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Letters by phone or speech by other means: the linguistics of email

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1. Introduction

Thirty years ago, in *The Naked Sun*, Isaac Asimov created the planet of Solaria, whose inhabitants rarely met face-to-face. Instead, people 'viewed' one another through trimensional imaging. At one point, Elijah Baley, a detective sent from earth to investigate a murder on Solaria, had 'tuned in' Galdia Delmarre, the wife of the murder victim, only to find she had just emerged naked from the shower:

> 'I hope you don't think I'd ever do anything like that, I mean, just step out of the drier, if anyone were *seeing* me. It was just *viewing*.'
> 'Same thing, isn't it?' asked Baley.
> 'Not at all the same thing. You're viewing me right now. You can't touch me, can you, or smell me, or anything like that. You could if you were seeing me. Right now, I'm two hundred miles away from you at *least*. So how can it be the same thing?'
> Baley grew interested. 'But I see you with my eyes.'
> 'No, you don't see me. You see my image. You're viewing me.'
> 'And that makes a difference?'
> 'All the difference there is.' (Asimov, 1957/1991, p. 63).

In earlier times, people in literate societies had two ways of communicating with one another: either face-to-face (through the immediacy of speech) or at a distance (through more temporally or geographically remote writing). The rules of interlocutor engagement were clear. You directly saw the person with whom you were speaking, but not the one to whom you were writing. With only minor exceptions (such as passing a note to a confederate during a public gathering), there was no middle ground.

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Over the last century, developments in telecommunications have made possible new communicative modalities that blend the presuppositions of spoken and written language. We speak on the telephone, but at a distance, and without seeing our interlocutor. We send written messages, once by telegraph, now by fax, that travel in near-real time. Voice mail (as its name implies) offers the vocal cues of speech without the opportunity for feedback from the interlocutor, thus truncating the expected parameters of spoken language. For a growing number of us, the most useful telecommunications device is electronic mail ('email'), which conveys messages written at a computer keyboard, again, in near-real time.

In only three decades, email has grown from a government-initiated, academically-implemented system for sharing research information into an international alternative to long distance phone calls, interoffice memos, and face-to-face encounters. The appeal of the medium is as pervasive in the private world as it is in business or academe. In Blacksburg, VA, where the entire town is part of a technological experiment launched by Virginia Tech and Bell Atlantic, homes, libraries, government, businesses, and special interest groups are electronically linked (see, for example, Carroll and Rosson, 1996; Rothenberg, 1996; http://www.bev.net). Through the Blacksburg Electronic Village, citizens are linked to millions of information sources and commercial sites. Yet when researchers analyzed what Blacksburg users were doing with their online capabilities, the data were uniformly consistent: largely eschewing other functions, the people of Blacksburg were predominantly interested in email (see Chandrasekaran, 1997; also see Sproull and Faraj (1997) and Baym (1995) on social rather than informational uses of the Internet and other electronic networks).

In the corporate world, email is becoming equally ubiquitous. In fact, in some contexts, it has all but replaced more traditional means of communication, from phones to memos to chance encounters in the hall (see, for example, Markus, 1994). Michael Kinsley, editor of Microsoft's interactive magazine, *Slate*, describes his transition into the Microsoft work culture this way:

> Shortly after I arrived, I met someone who'd just joined Microsoft from Nintendo North America—a similar high tech, post industrial, shorts-and-sandals sort of company, one would suppose. So I asked him, How is Microsoft different? He said, '*At Microsoft, the phone never rings.*' (emphasis added) (Kinsley, 1996, p. 113).

Kinsley estimates that at Microsoft, probably 99% of communication within the company takes place via email.

As a growing proportion of our linguistic communication shifts from more traditional spoken and written venues, it becomes increasingly important for us to understand the nature of this new medium. Is email a variety of speech (as many people are claiming)? What important properties does it share with writing? Does it have emergent qualities that are unlike those typifying speech or writing? Answers to these questions have implications not only for understanding success and failure in email communication but also for community standards and expectations in the use

of traditional spoken and written language (see Baron, 1997, 1999; Moran and Hawisher, 1998).

We begin (Section 2) with a brief overview of the linguistic character of spoken and written language, along with the role that technology has had in shaping usage. Section 3 explores the growth of email as a new communication genre, embedding the discussion in the larger context of computer mediated communication. Section 4 examines the formal linguistic properties of email, while Section 5 proposes a model of email as a creolizing linguistic modality, analogous to pidginization and creolization processes well known in spoken languages.

