long they would feel comfortable unplugging, with 29% ( $n = 130$ ) staying in the territory of 3 h or fewer, but 35% ( $n = 154$ ) reporting they would be comfortable unplugging for a day or longer.

##### 3.1.2. Feelings about unplugging (H2)

We expected that younger participants would report more negative emotions about the prospect of unplugging from CMC for 24 h (H2). Overall, age, computed as a continuous variable, was negatively correlated with the number of negative feelings reported ( $r(353) = -0.252$ ,  $p < 0.01$ ). In other words, younger participants reported more negative feelings (e.g. anxiety, boredom, loneliness, irritation), which supported our hypothesis. Many participants reported feeling a mix of emotions at the prospect of unplugging from CMC for 24 h. Beyond feeling disconnected, which was reported by exactly half of the sample ( $n = 223$ ), the most common feeling that emerged at the prospect of being unplugged was boredom (39%;  $n = 172$ ), followed by feeling free (33%;  $n = 146$ ), relaxed (32%;  $n = 144$ ), anxious (30%;  $n = 132$ ), relieved (24%;  $n = 107$ ), happy (20%;  $n = 90$ ), lonely (17%;  $n = 74$ ), and irritated (12%;  $n = 54$ ).

To further explore age differences in negative emotional valence, we calculated chi-square tests of independence comparing the frequency of reported anxiety, boredom, loneliness, and irritation at the prospect of unplugging among the four age groups. For anxiety, the difference in proportions across the four age categories was significant [ $\chi^2(3) = 19.964$ ,  $p < 0.001$ ]. To investigate this finding more closely, we examined the column proportions (i.e., age) and discovered that the relationship between anxiety and age categories was not linear. Anxiety was reported by 22% of adolescents ( $n = 32$ ), 40% of emerging adults ( $n = 69$ ), 31% of middle age adults ( $n = 26$ ), and 7% of older adults ( $n = 2$ ). These proportions show a spike in anxiety for the middle two age groups, particularly for emerging adults.

Jessica,<sup>2</sup> an emerging adult, shared in her narrative that, "I like knowing what my friends are up to since I'm away in college, and I would feel anxious without knowing something that's happening in their lives." Amanda added, "I would probably feel anxious because the physical action of picking up your phone or logging

<sup>2</sup> All participant names are pseudonyms.

onto your computer has become a regular habit.” Jeremy pointed out, “I am in continual communication with a handful of friends/family members throughout every day, and it is expected/a habit. If I were to stop communicating with these people out of the blue for 1 day it would seem odd and I would feel anxious, but if I were to let them know beforehand that I would be taking a 24 h hiatus, I would be able to feel much more relaxed and relieved, as opposed to feeling anxious and disconnected.”

In contrast, the prospect of unplugging triggered less anxiety in adolescents. Seventeen-year old Gianna shared: “I have gone many days without my phone for Blossomtime. It helps me get more connected with the world, I don’t mind it.” Jermaine, age 15, said: “I almost never use them, having them around is an obligated pressure.” Some of the adolescents’ responses implied that the lack of anxiety may stem from relief at not needing to engage in the drama involved in texting and social media. Take, for example, 15-year-old Luke, who said unplugging from CMC would mean, “I could get away from everything.” Freddie, 16, said, “There is less drama in being disconnected,” and Tessa, 17, shared, “I would be okay without having any problems to hear about or have someone that needs me to pity them.”

Older adults also felt less anxious than emerging adults or middle age adults. Linda, 55, said: “I can take it or leave it,” and Martha, 70, shared: “It is not that important to me.” Responses from some older adults suggested they were easily able to fill their days with activities other than CMC, like Jill, 53, who explained: “I appreciate the time I’m alone and writing, with no distractions,” and Ramona, 52: “If I were not able to connect, it would be because I had something better to do. Online is a way for me to kill empty hours.”

For boredom, the difference in proportions among age groups was significant [ $\chi^2(3) = 43.974, p < 0.001$ ]. Once again we examined the column proportions. For this variable, the relationship between age and boredom was linear, with boredom decreasing with age: boredom was reported by 55% of adolescents ( $n = 80$ ), 46% of emerging adults ( $n = 66$ ), 17% of middle age adults ( $n = 14$ ), and 10% of older adults ( $n = 3$ ).

For loneliness, the difference in proportions was also significant [ $\chi^2(3) = 12.957, p = 0.005$ ]. Examining the column proportions revealed that, similar to boredom, the relationship between age and loneliness was linear, with loneliness decreasing with age: loneliness was reported by 23% of adolescents ( $n = 34$ ), 16% of emerging adults ( $n = 28$ ), 8% of middle age adults ( $n = 7$ ), and 3% of older adults ( $n = 1$ ).

