

Article

Mobile Phones Bridging the Digital Divide for Teens in the US?

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Abstract: In 2009, just 27% of American teens with mobile phones reported using their devices to access the internet. However, teens from lower income families and minority teens were significantly more likely to use their phones to go online. Together, these surprising trends suggest a potential narrowing of the digital divide, offering internet access to those without other means of going online. This is an important move, as, in today's society, internet access is central to active citizenship in general and teen citizenship in particular. Yet the cost of this move toward equal access is absorbed by those who can least afford it: Teenagers from low income households. Using survey and focus group data from a national study of "Teens and Mobile Phone Use" (released by Pew and the University of Michigan in 2010), this article helps identify and explain this and other emergent trends for teen use (as well as non-use) of the internet through mobile phones.

Keywords: digital divide; internet; mobile phone; cell phone; teens; texting

1. Introduction

America can be understood in terms of gaps. There is the widening gap between the rich and poor [1]. There is also the digital gap between those with access to key communications technologies and those without access. The present paper considers the space where these gaps meet: Mobile phone

internet access among teenagers in the U.S. Specifically, we consider the paradox that teens with the least money are paying the most to go online with their phones.

Despite the availability of internet enabled mobile phones, teens primarily use their phones for texting and (to a lesser extent) for voice calling, pictures, music, and video. In fact, a survey from 2009 revealed that just 27% of teens with mobile phones ever used them to access the internet. This figure jumps to 41% when considering exclusively teens from households earning less than \$30,000 per year. Of these lower income teens, just 70% had computers in the home, compared to 92% from families earning more than \$30,000 per year. Thus, internet access via mobile phones may offer a means of narrowing the digital divide, allowing connectivity for those otherwise off the grid.

Using survey and focus group data from a 2009 national study of “Teens and Mobile Phone Use” [2], this paper seeks to examine and explain these trends. First, we outline how teens used and did not use their phones. Focusing on the low rates of mobile internet use (relative to other mobile phone function use by teens), we then consider the factors underlying this surprising finding: High cost and low utility relative to more traditional computing platforms. With these factors in mind, we consider the paradoxical nature of the fact that teens from lower income families are paying more to access an inferior version of the Web. Ultimately, we argue that mobile internet is better than no internet, but cannot match the interface of traditional computers, at least at the time of this study. While the associated potential narrowing of the digital divide is positive, it is those who can afford it least—teenagers from low income families—footing the bill. This speaks to the broader idea that “it is expensive to be poor.” To theoretically ground this idea, we begin with an overview of the relevant literatures.

In the media age, ensuring the needs of all citizens are met goes beyond the physical necessities of food, shelter, and clothing. Here we focus on the crucial issue of internet access, as it is instrumental to accruing and maintaining social capital. Putnam (1995) defines social capital as the “features of social life—networks, norms, and trust—that enable participants to act together more effectively to pursue shared objectives” (pp. 664–665, [3]). The internet is an important means of acquiring and maintaining social capital. An early skeptic of the new media’s impact on social capital, Putnam revised his claims, as, in 2000, he acknowledged the internet’s potential to foster social ties if used to “strengthen, not supplant, face-to-face ties with their neighbors” (p. 411, [4]). Challenging earlier claims that the internet induces social isolation (e.g., Putnam, 1995 [3]), a 2009 Pew study, “Social Isolation and New Technology” (Hampton, Sessions, Ja Her, and Rainie, 2009) found that internet use corresponds to more diverse social networks [5]. These results are echoed by Hampton, Sessions, and Ja Her’s (2011) finding that mobile phone and internet use are correlated with larger and more diverse social networks [6].

The centrality of internet access to social life transcends generations. Focusing on teens, Ito and colleagues (2010) conducted a three-year ethnographic study of how young people use new media. The authors coined the term “friendship-driven” to refer to media practices, including internet and mobile phone use that nourish real world friendships. A subtype of friendship-driven media practices is “hanging out” or “talking about and coordinating opportunities to ‘hang out’” (p. 38, [7]), via new media. This central facet of youth culture and social development takes root in online communication, which can both initiate real world interaction and facilitate virtual interaction between real world friends. Overall, the authors assert that new media enable “active participation of a distributed social

network in the production and circulation of culture and knowledge” (p. 19, [7]), thereby underscoring the importance of the internet to citizenship in general and teen citizenship in particular.