2. Modality, medium and message: the linguistics of speech and writing

2.1. Why think about written language?

Interest in written language (and how writing compares with speech) has been mushrooming in recent years. However, models that have emerged relating speech to writing are hardly uniform. Instead, they tend to reflect the varied research agendas of the investigators: *linguistic*, *historical/cognitive*, *ethnographic*, or *technological*.

2.1.1. Linguistic agenda: beyond mere transcription of speech

Linguists raised in the structuralist or transformational tradition largely focused on speech to the exclusion of writing, conditioned by Leonard Bloomfield's maxim that writing is 'not language, but merely a way of recording language by means of visible marks' (Bloomfield, 1933, p. 21) and therefore of little theoretical interest in its own right. Within the past 20 years, the tide has turned, and writing has emerged as a respected domain of linguistic inquiry. Works have ranged from comparisons of writing systems (e.g. Coulmas, 1989; Daniels and Bright, 1996) to discussions centered on the 'linguistics' of writing (e.g. Sampson, 1985; Harris, 1986, 1995; Biber, 1988; Downing et al., 1992; Taylor and Olson, 1995) to bibliographies on written language (e.g. Erlich et al., 1996).

2.1.2. Historical/cognitive agenda: a 'great divide'?

Motivated by a very different set of concerns, a second group has argued that the real interest in written language (particularly in alphabetic writing) lies in its transformative influences on human cognition, both historically and in modern times. Inspired by Eric Havelock's arguments (e.g. 1982) that the development of the Greek alphabet undergirded the emergence of classical Greek thought, a bevy of anthropologists, psychologists, and general students of the written word have probed whether literate peoples (and people) 'think' differently than non-literates and whether the form of literacy (e.g. alphabetic versus character systems) is, as Havelock claimed, a relevant variable (see, for example, Goody and Watt, 1968; Scribner and Cole, 1981; Ong, 1982; Goody, 1987; Illich and Sanders, 1988; Olson, 1994; Taylor and Olson, 1995; Baron, 1998a; Levinson, 1997). A central question in the discussion is whether the presence of writing creates what Brian Street (1984) has called a 'great divide' between literates and non-literates.

2.1.3. Ethnographic agenda: function driving form

A growing number of anthropologists and linguists concerned with language in social context have become interested in writing as a culturally relative variable, rather than as a static form of representation, defined identically in all contexts and for all societies. Usage-oriented linguists such as Deborah Tannen (e.g. 1982a,b), Wallace Chafe (e.g. Chafe and Danielewicz, 1987; Chafe and Tannen, 1987), and Douglas Biber, (1988, 1995) have argued that the linguistic properties of speech and writing vary from context to context, such that writing may assume the characteristics of speech (e.g. in a note to a friend) or speech may emulate the prototypic traits of writing (e.g. in a formal oration). A number of field-oriented anthropologists (e.g. Heath, 1983; Street, 1984, 1993; Finnegan, 1988; Besnier, 1995) caution us not to impose contemporary middle-class western usage patterns and values on other social groups.

2.1.4. Technological agenda: media and messages

Beyond the linguistic, historical/cognitive, and ethnographic agendas, there is a fourth perspective through which writing becomes important: that of technology. As Haas (1996, pp. *x–xi*) correctly observes, writing is necessarily intertwined with technology, since technology of some sort—chisel, brush, printing press, or computer—is necessary to turn orally-based language into writing.

The impact of technology manifests itself in a plethora of forms. Choice of writing implement and the medium upon which written symbols are inscribed can influence the shape of the representational system, as when pictograms evolved into arbitrary wedge shapes in ancient Mesopotamia because of the difficulty of etching curves in clay (Baron, 1989, p. 8). The medium through which a written message is conveyed can also alter the linguistic content of messages, including orthography, vocabulary choice, syntactic structure, and conventions governing semantic appropriateness. Such effects have been described for the printing press (Eisenstein, 1979), the telegraph (McLuhan, 1964/1994; Marvin, 1988; Carey, 1989), and, most recently, the computer (e.g. Haas, 1996). In the course of this essay, we will explore how the technology of email affects the written word. (See Baron (1998b) for more extensive discussion of the comparative impact of teletechnologies on linguistic messages.)

2.2. Ways of viewing linguistic representation

Each of these research agendas carries its own suppositions about the relationship between spoken and written language. If we hope to understand the extent to which email is speech-like or akin to writing, it seems logical to measure email against an independent model of what differentiates speech from writing in non-electronic media. But does such a unitary model exist?

What emerges from the literature is not one conceptualization but rather three: *dichotomous*, *spectral*, and *cross-modal*. These approaches largely differ in the extent to which they are intended to be paradigmatically descriptive as opposed to functionally accurate in accounting for real-world usage. Elements from each of the models will turn out to be important in understanding the linguistic nature of email.

