

The Kids Are Online—and Alright

Lack of broadband access is a greater threat to the well-being of young people than too much access.

Ninety-five percent of teens now report they have a smartphone or access to one; 45% of them say they are online on a near-constant basis. Some adolescents become entangled in inappropriate or exploitive relationships by exchanging personal information or ill-advised selfies. Others have been victims or perpetrators of online abuse and harassment, leading to real-world consequences for mental and physical health. College acceptances, job opportunities, or good credit ratings can all be forfeited because of impetuous decisions made by young brains in the grip of ubiquitous, addictive technologies.

Even when the consequences are less dire, most parents of adolescents have good reason to dread the hollow-eyed breakfast gaze of teens who spent the night playing online video games or texting with friends. Or the irascibility of children forcibly torn away from their screens to spend some undistracted time with family members.

But the news is not all bad. Teens benefit in sometimes unexpected ways from access to online information and real-time interactions. Researchers are discovering ways that social media and related activities can help teens feel more connected, find information on topics they may be too embarrassed to ask about in person, and join communities less exclusive than high school cliques and varsity teams. As much as teen behavior can be diminished by poor judgment—with accelerated and amplified consequences as a result of their online interactions—teens' lives can also be truly enhanced, and offline harms reduced, with access to high-speed networks.

Whether it's doing homework, communicating with friends, creating videos or music, or searching for a college or a job, the ubiquitous reality is that a typical day in teen life will include a lot of screen time. For parents, teachers, and

others who care about and for fledgling youth, the challenge is to provide guardrails for appropriate quantity and quality of online interactions. How much is too much? Which activities are beneficial and which more harmful? Of course there is no easy prescription here, but in addition to the well-known downsides, it turns out that internet platforms and resources play an important role in teens' social-emotional development, and online practices interact with offline behaviors in sometimes surprising and positive ways. Three areas where social science research suggests unexpected benefits include reproductive and mental health, professional development and economic security, and civic engagement. Some of these benefits are so significant that the greatest risk to children may come less from too much access to the internet than from not enough.

Sex, lies, and broadband

The teen birth rate in the United States has been declining overall since the 1950s and has plummeted in the past 10 years. It reached a historic low in 2017, at 19 births per 1,000 women aged 15 to 19, a drop from 57 pregnancies (and 34 births) per 1,000 women in 2010. An analysis of health economics by the US Centers for Disease Control and Prevention showed that a 64% drop in the teen birth rate between 1991 and 2015 “resulted in \$4.4 billion in public savings in 2015 alone.” It may come as little surprise that this dramatic reduction corresponds to a decline in teen sexual activity between the 1990s and mid-2000s. But it also corresponds to an uptake in social media activity and access to smartphones and high-speed online networks. In fact, quality and speed of broadband access are strongly correlated with reduced rates of teen pregnancy and sexual activity. Why? The drop in teen pregnancies—and commensurate

decline in sexually transmitted infections among teens—may be explained, at least in part, by an “incarceration effect,” a reduction in time that teens spend socializing in person in favor of time socializing online. Despite ready availability of online sexual content and matchmaking apps that one might imagine fuels the opposite result, so far there is no way to get pregnant electronically. “Netflix and chill”—solo.

Data from the United States and Germany suggest that roughly 10% of the recent declines in teen birth rates can be explained by increased broadband access. Enhanced availability of information on the risks and costs of early pregnancy and childbearing may also be part of the reason. Teens may feel more comfortable turning to anonymous platforms or chatbots for information on reproductive health than talking to parents or teachers; recognizing this, nonprofit public health organizations are deploying high-tech tools using artificial intelligence and natural language processing to offer information and advice.

Conversely, correlations between high teen birth rates and lack of broadband access intriguingly suggest that infrastructure investments could have unforeseen positive ripple effects. A map of teen birth rates by county in the United States shows striking resemblance to a map of broadband service, where areas of high teen birth rates correspond to areas of low broadband availability. Of course, both these indices likely point toward a third cause: low education, high poverty, high unemployment. But as a matter of policy, it would be worth exploring the potential public health benefits of investments in cyberinfrastructure in areas of economic and social disenfranchisement.

Broadband access appears to have an intriguing effect on reproductive choice and fertility for younger adult women as well as teens. For women of childbearing age, it can be an engine of liberation, with differential effects on fertility according to socioeconomic and educational status. A 2017 study based on German data found a twofold effect. For highly educated women aged 25 and above, high-speed internet availability correlates with increased fertility, especially the choice to expand the family beyond a single child. Yet such access had no effect or negative effect on fertility among highly educated men or women under the age of 25. These findings suggest that high-speed internet is helping highly educated women better manage the responsibilities of career and motherhood. For younger women, this can mean increased access to information on the risks and costs of early pregnancy and childbearing, contributing to reduced fertility. High-speed broadband access also may contribute to more satisfying reproductive choices for women by expanding options for working from home and for part-time employment. The study also found that broadband access correlated with increased satisfaction from time spent with children and from discretionary time overall.