Finally, the difference in proportions was significant for the feeling of irritation [ $\chi^2(3) = 7.800, p = 0.05$ ]. Examining the column proportions showed the relationship between age and irritation to trend toward linearity, with irritation decreasing and then leveling off with age: irritation was reported by 17% adolescents ( $n = 24$ ), 12% of emerging adults ( $n = 21$ ), 5% of middle age adults ( $n = 4$ ), and 7% of older adults ( $n = 2$ ).

The results of the chi square analyses provide insight into the significant negative correlation we found between age and number of negative feelings reported: with the exception of anxiety, all negative feelings (boredom, loneliness, irritation) decreased with age. Unexpectedly, adolescents reported less anxiety about unplugging than either emerging adults or middle age adults. We discuss the implications of this finding in our Discussion section.

In their narratives many participants shared mixed emotions at the prospect of unplugging. For example, 17-year old Ruby said, “I would be anxious wondering if I got calls or texts and bored if I had nothing else to do. I would be happy because no one could bug me.” Megan, 33, indicated that she would feel both “anxious” and “free” and explained, “I love to be away from technology or to choose not to use it, but I get anxious knowing my kids cannot get a hold of me

if they needed to.” Elise, an emerging adult, said: “I would feel a mix of emotions because I feel ‘addicted’ to these websites and technologies but at the same time I would feel liberated because I value solitude and nature and experiences that are disconnected from social media sites.” These contradictory feelings may arise because of the expectation to be constantly connected, whether for professional or social reasons. Ryan, 38, wrote: “There is a lot of pressure from colleagues and students to answer emails within a few hours. I am expected to be available at almost all times.”

Participants reflecting on their emotions revealed that they sometimes felt too attached to CMC. For example, Zoe, age 15, shared: “My phone is like my life. And I don’t feel good without it!” Dorene, age 63, wrote: “I’ve become a slave to checking email and Facebook, so going 24 h without would be good.” For some, the desire to remain “plugged in” to CMC arose because of a fear of missing out. For example, Colin, an emerging adult, voiced a common concern: “I wouldn’t want to miss out on something by being away.” This fear was not restricted to the younger participants; Gene, age 61, wrote: “I would be wondering what I was missing out on.”

Jim, 35, indicated on the emotion checklist that he would feel “relieved” to unplug for 24 h and explained, “I would have my life/experience back; I’d be present.” Andy, 34, marked “relaxed,” and added, “Like the old days when I got to actually talk to people.” For middle age adults ages 30–49, responses such as these indicate a harkening back to what may feel like the “good old days” before they adopted CMC technologies, although transitioning back to a “pre-CMC” lifestyle can still be difficult. For example, Maria, 37, replied, “Checking email/texts has become such a daily activity that to not do it would leave a period of time vacant during which I normally do those activities. It would take some time to remember what I used to do with that time, and until I did and began utilizing the time in that way I would experience boredom.”

## 3.2. Attitudes about unplugging

### 3.2.1. Anticipated unplugging activities

Participants were asked to list what activities they would do if they unplugged for 24 h. The open-ended responses were coded into ten categories, with reading for pleasure topping the list at 42% ( $n = 188$ ) (see Fig. 1 for a complete list of reported activities). However, this response varied by age; only 13% ( $n = 21$ ) of adolescents listed this response. In contrast, 49% ( $n = 86$ ) of emerging adults, 71% ( $n = 61$ ) of middle age adults, and 67% ( $n = 20$ ) of older adults reported that they would read for pleasure. Rather than read for pleasure, physical exercise was the top activity mentioned by adolescents (29%;  $n = 45$ ). For the sample as a whole, spending time

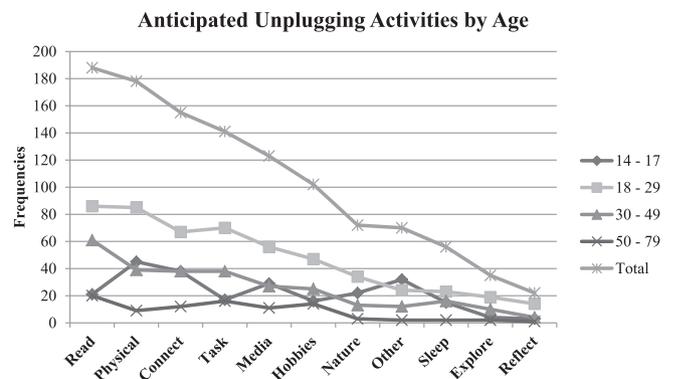


Fig. 1. Anticipated unplugging activities by age. This figure illustrates the activities participants anticipated doing when they unplugged from CMC for 24 h.

with friends or family was the third most commonly reported activity (35%,  $n = 155$ ). Another age related theme that emerged was a significant difference between adolescents and all other age groups in number of activities spontaneously generated, with adolescents generating the fewest activities ( $M = 2.21$ ), [ $F = 17.658$ , ( $df = 3, 383$ ), ( $p < 0.001$ )], compared with emerging adults ( $M = 3.52$ ), middle age adults ( $M = 4.11$ ) and older adults ( $M = 3.80$ ).