2.2.1. Dichotomous models

Both the linguistic agenda and the historical/cognitive agenda presuppose a dichotomous relationship between speech and writing. Lists of features distinguishing these two forms of language abound (Horowitz and Samuels, 1987, p. 9, is representative). Some discussions (e.g. Coleman, 1996, p. 44) cast the same dichotomy in terms of the conceptual mentalities that presumably underlie the formulation of written versus spoken messages. *Endophoric language* (associated with writing) is constructed with the assumption that the text can be interpreted without reference to extralinguistic information ('decontextualized'). *Exophoric* language (associated with speech) is created more freely, often requiring reference to extralinguistic, real-world context to make sense of the linguistic message ('contextualized').

Drawing upon the existing literature, Fig. 1 presents a representative sampling of features contained in dichotomous models.

2.2.2. Spectral models

The ethnographic and technological agendas both question the dichotomous model. By empirically examining linguistic usage in real-world contexts, anthropologically

	Writing (Endophoric)	Speech (Exophoric)
SOCIAL DYNAMICS:	separated in time and space	face-to-face
	objective	interpersonal
	monologue	dialogue
FORMAT:	durable	ephemeral
	scannable	linear access
	planned	spontaneous
	highly structured	loosely structured, including repetitive
GRAMMAR:	complex syntax	simpler syntax
	deals with past and future	deals with present
STYLE:	formal	informal
	expository	narrative
	argument-oriented	event-oriented
	decontextualized	contextualized
	abstract	concrete

Fig. 1. Sample dichotomous relationships between writing and speech.

oriented studies of writing (and of literacy more broadly) have noted significant mismatches between forms of representation (here, speech and writing) and the linguistic characteristics that the dichotomous model presumes they possess. Sometimes, for example, speech has the qualities we would expect to find in writing (e.g. an official spoken proclamation may be argument-oriented, formal, highly structured, and built through complex syntax) while a hand-written note to a friend may have the structure we would expect of speech (e.g. event-oriented, informal, loosely structured, composed using simpler syntax). Thus, it may be more accurate to recast the dichotomies of Fig. 1 as spectra, with the specific location of a written or spoken sample along a spectrum being determined by actual usage conditions (see Biber (1988) for an extended example of such a multivariate analysis).

The spectral model is also useful in visualizing the effects that technology has in the production and dissemination of spoken and written language. Fig. 2 offers a unitary communication spectrum that encompasses both traditional writing and speech, along with a number of technologies for formulating and conveying messages. (See Trevino et al. (1987) for a similar model, based on theories of symbolic interaction.) A representative sample of more fine-grained spectra that break out particular communication technologies are suggested in Fig. 3. In each case, the range of options is placed, for purposes of comparison, against the basic writing-speech spectrum.

2.2.3. Cross-modality models

Both dichotomous and spectral models of linguistic representation presume that linguistic messages are designed for and presented in a single modality: speeches are intended to be spoken, books are meant to be read only with our eyes. But is this assumption always appropriate? We can (and do) read Shakespeare's plays silently, and Chaucer could (and did) read aloud his tales to courtly audiences who were, Coleman (1996) argues, quite literate. (Also see Graham (1989) for discussion of cross-modal issues in holy scripture.)

Thus, merely because a 'text' is cast in speech or writing hardly ensures that such will be the modality through which all interlocutors experience it. As we will see in our discussion of the linguistics of email in Section 4, the availability of cross-modal access to a linguistic message often confounds attempts to characterize a form of language (such as email) as inherently like writing or like speech.

2.3. Principles versus practices

What emerges from this bird's-eye tour of alternative agendas for comparing written and spoken language (along with alternative models for doing so) is the realization that the relationship between speech and writing is relative rather than

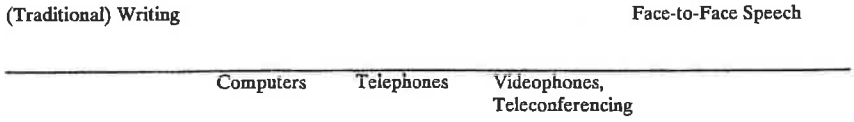

Fig. 2. Spectral relationships between writing and speech (adapted from Baron, 1984, p. 120).

