

ADJUSTING THE VOLUME: TECHNOLOGY AND MULTITASKING IN DISCOURSE CONTROL*

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I. Introduction

Consider two images associated with contemporary information and communication technologies (ICTs). The first: “Always on, always connected,” the slogan of RIM (Research in Motion), makers of the BlackBerry. The second: a college student in conversation with her professor (in this case, me), when the girl’s mobile phone rings. Rummaging in her backpack to retrieve the device, she glances at the number on the display screen. Dismissively, the student lets the call go to voicemail. “It’s just my mom,” she shrugs.

An apt metaphor for analyzing technologies and techniques for manipulating participation in linguistic discourse is that of the volume control on a radio or television. Users can “turn up the volume” as with BlackBerries that are constantly checked. Alternatively, users might “turn down the volume,” as did the student ignoring her mother’s call. In talking about communication, the volume control image alludes less to physical noise level than to frequency of contact or restrictions on access to an interlocutor.

The notion of volume control is applicable to any sort of linguistic interchange, be it face-to-face speech, traditional writing, or language mediated through an ICT. In-place ICTs include landline telephones and stationary computers used for composing and receiving email or instant messages. Among mobile technologies are personal digital assistants (PDAs) and cell phones, in both their speech and texting capacities. All these devices provide ample opportunities for users to control discourse in a variety of ways: increasing or decreasing contact with interlocutors, or manipulating the form that interaction takes.

Along with the volume-control metaphor, another useful concept is that of affordances, originally developed by the psychologist James Gibson (1979) and later applied to technology

issues (e.g., Gaver, 1991). Affordances are the physical properties of objects that enable people perceiving or using those objects to function in particular ways (Sellen & Harper, 2002:17). For example, an affordance of paper (as opposed to computers) is that it needs no electrical power source to record the written word. An affordance of mobile telephone systems is that they extend the physical circumstances under which communication is initiated and received.

Language users magnify the affordances of ICT when they engage in multitasking behavior. Multitasking (that is, involvement in more than one activity at a time) takes many forms – from simultaneously talking on the phone and reading email to participating in multiple IM conversations. Multitasking is widespread in contemporary society, especially when using ICTs. This chapter represents a first attempt to understand multitasking with ICTs as a venue for managing interpersonal communication.

We begin by looking at discourse control in traditional face-to-face and written-communication settings, and then at the affordances ICTs add for adjusting the conversational volume. We then turn to multitasking in both its cognitive and social dimensions, specifically in the context of instant messaging. Drawing upon additional data from both the IM study and separate research on mobile phone usage, the chapter closes by considering how technology-driven linguistic control stands to affect social communication and, derivatively, the social fabric.

II. Traditional User Control over Communication Volume

A. Adjusting Communication Volume through Access, Avoidance, and Manipulation

Although speech and writing are social activities, people are not inherently “Always on, always connected.” Rather, individuals have long found avenues for controlling their communicative exchange, including establishing zones of privacy, even in societies that offer little physical space for seclusion (Westin, 1967). What has shifted over time are the amount of control and the mechanisms for effecting it, reflecting both technological developments and concomitant opportunities for multitasking.

Language users can maneuver their communicative behaviors in three ways. The first of these is *access* to potential interlocutors, enabling them to increase the chances of a linguistic

exchange taking place. The second is *avoidance mechanisms*, through which potential interlocutors avert linguistic encounters. And the third is *manipulation*, whereby a message-sender or recipient alters the expected discourse relationship (e.g., violating status hierarchy or assumptions of veracity). All these maneuvers can be used for adjusting the volume on spoken and written language.

B. Affordances of Face-to-Face Speech for Volume Control

Speakers and listeners have historically been at the mercy of the laws of physics and the social pecking order. As for access, the human voice only projects so far, even with cupped hands or megaphone. Regarding avoidance, those in positions of authority could typically control face-to-face access, while the rest of the populace was more exposed to unregulated encounters – on the street, at the market, in church. In response, people have devised social avoidance mechanisms: crossing the street or looking in shop windows when attempting to circumvent conversation with someone heading their way, or offering a brief greeting before dashing off due to fabricated time constraints. Conversely, individuals sometimes manipulate social conditions to become privy to the conversations of others. Eavesdropping is an age-old practice – whether consciously arranged or arising serendipitously.

C. Affordances of Offline Writing for Volume Control

Writing that pre-dates modern ICTs can also be characterized with respect to affordances for volume control. Access was often limited by physical or economic circumstances: ships carrying the mail sometimes sank; roads on which mail coaches traveled were filled with brigands; and postal rates were high (Baron, 2002). At the same time, both letter-writers and recipients exercised some control over access. Senders, for example, could pay for mailing options such as “return receipt” or express delivery to speed transmission or to increase the chances of getting the recipient’s attention. Recipients, of course, could limit access by delaying a response or ignoring the missive outright.

Written letters or memoranda enable potential interlocutors to avoid face-to-face encounters. From classic “Dear John” letters breaking off romantic relationships to impersonal

termination notices delivered in the workplace, written communication has provided a social shield for people not wishing to deliver unwelcome news in person.