Conceptualized as a gap between users of modern communication technologies, the digital divide can be considered along different dimensions. For example, in summarizing several studies, Castells and colleagues (2007) differentiate between mobile communication users by age, gender, ethnicity, and socioeconomic status [8]. Specific to mobile phone use, Rice and Katz (2003) found that the divide between mobile phone users and nonusers was driven by income, work status, and marital status, with income and education only weakly predictive of this divide [9]. In the context of texting among Norwegians, Ling (2010) asserts age to be a driver of the digital divide, as youth both adopted texting faster and text more than older adults, with the distribution centered among late teens [10].

Here, we focus on divide in internet access created by socioeconomic status and potentially narrowed by mobile telephony. This very narrowing was predicted by Wareham, Levy and Shi (2004), who posited that the shift from the 2G, voice-centric network to the 3G, internet-enabled network “may be the most plausible avenue to internet connectivity for these groups that include Afro-Americans [sic], Hispanics, and certain professions” (456) [11]. Similarly, mobile phones may be the first form of internet access in developing countries. For example, Donner and Gitau (2009) explore mobile-only internet users in South Africa, finding mobile internet access to enable access to the news and social expression via social networking sites at a lower cost than internet caf  s or computer access, at least initially [12]. Walton and Donner (2009) explore the technological divide between global North and South, highlighting the creation of devices that match the sub-par technological specifications and low incomes of mobile users in South Africa [13].

The fact that the poor pay more for necessary goods and services helps us better understand the apparent paradox presented above as part of a larger, though nonetheless unjust, societal trend. This is a well-documented concept in economics, applied to many domains. The Engel curve, as developed by Ernst Engel in 1857 in the context of Belgian families’ food expenditures, distinguishes between necessary and luxury items on the basis of income percentage devoted [14]. A 2009 *Washington Post* article asserted that the poorer pay more for many items: Groceries, housing, banking, credit, etc. [15]. Similarly, in her 2001 book *Nickel and Dimed: On (not) getting by in America* [16], Barbara Ehrenreich recounts her time doing fieldwork as a minimum wage worker trying to survive in a variety of cities and positions. She found that poor people pay more for inferior housing and settle for low paying work, both at least partially caused by a lack of access to information about each. Though a symptom of this larger problem, it is possible that the information potential brought by the mobile internet to disadvantaged teens could also offer a solution to other manifestations of this issue. Ehrenreich (2008) ultimately concludes that ours is “not just an economy but a culture of extreme inequality” (p. 212, [16]). This phenomenon is not unique to the United States. For example, Cairncross and Kinnear (1992) found that the poorest households in Sudan devoted the highest percentage of their income to buying more expensive water, sacrificing food and causing malnutrition in the process [17]. Returning to mobile internet access, purchasing the computer necessary for cheaper internet access is prohibitively expensive for households with lower incomes. Opting for the initially cheaper mobile access, the poor ultimately pay more for the internet, as mobile internet subscriptions can be more expensive in the long run. Thus, the equipment divide is not narrowed. To this end, Barrantes and Galperin assert the importance of policies aimed at reducing entry costs to mobile telephony for the poor, given the limited services they

could afford on their cheaper handsets [18]. Hilbert (2009) similarly proposes subsidized rates for the poor to access communication. Focusing on Mexico, Uruguay, Brazil, Costa Rica, Hilbert characterizes those citizens from these nations who cannot pay 10 USD per month fall into “digital poverty” [19]. At one level, this raises the question as to whether these services are a luxury or a necessity. If impoverished people are willing to commit a large portion of their income to these services, they are, in some sense, seen as a necessity. This is the idea behind the Engel Curve. If there is a large degree of elasticity in the consumption of a product as income increases, this indicates that the product is a necessity. There is the suggestion here that this may be a characteristic of mobile internet, though there are some serious caveats. The cost in the US, our setting, is even higher. Here, we propose this broader trend applies to internet access. Specifically, we focus on mobile phones as an alternative means of connectivity that allows teens otherwise unable to access the internet to go online. We interpret 2009 statistics as a snapshot of mobile internet use that point to the future through present trends. Taking into account innovations in mobile internet, this (arguably) lesser internet is evolving, bringing with it the possibility of improved handset usability and data flow for everyone, including teens with no other means of access. Yet PC and tablet infrastructures are also evolving, while income structures remain stagnant. Thus, in some respects the digital divide is narrowing with mobile devices, but we do not see this gap completely closing in the coming decade.

