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Internet-Based Communication

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Abstract

Google the question, “How is the Internet changing the way we communicate?,” and you will find no shortage of opinions, or fears, about the Internet altering the way we communicate. Although the Internet is not necessarily making communication briefer (neither is the Internet making communication less formal), the Internet is manifesting our preference for writing over speaking. I propose that our preference for communicating through Internet-based text derives from a fundamental feature of writing: In contrast to speech, which is most often synchronous, text is most often asynchronous.

Introduction

In this article I argue that the Internet provides a fruitful new avenue for studying text and discourse. However, some readers might be wondering why scientists want anyone to spend more time on the Internet. As it is, if the Internet craze continues, we are destined to become a nation of morons. Just look around, and you will see how many teenage girls hang out from morning to night on Facebook and Snapchat, to the neglect of their school work and their mental health. And don't we all agree that YouTube, with its plethora of pratfall and cat videos, threatens to change us into creatures with eyeballs as big as cantaloupes with no brains at all? And what about the mental laziness enabled by our being able to Google anything we can't remember? Surely, Internet-based search engines create forgetfulness because people who search the Internet stop searching their own memories.

So why should text and discourse scientists flock to the Internet as a fruitful new avenue for study? Isn't Internet-based communication as a substitute for live, in-person communication merely a spurious form of progress? Don't we agree that we should only be studying face-to-face communication not mechanical Internet-based communication? And that we should join millions of others in the ... Musical Defense League.

Alas, the claim that Internet-based communication is a spurious form of progress (“like a loom converting good wool into shoddy”) was not protesting mechanical, Internet-based communication versus live, in-person communication. Rather, it was protesting mechanical (recorded) music versus live, in-person music. In movie theaters. In the 1930s (Smithsonian,

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2012). Figure 1 displays one of the ads the Musical Defense League placed in newspapers around the United States in 1932 and 1933. The ads decried the advent of accompanying motion pictures with recorded music rather than musicians performing live, sitting in each and every movie theater, during each and every cinematic screening. As Figure 1 illustrates, recorded music was deemed a robot's lullaby that would lull otherwise mature audiences back to infancy. However, as anyone who has been to a movie theater in the past 85 years knows, the protest was not successful.

As for the fear of the continued Internet craze leading to our becoming a nation of morons, that fear was voiced in a 1950s commencement address, given by Boston University's president, who was referring to that era's craze: television (Time, 1950). Similarly, the claim about YouTube changing us into creatures with eyeballs as big as cantaloupes with no brains at all? That, too, was a quote from the 1950s, also about the fearful rise of TV, this time spoken by Fred Allen, a radio personality (Sharbutt, 1978).

As for the public's distress about so many teenage girls who hang out on Facebook and Snapchat from morning to night, to the neglect of their school work and their mental health? That fear dates back to the 18th century and the use of those newfangled gadgets called novels. "Many young girls, from morning to night, hang over this pestiferous reading, to the neglect of industry, health, proper exercise, and to the ruin both of body and of soul" (Binhammer, 2003, p. 1). In his 1778 essay on morality and literacy, British schoolmaster Vicesimus Knox opined that "If it be true that the present age is more corrupt than the preceding, the great multiplication of novels has probably contributed to its degeneracy, because fifty years ago there was scarcely a novel in the kingdom" (as cited in Brantlinger, 1998, p. 1). Other 18th century scholars predicted that "the increase of novels will help to account for the increase of prostitution and for the numerous adulteries and elopements that we hear about" (Binhammer, 2003, p. 1). Indeed, in a list of presenting ailments recommending admission to the Trans-Allegheny Lunatic Asylum, we find novel reading adjacent to nymphomania and opium addiction (Jerreat, 2013).

As for Google rotting our memories? That declaration was made by Socrates about the invention of writing: "This discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories." Indeed, Socrates believed those who relied on the written word, including me as an author and you as a reader, "will appear to be omniscient, but will generally know nothing; they will be tiresome company, having the show of wisdom but without the reality" (Plato, c. 370 BC).

The Internet is Becoming Ubiquitous

Because I was a child of the 1950s who witnessed the advent of numerous important technological inventions, such as seat belts, the microchip, the cardiac pacemaker, and the antibiotic, tetracycline (as well as Barbie Dolls, Mr. Potato Head, McDonalds restaurants, and drive-in movies), I was imprinted on the power of technology. As for the Internet, I am particularly struck with its amazingly fast saturation speed. By saturation speed, we mean the number of years required to achieve saturation through half of all households. For the telephone, saturation through U.S. households took over 50 years; for air conditioning,

saturation took nearly 30 years. For the automobile, it took over 20 years. However, for the Internet, saturation has been achieved in a remarkable dozen years, second only in saturation speed to the smartphone (Dediu, 2012).