Finally, writing provides opportunities for deception or gossip. Rather than accurately presenting themselves, correspondents sometimes misrepresent their physical appearance or academic credentials. On the receiving end, instead of maintaining the presumed confidentiality of a letter addressed to a specific person, recipients may share documents with others for whom the writing was not intended..

III. Volume Control with Information and Communication Technologies

What do ICTs contribute to traditional mechanisms for managing spoken or written discourse control? In this section, we will look at usage parameters for several fixed and mobile technologies: landline phones, email and instant messaging (both prototypically fixed), and mobile phones. Later in the chapter, we turn to situations in which multitasking behavior involving ICTs augments users' ability to adjust the volume on social discourse.

A. Landline Phones

For most of the technology's existence, telephones have had ringers that could not be turned off, placing their owners at the social mercy of callers (Baron, 2000:232). A ringing phone remained a summons that nearly always took precedence over an on-going face-to-face conversation. Those within hailing distance of telephones were "always on" and potentially "always connected." This situation only began to ease in the 1970s with the widespread availability of telephone answering machines (Morton, 2000).

Over the last thirty years, technological developments have provided callers and recipients with increased opportunities for controlling their conversations (Katz, 1999). As for access, voicemail enables us to leave messages, regardless of the availability of our intended interlocutors. Through the Internet, we procure direct telephone numbers, enabling us to bypass traditional call screeners such as secretaries. Through call-waiting features, we can queue up for our desired interlocutor's attention.

Telephone technologies are also decreasing access. Intended interlocutors avoid contact by using caller ID, screening calls to go to voicemail or blocking calls from specific numbers. Call initiators can avoid conversations by using express messaging, whereby a call goes directly to voicemail without the recipient's phone ever ringing. In the business and professional worlds, a burgeoning number of telephone systems preclude our speaking with a human being, shunting us instead to telephone trees, voice recognition systems, and recorded messages.

Modern landline telephony also enables users to manipulate conversational audience. With speaker phones, for example, callers may have no choice – or even knowledge – of how many others are privy to a conversation intended only for the addressee.

B. Email

Email builds upon the volume-control affordances of modern landlines: we leave asynchronous email messages and use the Internet to locate electronic addresses of strangers whom we wish to contact. Anecdotal evidence suggests that many individuals are more likely to reply to email from an unknown correspondent than to an unsolicited letter or phone call. Not only is the effort in answering online relatively small, but the social distance afforded by the medium makes responding a less-personal act than a face-to-face or voice-to-voice encounter.

Again as with contemporary telephony, email affords recipients opportunities to avoid or manipulate communication from message senders. Email systems empower users to leave incoming messages unread (or unanswered) for as long as we please or local social conventions permit. As for manipulation, email can be forwarded – more potential for gossip – to unintended recipients, reminiscent of callers unknowingly being placed on speaker phones.

C. Instant Messaging (IM)

Unlike email, instant messaging is designed for synchronous communication. Moreover, IM systems contain features that email platforms lack, such as personal profiles, social affinity groups (known as Buddy Lists), away messages (informing Buddies that although your IM program is still on, you are temporarily away from your computer), and the ability to engage in multiple conversations simultaneously.

Access to interlocutors using IM can be controlled in a number of ways. Even if you know a person's IM screen name (less publicly available than an email address), that individual has the option of blocking your messages. A more subtle avoidance mechanism is to read the profiles or away messages that people on your Buddy List have posted rather than directly contacting them through an IM or a phone call (Baron, Squires, Tench & Thompson, 2005). Similarly, users wanting to avoid face-to-face or even telephone voice contact with acquaintances may choose to IM them instead (Baym, Zhang & Lin, 2004).

Instant messaging is particularly well-suited to manipulation of conversational volume control. As with phone calls and email, IMs can be forwarded to other recipients, unbeknownst to the original sender. Other practices (especially popular with adolescents and young adults) are unique to IM. For example, some individuals post away message when actually sitting at their computers, enabling them to screen which incoming IMs to respond to and which to ignore.

D. Mobile Phones

Mobile telephony enables users to be in "perpetual contact" with one another (Katz & Aakhus, 2002). However, having your mobile phone turned on need not imply you welcome being generally available. In studying mobile phone usage by American college students, my colleagues and I found that although the attribute students like most about mobile phones is being about to contact others, the aspect they like least is their continuing accessibility to people (Baron & Ling, in preparation; Young, Deal & DiMarco, 2005).

As speaking devices, mobile phones afford a variety of discourse control features transcending those available on landlines (e.g., caller ID, call waiting, speaker phone). Distinct ring tones can be assigned to each person in an address book, making it unnecessary to view the phone display panel before deciding whether to take a call. Moreover, camouflage services are available that, for example, provide background noise from a traffic jam, enabling a user to say with authority, "Sorry, I'll be two hours late. I'm stuck in traffic" (while actually sitting at a cafe). These services can also generate a ring tone in the middle of a conversation (appearing to signal an incoming call), providing a plausible excuse for terminating the current exchange.