Handwriting or Printing Spectrum	(Traditional) Writing			Face-to-Face Speech
	calligraphy, professional printing, formal letters	desktop publishing	posters, handbills, thank-you notes	written notes passed during oral event
Telephone Spectrum	(Traditional) Writing			Face-to-Face Speech
	conversations in culture where telephone is rarely used	business conversations		chat with close acquaintances
Voice Mail Spectrum	(Traditional) Writing			Face-to-Face Speech
	Message initiator didn't intend to reach intended interlocutor directly (express messaging, calling at off hours, distribution lists)	intended interlocutor not available, though message initiator hoped to reach him or her directly (traditional voice mail)		both parties available to speak (no voice mail)
Email Spectrum	(Traditional) Writing			Face-to-Face Speech
	asynchronous email		synchronous email	

Fig. 3. Sample spectral models of communication technologies.

fixed. The distinctions scholars choose to make reflect particular interests in writing as much as they capture inherent properties distinguishing these two forms of representation.

But what about distinctions we make as *individual* readers and authors, listeners and speakers? Are we consistent in our own minds about differences between spoken and written language, or do we individually embody contradictory perspectives?

In nearly all literate societies, children learn to read and write through formal schooling. As part of the educational process, children are taught many dichotomous distinctions between written and spoken language. My own composition teachers, for example, railed against using contractions, beginning a sentence with a conjunction, or ending one with a preposition in a written text, acts which were permissible in speech. (But obviously, these were suggestions I didn't always listen to.)

The ability to state learned principles hardly assures individual much less community practice. For example, while spoken face-to-face communication paradigmatically assumes a response from an interlocutor, communities develop recognized mechanisms for avoiding answering unwelcome questions (such as the studied art of conveniently running out of time at a meeting). In the email domain (Section 4), while we know that the physical medium of email transmission is writing, we often behave as if email, like speech, were ephemeral (e.g. not pausing to edit messages before sending them; ignoring the fact that our private communications can be accessed and printed by others).

In our analysis of the linguistics of email, we will find all of these agendas and models—plus the need to distinguish between principles and practices—coming into play.

3. Email as a communicative genre

How does email function as a linguistic modality? As we begin constructing an answer to this question, it is useful to contextualize our own study by looking both at email's origin and at its relationship to computer mediated communication more generally.

3.1. The history of email

The family tree of email predates modern computing by more than a century. The earliest teletechnologies—Samuel Morris' telegraph in 1838 and Alexander Graham Bell's telephone in 1876—made it possible to send messages at distances in near-real time. The telex, developed in 1900, hard-wired a typewriter to a telephone; the earliest fax machines, developed in the 1950s, joined copy machine technology with telephone transmission.

Email as we know it today has its more immediate roots in several intertwined developments in the 1960s and 1970s, most of whose origins were in the service of America's national defense. In the early 1960s, the height of the Cold War, both the

RAND Corporation and researchers at MIT were exploring how computers could be used for transmission of information in case of nuclear attack. The goal was to decentralize the distribution of defense data so that no targeted nuclear strike would wipe out America's command and control system.

By 1968, this decentralized computing system was implemented as ARPANET (Advanced Research Projects Agency Network), run by the U.S. Department of Defense. The system linked geographically dispersed computers in governmental and university research installations, enabling them to share data across dissimilar host machines. Over the next two decades, ARPANET was to undergo a number of transformations (including separation from specifically military functions, and internationalization), eventually emerging as the Internet of the early 1990s.

Use of this decentralized network for the exchange of electronic messages (as opposed to transfer of data files or remote log-in to other computers) was not part of the original ARPANET design. It was only in the early 1970s that two programmers at Bolt Beranek and Newman (the research company awarded the government contract to develop ARPANET) experimented with sending personal messages, rather than just data, to one another (see Lynch and Rose (1993) and Rheingold (1993) for fuller accounts of the relationship between the Internet and email).

A second major thread in email's history was the development of computer-based conferencing systems, originally created for group decision-making. The moving force behind these developments was Murray Turoff who, in the late 1960s, was working on multi-player computer war-games simulations for the Institute for Defense Analysis. As Rheingold relates the story, Turoff, drawing upon his war-games experience,

> started experimenting with computers as a way of mediating a special expert-consulting process developed at RAND, known as the Delphi method. Delphi was a formal method of soliciting anonymous ideas and critiques of those ideas from panels of experts – a combination of brainstorming and opinion polling (1993, p. 112).

Over the next two decades, Turoff (later in collaboration with Starr Roxanne Hiltz; see, for example, Hiltz and Turoff, 1978/1993) crafted and extensively studied systems of computer-based conferencing that could be used not only for decision-making but for broader group discussion and message-sharing as well.