2. Methods

The data presented in this study come from the “Teens and Mobile Phones” study by the Pew Internet and American Life and the University of Michigan. The present paper focuses on the survey and focus group data pertaining to teen internet use. First, we define how we distinguish between types of internet access. There are two broad ways of connecting to the internet. The most common is to connect via what might be called the “open” internet where the user has access through a provider such as Comcast, AOL or the like. This type of access might also come through the network at a person’s job, their school (as is the case with many teens in this paper), or at a public site such as a library. This type of internet access is often, but not only, PC centric. That is, we use our PC’s to link up to the internet. The specific link might be through a cable or through a local WiFi node. The alternative is using the mobile internet. In this case, access to the internet is mediated through the network of a mobile phone operator such as Sprint or AT&T. There is no local node in the form of a WiFi connection point, rather the individual connects via their local cell tower. Payment is also different in the two systems. In the case of the open internet, it is often an “all you can eat” subscription where in the case of the mobile internet there is more likely to be a limitation on the number of bytes that can be downloaded per month before there is an extra charge. Even so-called unlimited mobile internet plans, a growing trend, can be subject to restriction with an extreme amount use. All of this is confounded in that companies can be both mobile internet as well as traditional “open” internet providers. In addition, it is possible to hook an advanced mobile phone up to a WiFi node just as it is possible to hook a PC up to the mobile internet. In this paper, when we discuss use of the mobile internet it is almost exclusively the case that the individual has an advanced mobile phone that accesses the internet via the mobile network. Bit for bit, this mobile internet access is perhaps the most expensive type of internet access. Here, we outline the data collection and analysis procedures.

The survey results are taken from a parent-teen survey, conducted by the Princeton Survey Research Associates International. The response rate was 13.7% for landline phones and 11.2% for cell phone contacts. This telephone survey included 800 teen participants and their parents. Conducted between June and September of 2009, the sample design utilized random digit landline and mobile phone dialing provided by Survey Sampling International, LLC (SSI) according to PSRAI specifications. The sample was then weighted so that results were representative of American teenagers in accordance with the Census Bureau's 2008 Annual Social and Economic Supplement (ASEC). The margin of error for the weighted data is $\pm 3.8\%$. Among the questions asked, those most relevant to the current investigation pertain to internet access in general and mobile phone feature use, including mobile internet capability and connectivity. Question wording and response distributions for questions most relevant to the present paper can be found in Appendix A.

This paper also draws from focus group data. The University of Michigan and the Pew Research Center's Internet and American Life Project conducted nine focus groups with teen mobile phone users in four American cities between June and October of 2009. Participants were strategically recruited to ensure a balance of age, gender, race, and socio-economic status. Three groups were co-ed, and the other six were divided by sex (*i.e.*, three all male, three all female). Sessions were also divided according to age group, with middle and high school teens grouped separately. Running for about an hour and a half, the focus groups asked teens about their adoption and use of mobile communication technology and the role it plays in family dynamics, peer interactions, school clubs and activities, and other key areas of social life. This paper draws primarily from their responses regarding adoption and use, particularly with regard to whether, how, and why they do/do not use the mobile phone to access the internet. All proceedings were transcribed and thematically analyzed, allowing for triangulation of the survey results and a deeper understanding of the underlying reasons for trends found in the quantitative portion of the study.

For a complete description of the procedures, measures, analysis, and results of the larger study from which this paper draws, see the full report, which is available online [2].

3. How Do Teens Use Their Mobile Phones? Or, Why Was the Internet Not a Prominent Use?

Traditional voice calling is still a fairly common mobile feature used by teens, with the average user placing five calls per day. However, texting is by far the most dominant and fastest growing form of mobile communication for teens in the US. Among teens with mobile phones responding to the 2009 survey, 88% reported ever texting, with one third sending more than 100 texts each day. Other non-Web based utilities are also popular with teens: 83% used their phones to take pictures, 64% shared pictures, 60% listened to music, 46% played games, and 32% shared videos.