3.2.2. Anticipated losses

When asked what they would lose if they unplugged from CMC for 24 h, the most common response for all age groups was loss of connection from friends and family (47%) ( $n = 208$ ) (see Fig. 2). For example, 15-year old Louisa reported, “I wouldn’t talk to my friends for a day and I wouldn’t be able to see what’s going on in their life.” The Internet can facilitate communication with family and friends who are separated, as in the case of 17-year old Mike, who said he would lose, “immediate contact with distant family.” Alice, 79, wrote, “I would miss pictures of my grandchildren and wouldn’t hear about what they are doing,” and Ron, 65, shared that he would lose the “sense of being up to date on things, sense of being part of a community, contact with some of my family.” To our surprise, the second most common response to anticipated losses was “Nothing” (20%;  $n = 87$ ), and this response frequency did not vary significantly by age.

3.2.3. Anticipated gains

Being productive emerged as the most frequent gain (17%;  $n = 78$ ), followed closely by having more free time (16%;  $n = 71$ ), experiencing an enhanced mental state of clarity and focus (13%;  $n = 56$ ), and connecting with friends and family in person (12%;  $n = 55$ ) (see Fig. 3). Two noteworthy themes emerged from these data.

First, we were especially interested in the theme of “me time” which we coded as *personal*. This appeared in 17% ( $n = 29$ ) of the emerging adult narratives. Casey, for example, said he would gain, “time to just be by myself,” and Steve wrote: “I would gain some self awareness.” Felicia shared that she would gain, “a deeper connection with myself and feelings, learning more about myself and [my] aspirations.” Mai wrote that she would, “be more in touch with myself. I’d get to know myself better.” A chi-square test of independence was calculated comparing the frequency of this gain of personal time at the prospect of unplugging among the four age groups. The difference in proportions was significant [ $\chi^2(3) = 9.564$ ,  $p < 0.05$ ], and the column proportions verified a spike in this gain for emerging adults; personal time was reported by 10% of adolescents ( $n = 14$ ), 17% of emerging adults ( $n = 29$ ), 6%

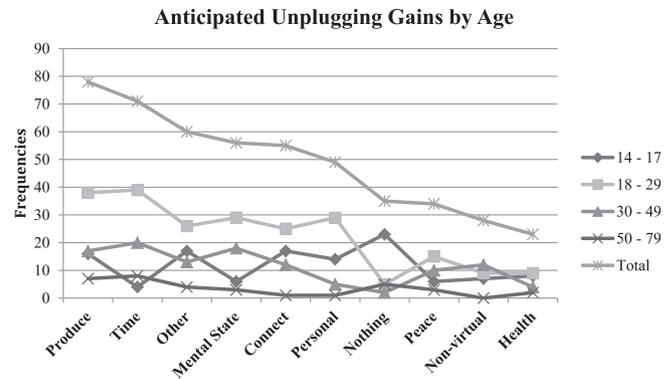


Fig. 3. Anticipated unplugging gains by age. This figure illustrates themes that emerged when participants reflected on what they would gain if they unplugged from CMC for 24 h.

of middle age adults ( $n = 5$ ), and 3% of older adults ( $n = 1$ ).

Second, we discovered that the relationship between age groups and the reported gain of “nothing” resulted in a U shaped curve. Chi square analysis indicated a significant difference among age groups for this variable [ $\chi^2(3) = 24.684$ ,  $p < 0.001$ ], and column proportions indicated that adolescents and older adults were more likely to claim they would gain nothing, whereas emerging adults and middle age adults were less likely: the gain of nothing was reported by 16% of adolescents ( $n = 23$ ), 3% of emerging adults ( $n = 5$ ), 2% of middle age adults ( $n = 2$ ), and 17% of older adults ( $n = 5$ ).