The one non-military thread in this history was the emergence of independent computer bulletin-board systems (BBSs) in the late 1970s. Early computer aficionados in both Chicago and California created the hardware and software needed to connect microcomputers via telephone lines. While two pioneering computer hackers in Chicago had simply been interested in exchanging computer files with one another, the earliest BBS in California was designed to build an on-line community, sharing information of all sorts. With time, BBSs became multifunctional, allowing users either to post to public lists (what have evolved into chat groups and listservs) or to direct messages to specific recipients (i.e. email) (see Rheingold, 1993, pp. 131ff).

Email has been a common fixture in business and academia for at least two decades. In the commercial sphere, local area networks have been used to connect dumb terminals or stand-alone machines via which employees use email for business and sometimes personal messaging. In the academic world, the email circle has widened from an initial coterie of computer cognoscenti to encompass the majority of faculty, students, and staff, as campuses have been wired and the Internet has come to provide resources attractive to an expanding usership.

3.2. Email as computer mediated communication

As we see from its history, electronic messaging has emerged as a way of communicating both with a number of individuals simultaneously (as in computer-based conferencing or listservs) or with a specific individual. This broad domain of information exchange via computers has come to be known as computer mediated communication, or CMC (see, for example, Sabourin and Lamarche, 1994; Herring, 1996).

Where does email fit into the larger scheme of CMC? Building on the notion of spectral (rather than dichotomous) analysis for understanding the relationship between different forms of linguistic expression, Fig. 4 identifies five basic types of CMC.

Differences between forms of CMC result largely from the relationships defined between senders and recipients. Do the interlocutors know each other? Is the communicative goal downloading of information, dialogue with friends or colleagues, entertainment for the bored or lonely, or literary composition?

In this essay, we will focus on CMC as *one-to-one dialogue* with an identified interlocutor (email), with some reference to its close cousin, *one-to-many dialogue* (e.g. listservs, computer conferencing, BBSs) with identified interlocutors (i.e. people with whom one is acquainted either personally or by name, position, or reputation). Briefly, the other three types of CMC, which we will not be discussing further, are:

- Posting—A posting is a 'finished' piece (such as a scholarly paper, an electronic journal, or the contents of a web site) that an author makes available for public consumption. Such postings come closest to traditional writing, which results in a 'product' that others can access. Like books or journals in a library, they invite a readership whose members are generally unknown to the author. However, while presented as 'finished' products, postings are potentially open to revision based upon elective feedback from readers.
- Joint composition—A joint composition is writing undertaken on the computer with one or more co-authors, who may work coterminously or sequentially. Joint composition grows out of contemporary composition theory that conceives of writing not as an individual process undertaken by a solitary author but rather as a dialogue between writer and readers, where the distinction between the two may become blurred (see, for example, Bolter, 1991; Landow, 1992; Snyder, 1996; Baron, 1998a). Joint composition takes two basic forms: (1) collaborative writing (typically in composition classrooms), where the identity of all participants is known and (2) what I have elsewhere (Baron, 1997) called compositional hypertext, whereby (unknown) end-users modify literary works that

	PRODUCT				PROCESS
	Posting	**Joint Composition**	**Anonymous Dialogue**	**One-to-Many Dialogue (identified interlocutors)**	**One-to-One Dialogue (identified interlocutor)**
Sender:	identified	identified	may be camouflaged	identified	identified
Recipient:	unknown	known or unknown	may be camouflaged	identified	identified
Example:	web page, scholarly work	known: collaborative paper unknown: compositional hypertext	chat groups, MOOs, MUDs	listservs, computer conferencing, BBSs	email

Fig. 4. Spectral analysis of computer mediated communication.

have been created through hypertext links (e.g. Michael Joyce's *Storyspace*—see Hawisher et al., 1996, pp. 211–214).

- Anonymous dialogue—An anonymous dialogue is typically a real-time 'discussion' or fantasy simulation in which the identity of participants is often camouflaged. Interlocutors have been known to represent themselves with different ages, personal characteristics, or even sexual identities than they have in real life. These largely anonymous dialogues (in the form of IRCs, MUDs or MOOs) have dominated much of the public discussion (and concern) about computer mediated communication (see, for example, Jones, 1995; Ess, 1996; Herring, 1996; Snyder, 1998).

4. The linguistics of email

> '[Computer conferencing is like] writing letters which are mailed over the telephone' (Jim Girard, quoted in Spitzer (1986, p. 19).
>
> It might help to consider the [email] message as a written verbal communication rather than real writing (Shapiro and Anderson, 1985, p. 21).

4.1. Describing a moving target

It is a linguistic truism that all living languages change, though some systems change more swiftly than others. Factors contributing to rapid evolution may include social or political realignment (as in the rise of modern Hebrew—see Fellman, 1973; Harshav, 1993), prescriptive edict (such as simplification of the character system in the People's Republic of China—see Seybolt and Chiang, 1979), or development of new technology (e.g. the effect of the telegraph in creating modern journalistic style—see Carey, 1989).