Mobile internet functions were utilized less frequently. Among those that were utilized, instant messaging (IM) was most popular, although it is likely that many using IM via mobile do so without actually navigating the Web (*e.g.*, with BlackBerry Messenger). Roughly one-quarter of all teens who own mobile phones used them to perform general internet functions and visit social networking sites. The data show that 21% of teens used their phones to email, while just 11% shopped online. Taken together, these figures suggest that teens that accessed the internet via mobile phones in 2009 were in the minority.

This begs the question: Why were teens in the US not using their phones to go online when the technology has come to play a central role in their daily life? Insights from the focus group data suggest this comes down to two main factors: Cost and usability. Or, as one respondent put it, “[The] internet costs more and half the time I am around a computer anyway so there is really no point of having it.”

Mobile phone plans that include internet access are expensive, adding between 10 and 35 USD per line per month. This high cost is weighed against the fact that teens often have open access to the internet via Wi-Fi-enabled computers and other gadgets. With computer-enabled internet in the home and wireless internet outside the home, the need for most teens to access the internet with a mobile phone is minimal. Other (perhaps up-scale) devices like Apple’s iPod Touch allow teens to use free Wi-Fi to access the internet on the go. As one teen explains, “Well, we both have the iPod touch or whatever so if we are at school it has like the wireless there and so at lunch and during school or whatever, you can get on internet and stuff and like, there is no charge for that, so...” Looking at a somewhat different context, 95% of mobile internet traffic in Denmark in 2009 was generated by PC-like devices such as iPads, iPods, and netbooks, with just 5% created by traditional mobile phones [20]. Even teens who have internet access on their phones may prefer Wi-Fi through other devices: “I use my phone if I am away from home and I can get internet service, I will just use my iPod Touch, but if I, if there is no internet I could connect to, I will just use my phone.” Thus, teens bypass the cost of mobile internet subscriptions by taking advantage of these cheaper or free options.

In addition to the associated expense of mobile internet access and the availability of cheaper or free internet access, the mobile internet is viewed as a slower, clumsier, smaller, and generally lesser internet. As Madsen (2010) argues, the traditional internet is designed for mouse navigation and keyboard typing, thus “finger” navigation and typing does not allow full utilization [20]. In addition to interface issues, the content can be likewise inferior. As one teen explains, “I just get on Myspace and usually look up stuff. Like anything. But, it does not like show pictures and videos on [my phone]. So it is different from the internet.” This sentiment was echoed by several other respondents, who voiced the following concerns: “They have a mobile version of the internet but it is really basic, you cannot see all the features, like what the site has to offer, and it is slow;” “Using the computer is easier because I have the mouse, and the phone is slower than the computer;” and “For some reason there is just something about (using the mobile phone to go online) that is not, you do not get like the same effect out of it, and I personally like to be on the computer.”

Instead of offering a new portal to the internet, the mobile phone is oftentimes seen as a convenient means of bypassing internet-based communication. The focus groups revealed that teens have adopted the metaphor of the mobile phone as the locus of texting and talking. A similar mental focus can be seen among people who grew up with only landline telephones. Since they developed a lifestyle wherein telecommunication was from place to place, they were typically reluctant to accept the functionality of mobile telephony [21,22]. As one teen explains: “The best thing about having a phone is like, I do not have to go on MySpace or Facebook or anything I can just text them from right there. And I can just call and talk to them.” Similarly, internet functions are sometimes reserved for friends without phones, which, since the vast majority of teens in the US have mobile phones, tends to be a temporary situation due to confiscation or hardware damage: “They have AOL, like AIM, it is

supported by my phone. So if one of my friends does not have a phone, they can get on the computer and text me on my phone.”