Nearly 8 of 10 North Americans, 6.5 of 10 Europeans, and 6 of 10 Australasians use the Internet daily (Internet World Stats, 2012). Drilling down to look at only my home country, the United States, men are just as likely as women to use the Internet daily (85% and 84%). Black non-Hispanic Americans (85%) are just as likely as White non-Hispanic Americans (86%) to use the Internet daily, with only a small dip for Hispanic Americans (76%). Americans who live in urban areas are just as likely to use the Internet daily (86%) as Americans who live in suburban areas (86%), with just a small decrease for those who live in rural areas (80%). Although daily Internet use is somewhat tied to a person's annual salary, over three fourths of Americans who live in poverty access the Internet daily (Pew Research Center, 2013).

As in many countries, it is the younger adults who go online most frequently; for example, 98% of Americans age 18 to 29 and 92% of Americans age 30 to 49 use the Internet daily. But more than half of U.S. senior citizens use the Internet daily (Pew Research Center, 2013). It is this older age group who is demonstrating the most rapid increase in Internet usage. In just a few years, when the rest of the baby boomers join this age group, the age-Internet use disparity will undoubtedly diminish (Madden, 2010).

We use the Internet for e-mail, with 150 billion messages sent per day, of which 69% are spam (Radicati Group, 2012). We use the Internet for social media, spending an average 3.2 hours a day on sites such as Facebook, where 500 million people log in every day; Twitter, where 175 million tweets are sent every day, and YouTube, where 4 billion videos are viewed every day (Pring, 2012). On Instagram, 40 million photos are uploaded every day and 1,000 comments are made every second, along with 8,500 likes (Valant, 2013). However, one of the newest social media eclipses its adolescent siblings: Snapchat users send an astounding 400 million photos and videos each day (Colao, 2014).

Other social media include Google+, where the Dalai Lama hangs out with Desmond Tutu (Marya, 2011), and LinkedIn, whose membership includes executives from every Fortune 500 company (LinkedIn.com). Half of 18- to 34-year-olds check Facebook as soon as they wake up each day, and nearly a third do so on their mobile phones before getting out of bed (Pring, 2012).

In regions of the world that have less access to computers, mobile and smartphone use is burgeoning. For example, there are nearly a quarter billion mobile smartphone users in Africa (Chetty, 2013). The World Bank reports that in some countries, citizens are more likely to have access to a mobile phone than they are to a bank account, electricity, or clean water (Kelly & Minges, 2012). Citizens of countries such as Kenya, Tanzania, and Ethiopia are willing to pay as much as 25% of their monthly income to have mobile phone access (Hersman, 2009).

Africans “use their mobile phones for everything” (Murray, 2012): socializing with friends and family both near and far away, paying for goods and services, and even interacting with

their governments (Chetty, 2013). African farmers use their smartphones to trade crops and to check on market prices (Smith, 2009). African children use smartphones to receive educational materials, and African teens use smartphones to engage in peer-to-peer tutoring (Murray, 2012). For persons without access to electricity, they charge their smartphones through car batteries located in the village (Smith, 2009).

Mobile smartphones, and ergo access to the Internet, are becoming ubiquitous throughout the world. When the Reddit community was recently asked what would be the most difficult thing to explain if someone from the 1950s suddenly appeared today, the most up-voted response—among the 12,000 answers this question received—was the following: “I possess a device, in my pocket, that is capable of accessing the entirety of information known to man. I use that device to look at pictures of cats and get in arguments with strangers” (Nuseramed, 2013).

How is the Internet Changing the Way we Communicate?

Google the question, “How is the Internet changing the way we communicate?,” and you will find no shortage of opinions, and fears, about Internet-based communication altering the way we think, write, and speak (Arnett, 2012; Chopra, 2013; Leonardi, 2012; and the mother lode, nearly 200 essays in response to The Edge Annual Question [Brockman, 2010], “How is the Internet changing the way you think?”).

Internet-based communication is not necessarily less formal (Baron, 2002; Feenberg, 1989). Sure, some of us raised our eyebrows when we saw Dr. Francis Collins, Director of the U.S. National Institutes of Health, the world's largest medical research and funding agency, end his tweet about the U.S. Supreme Court case decision disallowing DNA patenting, with the slang expression, “Woo Hoo!!!” (complete with triple exclamation points; Collins, 2013).

However, textual slang dates back centuries. For example, in an exasperated letter to Winston Churchill in 1917, Lord Fisher not only used double exclamation points (“some headlines in the newspapers have utterly upset me! Terrible!!”) but also used the abbreviation OMG! (“I hear that a new Knighthood is on the tapis – OMG!”; Locker, 2012). Similarly, emoticons, like those smiley faces composed of colons and parentheses, are nothing new. They arrived in text in the late 1800s, as soon as the typesetters of *Puck* magazine could rejigger their typesetting machine, as shown in Figure 2.