Email is more a moving linguistic target than a stable system, thereby complicating the problem of constructing a unified grammar of email. Three major sources of fluidity in email bear note: evolution of the *technology*, growth in *usership*, and partial *maturation* of the genre.

4.1.1. Technology

Hardware and software used for sending and receiving email have evolved enormously over the past three decades. Many of us still remember when minicomputers, CRT displays, and keyboards were novelties, replacing mainframes and punched cards. The early line editors available for composing email messages made it cumbersome to create or correct text, or to shift from one screen-worth of information to another.

Technological limitations became defining parameters for constructing email. Messages were intended to be brief—no longer than could fit on a single screen (e.g. Shapiro and Anderson, 1985, p. 23). The awkward technology of the 1970s bears little relationship to the large screen, intuitive systems of today that include word

wrap; easy insertion, deletion, and block movement of text; and, increasingly, even such editing devices as spell-checkers. The growing availability of complementary communication technology such as digitized speech signals, voice recognition, and real-time video imaging of one's interlocutor stands, in turn, to alter many of our assumptions about the linguistics of email that emerged before such enhancements began to appear.

4.1.2. Usership

The sheer volume of email traffic, whether through local area networks, BBSs, or the Internet, has grown explosively, especially during the late 1990s. As the number of users of any communicative medium increases, rapid change is likely, especially if there is no prescriptive counterforce. Such rapid evolution can be seen, for example, in modern English (as the number of people who speak at least 'some' English approaches a billion) or in contemporary telephone protocols (now that telephones have penetrated nearly the whole world). The Internet—like American English and telephone usage—has no centralized control. Though guides for new Internet users continue to appear (e.g. Shea, 1994; Lamb and Peek, 1995), no one monitors their content, much less who is reading them.

Not only has email participation increased in raw numbers but the composition of users has diversified as well. While many of the earliest users were computer-savvy males, often in the scientific community, today's usership covers the age spectrum and includes far more women. As a result, it becomes increasingly difficult to make linguistic generalizations that apply to all age groups and social cohorts.

A good example is politeness levels in email messages. ARPANET was notorious for its level of 'flaming', i.e. use of rude and often profane language in email exchanges. A recent study of politeness in email (Harrison, 1997) found little evidence of flaming. While flaming has historically been described as an intrinsic quality of email resulting from lack of visual and auditory cues (see, for example, Lea et al., 1992; Dery, 1994), the nature of the community of users seems equally relevant in predicting degree of linguistic hostility. Women are generally more consensual than men, and some disciplines are known as being less combative than others.

4.1.3. Maturation

Like the telephone before it, email has already undergone something of a maturation process. In the case of the telephone, no one today attempts to cram written messages into the telephone transmitter (as novices were jokingly described as doing in the early years of the phone–Marvin, 1988, p. 20). Similarly, today's email users tend to be more comfortable with the logistics of email (and, perhaps, more trusting that it will reliably convey their messages). In fact, user maturation in formulating messages without the benefit of visual cues may account, in part, for diminution of flaming in contemporary email. As Feenberg (1989, p. 23) notes,

> experienced users of the medium usually deny that it obstructs human contact. It turns out that many ordinary individuals possess a compensatory 'literary' capability to project their personality into writing destined for the computer screen.

4.2. Object of study: 'electronic language'

As we noted in Section 3, our object of study is computer mediated communication as one-to-one dialogue with an identified interlocutor (email), with some reference to one-to-many dialogue with identified interlocutors (e.g. listservs, computer conferencing). Collot and Belmore (1996) cluster these two kinds of electronic message exchange under the name 'electronic language'.

Although one-to-many dialogues are not technically email, the line between them and email is often as much a function of technology or institutional organization as it is a difference in language style. On the one hand, by addressing email to multiple recipients (either in the address or 'cc' line), one can approximate one-to-many conversation. On the other hand, in some one-to-many dialogues, especially on smaller listservs or computer conferences, the central exchange is, in essence, between two main participants (albeit with an audience to the proceedings). This blurring of distinctions between one-to-one and one-to-many dialogue was clear even from the inception of the technology (see Siegman, 1983, p. 3).

Most existing studies of electronic dialogue have been of one-to-many conversation. This research choice has been driven both by technology and by privacy conventions. Since many organizations keep central copies of exchanges of one-to-many electronic dialogues, getting hold of such data bases to analyze is relatively easy, especially because the messages are already semi-public (i.e. to other members of the list/conference/bulletin board). Moreover, until recently, computer conferencing (i.e. one-to-many dialogue) was the predominant form of computer mediated communication (Feenberg, 1989). Widespread access to individual email only emerged in the 1990s.