While texting is the primary means of communication between peers, phone calls and emails tend to be reserved for communication with older generations. One teen highlights this trend, saying, “The only people I really call are my family members or like if you need to send a real quick message to somebody I will send an email like I am over here, I am over there. But everybody else is just text.” Thus, texting is seen as the preferred means of communication. Another teen notes, “I would not like go on the internet to look at the news, but I had news about the snow days, I had a couple text messages from friends.” This preference for texting over mobile internet speaks to a generational divide. Teen internet use similarly differs from that of adults. While 93% of teens email in general, just 11% do so with friends on a daily basis, a figure that declined between 2006 and 2009. Daily texting to all contacts, on the other hand, stood at 54% and increased between 2006 and 2009. Just 21% of teens emailed from their mobile phones. As phone calls and emails are reserved for interactions with adults, mobile internet is similarly associated with school-related communications. For example, one teen claims, “a lot of my friends have a lot of current events for their classes, so they would just go online really quickly and look it up and do the current event in the next hour. And it was really convenient for them,” while many others report using phone email and internet to contact teachers and peers for homework information. Schools appear to encourage internet access by making Wi-Fi available, as one focus group participant explains, “Our school is an open Wi-Fi school, they want you to have phones and computers and crap, so there is Wi-Fi all the time.” Thus, where texting is preferred for peer-to-peer exchanges, internet communication tends to be reserved for adults and can often be accomplished by computers or other PC-live devices.

4. Narrowing the Digital Divide? Or, It Is Expensive to Be Poor

As outlined above, just 27% of teens interviewed in 2009 reported accessing the internet through their mobile phones. This figure jumps to 41% of teens when considering only teens from households earning less than \$30,000 annually. Just 70% of teens in this group had computers in the home, compared to 92% from families earning more than \$30,000 per year. This disparity is even greater when we compare this group to teens from families making more than \$75,000; as of 2009, 97% of whom had a computer at home and 23% of whom reported using their phones to go online. Mobile internet access was also higher among minority teens that are less likely than white teens to have a computer in the home, with 44% of African American teens and 35% of Hispanic teens using their phones to go online. This finding is echoed by a 2010 study by the Pew Hispanic Center, which found that mobile phone owners regardless of age, 51% of African Americans and 40% of Latinos access the internet on their phone, compared to 34% of whites [23]. Further, overall, 21% of teens who could not otherwise access the internet did so with their mobile phones. These surprising trends suggest a means of narrowing the digital divide.

American teens from lower income households and minority teens are less likely to have a computer in the home but more likely to access the internet using mobile devices compared to teens from higher income households. Similarly, the 2010 Pew Hispanic Center study found that where 65% of white Americans had home broadband access, just 52% of blacks and 45% of Latinos had this

same access. This, therefore, suggests a narrowing of the digital, but not necessarily the equipment, divide. Cost is the key prohibitive factor preventing teens from using their mobile phones to access the internet. Yet, lower income teens are *more* likely to use their phones to go online. This therefore presents a paradox: At face value, it seems counterintuitive that those with the least money are spending the most to go online. Here we consider the mechanisms underlying this observation.

By looking at the type of plan and who pays for it, this paradox can be at least partially explained. First, teens from higher income households are more likely to be on family plans paid for by someone else. Considering those who own mobile phones, 65% of teens from households earning more than \$75,000 per year are on family plans with someone else (*i.e.*, a parent) paying the bill. In contrast, just 31% of teens from households earning under \$30,000 per year are on a family plan paid for by someone else, with 23% paying for their own entirely (in contrast to only 4% of those from the high income group). Paying for their own phones, as well as having their own contract, is associated with using more of the service's features, especially those that require internet access, *e.g.*, email, instant message, sharing pictures and videos, accessing social networking sites, and making online purchases. In 2009, 40% of teens in the study who paid their entire mobile phone bill used their phones to access the internet, compared to 23% of teens who paid part of their bill and 26% who paid none. One teen's overview of his personal plan highlights this emphasis on features: "I pay for my own. I have a sidekick plan...which is unlimited texts, Web browsing, email and all that. And I have about 800 min." Similarly, among black and Latino teens with household incomes less than \$30,000, 63% paid for some or all of their mobile phone use, compared to 29% of teens in general. Forty-four percent of black teens and 35% of Latino teens with mobile phones use them to access the internet, compared to 21% of white teens. Thus, teens from lower income families and minority teens are more likely to pay for their own mobile devices and, given that teens who pay for their own phones are more likely to go online, are more likely to use their phones to go online. This suggests that teens without other means of going online value internet access enough to pay for it themselves.