3.2.4. Reasons for unplugging (or not)

When asked if they felt like sometimes they needed to take a break from CMC, 65% ( $n = 290$ ) of the sample said yes. The most common reason for this response was feeling too addicted or attached to being on-line. For example, Carla, 63, reported, “I check [social networking sites] too often and feel compelled to do so. Twice a day is sufficient, but I check every few hours.” Marcus, 22, wrote: “The technologies take over my life. I think from viewing them it makes me more depressed. People create these false lives and no one can question them. I get more anxiety not being invited to a public party on Facebook than prepping for an exam.” Ashley, 29, also noted that she felt too attached to CMC: “I compulsively check email even when I don’t have any. Can’t be healthy.”

Participants also reported they wanted to periodically unplug because being on CMC felt like it wasted too much of their time, that it interfered with real-world experience, and that it overloaded them with too much stimulation and information. Some participants acknowledged they would like to unplug for a variety of the above reasons, but faced an unexpected barrier: “I enjoy these technologies but often go without them for days at a time,” said Kate, 33. “However, I often wish those around me (spouse, family, friends) would sometimes take a break when we are together.” Only the adolescents framed their reason for unplugging in terms of avoiding the drama that CMC can entail. Elena, 17, acknowledged that she wanted a break because texting and being on Facebook, “can sometimes get you in trouble,” and Luke, 15, wrote, “The drama and the lies and the bullying is just too much.”

And what of the 25% ( $n = 113$ ) of participants who reported that they did not feel the need to periodically unplug from CMC? Although some reported that they would feel isolated if they unplugged, the most common reason for not wanting to take a break was because these participants felt like their use of these technologies was balanced; they used CMC as a tool when needed and therefore no breaks were necessary. For example, Caitlin, 25, said, “I

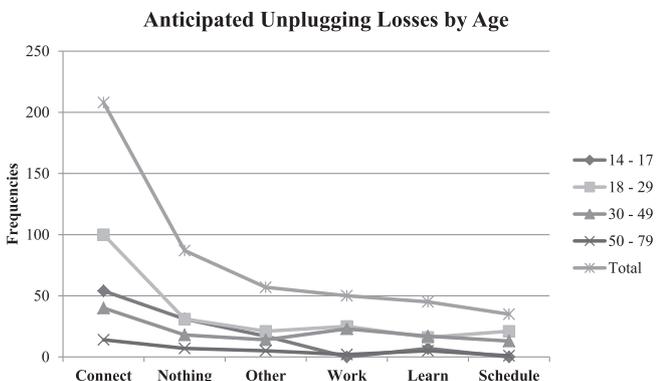


Fig. 2. Anticipated unplugging losses by age. This figure illustrates themes that emerged when participants reflected on what they would lose if they unplugged from CMC for 24 h.

love technology, and I believe it makes my life better. I use the communication technologies I like and avoid the ones I'm not interested in." Paula, 54, explained, "It's a tool and a great one. Why would I give it up?"

### 3.3. Prior unplugging experience (H3)

Overall, 52% ( $n = 234$ ) of the sample reported that they had voluntarily unplugged from CMC, while 32% ( $n = 141$ ) had undergone an unplugging experience involuntarily, typically due to lack of Internet service, loss of battery power, or in the case of adolescents, having their cell phone privileges taken away. Only 3% ( $n = 15$ ) of the total sample could not recall a recent experience of unplugging at all. We predicted that participants who could recall a recent experience of unplugging voluntarily would be significantly less likely to report feeling anxious about the prospect of unplugging in the future than individuals who experienced unexpected or unwanted breaks in connectivity (H3). The hypothesis was supported; ( $\chi^2(2) = 25.458, p < 0.001$ ).

Because of the high frequency of negative emotions reported by adolescents about a hypothetical unplugging experience, we more closely investigated this age group's responses about their recent actual unplugging experiences. Thirty-six ( $n = 56$ ) of the adolescent sample reported that they either had no recent experiences unplugging, or were unplugged involuntarily. The most common reason they involuntarily unplugged was because they had no access to CMC, usually because they had either lost their device or were restricted from using it by parents or teachers. However, it is worth noting that 49% ( $n = 52$ ) of the adolescents who unplugged, no matter whether it was voluntary or not, rated it as a positive experience. For example, 15-year old Samantha shared, "I took time to be by myself and enjoy the day without a screen in my face." Fourteen-year old Jamie voiced a similar sentiment: "I felt like I had the freedom to do whatever it is I wanted." However, some adolescents had a negative experience (15%;  $n = 16$ ), like Gaby, who voluntarily unplugged just to see what it would be like: "I was anxious and I constantly was thinking about what I could be missing out on, the same way I feel when I don't get a message or notification."