Internet-based communication is not necessarily briefer. Very few contemporary text messages can match the brevity of a postal letter written in 1862 by the noted author Victor Hugo. Hugo had just completed his latest novel, *Les Miserables*, and had gone away on a vacation. But he was understandably anxious to learn how the book was selling. Therefore, he wrote his publisher the following letter:

?

Indeed, his correspondence comprised only one character, a question mark. Hugo's publisher responded just as tersely:

!

We might grouse when we hear that authors are now using Twitter, with its 140-character limit, to pen short stories. But Guatemalan author Augusto Monterroso beat the 140-character limit back in 1959, with his ultra-short story, “El Dinosaurio,” the entirety of which is “Cuando despertó, el dinosaurio todavía estaba allí.” (“When she or he awoke, the dinosaur was still there.”). Short forms of formal communication have been with us for centuries.

Thus, the Internet is not making communication briefer. Neither is the Internet making communication less formal. We have always had brief forms of communication, even in writing, and we have always used written communication in informal modes. But the Internet and the smartphone are changing one way that we communicate: Internet-based communication is manifesting either our latent or a newfound preference for written communication over spoken communication—for text over discourse.

Internet-Based Communication Manifests a Preference for Written Communication

As heralded by the title of Clive Thompson's (2010) article, “On the Death of the Phone Call,” we are witnessing a steady decrease in communicating by spoken telephone call. In its wake, we are witnessing a steady increase in communicating by written text message. U.S. teenagers are leading the pack, each sending, on average, over 4,000 text messages a month (Nielsen, 2011). But even senior citizens are gravitating toward texting. U.S. adults over age 65 send, on average, two text messages a day, as demonstrated by NBA basketball player Kevin Durant's grandmother, who texted to congratulate his team, the Oklahoma City Thunder, on their win over the Phoenix Suns (“Thunder struck again & the Sun(s) went down (Great W)! Love u g mom”), and to add some old-fashioned grandmother scolding (“Kev kev stop cussing so much [because the TV cameras] be showing u when u do”), to which the dutiful 6'9" grandson apologized (“sorry grandma I be so emotional, I love u”; Devine, 2013).

The more we text message each other, the less we phone call. Indeed, *The New York Times* asks: Why talk when you can text? (Midlin, 2010). Nielsen (as cited in Midlin, 2010) reports that “Teenagers growing up now don't even think the phone is primarily for voice. It's primarily for text.” The phone call is becoming so *passé* that a recent cartoon demonstrating a tongue-in-cheek flow chart for choosing the appropriate communication mode placed phone calling at the end of the line, only slight above the recommendation to “Try smoke signals, gramps” (Paul & MacNaughton, 2013). In response to U.S. President Obama's “We The People” mechanism, for which heavily endorsed petitions are forwarded to the President himself, there is a petition to make it a felony to respond to a text message with a phone call (www.Petitions.WhiteHouse.org).

Thus, the major influence the Internet is having on the way we communicate is by manifesting our preference for writing over speaking. But why? I propose that the preference for written communication derives from a fundamental feature of writing: It is most often asynchronous. In contrast, speaking is most often synchronous, as when we converse face-to-face or talk on the phone. As illustrated in Figure 3, although forms of

writing exist that are synchronous (e.g., Internet-relay chat [IRC], which operates as synchronous text-messaging) and technologically supported forms of speaking exist that are asynchronous (e.g., recorded lectures and voice mail), there are many more forms of asynchronous written communication than asynchronous spoken communication. It is writing's asynchrony that I propose underlies the preference for writing over speaking that the Internet is manifesting.

Internet-Based Communication Manifests a Preference for Asynchronous Communication

Asynchronous text-based communication dates back to the invention of writing. All of today's popular modes of asynchronous Internet-based communication have precursors in the pre-Internet era. For instance, Facebook and other Internet-based discussion boards were predated with community bulletin boards. One member of the community would post (with literal thumbtacks) onto a (physical) bulletin a written message or document (Ride Needed; Garage Sale Tomorrow). Other persons came along later, read the initial posting, and perhaps added to it. Then, another person posted another written message or document, and the cycle continued.

Thirty-five years ago, one of the ways I asynchronously communicated with colleagues during graduate resembled e-mail. Whenever I wanted to set up a meeting with my advisor or arrange lunch with another graduate student, I walked to the departmental mailbox room. There, beside the wooden cubbies all of us were assigned, lay a pad of hot pink "While You Were Out" notes. I wrote my message on one of the notes, tucked it into the recipient's mailbox, and waited until the person replied to my note by writing on it and tucking it back into my mailbox. All of us walked by that wall of mailboxes multiple times a day, sending messages or receiving messages, much like we use e-mail in current day. (Indeed, we used these departmental mailboxes for file sharing: If we wanted to share a file, we simply paper-clipped the note onto the file folder and stuck that into the person's mailbox.)