Text messages on mobile phones share affordances with email (both are asynchronous) and IM (both tend to be social media). Access and avoidance issues with texting are similar to

those with email and IM in that users can identify the message sender before deciding how and when to respond. As with IM (but unlike email), mobile phone users nearly always know the message sender, increasing the likelihood of a timely reply.

IV. Multitasking

ICTs afford users considerable control over the ways in which they interact with other people. However, control can be augmented by combining communicative exchanges with other tasks – that is, by multitasking. Because recipients of ICT-based messages cannot see us (Web-cam technology excluded), they typically are unaware when we engage in additional activities. On the phone and on the Internet, nobody knows you're multitasking.

A. Reasons for Multitasking

Multitasking commonly occurs in ordinary tasks that make simultaneous demands of our cognitive or physical faculties. For example, in driving a car, we must look three ways (ahead, in the rear view mirror, and peripherally), while controlling the speed and direction of the vehicle, and perhaps conversing or listening to the radio. Another real-world example is playing the piano or the organ, for which we need to read multiple lines of musical notation and control two hands, along with one or two feet.

A second reason for multitasking is perceived time demands. Time-driven multitasking (e.g., house cleaning plus child care; commuting plus reading) is prevalent in everyday life (Damos, 1991; Floro & Miles, 2003; Ironmonger, 2003; Michelson, 2005; Ruuskanen, 2004; sciam.com, 2004). Using data from time-interval diary studies in the UK, Susan Kenyon and Glenn Lyons (In Press) report that through multitasking, people “add” nearly seven hours of activity to each day.

Thirdly, multitasking may be a response to an emotional state such as loneliness or boredom. Many people turn on a radio, music player, or television upon returning home or entering a hotel room, even though their primary activity is neither listening nor viewing. As we will see, impatience is a motivation for some college students to multitask while using ICTs.

B. Cognitive versus Social Multitasking

Multitasking may affect us either cognitively or socially. The classical psychological literature has explored whether multitasking degrades performance and has also attempted to explain how the mind handles multiple tasks or task shift. More recent inquiries have considered multitasking situations that involve social communication as one of the “tasks” (e.g., driving a car while conversing on a mobile phone).

We will use the term *cognitive multitasking* to refer to performance of two or more mental tasks, where all tasks are primarily cognitive in nature (e.g., doing a crossword puzzle while completing a questionnaire). In contrast, we will speak of *social multitasking* when the activities are primarily social-interactive (e.g., alternating between a face-to-face conversation and typing an IM). We extend the term cognitive multitasking to situations in which the tasks include both cognitive and social activities, but where the research interest is in cognitive performance. Similarly, we extend the term social multitasking to combined social and cognitive undertakings, but in which concern focuses on the social consequences of mingling these activities. Obviously, the language we use in social interaction is itself grounded in cognitive activity, but for our purposes, we will focus on its social dimension.

C. Cognitive Issues in Multitasking

Multitasking behavior has long been of interest to psychologists (Manhart, 2004; Stroop, 1935). Most studies have suggested that engaging in simultaneous activities (particularly involving unfamiliar or unpracticed tasks) decreases performance level. For example, watching television while simultaneously recalling sets of digits (Armstrong & Sopory, 1997) or while doing homework (Pool, Koolstra & Van der Voort, 2003) makes for poorer recall (and homework results) than when focusing on a single task. Similarly, switching between tasks (such as alternating between solving mathematics problems and classifying geometric objects) has been shown to degrade performance (Rogers & Monsell, 1995; Rubenstein, Meyer & Evans, 2001).

Tests done under laboratory conditions indicate that if the tasks at issue tap different modalities (e.g., visual versus auditory), the amount of performance degradation may be less than if both tasks rely upon the same modality (Brooks, 1968). However, in the real world, other factors may come into play, such as the amount of experience a person has in processing

particular multiple stimuli (e.g., students who typically study with background music versus those who do not – Daoussis & McKelvie, 1986) and the nature and difficulty of the tasks at hand.

D. Cognitive Multitasking while Using ICTs

Recent experiments involving ICTs confirm that multitasking commonly degrades cognitive performance. Even when individuals attempt to attend strictly to a single task, they are often distracted by ICT demands such as phone calls or email messages – with dramatic results.

Psychologist Glenn Wilson administered a variety of tasks, including IQ tests, to 90 subjects in the UK. When these tasks were performed in the presence of communication distracters such as a ringing telephone, average performance on the IQ test fell 10 points – essentially the equivalent of missing an entire night's sleep (Hewlett-Packard, 2005).

Several investigations have explored the relationship between academic accomplishments and use of the Internet. Hembrooke and Gay (2003) report degraded memory for lecture content when students simultaneously listened to classroom lectures and accessed the Internet to do searches or communicate with colleagues online. Crook and Barrowcliff (2001) found not only that undergraduate students with Internet access in their dormitory rooms engaged in considerable multitasking but also that the ratio of school work to recreational computer-based activity was roughly 1 to 4 – hardly an efficient way to complete assignments.