Another issue is whether mobile communication (or mobile internet) can be seen as a necessity given that relatively impoverished people are willing to pay such a high price (expensive handsets that can access the internet plus the cost of expensive subscriptions). As noted above, one way to test this would be to calculate an Engel curve that would compare the expenditures on internet for different income levels. This would, in all likelihood, show that the more impoverished people spend a higher portion of their income on the internet than those with higher income. In reality richer teens would probably also pay less in absolute terms since they often have alternative forms of access (via a PC paid for by their parents or eventually at a job). The willingness of poor people to pay for internet access underscores the idea that net access is not just "nice to have" but that it is increasingly seen as a necessity.

While the calculation of an Engel curve would likely show this, the metrics for measuring this are very messy. Indeed it is not possible to make this calculation using the data from the Pew study. First, income for teens is difficult to calculate. Some teens have their own jobs; others are completely subsidized by their parents. Thus, there is no simple metric for individual income. A proxy for this could be household income. Again, however, there are problems since the household income per person dwelling in the home is not immediately available. Another set of issues arises when thinking about money spent on internet access. For some teens, this is provided free of charge by their parents via a PC and an internet subscription. For others, the teen must buy their own access terminal, such as

a smart phone, and then pay for their internet traffic. There is a range of alternatives between these two poles. While we have many items that suggest that impoverished teens pay more for inferior internet access, we cannot specifically calculate the elasticity of this demand curve.

Thus, while this paradox indicates a potential means of narrowing the digital divide, the cost is absorbed by those who can least afford it: Low income and minority teens. As discussed above, the digital divide is not always a simple matter of access or no access. Instead, it is a complicated series of fissures dividing people by quality and type of access, in addition to types and competency of use. The present paper suggests that purchasing the computer necessary for cheaper internet access is prohibitively expensive for households with lower incomes. Opting for the initially cheaper mobile access, the poor ultimately pay more for the internet, as mobile internet subscriptions are more expensive in the long run. Thus, the equipment divide is not narrowed. In sum, it is expensive to be poor.

5. Conclusions

The majority of teens did not use their mobile phones to access the internet. By far, texting was the preferred means of communication. With access to the internet via Wi-Fi and computers, teens can utilize the internet at a cheaper cost with superior interface. Without computer-based internet access, teens from lower income households were more likely than their wealthier counterparts to report using their phones to go online when interviewed in 2009. At face value, this finding presents a paradox: Those with the least money are paying the most for the internet. Once we understand that it is the teens themselves paying for this service, it becomes clear that, despite being more expensive and less elegant than computer accessed internet, mobile internet is better than no internet. While mobile devices present a means of narrowing the digital divide by offering internet access to those otherwise unable to connect, the cost is incurred by those who can least afford it. This trend is just a more recent development in the injustice of poverty, as those with the least must pay the most for essential goods and services, including the internet. This speaks to the drive to participate created by the internet; it is striking that teens with no other form of access would prioritize internet access, thereby illustrating the centrality of technical access to our society.

It is important to note that these data were collected in 2009. While in the realm of research, the data are fresh, in the world of technology, they are already dated. Internet phones with superior technology have further infiltrated the mobile phone market. For example, the iPhone and similar smartphones offer internet applications, or apps, designed especially for mobile devices that deliver a more user-friendly interface. As one focus group participant explains, “iPhones are like more compatible with like internet and stuff...the web browsers like on my phone...most little handheld phones...are not that great.” Another respondent echoes this: “Plus, you can zoom in on iPhones, so you can see everything a lot better.” It is interesting to note that the development of apps specifically addresses some of these issues associated with the “browser metaphor” in the case of mobile phones. As apps are tailored to mobile devices, *i.e.*, they are “finger” sized, the content is often scaled to fit the mobile screen, filtering out many of the hyperlinks associated with traditional PC-based browsers. Thus, we might expect a mobile based internet culture to emerge with the new technology. At the time of this study, though, most teens did not have access to smartphones like the iPhone due to the high equipment cost and high risk of being stolen at school (indeed, this was mentioned by several focus

group participants). As prices decrease and more industry players make their own versions (e.g., the Droid), however, smartphones are beginning to proliferate the market and may be a game changer. Similarly, tablets and netbooks, which combine mobile phone and PC interfaces in a mobile package at a cheaper cost, could be a game changer. While we cannot predict the future, current trends suggest that mobile internet subscriptions are on the rise and networks are developing more bandwidth to support more data transfer, as in the current shift from 3G to 4G networks. Thus, the inferior internet discussed here is evolving, which is good news for teens without other means of access. Yet, for the foreseeable future, mobile phone user interface and processing capacity and, thus, internet capabilities will remain inferior to personal computers. Further, given the stability of the larger trend that the poor pay more for inferior necessities, we believe the findings presented here will nonetheless retain their relevance. That is, technology may change, but income structures face greater inertia.