One of Twitter's precursors was the car bumper sticker, which reached its peak popularity in the 1960s and 1970s (Hubert, 2005). Like Tweets, the messages on bumper stickers were also limited in length, and, like Tweets, bumper sticker communication was designed for large-scale broadcast. Bumper sticker communication ran the gamut of advertising, imparting personal and political opinions ("discursive political dialogues"; Salamon, 2005), and documenting the communicator's achievements (e.g., "My Child Is an Honor Student at ..."; Baker, 2011). The popularity of bumper stickers, as a short-form of communication, has diminished so much over the past couple of decades that archivists call for the historical preservation of what was once a "seemingly ubiquitous" short-form of communicating a "range of historical and social events and trends" (Baker, 2011, p. 268).

A precursor to the text message was the venerable telegram, the last of which was sent in the summer of 2013, completing a three-century stride (Associated Press, 2013). Telegrams were, by practice, a form of brief communication because users were charged by the word. Indeed, the bulk of Nelson Ross's 1928 publication, *How To Write Telegrams Properly: A Small Booklet*, instructed telegram users in the fine art of telegram-chat (e.g., "A man high

in American business life has been quoted as remarking that elimination of the word ‘please’ from all telegrams would save the American public millions of dollars annually.”)

A telegram announced the Wright brothers' invention of aviation (“Successful four flights Thursday morning.”) and the Titanic's demise (“SOS SOS CQD CQD Titanic. We are sinking fast. Passengers are being put into boats.”). A telegram authored by the head of the British Navy in early September 1939 rivaled the brevity and informality of many teen's current day text messages (“Winston is back”), as did physicist Edward Teller's 1952 telegram reporting the detonation of the first hydrogen bomb (“It's a boy”; Alexander, 2009).

During the telegram's heyday, 300 million were sent a year (Neuffer, 1987). This form of brief, asynchronous text-based communication could be sent from just about anywhere. A telegram addressed to “The President, White House, Washington, D.C.” would reach the Chief Executive “if filed at any telegraph office in the world” (Ross, 1928). And this very popular form of brief, asynchronous text-based communication could be received just about anywhere, as in the most likely apocryphal story of American short-story author, Dorothy Parker, receiving a telegram from her editor, pestering her for overdue work—during her honeymoon. According to the tale, Dorothy replied via telegram, “Too ****ing busy and vice-versa” (Forsyth, 2013).

In both the precursors to and the current instantiations of Internet-based text communication, asynchrony is key. Asynchrony provides convenience, as the National Science Foundation (2009) explains: “The popularity of [Internet-based text communication] lies in its convenience. No more games of telephone tag, no more staying late to wait for a phone call.” Such convenience was illustrated recently when the Nobel Peace Prize committee was unable to contact its 2013 recipient synchronously by telephone but were able to turn to Twitter (Dewey, 2013).

Parents overwhelmingly prefer communicating via asynchronous Internet-based text to speaking synchronously on the phone when contacting their children's pediatricians (for test results, scheduling appoints, or discussing a particular symptom; Kleiner Akers, Burke, & Werner, 2002). Corporate employees, from clerks to vice presidents, also overwhelmingly prefer communicating via asynchronous Internet-based text to speaking synchronously on the phone (when negotiating, explaining, clarifying, and exchanging quantitative and technical information). As one employee relates: “If an issue requires back and forth communication, I am much more comfortable on email. Messages are more understandable since people have thought the message through” (El-Shinnawy & Markus, 1997, p. 456).

College students, enrolled in traditional face-to-face courses, overwhelmingly prefer to contact their professors through asynchronous forms of Internet-based communication (e.g., e-mail or discussion board) than to ask questions in person at the beginning or end of class, attend in-person office hours (which was preferred by only a fraction of a large sample of university students), or telephone the professor (not preferred by any student; Finley, Pitts, & Guo, 2010). Professors also overwhelmingly prefer asynchronous forms of Internet-based communication to synchronous, in-person forms when communicating with students

(Simonidesová & Hlavová, 2013; although communication preferences in courses taught completely online are less easy to interpret clearly).

Adolescents overwhelmingly prefer the “controllability” of asynchronous forms of Internet-based communication when developing and maintaining friendships (Peter & Valkenburg, 2006). As Thompson (2010) philosophizes: “For all the hue and cry about becoming an ‘always on’ society, we’re actually moving away from the demand that everyone be available immediately.”

Another attraction of text-based communication is its intransience. The written word itself is intransient or permanent, whereas all but recorded speech is transient (Feenberg, 1989; Frehner, 2008). Speech can go in one ear and out the other, as the expression says, whereas text can be retrieved, reproduced, and searched. The advantage of intransient text over more transient speech has been noted for decades and undoubtedly motivated the decision in the 1960s to use a teletype machine as the hotline between the U.S. Pentagon and the USSR’s Kremlin, rather than a bat phone (History.com). “I’m bound to have problems if I communicate numbers [via phone],” confesses one business professional. “Who wants to sit with a paper and pencil and jot down these numbers? I would much rather have it on email where I can see it and print it if I so desire” (El-Shinnawy & Markus, 1997, p. 458).