Another cluster of experiments (e.g., Adamczyk & Bailey, 2004; Cutrell, Czerwinski & Horvitz, 2001; Dabbish & Kraut, 2004) has explored the cognitive effects of interrupting a person's work flow, e.g., sending an IM to someone engaged in an online search task. Research suggests that the timing and form of such interruptions are critical in determining how disruptive the incoming message is.

Is multitasking with ICTs necessarily detrimental to cognitive performance? The answer may reflect the extent to which users perceive themselves to be doing multitasking. One of my students, Tim Clem, argues that it makes little sense to talk about multitasking on a computer. In his eyes, computers are naturally multitasking devices. (By analogy, recall how driving an automobile or playing the organ puts simultaneous demands on our cognitive and physical faculties.) Having grown up with the technology, Clem does not notice a degradation of

performance by engaging in simultaneous computer-based activities (e.g., surfing the Web and writing a paper or carrying on an IM conversation). Drawing upon Roger Silverstein and Leslie Haddon's notion of domestication (1996), computers are domesticated technologies for much of Clem's generation – though whether computer multitasking actually degrades performance within this age cohort remains an empirical question.

Putting aside teenagers and young adults, what about the rest of us? In learning to drive a car, the ability to look three places at once develops with experience. It is, then, possible, that learning to multitask on computers without cognitive degradation is a matter of training and experience. A growing literature documents how practicing complex skills, such as taxi drivers navigating the streets of London (Maguire, Gadian, Johnsrude, Good, Ashburner, Frackowiak & Frith, 2000) or novices learning to juggle balls (Draganski, Gaser, Busch, Schuierer, Bogdahn & Arne, 2004) leads to changes in adult brains. Plausibly, if we practice multitasking with ICTs, our brains will adapt, and performance degradation will diminish.

E. Social Issues in Multitasking

But what about social multitasking? Does it degrade social performance? Consider a person talking on the telephone while doing a Web search or engaging in an IM conversation. Does the quality of the IM conversation or the spoken exchange suffer? Unlike the case of cognitive multitasking, there is little research on the interpersonal effects of multitasking while communicating with others. What is clear, though, is that social multitasking involves volume control over the communication, e.g., saying just “uh huh” to an interlocutor so you can focus on making an online purchase, or deciding which of three IM messages to respond to first.

V. Multitasking and Volume Control while Using Instant Messaging

To objectively gauge the impact of social multitasking on human interaction, we need empirical information on contemporary multitasking behavior entailing ICTs such as email, instant messaging, and mobile phones. A few studies (e.g., Baym, Zhang & Lin, 2004; Lenhart, Madden & Hitlin, 2005; Shiu & Lenhart, 2004) have asked participants to note their multitasking behavior while using these technologies. However, self-reporting of behavior is notoriously

problematic. To help address this methodological challenge as well as to gather data specifically involving instant messaging, my students and I undertook research on undergraduate multitasking while communicating via an ICT.

A. Multitasking Patterns of American College Students

Using online questionnaires, we explored the multitasking behavior of undergraduates who were engaged in IM conversations (Baron, Clem & Rabinovitz, in preparation). The data were collected in fall 2004 and spring 2005 at American University, in Washington, DC. We knew that all subjects were participating in at least one IM conversation at the time they completed the questionnaire, since IM was the medium through which student experimenters distributed the URL for the questionnaire website to subjects, who were members of their Buddy Lists. Therefore, the other online and offline activities in which the subjects were engaged entailed cognitive or social multitasking. Since most subjects were in their dormitory rooms at the time they participated in the experiment, they had ample opportunities for involvement in multiple activities.

The results revealed a high level of multitasking. In our first study, out of 158 subjects (half male, half female), 98% were engaged in at least one other computer-based or offline behavior while IMing:

Computer-Based Activities:

Web-based activities:	70.3%
Computer-based media player:	47.5%
Word processing:	38.6%

Offline Activities:

Face-to-face conversation:	41.1%
Eating or drinking:	36.7%
Watching television:	28.5%
Talking on the telephone:	21.5%

Subjects often participated in multiple examples of the same activity (e.g., having three Web applications open, being involved in more than one IM conversation). Students in this study averaged 2.67 simultaneous IM conversations, with a range from 1 to 12.

Logic dictates that users cannot literally engage in multiple IM conversations simultaneously. And indeed they do not. Subsequent focus groups revealed that many college students use IM both synchronously and asynchronously, that is, turning the volume up or down on particular conversations. Decisions depend upon such factors as how good the “gossip” is in a conversation, how serious the conversation is, and individual communication habits. A few students found it rude to hold simultaneous IM conversations, though they were by far in the minority.

B. Why Multitask while Doing IM?

We used both informal focus groups and a revised online questionnaire (this time with 51 subjects) to probe why students multitask while using a computer. Most respondents spoke of time pressures: multitasking enabled them to accomplish several activities simultaneously. Time pressures were also specifically invoked to justify multiple concurrent IM conversations. Interestingly, several students commented that IM is not, by nature, a standalone activity. When asked whether they ever held a single IM conversation during which time they did not engage in any other online or offline activity, the overwhelming response was “no”. Such behavior, said one participant, would be “too weird,” because IM conversations are (she said) conducted as background activity to other endeavors. Several students from the second online study noted they multitasked on computers because the technology enabled them to do so. As one student put it, “There is no reason not to when everything is accessible at once.”