### 3.4. Loneliness (H4)

We predicted that those with higher scores on the UCLA Loneliness Scale would report more negative emotions at the prospect of being unplugged (H4). This hypothesis was supported. Loneliness scores positively correlated with the number of negative feelings reported ( $r(440) = 0.15, p < 0.01$ ). In other words, the higher someone scored on loneliness, the more negative feelings they reported. Given the modest size of correlation, however, this result should be interpreted with caution. We were curious about whether loneliness also predicted other responses. However, we found no significant differences in loneliness scores among participants who did and did not report feeling addicted to being online or feared being isolated if unplugged. There was also no relationship between loneliness and the amount of time individuals reported spending unplugged from their devices.

## 4. Discussion

### 4.1. Discussion of results

Despite the widespread use and appeal of computer-mediated-communication (CMC), there is a growing pushback movement by some users of mobile devices, encompassing resistance behaviors and mixed emotions about being constantly "plugged in" (Foot,

2014; Portwood-Stacer, 2012). Findings from our study showcased these mixed emotions and explored the underlying attitudes about the costs and benefits of unplugging in a relatively large sample that ranged in age from 14 to 79 years old. Feeling addicted to digital communication technology emerged as a common reason for wanting to unplug, a finding that reflects anecdotal public concerns and is in keeping with other research on motivations to unplug (Morrison & Gomez, 2014). However, there are serious roadblocks to unplugging. Our participants noted the difficulty of being the sole person unplugged around friends and family who are habitually on their devices; add to that the pressure of colleagues at work to be constantly available, and the idea of retreating from digital technology can seem untenable.

Ambivalence added another layer of complication for our participants. For example, *connection with family and friends* emerged as a common theme for perceived gains and losses, as well as a frequently reported unplugging activity. In other words, not only was spending time with close others something these participants anticipated doing when unplugged, they also perceived face-to-face interaction as something they would gain by unplugging. At the same time participants cited connection with close others as something they would lose when unplugged. It appears our participants found themselves in a dilemma—they viewed digital devices as tools to connect but at the same time perceived them as barriers to real-time interaction with people they cared about, thus partially supporting the claim that CMC usage competes with real-time sociability and intimacy (Turkle, 2011). While the literature has tended to either exhort the benefits of unplugging (e.g. Maushart, 2011; Sieberg, 2011; Turkle, 2011) or the advantages of being plugged in for developing close relationships and social capital (Ellison et al., 2011; Valkenburg & Peter, 2009), our findings suggest that adolescents and adults do not perceive the prospects of unplugging as unambiguous. Rather, they feel ambivalent about the prospects of unplugging and moreover, they perceive that unplugging is further complicated by others' pressures not to unplug.

Age does seem to matter when it comes to feelings and behaviors around unplugging; however, our results suggested more than differences between digital natives and digital immigrants. Despite adolescents and emerging adults both belonging to the category of digital natives, having been exposed to the Internet and digital technology for most or all of their lives, our results showed significant differences between these two sets of digital natives in their responses to unplugging. For example, although adolescents and emerging adults reported more negative feelings about unplugging compared with middle and older adults, anxiety was reported by emerging adults significantly more frequently than expected, whereas this was not the case for adolescents. In fact, their results trended in the opposite direction. Perhaps because many of the members of our emerging adults sample were college students, they were more likely than the other participants to be separated from their families and friends from their hometowns. If this is the case, then these emerging adults may depend more heavily on their digital devices for regular communication with their support network, and therefore may experience more anxiety at the prospect of unplugging from such support. When asked what they would lose by unplugging, emerging adults, more than any other age group, reported that they feared losing connection with friends and family. Perhaps because emerging adults tend to be more transient than other age groups due to frequent moves for jobs, college, military service, or travel (Arnett, 2004), their social networks begin to spread geographically and they depend on CMC to maintain these relationships (Ellison et al., 2011). More importantly, emerging adults are at the developmental stage where cultivating intimate relationships takes on great importance

(Erikson, 1968). Therefore, it is not surprising that emerging adults utilize CMC for communicating with romantic partners, friends, and family, and then experience anxiety at the prospect of losing such connection. Our findings are thus consistent with previous research indicating that emerging adults use social media such as Facebook for intimate disclosure and social support (Manago et al., 2012).