Example Internet-Based Communication Research Program

Although the Internet is not making communication briefer (neither is the Internet making communication less formal), the Internet is manifesting our preference for writing over speaking. I have argued that our preference for communicating through Internet-based text derives from a fundamental feature of writing: In contrast to speech, which is most often synchronous, text is most often asynchronous. Thus, a primary way that the Internet is changing the way we communicate is by manifesting our preference for asynchronous, intransient, written communication over synchronous, transient spoken communication.

Researchers in the fields of computers and human interaction and computers and education are already embracing the opportunity to study Internet-based interaction and learning and, as a viable offshoot, Internet-based communication. However, text and discourse researchers themselves have not fully seized the opportunity. For instance, over the past decade of presentations at the annual meeting of the Society for Text and Discourse, only a few have presented research focused on Internet-based communication, as have only a handful of research articles published in the Society’s journal, *Discourse Processes*.

Two text and discourse researchers who are already embracing the opportunity to study Internet-based communication are Michael Schober and Frederick Conrad (2008). Schober and Conrad, long-time investigators of survey interviewing, have recently moved their investigations to the Internet and smartphones. Among the provocative results they have observed is the finding that when respondents are allowed to complete a survey through asynchronous, intransient text message rather than synchronous, intransient phone calls, responses tend to be more accurate.

For instance, when allowed to complete a survey through text message rather than telephone, respondents are less likely to straightline (respond similarly to a series of items, suggesting that the repetitive responses might not be authentic; Schober et al., 2012, 2013), respondents are less likely to satisfice (round off answers, e.g., respond with a number divisible by 10 when asked how many songs they have on their iPhone; Schober et al., 2012, 2013), and respondents are less likely to fall prey to socially desirable responding (e.g., fail to admit to having more than one sex partner, to binge drinking, to not attending religious services, or to not exercising daily; Schober et al., 2012).

Schober and Conrad report that respondents who complete surveys through text message take full advantage of the asynchrony that Internet-based text communication affords: The respondents take more time in between conversational turns, suggesting they might be multitasking—or simply ensuring the verity of their responses (Schober et al., 2013). Respondents who complete surveys through text message also take advantage of textual intransience: The respondents rarely ask the interviewers to repeat the question (Schober et al., 2013). Thus, Schober and Conrad's work demonstrates not only that Internet-based communication can be a fruitful avenue for research, but also that Internet-based communication can be a fruitful avenue for conducting survey interviews.

Conclusion

Let me conclude by returning to another one of those 1930s Musical Defense League ads, which I presented at the outset (Figure 1). In another ad, the copy asks, “When is that young man going home? This unwelcome suitor has been wooing the muse for many dreary months without winning her favor. Patience of the household seems about exhausted.” The ad continues, “If you, too, feel that the cause of human happiness would be better served by the return of Living Music to the theater, you can help to hand the robot his hat—just sign and mail the coupon.” In current day, the request would be to click on an Internet petition, which would be sent to the offending party—in this case, the canned music.

My point is that with the advantage of history behind us, we know that the metaphorical young man in this ad never did go home. Canned music—non-live music—became the norm in American cinemas, and I'm betting that Internet-based communication (Internet-based discussion boards and even Internet-based instruction) will also soon become the norm. Therefore, I encourage us, as language researchers, to abide, if not openly welcome, the suitor—and to think of the Internet as providing new avenues for the study of text and discourse.

References

- Alexander, H. Ten famous telegrams. *The Telegraph*. 2009 Nov 4. Retrieved from <http://www.telegraph.co.uk/news/uknews/6494297/Ten-famous-telegrams.html>
- Arnett, E. Technology has changed the way we communicate. *News-Graphic*. 2012 Aug 11. Retrieved from http://www.news-graphic.com/opinion/article_753cd746-e332-11e1-955b-001a4bcf887a.html
- Associated Press. India sends its last telegram. *Stop. The Telegraph*. 2013 Jul 15. Retrieved from <http://www.telegraph.co.uk/news/worldnews/asia/india/10180463/India-sends-its-last-telegram.-Stop.html>