The policy implications of what researchers are learning

about broadband access and reproductive choice have so far largely escaped notice. But given the relationship between broadband access and declining teen birth rates, the \$250 million of federal funds spent on largely ineffective abstinence-only sex education between 2010 and 2014 might have been better invested in broadband diffusion.

Fitting in without being there

Aside from its implications for hooking up (or not), how do teens themselves perceive the effects of time online? Most say they feel more connected with friends, and a minority say they feel pressure to post positive things. A Pew Research Center study published in August 2018 found that 9 out of 10 teens feel that spending too much time online is a problem for kids their age, and 6 of 10 said it was a major problem. How long is too long? Some studies show that lengthy and persistent time online, especially time spent viewing violent content, correlates with increased risk for violent or impulsive behavior.

But other studies suggest that the relationship between teen happiness and time online is not directly proportional. Although it might be assumed that the less screen time the better, the dynamic is not that straightforward. Two researchers in the United Kingdom, Andrew Przybylski and Netta Weinstein, collected data on the digital habits and mental health of more than 120,000 British 15-year-olds. They found that the effect on mental health of time spent with devices depends on what teens are doing online and how long they spend doing it. The study showed differences in the type of activity by gender, with boys spending more time playing video games and girls spending more time on their smartphones (texting or using social media). The genders spent similar time watching movies or television shows. An hour or two immersed online every day—dubbed by the researchers as “the digital Goldilocks effect”—was actually found to be associated with better well-being than complete abstinence. Negative associations begin to emerge only after participants spent several hours per day with their devices.

In the United States, a national survey in 2018 by Hopelab and Well Being Trust found that two-thirds of teens and young adults between the ages of 14 and 22 “hardly ever” or “never” feel left out when using social media. The study found no relationship between time spent online and self-reported symptoms of moderate to severe depression. And for teens with depressive symptoms, social media was more important for expressing themselves creatively (25% versus 13%), getting inspiration from others (27% versus 13%), and feeling less alone (30% versus 7%) than for teens without such symptoms. Teens with symptoms of depression were also more likely than nondepressed teens to prefer communicating with people through social media rather than in person (42% versus 25%). The results of this study are hardly unambiguous—for example, teens experiencing depression were also more likely than those who are not to have negative experiences on social media. But

the important point is that in contrast to dire pronouncements about social media's negative effects on mental health, emerging studies are suggesting that social media can provide real benefits for the well-being of many young people.

Easy access to online health information is another benefit of broadband for young people. Ninety-four percent of young adults (18–22 years old) say they have gone online for health advice; for teens (14–17 years old), it's 79%. The older cohort is more likely by a significant margin to seek information regarding pregnancy, anxiety, depression, birth control, and stress.

Information consumption patterns vary by gender: 91% of teen and young adult females say they have gone online for health information, compared with 83% of males. The largest differences are in females' searches for information on birth control and pregnancy (36 and 35 percentage point difference, respectively). Girls are also much more likely to report having gone online for information about anxiety and depression.

Online behavior also differs by sexual orientation. Female and LGBTQ youth are far more likely to look online for resources about mental well-being. About 75% of LGBTQ youth search for information on depression and anxiety, versus about one-third of straight youth. Half of girls go online looking for similar information versus one-quarter of boys.

Other improvements in teen public health may be correlated to broadband access. Teen drunk driving fatalities have decreased 80% since 1982. Although much of this decline occurred in the 1980s, a rapid additional decline after about 2006 might be linked to the internet offering an alternative to partying: high school seniors spent only two hours per week at parties in 2016, one-third the time spent by this cohort in 1987. When asked why, many respond that with the content and connection provided by streaming entertainment (Netflix, YouTube) and social platforms (Snapchat, Instagram), they had no need to socialize in person.

Of course, the detrimental effects of networks and mobile devices cannot be overlooked. For example, although teens are aware of the dangers of texting while driving, many do so nevertheless (in a 2015 survey, 42% of high school students admitted to texting while driving in the past 30 days). Research has also suggested a link to higher rates of teen suicide. A 23% rise in teen suicide rates between 2010 and 2015 correlates with a time of rapid increase in smartphone use. Increased use of phones and screens is also implicated in decreased time and poorer quality of sleep among all ages, but the consequences for teen physical and neurological development may be particularly troubling.