An additional age-related finding that we found noteworthy is that adolescents were significantly more likely than all other age groups to assert that they would gain “nothing” by unplugging. Perhaps because adolescents have grown up with digital technology, they cannot imagine what they would gain by unplugging. In contrast, emerging adults were significantly less likely to report that would gain “nothing.” Clearly, emerging adults recognize more benefits to unplugging than adolescents can imagine. Furthermore, adolescents generated the fewest activities when asked what they would do if they unplugged, whereas emerging adults were no different in this respect compared with middle and older adults. The results exemplify the nuanced differences between digital natives when age is taken into account; perhaps emerging adults are developmentally more capable of imagining activities to fill their leisure time, or have more experiences with autonomy and freedom to pursue their own interests. These results may also help to explain why adolescents reported more negative emotions at the prospect of unplugging, particularly feeling bored and lonely; as digital natives, adolescents have had far less lifetime experience where CMC was absent, but may also be at a developmental disadvantage when it comes to imagining and accessing alternate activities compared with their slightly older digital native cohort of emerging adults. Our results therefore extend theories of how different groups engage with technology (Mäntymäki & Riemer, 2014; Pfeil et al., 2009; Prensky, 2001), suggesting that there may be important differences between different types of digital natives by age and in relation to their fundamental attitudes to connection.

One of the benefits of unplugging discussed by our participants appears to be engaging in “me time,” described by the emerging adults as time for self-reflection, solitude, and an opportunity to engage in pleasurable pursuits by themselves. Volitional solitude is an important ecological niche for emerging adults because it can facilitate identity work (Goossens & Marcoen, 1999) and self-awareness (Franzoi & Brewer, 1984). It appears that the emerging adults in our study were attuned to this need, and their more frequent reporting of a desire for “me time” suggests that, for them, time plugged into CMC inhibits time in solitude. Although solitude is also important for emotional development in adolescence (Larson, Csikszentmihalyi, & Graef, 1982), we did not find a high frequency of adolescents in our sample reporting the anticipated gain of alone time, though 10% ( $n = 16$ ) of them did mention it in their narratives. For example, Emily, 16, described the gain as, “Learning how to be with myself and my inner thoughts,” and Hannah, 17, said she would gain, “more time to think about my life. But that can often be depressing. Which is why most teens stay oh-so busy.” Perhaps for the adolescents in our sample, solitude presented too much of a challenge to turn off their devices and tune in to themselves, whereas the emerging adults were developmentally poised to take advantage of it.

Another unexpected and noteworthy age difference was found in responses to the question, “What would you do if you unplugged?” Although reading for pleasure emerged as the most preferred activity overall, it sharply declined for adolescents. This finding aligns with research indicating that rates of daily reading have declined precipitously for adolescents and children over the past several decades (Common Sense Media, 2014). Rather than read for pleasure, engaging in physical exercise was the top activity mentioned by the adolescents, which may indicate that being

plugged into digital devices is indeed inhibiting physical exercise—as many parents and cultural critics fear, and as some research indicates (Moreno et al., 2013). On the positive side, adolescents seem to want to be more physically active if given the opportunity to unplug, as do all age groups; overall, 41% of the entire sample listed some form of exercise as a desired unplugging activity.

Findings from our data indicate that loneliness is correlated with feelings about unplugging—lonelier people reported a higher number of negative feelings about the prospect of going without CMC for 24 h. However, loneliness scores did not correlate with the number of consecutive hours spent unplugged from CMC during a typical day, nor did they correlate with reports of feeling addicted to being on-line. Prior research shows that lonely people are more likely to use CMC and paradoxically, CMC makes them feel lonelier and more isolated (Brandtzaeg, 2012; Hu, 2009). In contrast, in our work it appears that being lonely is not a pre-requisite for feeling addicted to digital devices or for spending large amounts of time on email, text, and social media. To phrase it another way, digital communication technology may be so embedded in the culture that feelings of addiction to it are now typical of the general population, and not solely of a clinical subgroup (e.g. people who are lonely, isolated, or depressed).

Finally, an instructive finding from our data shows that when a person has prior experience voluntarily abstaining from CMC, the prospect of unplugging again in the future induces less anxiety. Especially for adolescents, comfort with unplugging may take practice, and the more voluntary experiences one has the less anxious one may feel if unable or unwilling to access CMC. Take, for example, 15-year-old Isabella, who voluntarily unplugged in order to take the time, “to be by myself and enjoy the day without a screen in my face. It was difficult at the beginning but then it became easier and I began to enjoy the privacy.” We found that whether the unplugging experience was rated positively or negatively made no difference in anticipated anxiety levels. Thus, volition over unplugging seems to matter more than the valence of the actual unplugging experience when it comes to being anxious about unplugging. This finding has important implications for parents and school administrators who are interested in digital interventions for youth. For example, if adolescents were encouraged as part of a school intervention to gain unplugged experiences, then they might be both less anxious about unplugging on their own time, and more able to discover the benefits that older participants in our study were able to articulate. Furthermore, having more experiences of voluntarily unplugging can allow adolescents to gain more self-awareness and control of how they deploy and use technology; such self-awareness has been shown to be critical in moderating Internet addiction (LaRose et al., 2011).