Ten of the 51 students in the second online study indicated they multitasked while using computers because they were bored. Boredom sometimes resulted from having to wait for the person with whom they were IMing to respond. Other students spoke of “get[ing] bored with just one activity” or “having too short an attention span to only do one thing at a time.”

The ability to control both their individual activities and their social networks figures as a significant motivation for multitasking while doing IM. A student from the second study said he multitasks on the computer “because i can.” Focus-group members observed that with IM, participants are in control of how dynamic a given IM conversation is. With lengthy IM dialogues, interlocutors may go through spurts of communication interlaced with periods of inactivity. One student aptly described IM as “language under the radar,” meaning it resides in

the background of other online or offline endeavors. Users control whether to make a particular conversation active (i.e., synchronous) or let it lie dormant (i.e., asynchronous), without formally closing the interchange.

VI. Why Social Multitasking and Volume Control Matter

We have argued that people find ways to “control the volume” in spoken and written discourse. ICTs augment the options for control because of their technological affordances, which include opportunities for multitasking. Multitasking often depresses cognitive performance, and may compromise social interaction by reducing interlocutors’ level of interpersonal engagement. To expand our understanding of multitasking while using ICTs, we studied American college-student multitasking while doing instant messaging on computers.

Are there social consequences of contemporary ICT usage patterns? While technologies such as computers and mobile phones may be too new for us to answer this question definitively, two studies hint at trends that bear watching.

A. Acceptable and Unacceptable Social Multitasking: IM Multitasking Study

As part of the second administration of the IM multitasking study, we asked a series of free-response questions regarding multitasking behaviors the students felt were or were not suitable. A typical response to the question “For which computer-based activities is multitasking appropriate? Why?” was

IMing, listening to music, browsing the web. Those are all things that do not interfere with one another

A content analysis revealed that 86% of the 50 students responding to this question specifically mentioned IM or email – both forms of interpersonal communication – or indicated that any type of multitasking behavior is acceptable.

In an earlier portion of the questionnaire, 43% of the participants claimed they often engaged in only one IM conversation at a time, suggesting that even if the students were multitasking, perhaps they were not doing social multitasking. However, in their real-time responses to questions about specific online and offline multitasking activities, the same subject

cohort averaged 2.5 simultaneous IM conversations, leading us to question whether the 43% statistic reflects perceptions of appropriate social etiquette rather than actual practice.

Another free-response question asked, “For which non-computer activities is multitasking not appropriate? Why?” Of the 44 students responding, 59.1% singled out face-to-face or telephone conversations as inappropriate contexts for multitasking. This number stands in stark contrast to the 86% who felt that carrying on an IM or email conversation while using the computer for other functions was appropriate.

Students offered various explanations for avoiding multitasking while speaking face-to-face or by phone. The most prevalent answer was that such behavior was simply wrong. One male student said,

It’s rude not to give your full attention to someone face to face.

while a female observed that

talking on the phone and talking to people on the computer [i.e., IM] isn’t appropriate because the person on the other phone line usually feels left out or unattended to

Similar feelings of personal abandonment were reported in a study conducted by Sprint (2004).

More than 50% of the respondents said they felt unimportant when a friend or colleague interrupted a face-to-face conversation with them to answer a mobile phone. Hewlett-Packard (2005) reported that 89% of office workers felt that colleagues who responded to emails or text messages during a face-to-face meeting were being rude. However, 30% of the same respondents indicated that such behavior was both acceptable and an efficient use of time.

Apparently, at least 19% of those surveyed (i.e., the difference between the 11% who were not bothered by the behavior in others and the 30% who justified the behavior – perhaps in themselves) had yet to resolve the conflicting demands of social etiquette and work pressure.

Some respondents in our IM study said multitasking was only precluded if the topic of a face-to-face or telephone conversation was important. Of the 26 students who were against multitasking while face-to-face or on the phone, 6 only disapproved of such behavior if the conversation was particularly serious or important. Other explanations for avoiding multitasking while face-to-face or on the phone were strictly pragmatic. For example, you might be found out. As one male remarked,

people [on the phone with you] get pissy about hearing a keyboard clicking

Another said,

You should devote attention to someone who can see what you are doing.

This second response came from a student who believed that reading while talking on the phone, or cooking while talking on the phone, was an appropriate type of multitasking because

If they don't know, it won't hurt them.

Four students (all female) eschewed multitasking while talking face-to-face or on the phone because they were not good at it. Another complained that she was disturbed when other people with whom she was speaking were multitasking:

Talking on the phone – I [don't] want to listen to someone else's TV while I'm having a conversation with them. Nor do I want to hear their music. It is distracting.