Clearly, not nearly enough is known about the connections between broadband access and the mental and public health

of youth. But certainly enough is known to say that social media and internet access should be recognized as promising tools for helping young people navigate the many social and psychological challenges they face in today's complex and rapidly changing world.

Livelihoods and lifelines

Access to adequate broadband is also increasingly important for helping young people at economic risk to gain employable skills, discover work opportunities, and apply for jobs and financial aid. For the nearly two million unaccompanied homeless youth in the United States, smartphones are a lifeline for accessing services, navigating public transit, keeping in touch with family members, and responding to job opportunities. A study in Denver found that nearly half of homeless youth owned a cell phone, and more than 70% used Facebook to keep in touch with friends and family. Young people also use digital devices to watch TV episodes, movies, or other entertainment. Although these activities may seem like a waste of time, they keep at-risk youth off the street and away from drugs, according to case workers at a Denver shelter. Indeed, smartphones can play an important role in

long-term case management and harm reduction. Some cities recognize these advantages and are investing in better wireless networks for public use. In San Francisco, for example, ShelterTech is using city funds to provide single-room occupancy hotels and shelters, such as Larkin Street Youth Services, with wireless infrastructure and access.

Communities can also benefit from investment in cyberinfrastructure for keeping young adults near their hometowns and reducing the evaporation of post-high school talent. Some states have introduced legislation that calls for providing cash assistance to repay college loans if recipients stay in-state for a certain amount of time after graduation. Others offer incentives for highly trained employees to move into underpopulated areas and work remotely. US Representative Ro Khanna (D-CA), who represents Silicon Valley, offers a similar message of encouragement for investing in opportunities for remote work and start-ups, as well as in the network infrastructure that underpins these opportunities for residents in more rural areas. University of North Dakota system chancellor Mark Hagerott is recommending the creation of digital "Cyber Land-Grant Universities" to help rural states make the transition to today's economy.

Broadband access is increasingly essential for students to get their homework done—and for the teachers who are providing content and grading assignments. Lack of adequate broadband can become a legal and financial liability for public school systems that require teachers to enter data into online

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platforms with insufficient bandwidth. In April 2013, teachers in New York City reached a \$41 million agreement with the city's Department of Education to pay for overtime and back pay due to lack of internet infrastructure for required work. The agreement ordered the city to pay back wages to more than 30,000 special education teachers, school psychologists, social workers, and others who spent hours beyond the school day wrestling with new software, slow bandwidth connections, and less-than-helpful technical assistance. If this was a problem for New York City, how much worse must it be for school districts across the country struggling to provide adequate technology and internet bandwidth for their employees and students?

Look who's voting

In addition to facilitating entertainment, friendships, and homework, social media often provides youth with their first introduction to political issues. Contrary to the specter of "slacktivism" raised by some pundits, researchers have found a correlation between levels of online activity and offline political engagement. Immersed in the landscape of virtual communities, young people can become strongly engaged in social movements such as #BlackLivesMatter and anti-gun violence activism through online participation. Rather than displacing civic engagement, online activity encourages it and allows geographically disparate interest groups to connect with like-minded communities online. This is especially true for young people: in 2013, two-thirds of people in the United States between the ages of 18 and 24 engaged in political activity via social networking sites such as Facebook and Twitter, compared with about 40% of all adults. The younger group is more likely to engage politically on social media than in any other venue and has been found to pursue topics discovered on these platforms via other online or offline political activities.

By way of illustration, the Youth Participatory Politics Survey polled a nationally representative sample of people between the ages of 15 and 29 in 2013 and again in 2015. Researchers asked participants who reported being active on social media in 2013 whether they were more likely to have engaged in political discussions online or political activities offline two years later. Results suggest that they were. Young people who were active in friend-related or interest-driven activities online were also more likely to engage in political discussions online and to participate in offline political activities (e.g., attending political events, contributing to a campaign, voting). Although fewer than 20% of eligible voters (ages 18 to 29) participated in the 2014 midterm election, the number was significantly higher in the next midterm in 2018, at closer to 30%. (Young voters' participation in general election years, in 2012 and 2016, held steady at around 50%. Democrats and Republicans alike must view these low numbers as targets of opportunity to influence the outcome of the next presidential election.)