In comparison, large-scale studies of one-to-one electronic dialogue are more methodologically challenging. For practical purposes, files reside on the individual computer accounts of senders and recipients (the presence of organizational backup files is unknown to many users). Few individuals would likely volunteer their email 'in' and 'out' baskets for public analysis. Some early studies were done on the use of email within business settings (e.g. Sherblom, 1988), but less is known about email exchange between private individuals.

As a result, much of our thinking about the linguistic properties of actual email is anecdotal, based on small sample size, or derived from simulated message-sending (e.g. Seu et al., 1991) rather than naturalistic data. Given these methodological hurdles, it is perhaps not surprising that studies purporting to discuss the linguistic character of email often turn out to be analyses of one-to-many dialogue.

Lacking two distinct sets of studies, we will treat data collected from either source as reasonably indicative of the specific genre here under investigation, namely email. While more differentiated studies might reveal differences reflecting the number of recipients (and the presence or absence of an 'audience' choosing merely to observe the passing show), we do not anticipate that such analyses will significantly alter the profile of email that emerges later in this paper.

4.3. Existing studies of email

The majority of early email studies emerged not from linguists but from students of information systems and organizational behavior. Many of our commonly held ideas about email (and CMC more generally) derive from work done by Lee Sproull and Sara Kiesler (e.g. 1986, 1991) and from the research of Starr Roxanne Hiltz and Murray Turoff (e.g. 1978/1993). Other socially-oriented studies (including more recent work) can be found in Murray (1991), Lea (1992), Tuman (1992a,b), Jones (1995), Ess (1996), and Herring (1996).

Many of these 'human factors' investigations involved social parameters of language use. The following conclusions were commonly drawn:

Email is informal (compared with 'traditional' writing)
Email helps develop a level conversational playing field
Email encourages personal disclosure
Email can become emotional ('flaming')

4.3.1. Email is informal

Analyses of email frequently comment on its informality (e.g. Turner, 1988; Feenberg, 1989; Spears and Lea, 1992). Compared with prose composed with paper and pen (or even typewriter or word processor), email tends to use more casual lexicon, to be less carefully edited, and to assume a greater degree of familiarity with the interlocutor (as evidenced, for example, by choice of salutation or ease with which you introduce humor or sarcasm into an exchange with a person you don't know or don't know well). In email, for example, the use of first names is quite common, even with people you have never met.

4.3.2. Email helps develop a level conversational playing field

Studies of email in business or academic settings repeatedly note that by reducing visible and auditory social cues about interlocutors, email enables participants to interact in a less constrained way than when face-to-face (see, for example, Sproull and Kiesler, 1986, 1991; Murray, 1991). This observation has been applied to females communicating with male colleagues, to those lower on the organizational chart interacting with those higher up, and to students (especially female) engaging in dialogue with faculty (especially male). Even when one's identity is revealed, the level of 'comfort' in initiating communication, suggesting new ideas, and even critiquing proposals made by those perceived as higher on the status chain is not necessarily reduced.

4.3.3. Email encourages personal disclosure

In their 'meta-analysis' of 25 years of research findings (1969–1994) on the role of computers in personal self-disclosure, Weisband and Kiesler (1996) report that people offer more accurate and complete information about themselves when filling out questionnaires using a computer than when completing the same form on paper or through a face-to-face interview. The differences were especially marked when the information at issue was personally sensitive. Interestingly, although these differences

remained significant throughout the period of study, the effect of the computer on encouraging self-disclosure seems to have lessened in recent years. Weisband and Kiesler hypothesize that as users gain computer experience and as computer screens increasingly emulate traditional paper-and-pen formats, the discrepancies between the computer's surface character (as anonymous, ephemeral representation) and its actual function (here, of recording personal data for others to read) become more apparent.

Although the Weisband and Kiesler review focuses on computers used for data-gathering rather than social dialogue, the same issues of privacy and disclosure are at work in both electronic contexts.

4.3.4. Email can become emotional

As we have already noted, early discussions of email repeatedly talked about the emotional nature of the medium. Out-and-out rudeness may, statistically, be declining in email, though the potential for misunderstanding and bruised feelings still remains high, particularly as email continues to attract waves of new users who have no experience in coping with its absence of traditional paralinguistic cues. While many email users have historically added emotion-markers (so-called 'emoticons' or 'smileys') as paralinguistic footnotes to their literal messages (see Sanderson, 1993), it is not clear that these less-than-intuitive symbols will achieve widespread usage among email's currently burgeoning clientele.