To what degree do college undergraduates actually multitask with ICTs while engaging in face-to-face or telephone conversations? Baym, Zhang and Lin (2004) found that 73.9% of their nearly 500 subjects reported multitasking on an ICT while in face-to-face conversation. Of the 158 students in our initial multitasking study, 41.1% were engaged in at least one computer activity while talking face-to-face, and 21.5% were simultaneously on the computer and on the phone. Clearly, many American college students control the volume on their face-to-face and telephone conversations by multitasking on computers.

B. Attitudes and Practices Regarding Volume Control: Mobile Phone Study

We turn now from social multitasking and volume control on computers to social issues surrounding mobile phone use. The results reported here are from a questionnaire administered to 68 American University undergraduates (half male, half female) in fall 2005 (Young, Deal & DiMarco, 2005).

ICT researchers (e.g., Katz, 2003; Ling, 2004) have been analyzing the use of mobile phones in public space in many parts of the world. Our mobile phone study tried to get a statistical fix on practices and attitudes in the US. The majority of females in the study responded "yes" to the question "Does it ever bother you when other people talk on their cell phones in public places?" Fewer males reported feeling bothered. When asked to identify their complaints, both males and females indicated they were most troubled by volume level. The second biggest grievance for females was use of phones in inappropriate locations (e.g., houses

of worship, public restrooms), while second on the male list of objections was hearing about other people's private business.

We also inquired whether students felt other people spoke more loudly on cell phones than in face-to-face conversation, and whether they themselves did so. Nearly 70% of both males and females perceived other people to be louder on cell phones than in face-to-face discourse, implying an ICT-based imposition of control over the auditory space of innocent passersby. However, while 79.4% of females acknowledged speaking more loudly on mobiles than face-to-face, only 35.3% of males reported doing so.

Another control issue we explored was whether students ever pretended to be talking on their phones when actually they were not. Out of 68 subjects, 35.3% replied affirmatively (with equal numbers of males and females). Of the 24 students who engaged in this behavior, 83.3% (i.e., 20 students) did so "to avoid talking with someone I see." This unexpected finding suggests ICTs (here, mobile phones) may be replacing a more low-tech move across the street to circumvent conversation.

C. From the Amish to iPod Nation

Interpersonal communication is progressively reshaped by technological contrivances that enable us to adjust the volume on spoken and written discourse. From the earliest landline phones to today's mobiles; from the first phonograph through earphones, the Sony Walkman, and now MP3 players; from the ENIAC to the modern wireless laptop, we have created both physical devices and social practices by which to orchestrate when and how we say (or write) what to whom.

Alongside the technological developments, some voices have questioned the effects technology might have upon the social fabric. A few years ago, Howard Rheingold began thinking about the tools that allow him to be "Always on, always connected" and asked, "What kind of person am I becoming as a result of all this stuff?" (1999). His search for an answer led him to Lancaster, Pennsylvania, for a series of conversations with the Amish.

For over a century, the Amish have struggled with the question of whether their members should be allowed to have telephones (Umble 1996). The issue of adopting new technologies is not as simple as outsiders might think. Today's Amish use disposable diapers, gas barbecue

grills, and even some diesel-powered machinery. Each new contrivance must be evaluated by the Amish bishops, with one fundamental query in mind: “Does it bring us together, or draw us apart?” Diesel machinery is not allowed in working the fields, since use of the technology might jeopardize the social connection of families laboring cooperatively. Just so, having a telephone in the house is forbidden. In the words of one Amish man whom Rheingold interviewed,

What would that lead to? We don’t want to be the kind of people who will interrupt a conversation at home to answer a telephone. It’s not just how you use the technology that concerns us. We’re also concerned about what kind of person you become when you use it.

Fast forward to the end of 2005. Writing in the *New York Times*, David Carr began a story about his new video iPod with more than a hint of guilt:

Last Tuesday night, I took my place in the bus queue for the commute home. Further up the line, I saw a neighbor – a smart, funny woman I would normally love to share the dismal ride with. I ducked instead, racing to the back of the bus because season one of the ABC mystery-adventure “Lost” was waiting on my iPod. (Carr 2005)

Like my student at the opening of this chapter who “turned down the volume” on her mother’s cell-phone call, Carr “turned down the volume” on his neighbor – at least this time, in favor of watching reruns on a 2.5 inch screen.

Admittedly, few of us would go as far as the Amish in banishing ICTs from our social space, and Carr has, I suspect, started chatting again on the bus. Kevin Kelly, former executive editor of *Wired* magazine, claims that many ICT-savvy people are making conscious choices – like the Amish – about which technologies to employ, which to eschew, and when. Referring to such individuals as the neo-Amish, Kelly suggests that a growing number of would-be power users are laying down their own individual and social ground rules, such as no personal email at work, turn off the BlackBerry when you get home, or only give your mobile phone number to your spouse (Vargas, 2006).

Realistically, though, it takes considerable self-discipline to be neo-Amish. Given the lure of advertising, the perception of always being pressed for time, and the feeling of empowerment that comes with conversational control, there is little incentive to put the metaphoric brakes on our use of ICTs.