- Australia Post. About letters and letter writing. Australia Post Letter Writing. n.d. Retrieved from <http://auspost.com.au/education/letterwriting/students/about-letters.html>
- Baker W. Soapbox for the automobile: Bumper sticker history, identification, and preservation. *Collections: A Journal for Museum and Archives Professionals*. 2011; 7:251–270.
- Baron, NS. ‘Whatever’: A new language model?; Paper presented at the Convention of the Modern Language Association; New York, NY. 2002 Dec.
- Binhammer K. The persistence of reading: Governing female novel-reading in memoirs of Emma Courtney and memoirs of modern philosophers. *Eighteenth-Century Life*. 2003; 27:1–22.
- Brantlinger, PM. *The reading lesson: The threat of mass literacy in nineteenth-century British fiction*. Bloomington, IN: Indiana University Press; 1998.
- Brockman, J. How is the internet changing the way you think?. Edge. 2010. Retrieved from <http://www.edge.org/annual-question/how-is-the-internet-changing-the-way-you-think>
- Chetty, LR. The social (studies) network: Africa's cellular education revolution. *The Christian Science Monitor*. 2013 Apr 9. Retrieved from <http://www.csmonitor.com/World/Africa/Africa-Monitor/2013/0409/The-social-studies-network-Africa-s-cellular-education-revolution>
- Chopra, K. The effects of social media on how we speak and write. *Social Media Today*. 2013 Sep 17. Retrieved from <http://socialmediatoday.com/karenn1617/1745751/effects-social-media-how-we-speak-and-write>
- Colao, JJ. The inside story of Snapchat: The world's hottest app or a \$3 billion disappearing act?. *Forbes*. 2014 Jan. Retrieved from <http://www.forbes.com/sites/jjcolao/2014/01/06/the-inside-story-of-snapchat-the-worlds-hottest-app-or-a-3-billion-disappearing-act/>
- Collins, FS. SC: “A naturally occurring DNA segment is a product of nature and is not patent eligible merely because it has been isolated” Woo Hoo!!!. Twitter. 2013 Jun 13. Retrieved from <http://twitter.com/NIHDirector/status/345194268840849411>
- Dediu, H. When will smartphones reach saturation in the US?. ASYMCO. 2012 Apr 11. Retrieved from <http://www.asymco.com/2012/04/11/when-will-smartphones-reach-saturation-in-the-us/>
- Devine, D. Kevin Durant's grandma doesn't like it when he curses. *Yahoo Sports*. 2013 Jan 16. Retrieved from <http://sports.yahoo.com/blogs/nba-ball-dont-lie/kevin-durant-grandma-doesn-t-curses-175318667-nba.html>
- Dewey, C. This year's Nobel Peace Prize winner was officially notified through Twitter. *Washington Post*. 2013 Oct 11. Retrieved from <http://www.washingtonpost.com/blogs/worldviews/wp/2013/10/11/this-years-nobel-peace-prize-winner-was-officially-notified-through-twitter>
- Dorman M. Using e-mail to enhance instruction. *Journal of School Health*. 1998; 68:260–261.
- El-Shinnawy M, Markus ML. The poverty of media richness theory: Explaining people's choice of electronic mail vs. voice mail. *International Journal of Human-Computer Studies*. 1997; 46:443–467.
- Feenberg, A. The written world: On the theory and practice of computer conferencing. In: Mason, R.; Kaye, A., editors. *Mindwave: Communication, computers, and distance education*. Oxford, UK: Pergamon Press; 1989. p. 22-39.
- Forsyth, M. *The elements of eloquence: How to turn the perfect English phrase*. London, UK: Icon Books; 2013.
- Frehner, C. *Email, SMS, MMS: The linguistic creativity of asynchronous discourse in the new media age*. Bern, Switzerland: Peter Lang International Academic Publishers; 2008.
- Hersman, E. Mobile phone access and usage in Africa. *White African*. 2009 Apr 19. Retrieved from <http://whiteafrican.com/2009/04/19/paper-mobile-phone-access-and-usage-in-africa/>
- Hubert, C. Bumper stickers losing popularity as tolerance, vehicle trends evolve. *Journal Gazette*. 2005 Apr 24. Retrieved from <http://www.freerepublic.com/focus/news/1391015/posts>
- Ijsselstein, WA.; van Baren, J.; van Lanen, F. Staying in touch: Social presence and connectedness through synchronous and asynchronous communication media. In: Stephanidis, C.; Jacko, J., editors. *Human-computer interaction: Theory and practice*. Vol. Part II. New York, NY: CRC Press; 2003. p. 924-928.
- Internet World Stats. World internet usage and population statistics. 2012 Jun 20. Retrieved from <http://www.internetworldstats.com/stats.htm>