#### 4.2. Limitations

Although the present study offers important insights about the underlying attitudes and feelings about a hypothetical unplugging experience for a sample diverse in age, it does not provide experimental evidence about what people feel and how they behave in situ when undergoing an actual unplugging experience. Although our survey did inquire about a recent actual unplugging experience, these reports were retrospective and limited by potential recall bias and forgetting. It may be that what people anticipate feeling and doing in a hypothetical scenario diverges greatly from how they actually behave once they do unplug, and thus, this area of inquiry warrants future research.

#### 4.3. Future directions

Future studies should examine how people actually behave and feel when they undergo an unplugging experience, whether it be for 24 h or a week. Partnering with organizations such as Digital Detox and Sabbath Manifesto could be beneficial because they attract thousands of participants each year. Research questions about motivation could be tested, as well as a comparison of anticipated feelings, gains, and losses with the actual feelings, gains, and losses felt during the unplugging experience. Other variables of individual differences could also be explored, given that loneliness was not as highly correlated with CMC usage as expected.

#### 5. Conclusions

Much of the debate about the disadvantages and advantages of constant connectivity has focused on opinions and not data. We empirically inform that debate, finding that the decision to disconnect is complex. Unplugging is not only an individual choice; rather, there are many social pressures from friends, family, and colleagues that inhibit voluntary unplugging. Our findings also provide a more nuanced picture of digital natives. While both adolescents and emerging adults have grown up with technology, the reactions of each group are mediated not only by their lifetime experiences with the digital world, but also by their developmental stage.

Given the increasing ubiquity of CMC usage and the sophistication of digital communication technology, permanent media refusal may not be realistic nor advisable for most people. However, periodic experiences of temporarily unplugging from email, text, and social media may become a mainstream practice for reasons listed by some of our participants: more time for connection with friends and family in the here and now, less distraction and cognitive overload, and a welcome break from the pressure to be constantly available to work colleagues. Adolescents appear to be particularly challenged by the idea of unplugging, which may be partially due to their status as digital natives. Whether unplugging is a practice that many people take up remains to be seen, given the inherent complexity of retreating from the web of digital technology and its pull of readily available community, connection, and information for both digital natives and digital immigrants.