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Appendix

Table A1. At home, do you connect to the internet through a dial-up telephone line, or do you have some other type of connection, such as a DSL-enabled phone line, a cable TV modem, a wireless connection, a fiber optic connection such as FIOS or a T-1¹?

	Current Parents		February 2008	November 2007 ⁱ	November 2006 ^{ii,2}	November 2004 ^{iii,3}
%	10	Dial-up telephone line	16	22	25	49
	76	High-speed	71	66	73	50
	30	DSL-enabled phone line	35	31	39	20
	32	Cable modem	26	27	27	27
	11	Wireless connection	8	7	5	2
	3	Fiber optic connection ⁴	2	1	1	0
	*	T-1 connection	—	—	—	—

Table A1. Cont.

*	Other	*	0	1	1
8	No computer at home (VOL.)	6	6	<i>n/a</i>	<i>n/a</i>
4	Computer at home not connected to internet (VOL.)	4	4	<i>n/a</i>	<i>n/a</i>
2	Do not know	2	1	1	1
0	Refused	—	—	—	—

¹. Trend question wording was as follows: “Does the computer you use at home connect to the Internet through a dial-up telephone line, or do you have some other type of connection, such as a DSL-enabled phone line, a cable TV modem, a wireless connection, or a T-1 or fiber optic connection?” ². In November 2006, question was asked only of parents who use the internet from home [$N = 799$]. ³. In November 2004, question was asked only of parents who use the internet from home [$N = 885$]. ⁴. Trend results for “Fiber optic connection” reflect combined “Fiber optic” and “T-1” responses. ⁱ. November 2007 trends based on the Pew Internet & American Life Project’s “Teen/Parent Survey on Writing” conducted September 19-November 16, 2007 [$n = 700$ parents of 12–17 year-olds, $n = 664$ internet teens ages 12–17 and 36 offline teens ages 12–17]. ⁱⁱ November 2006 trends based on the Pew Internet & American Life Project’s “Parents and Teens 2006 Survey,” conducted October 23-November 19, 2006 [$n = 935$ parents of 12–17 year-olds, $n = 886$ internet teens ages 12–17 and 49 offline teens ages 12–17]. ⁱⁱⁱ November 2004 trends based on the Pew Internet & American Life Project’s “Parents and Teens 2004 Survey,” conducted October 26-November 28, 2004 [$n = 1100$ parents of 12–17 year-olds, $n = 971$ internet teens ages 12–17 and 129 offline teens ages 12–17].

Table A2. Different cell phones have different features. Can you use your cell phone to [INSERT IN ORDER]? [IF YES: How often, if ever, do you use your cell phone to [INSERT]—several times a day, at least once a day, a few times a week, less often or never?] (Based on teen cell users [$N = 625$]).

	Yes/ Several Times a Day	Yes/ at Least Once a Day	Yes/ a Few Times a Week	Yes/ Less Often	Yes/ Never	No, Can Not Do This on Cell	Do Not Know	Ref.
a. Send or receive text messages	63	9	7	8	5	7	1	0
b. Send or receive email	4	3	6	8	14	64	2	0
c. Take a picture	10	11	30	32	4	13	0	*
d. Send or receive pictures	6	8	18	32	12	23	*	*
<i>Item E: Based on Form B teen cell users [N = 306]</i>								
e. Play music	21	11	13	15	16	23	*	0
<i>Item F: Based on Form A teen cell users [N = 319]</i>								

Table A2. Cont.