- Jerreat, J. "Women trouble", immorality and post traumatic stress from fighting in the civil war: The reasons patients were admitted to a lunatic asylum in the 1800s. Daily Mail. 2013 Sep 5. Retrieved from <http://www.dailymail.co.uk/news/article-2413131/Immorality-post-traumatic-stress-Reasons-patients-admitted-lunatic-asylum-1800s.html>
- Kelly, T.; Minges, M. IC4D 2012: Maximizing mobile. The World Bank. 2012. Retrieved from <http://siteresources.worldbank.org/extinformationandcommunicationandtechnologies/Resources/IC4D-2012-Executive-Summary.pdf>
- Kleiner KD, Akers R, Burke BL, Werner EJ. Parent and physician attitudes regarding electronic communication in pediatric practices. *Pediatrics*. 2002; 109:740–744. [PubMed: 11986430]
- Lapadat JC. Written interaction: A key component in online learning. *Journal of Computer-Mediated Communication*. 2002; 710.1111/j.1083-6101.2002.tb00158.x
- Lea M. Rationalist assumptions in cross-media comparisons of computer-mediated communication. *Behaviour & Information Technology*. 1991; 10:153–172.
- Leonardi, M. Social media–communications perspective. News and Events: St Ambrose University. 2012 Jan. Retrieved from http://www.sau.edu/News_and_Events/N120125_Social_Media%E2%80%9393Communications_Perspective.html
- Li L, Finley J, Pitts J, Guo R. Which is a better choice for student-faculty interaction: Synchronous or asynchronous communication? *Journal of Technology Research*. 2010; 2:1–12.
- Lin L, Cranton P, Bridglall B. Psychological type and asynchronous written dialogue in adult learning. *Teachers College Record*. 2005; 107:1788–1813.
- Locker, M. OMG! First use of abbreviation found in a 1917 letter to Winston Churchill. *Time*. 2012 Nov 29. Retrieved from <http://newsfeed.time.com/2012/11/29/omg-first-use-of-abbreviation-found-in-a-letter-to-winston-churchill>
- Lovejoy, T.; Grudin, J. Messaging and formality: Will IM follow in the footsteps of email?. In: Rauterberg, M.; Menozzi, M.; Wesson, J., editors. *Human-computer interaction—INTERACT'03*. Zurich, Switzerland: IOS Press; 2003. p. 817-820.
- Madden, M. Older adults and social media. Pew Internet & American Life Project. 2010 Aug 27. Retrieved from <http://pewinternet.org/Reports/2010/Older-Adults-and-Social-Media.aspx>
- Marya, R. Dalai Lama joins Google+, plans hangout with Desmond Tutu. *Mashable*. 2011 Oct 07. Retrieved from <http://mashable.com/2011/10/07/dalai-lama-desmond-tutu-google-plus/>
- Mindlin, A. So why talk when you can text?. *The New York Times*. 2010 Oct 17. Retrieved from <http://www.nytimes.com/2010/10/18/technology/18drill.html>
- Murray, M. Kenyans use cell phones for everything from buying groceries to paying rent. *NBC News*. 2012 Jul 24. Retrieved from http://worldnews.nbcnews.com/_news/2012/07/24/12909129-kenyans-use-cell-phones-for-everything-from-buying-groceries-to-paying-rent
- National Science Foundation. Arlington, VA: Author; 2009. *The Internet: Changing the way we communicate*. Available for download at <http://www.nsf.gov/about/history/nsf0050/pdf/internet.pdf>
- Neuffer, E. Telegrams are on the wane. *New York Times*. 1987 Aug 7. Retrieved from <http://www.nytimes.com/1987/08/07/style/telegrams-are-on-the-wane.html>
- Nielsen. New mobile obsession: U.S. teens triple data usage. *Mobile*. 2011 Dec 15. Retrieved from <http://www.nielsen.com/us/en/newswire/2011/new-mobile-obsession-u-s-teens-triple-data-usage.html>
- Nuseramed. If someone from the 1950s suddenly appeared today, what would be the most difficult thing to explain to them about life today?. *Ask Reddit*. 2013 Jan 4. Retrieved from http://www.reddit.com/r/AskReddit/comments/15yaap/if_someone_from_the_1950s_suddenly_appeared_today/c7qyp13
- Paul, C.; MacNaughton, W. Contemplating Friday: Communication 101. *Tech Page One*. 2013 Jan 25. Retrieved from <http://techpageone.dell.com/downtime/contemplating-Friday-communication-101>
- Peter J, Valkenburg PM. Research note: Individual differences in perceptions of Internet communication. *European Journal of Communication*. 2006; 21:213–226.
- Pew Research Center. Pew Internet & American Life Project. 2013. Retrieved from <http://www.pewinternet.org/>