As communication technologies become increasingly integrated into all aspects of life, two diametrical outcomes are plausible. The first is that as a society, we will determine to put the ICT genie back in the bottle whenever it seriously threatens communal propriety. Much as public spitting – and spittoons – are now banished from polite society, we can visualize some influential neo-Amish re-directing general ICT usage conventions. Admittedly, though, outside of giving up the gun in Tokugawa Japan (Perrin, 1979), historical precedence for suppressing technology is scant. A more likely scenario is that we will find ourselves redefining acceptable patterns of interpersonal communication, with progressive amnesia about the way things used to be.

If practice makes us more adept at multitasking, then multitasking with ICTs may soon become no more challenging than playing the piano with both hands, and no more worthy of remark. But unlike the piano, language is at base a tool for social interaction. As of yet, many people still feel discomfited by multitasking (their own or that of their interlocutor) when speaking face-to-face or on the phone. Take visual and voice contact away (as with email, IM, or text messaging), and our standards for demanding (and giving) exclusive attention promptly drop off.

Will IM or texting edge out physical (or voice-phone) conversations in the name of the increased efficiency and control that multitasking on ICTs affords? Given the success of mobile phones and Skype, telephony is not going away any time soon. However, ICTs do potentially degrade live face-time. We need to ask ourselves what is unique about two people meeting and talking face-to-face, and how important it is to preserve uninterrupted live contact. Not easy questions, but their answers are part of what makes us human.

REFERENCES

- Adamczyk, Piotr, & Bailey, Brian (2004). If not now, when?: The effects of interruption at different moments within task execution. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '04)*, Vienna, Austria (pp. 271-278).
- Armstrong, G. Blake, & Sopory, Pradeep (1997). Effects of background television on phonological and visuo-spatial working memory. *Communication Research* 24, 459-480.
- Baron, Naomi S. (2000). *Alphabet to email: How written English evolved and where it's heading*. London: Routledge.

- Baron, Naomi S. (2002). Who sets email style: Prescriptivism, coping strategies, and democratizing communication access. *The Information Society* 18, 403-413.
- Baron, Naomi S., Clem, Tim, & Rabinovitz, Brian (in preparation). Multitasking behavior of American college students.
- Baron, Naomi S, and Ling, Rich (in preparation). Emerging patterns of American mobile phone use: CMC in transition.
- Baron, Naomi S., Squires, Lauren, Tench, Sarah, & Thompson, Marshall (2005). Tethered or mobile: Use of away messages in instant messaging by American college students. In R. Ling & P. Pederson (Eds.), *Mobile communications: Re-negotiation of the social sphere* (pp. 293-311). London: Springer-Verlag.
- Baym, Nancy K., Zhang, Yan Bing, & Lin, Mei-Chen (2004). Social interactions across media: Interpersonal communication on the Internet, face-to-face, and the telephone. *New Media & Society* 6, 299-318.
- Brooks, Lee R. (1968). Spatial and verbal components of the act of recall. *Canadian Journal of Psychology* 22, 349-367.
- Carr, David (2005, December 18). Taken to a new place, by a TV in the palm. *New York Times*, Section 4 (Week in Review), p. 3.
- Cutrell, Edward, Czerwinski, Mary, & Horvitz, Eric (2001). Notification, disruption, and memory: Effects of messaging interruptions on memory and performance. In M. Hirose (Ed.), *Human-computer interaction (INTERACT '01)*. Tokyo (pp. 263-269). IOS Press (for IFIP).
- Crook, Charles, & Barrowcliff, David (2001). Ubiquitous computing on campus: Patterns of engagement by university students. *International Journal of Human-Computer Interaction* 13, 245-256.
- Dabbish, Laura, & Kraut, Robert (2004). Controlling interruptions: Awareness displays and social motivation for coordination. *Proceedings of the 2004 ACM Conference on Computer Supported Cooperative Work (CSCW '04)*. Chicago, IL (pp. 182-191).
- Damos, Diane L. (Ed.) (1991). *Multiple-task performance*. London: Taylor & Francis.
- Daoussis, Leonard, & McKelvie, Stuart J. (1986). Musical preferences and effects of music on a reading comprehension test for extraverts and introverts. *Perceptual and Motor Skills* 62, 283-289.
- Draganski, Bogdan, Gaser, Christian, Busch, Volker, Schuierer, Gerhard, Bogdahn, Ulrich, & May, Arne (2004). Changes in grey matter induced by training. *Nature* 427 (January 22), 311-312.
- Floro, Maria Sagrario, & Miles, Marjorie (2003). Time use, work and overlapping activities: Evidence from Australia. *Cambridge Journal of Economics* 27, 881-904.
- Gaver, William (1991). Technology affordances. *Proceedings of the SIGCHI Conference on Human Factors in Computer Systems (CHI '91)*, New Orleans, LA (pp. 79-84).
- Gibson, James J. (1979). *The ecological approach to visual perception*. New York: Houghton Mifflin.
- Hembrooke, Helene, & Gay, Geri (2003). The laptop and the lecture: The effects of multitasking in learning environments. *Journal of Computing in Higher Education* 15, 46-64.