#### References

- Amichai-Hamburger, Y., & Hayat, Z. (2011). The impact of the Internet on the social lives of users: a representative sample from 13 countries. *Computers in Human Behavior*, 27, 585–589.
- Arnett, J. J. (2004). *Emerging adulthood: The winding road from the late teens through the twenties*. New York: Oxford University Press.
- Atchley, R. A., Strayer, D. L., & Atchley, P. (2012). Creativity in the wild: improving creative reasoning through immersion in natural settings. *PLoS ONE*, 7(12), 1–3.
- Brandtzaeg, P. B. (2012). Social networking sites: their users and social implications – a longitudinal study. *Journal of Computer-Mediated Communication*, 17, 467–488.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Burke, M., & Kraut, R. (2014). Growing closer on Facebook: changes in tie strength through site use. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 4187–4196). NY: ACM Press.
- Camp Grounded. <http://campgrounded.org/>.
- Common Sense Media. (2014). *Children, teens, and reading: A commonsense media research brief*. San Francisco: Common Sense Media.
- Coyne, S. M., Padilla-Walker, L. M., & Howard, E. (2013). Emerging in a digital world: a decade review of media use, effects, and gratifications in emerging adulthood. *Emerging Adulthood*, 1(2), 125–137.
- Dabbish, L., & Kraut, R. (2006). Email overload at work: an analysis of factors associated with email strain. In *Proceedings of the ACM conference on computer supported cooperative work* (pp. 431–440). NY: ACM Press.
- Duggan, M., Ellison, N. B., Lampe, C., Lenhart, A., & Madden, M. (2015). *Social media update 2014*. PEW Research Center. Retrieved from <http://www.pewinternet.org/2015/01/09/social-media-update-2014/>.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2011). Connection Strategies: social capital implications of Facebook-enabled communication practices. *New Media & Society*, XX(X), 1–20.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York, NY: Norton.
- Foot, K. (2014). The online emergence of pushback on social media in the United States: a historical discourse analysis. *International Journal of Communication*, 8, 1313–1342.
- Franzoi, S. L., & Brewer, L. C. (1984). The experience of self-awareness and its relation to level of self-consciousness: an experiential sampling study. *Journal of Research in Personality*, 18, 522–540.
- Goossens, L., & Marcoen, A. (1999). Adolescent loneliness, self-reflection, and identity: from individual differences to developmental processes. In K. J. Rotenberg, & S. Hymel (Eds.), *Loneliness in childhood and adolescence* (pp. 225–243). Cambridge, UK: Cambridge University Press.
- Hays, R., & DiMatteo, M. R. (1987). A short form measure of loneliness. *Journal of Personality Assessment*, 51, 69–81.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33, 61–135.
- Hu, M. (2009). Will online chat help alleviate mood loneliness? *CyberPsychology & Behavior*, 12, 219–223.
- Jacobsen, W. C., & Forste, R. (2011). The wired generation: academic and social outcomes of electronic media use among university students. *Cyberpsychology, Behavior, and Social Networking*, 14(5), 275–280.
- LaRose, R., Kim, J., & Peng, W. (2011). Social networking: addictive, compulsive, problematic, or just another media habit? In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 59–81). New York: Routledge, Taylor and Francis.
- Larson, R., Csikszentmihalyi, M., & Graef, R. (1982). Time alone in daily experience: loneliness or renewal? In L. Peplau, & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research and therapy* (pp. 40–53). New York: John Wiley & Sons.
- Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.
- Manago, A. M., Taylor, T., & Greenfield, P. M. (2012). Me and my 400 friends: the anatomy of college students' Facebook networks, their communication patterns, and well-being. *Developmental Psychology*, 48(2), 369–380.
- Mäntymäki, M., & Riemer, K. (2014). Digital natives in social virtual worlds: a multi-method study of gratifications and social influences in Habbo Hotel. *International Journal of Information Management*, 34(2), 210–220.
- Mark, G., Voids, S., & Cardello, A. (2012). A pace not dictated by electrons: an empirical study of work without email. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 555–564). New York: ACM Press.
- Maushart, S. (2011). *The winter of our disconnect*. New York: Tarcher.
- Moreno, M. A., Jelenchick, L. A., Koff, R., Eickhoff, J. C., Goniou, N., Davis, A., et al. (2013). Associations between Internet use and fitness among college students: an experience sampling approach. *Journal of Interaction Science*, 1(4), 1–8.
- Morrison, J., & Gomez, M. (2014). The effects of ambient media: what unplugging reveals about being plugged in. *First Monday*, 19(8). Retrieved from <http://pearl.accc.uic.edu/ojs/index.php/fm/article/view/5220/4108>.
- Parks, M. (2011). Social network sites as virtual communities. In Z. Papacharissi (Ed.), *A networked self: Identity, community and culture on social network sites* (pp. 105–122). New York: Routledge.
- Pfeil, U., Arjan, R., & Panayiotis, Z. (2009). Age differences in online social networking: a study of user profiles and the social capital divide among teenagers and older users in MySpace. *Computers in Human Behavior*, 25(3), 643–654.
- Portwood-Stacer, L. (2012). Media refusal and conspicuous non-consumption: the performative and political dimensions of Facebook abstention. *New Media and Society*, 15(7), 1041–1057.
- Premsky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1–6.
- Roberts, J., & Koliska, M. (2014). The effects of ambient media: what unplugging reveals about being plugged in. *First Monday*, 19(8). Retrieved from: <http://pearl.accc.uic.edu/ojs/index.php/fm/article/view/5220/4108>.
- Sabbath Manifesto. <http://www.sabbathmanifesto.org/>.
- Sieberg, D. (2011). *The digital diet*. New York: Three Rivers Press.
- Smith, A. (2015). *U.S. Smartphone use in 2015*. PEW Research Center. Retrieved from <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/>.
- Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: its nature and impact in secondary school pupils. *Journal of Child Psychology and Psychiatry*, 49(4), 376–385.
- Strayer, D. L., & Cooper, J. M. (2010). Cell phones and driver distraction. In B. Goldstein (Ed.), *The SAGE encyclopedia of perception*.
- Tehrani, Y. (2013). *Social media, social kids: Sociocultural implications of 21st century media for development in the preteen period* (Doctoral dissertation). Retrieved from ProQuest.
- Turkle, S. (2011). *Alone together*. New York: Basic Books.
- Valkenburg, P. M., & Peter, J. (2009). Social consequences of the Internet for adolescents: a decade of research. *Current Directions in Psychological Science*, 18(1), 1–5.
- Whittaker, S., & Sidner, C. (1996). Email overload: exploring personal information management of email. In M. J. Tauber (Ed.), *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems: Common Ground (CHI '96)* (pp. 276–283). New York: ACM.
- Zomorodi, M. (2015). *What 95 minutes of phone time a day does to us*. Retrieved from <http://www.wnyc.org/story/bored-and-brilliant-data-preview/>.