Rural youth—approximately 14% of young voters—often lack access to opportunities for civic and political learning and engagement; more than half of them live in so-called civic deserts, a far higher proportion than youth in urban or suburban areas. Young people in rural areas voted for Donald Trump by 53% in 2016, compared with the youth vote overall in which only 37% voted for Trump, mirroring the urban/rural gap in party preference among voters of all ages. Improved high-speed access to online platforms could allow exposure to a wider range of political views. On the other hand, improved network access could in fact exacerbate the divide, if it increases exposure to disinformation campaigns or extreme partisan views, as seen in the 2016 election. Both scenarios are worth further investigation. In either case, improved broadband access is an important tool for rural populations to overcome feelings of disenfranchisement, but the ability to connect to political discussions online must have a bridge to offline action in order to mobilize civic engagement, regardless of political sentiment.

Broadband for all

Legislative efforts over the past decade have sought to provide equitable access to online resources through a variety of federal, state, and local programs. A complicated patchwork of legislation and regulatory agencies governs policies for commercial internet providers and public subsidies for services. A leading effort to improve broadband access and reduce disparities in digital access was incorporated in the American Recovery and Reinvestment Act a decade ago with the allocation of \$4 billion for the Broadband Technology Opportunities Program. Funds have been nearly completely distributed and have resulted in substantial improvements nationwide. The American Broadband Initiative, announced in February 2019, brings together 20 federal agencies to study gaps in accessibility and suggest improvements. The Digital Equity Act of 2019, introduced by Senator Patty Murray (D-WA) along with eight Democratic and one Independent cosponsors, would offer \$125 million in competitive grants to support digital equity projects. It may be unlikely to pass a Republican Senate, but this kind of support is needed for noncommercial enterprises to increase broadband access.

The Federal Communications Commission (FCC) is charged with reporting annually on access to fixed and mobile broadband throughout the United States. The 2019 Broadband Deployment Report found that 98% of people living in urban areas had access to adequate speeds for downloading and uploading content, while only 74% of those living in rural areas and 68% of those on tribal lands had comparable access. This disparity, though still substantial, has been narrowing over the past five years. These statistics also hide local and regional differences in bandwidth availability, internet speed, and cost of service. Although federal funding has been earmarked for improving internet access in rural communities, the FCC, telecommunications providers, and consumers disagree on

where the needs are most acute. The Digital Opportunity Data Collection program, approved by the FCC in August 2019, will require more detailed mapping from service providers and validation from the public.

Leaders can look for unexpected partners or opportunities to include network infrastructure in other funding bills. Legislation to improve rural connectivity passed in December 2018 as part of the Farm Bill. The comprehensive legislation incorporates the Precision Agriculture Connectivity Act, which requires the FCC to work with the Department of Agriculture to boost broadband deployment and adoption in rural areas.

Legislative and regulatory negotiations could benefit from advocacy by educators and health care practitioners whose ability to do their jobs is affected by the availability of high-speed internet to deliver remote health care and support remote learning. The 15 million rural residents without access to sufficient mobile broadband services include students and patients who stand to benefit from improved connectivity or suffer from its lack.

Corporate industry leaders and nonprofit organizations should support partnerships with schools, libraries, and sites of informal education by providing technology devices, internet access, and teacher training. The FCC's E-Rate program supports such collaboration by providing deep discounts to schools and libraries for services from telecommunications vendors. Broadband Connects America is a new coalition of diverse public and private organizations that advocates for affordable broadband and connectivity in rural areas, and represents one useful model for such partnerships.

Employers and educational institutions should make as many materials as possible optimized for the smartphone, including course materials and applications for college, financial aid, and jobs. Studies show that a greater percentage of underserved youth have access only to a smartphone or to a single device at home, and for youth in rural communities or lower-income households, only 56% have access to home broadband. Though these groups may technically have "access" to the internet, tasks such as completing an advanced homework assignment or applying for financial aid on a smartphone may often be impractical and sometimes impossible. When assigning homework, teachers must be aware of disparities among students in the resources available to them, both with respect to devices (computer and printer) and online access and connectivity speeds. Efforts such as the California Rural Education Network and the Education SuperHighway seek to improve online access for educators, administrators, and rural and underserved students.

While many well-to-do parents anguish about the effects of too much screen time on their kids, and how to reduce it, the more serious imperative is to ensure that all young people have the high-speed access they need. To gain the benefits of an information economy and participate fully in civic life, underserved communities require access to online resources

that are possible only through public and private investment in cyberinfrastructure. Despite alarming headlines about online threats to privacy or endless consumption of mindless entertainment, the more edifying benefits of internet access for the younger generation may be unexpected, but are now beginning to come into focus through social science research. To achieve a vision of greater social, economic, and educational equity, public and private stakeholders—policy-makers, telecommunications companies, parents, health care providers, educators, and students themselves—must attend to this essential resource for full participation in twenty-first century life.

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Recommended reading

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