f. Send or receive Instant Messages	11	4	7	9	18	48	3	0
<i>Items G & H: Based on Form B teen cell users [N = 306]</i>								
g. Record a video	3	4	10	37	14	31	1	0
h. Send or receive a video	2	1	7	22	21	44	4	0
<i>Items I & J: Based on Form A teen cell users [N = 319]</i>								
i. Play a game	5	4	11	26	23	30	1	0
j. Use a Social Networking site	6	3	7	7	13	63	2	0
<i>Item K: Based on Form B teen cell users [N = 306]</i>								
k. Use an application (or app) that you installed	3	1	7	9	14	62	4	0
<i>Item L: Based on Form A teen cell users [N = 319]</i>								
l. Buy a product, such as books, music or clothing	1	0	4	6	16	73	1	0

Table A3. On an average day, about how many text messages do you send and receive on your cell phone? **OR** Well, on an average day, would you say you send or receive...[READ] (Based on teen cell users who text message [N = 552]).

Current Teens		
%	2	No text messages on your cell phone
	22	1 to 10 text messages
	11	11 to 20
	18	21 to 50
	18	51 to 100
	14	101 to 200
	15	More than 200 text messages a day
	*	Do not know/Can not say/Could not guess
	0	Refused
	Mean # of texts:	112.39
	Median # of texts:	50.00

Table A4. How often do you send or receive text messages with [INSERT] on your cell phone... several times a day, at least once a day, a few times a week, less often or never? (Based on teen cell users who text message [$N = 552$]).

	Several Times a Day	At Least Once a Day	A Few Times a Week	Less Often	Never	(Vol) n/a	Do Not Know	Ref.
Friends	75	7	10	7	2	0	0	0
Your parents or guardian	24	24	15	16	20	0	0	0
Your brothers, sisters or other family members	17	16	21	22	24	1	0	*
Your boyfriend or girlfriend	40	6	8	5	27	14	0	0

Table A5. When you want to reach [INSERT], are you more likely to use your cell phone to Text them or to Talk to them? (Based on teen cell users who text message [$N = 552$]).

	Text	Talk	(Vol) Both	(Vol) Neither	(Vol) Depends	(Vol) n/a	Do Not Know	Ref.
Friends	67	28	5	0	1	*	*	0
Your parents or guardian	18	78	4	0	*	0	0	0
Your brothers, sisters or other family members	38	55	4	1	0	1	*	0
Your boyfriend or girlfriend	42	26	7	2	0	22	0	*

Table A6. What kind of cell phone plan do you have? Is it...[READ]? (Based on teen cell users [$N = 625$]).

Current Teens		
%	18	A prepaid or pay-as-you-go plan [IF NEEDED: A Go-phone or plan without a contract]
	10	A separate contract covering only your cell phone
	3	Do not know what kind of plan
	0	Refused

Table A7. Do you happen to know what kind of voice calling you have on your cell phone? Do you have a set number of minutes you can use a month; OR a set amount of money to use to buy minutes; OR an unlimited number of minutes per month? (Based on teen cell users [$N = 625$]).

Current Teens		
%	42	A set number of minutes you can use a month
	8	A set amount of money to use to buy minutes
	37	An unlimited number of minutes per month
	13	Do not know what kind of plan
	0	Refused

Table A8. What about the text messaging plan on your cell phone, if any? Do you have an unlimited text messaging plan; OR a plan with limits on the number or kind of messages you can send and receive per month; OR do you not have a plan and have to pay per-message? (Based on teen cell users [$N = 625$]).

Current Teens		
%	75	Unlimited plan
	8	A limited plan
	13	No plan—I pay per message
	2	My phone cannot send text messages (Vol.)
	2	Do not know what kind of plan
	0	Refused

Table A9. Do you, yourself, pay all of the bills for your cell phone... do you pay only part of the costs... or do you pay none of the cell phone costs? (Based on teen cell users [$N = 625$]).

Current Teens		
%	10	Pay all the costs
	19	Pay part of the costs
	70	Pay none of the costs
	1	Do not know
	0	Refused

Table A10. K43 Who pays [the costs/the other part of the costs] of your cell phone? Is it your parents or someone else? (Based on teen cell users who do not pay all the costs of their cell phone [$N = 566$]).

Current Teens		
%	94	Parents
	6	Someone else (SPECIFY)
	0	Do not know
	*	Refused