- Hewlett-Packard (2005). Abuse of technology can reduce UK workers' intelligence. Small & Medium Business press release, April 22. Retrieved July 22, 2006, from <http://h41131.www4.hp.com/uk/en/pr/UKen22042005142004.html>.
- Ironmonger, Duncan (2003). There are only 24 hours in a day! Solving the problematic of simultaneous time. *Proceedings of the 25th IATUR Conference on Time Use Research*. Brussels, Belgium.
- Katz, James E. (1999). *Connections: Social and cultural studies of the telephone in American life*. New Brunswick, NJ: Transaction Publishers.
- Katz, James E. (2003). A nation of ghosts? Choreography of mobile communication in public spaces. In K. Nyíri (Ed.), *Mobile democracy: Essays on society, self, and politics* (pp. 21-31). Vienna: Passagen.
- Katz, James E., & Aakhus, Mark (2002). *Perpetual contact: Mobile communication, private talk, public performance*. Cambridge: Cambridge University Press.
- Kenyon, Susan, & Lyons, Glenn (In Press). Introducing multitasking to the study of travel and ICT. *Transportation Research A*.
- Lenhart, Amanda, Madden, Mary, & Hitlin, Paul (2005). Teens and technology. Pew Internet & American Life Project, July 27. Retrieved July 22, 2006, from http://www.pewinternet.org/pdfs/PIP_Teens_Tech_July2005web.pdf.
- Ling, Rich (2004). *The mobile connection: The cell phone's impact on society*. San Francisco: Morgan Kaufmann.
- Maguire, Eleanor A., Gadian, David G., Johnsrude, Ingrid S., Good, Catriona D., Ashburner, John, Frackowiak, Richard S. J., & Frith, Christopher D. (2000). Navigation-related structure change in the hippocampi of taxi drivers. *Proceedings of the National Academy of Sciences* 97 (April 11), 4398-4403.
- Manhart, Klaus (2004). The limits of multitasking. *Scientific American Mind* 1 (December), 62-67.
- Michelson, William (2005). *Time use: Expanding explanation in the social sciences*. Boulder: Paradigm Publishers.
- Morton, David (2000). *Off the record: The technology and culture of sound recording in America*. New Brunswick, NJ: Rutgers University Press.
- Perrin, Noel (1979). *Giving up the gun: Japan's reversions to the Sword, 1543-1879*. Boston: David R. Godine.
- Pool, Marina M., Koolstra, Cees M., & Van der Voort, Tom H.A. (2003). Distraction effects of background soap operas on homework performance. *Educational Psychology* 23, 361-380.
- Rheingold, Howard (1999). Look who's talking. *Wired* 7.01 (January).
- Rogers, Robert, & Monsell, Stephen (1995). Costs of a predictable switch between simple cognitive tasks. *Journal of Experimental Psychology—General* 124, 207-231.
- Rubenstein, Joshua S., Meyer, David E., & Evans, Jeffrey E. (2001). Executive control of cognitive processes in task switching. *Journal of Experimental Psychology—Human Perception and Performance* 27, 763-797.
- Ruuskanen, Olli-Pekka (2004). Essay 4. More than two hands: Is multitasking an answer to stress? *An economic analysis of time use in Finnish households*. PhD dissertation, Helsinki School of Economics, Helsinki, Finland, pp. 188-229.

- sciam.com (2004). *Scientific American Mind* Poll: 90% of American adults are multitaskers. Press release summarizing results of *Scientific American Mind* / Harris Interactive study, December 20. Retrieved July 22, 2006, from <http://pr.sciam.com/release.cfm?site=sciammind&date=2004-12-20>.
- Sellen, Abigail, & Harper, Richard (2002). *The myth of the paperless office*. Cambridge, MA: MIT Press.
- Shiu, Eulynn, & Lenhart, Amanda (2004). How Americans use instant messaging. Pew Internet & American Life Project, September 1. Retrieved July 22, 2006, from http://www.pewinternet.org/PPF/r/133/report_display.asp.
- Silverstein, Roger, & Haddon, Leslie (1996). Design and domestication of information and communication technologies. In R. Silverstein & R. Mansell (Eds.), *Communication by design* (pp. 44-74). Oxford: Oxford University Press.
- Sprint (2004). Sprint survey finds nearly two-thirds of Americans are uncomfortable overhearing wireless conversations in public. News release, July 7. Retrieved July 22, 2006, from http://www2.sprint.com/mr/news_dtl.do?id=2073.
- Stroop, John R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology* 18, 643-662.
- Umble, Diane Zimmerman (1996). *Holding the line: The telephone in Old Order Mennonite and Amish life*. Baltimore: Johns Hopkins.
- Vargas, Jose A. (2006, January 16). One answer to too much tech: Sorry, I'm not here. *Washington Post*, Section 2, p.1.
- Westin, Alan F. (1967). *Privacy and freedom*. New York: Atheneum.
- Young, Katie, Deal, Laura, & DiMarco, Gia (2005). R U Thr? Text messaging and cell phone use by American college students. Unpublished paper, American University, Washington, DC.