- Plato. The Phaedrus—A dialogue between Socrates and Phaedrus written down by the pupil of Socrates, Plato. c. 370 BC Retrieved from <http://www.units.muohio.edu/technologyandhumanities/plato.htm>
- Pring, C. 100 social media statistics for 2012. The Social Skinny. 2012 Jan 11. Retrieved from <http://thesocialskinny.com/100-social-media-statistics-for-2012/>
- Radicati Group. Email market 2012–2016. Palo Alto, CA: The Radicati Group, Inc; 2012.
- Ross, NE. How to write telegrams properly: A small booklet. Philadelphia, PA: Haldeman-Julius Publications; 1928.
- Salamon H. Ha'am in the turbulent discursive sphere of Israeli bumper stickers. Hebrew Studies. 2005; 46:197–234.
- Schober, MF.; Conrad, FG. Survey interviews and new communication technologies. In: Conrad, FG.; Schober, MF., editors. Envisioning the survey interview of the future. New York, NY: Wiley; 2008. p. 1-30.
- Schober, MF.; Conrad, FG.; Antoun, C.; Bowers, AW.; Hupp, AL.; Yan, H. Conversational interaction and survey data quality in SMS text interviews. Paper presented at the annual meeting of the American Association for Public Opinion Research; Boston, MA. 2013 May. Retrieved from http://sitemaker.umich.edu/antoun/files/schober_et_al_aapor_13.pdf
- Schober, MF.; Conrad, FG.; Antoun, C.; Carroll, D.; Ehlen, P.; Fail, S.; et al. Zhang, C. Disclosure and quality of answers in text and voice interviews on iPhones. Paper presented at the annual meeting of the American Association for Public Opinion Research; Orlando, FL. 2012 May. Retrieved from http://sitemaker.umich.edu/antoun/files/aapor_2012_schober_et_al.pdf
- Sharbutt, J. Eyes as big as cantaloupes. Nashua Telegraph. 1978 Dec 15. Retrieved from http://news.google.com/newspapers?id=TaIrAAAAIABAJ&sjid=1_wFAAAAIBAJ&pg=6172%2C3400461
- Simonidesová, J.; Hlavová, B. The use of Internet communication forms and their quality in the educational process in higher education; Paper presented at the International Academic Workshop on Social Science (IAW-SC 2013); Changsha, Hunan, China. 2013 Oct.
- Smith, D. Mobiles give Africa's farmers the chance to set out their stall. The Observer. 2009 Jan 3. Retrieved from <http://www.theguardian.com/katine/2009/jan/04/katine-uganda-africa-mobile-phones>
- Smithsonian. Musicians wage war against evil robots. 2012 Feb 10. Retrieved from <http://blogs.smithsonianmag.com/paleofuture/2012/02/musicians-wage-war-against-evil-robots>
- Thompson, C. On the death of the phone call. Wired. 2010 Jul 28. Retrieved from http://www.wired.com/magazine/2010/07/st_thompson_deadphone/
- Time. Radio: Morons & happy families. 1950 Jun 19. Retrieved from <http://content.time.com/time/magazine/article/0,9171,858841,00.html>
- Typographical Art. Puck. 1881 Mar 30.212:65.
- Valant, S. A day in the life of the Internet. Gator Crossing. 2013 May 3. Retrieved from <http://blog.hostgator.com/2013/05/02/a-day-in-the-life-of-the-internet/>
- Wang Q, Woo HL. Comparing asynchronous online discussions and face-to-face discussions in a classroom setting. British Journal of Educational Technology. 2007; 38:272–286.



THE ROBOT'S LULLABY

Figure 1.
Ad from September 15, 1930, *Capital Times* newspaper, Madison, Wisconsin.

TYPOGRAPHICAL ART.

We wish it to be distinctly understood that the letterpress department of this paper is not going to be trampled on by any tyrannical crowd of artists in existence. We mean to let the public see that we can lay out, in our own typographical line, all the cartoonists that ever walked. For fear of startling the public we will give only a small specimen of the artistic achievements within our grasp, by way of a first instalment. The following are from *Studies in Passions and Emotions*. No copyright.

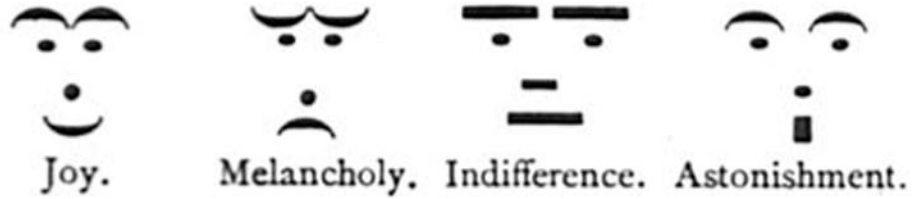


Figure 2.
Column from March 30, 1881, *Puck magazine*, vol. 212, p. 65.

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| | SPOKEN | WRITTEN |
|---------------------------|---|---|
| SYNCHRO- NOUS | <p>in-person conversations</p> <p>phone calls</p> | <p>Internet-relay chat (IRC)</p> |
| ASYNCHRO- NOUS | <p>recorded lectures</p> <p>voicemail</p> | <p>person-to-person notes; postal letters; email; Internet- discussion boards (e.g., Facebook); text messages</p> |

Figure 3.
Synchronous and asynchronous modes of speaking and writing.