A second branch of research has added more formal linguistic analysis to the continuing 'human factors' approach to electronic dialogue. With the exception of a few early discussions (e.g. Baron, 1984; Sherblom, 1988), linguistically oriented studies are fairly recent (see Written Communication, 1991, 8 (1), including articles by Wilkins and by Ferrara et al.; Herring, 1996, Part I; Moran and Hawisher, 1998).

Sherblom's study, while narrowly focused, provides insightful linguistic findings on the use of signatures at the end of email messages sent within a large organization. Since in this organization the identity of the sender was already clearly stated in the 'FROM' line at the top of the email form, signatures did not add new semantic information. The study examined whether signatures served as electronic paralanguage, reflecting 'the hierarchical and communication relationships between the mail file sender and the receiver' (Sherblom, 1988, p. 44).

Sherblom found that relative social position in the organizational hierarchy indeed influenced signature use. None of the messages sent down the organizational chain was signed, while 33% of the messages sent up the chain had signatures. Messages from other offices (i.e. outside the direct organizational hierarchy) were the most likely to be signed—39%, while 13% of messages sent horizontally (i.e. to peers) bore signatures.

The author also analyzed the types of messages correspondents sent to one another. Organizational hierarchy was once again reflected in message content. Of the 157 mail files examined, roughly 80% provided or requested information, or contained administrative detail. Only a handful of messages were personal or social in nature, and these were generally found in horizontal communication (i.e. with peers) rather than either up or down the vertical organizational hierarchy. However, Sherblom recognized that this functional distribution was not necessarily intrinsic to the medium:

> As electronic mail and other forms of computer mediated communication are used by more organizations, changes can be expected in the function and context of the organizational communication as a whole and, perhaps, in the definitions and meaning structures through which the organizations themselves are constituted (Sherblom, 1988, p. 51).

Sherblom's exclusive focus on email data has been the exception thus far. As in the case of 'human factors' research, the two major linguistic studies (to date) of electronic language (Collot and Belmore, 1996; Yates, 1996) have analyzed corpora collected from one-to-many dialogues. Both studies compared their 'electronic' corpus against the same spoken and written data bases, namely, the 500,000-word London–Lund corpus of spoken English (Svartvik, 1990) and the one-million-word Lancaster–Oslo/Bergen corpus of written English (Johansson et al., 1978).

The two studies drew upon existing analyses of differences between spoken and written language (including Halliday, 1978; Chafe and Danielewicz, 1987; Biber, 1988) as points of comparison. All of these studies assume spectral rather than dichotomous relationships between speech and writing. Thus, the question for Collot and Belmore and for Yates became, in which particular communicative contexts is electronic dialogue more like writing or speech. The spoken, written, and computer mediated data were analyzed with respect to such linguistic variables as lexical type/token ratio, word length, and prevalence of particular kinds of lexical or grammatical categories (e.g. attributive adjectives, passive voice, modals, sentential complements, and pronominal usage).

The resulting linguistic profile of electronic dialogue (i.e. more like writing or more speech-like) reflected communicative context and the particular linguistic measure used. For example, on such textual measures as type/token ratio or frequency of adverbial subordinate clauses, the electronic text more closely approximated writing. However, on communicative measures such as the extent to which the message sender appeared personally involved in crafting the message (as opposed to merely informative), electronic messages looked more like speech. ('Involvement' was linguistically measured by the presence of first and second person pronouns, contractions, and modal auxiliary verbs.) A sampling of the results from these two studies appears in Fig. 7.

Summing across the communicative spectra, Collot and Belmore (1996, p. 21) concluded that 'the genres which [electronic language] most closely resembles are public interviews and letters, personal as well as professional.' Yates (1996, p. 46) closed his analysis by emphasizing the heterogeneous character of electronic messages:

> As with both written and spoken discourse, computer mediated communication is affected by the numerous social structural and social situational factors which surround and define the communication taking place.

(See Moran and Hawisher (1998) for a summary of several studies in Herring (1996), along with an independent analysis of 'the rhetoric and languages of electronic mail'.)

Having surveyed some previous attempts to characterize the social and formally linguistic properties of electronic dialogue in comparison with speech and writing, it is time to attempt an integrated analysis.

4.4. Integrated profile of email: a first approximation

What follows is a first attempt, at a particular moment in time (the late 1990s), to lay out the major social and linguistic factors of email as a communicative system. We do so by measuring each factor against a single dichotomous yardstick, with writing at one end and speech at the other. While the unitary dichotomous model has acknowledged shortcomings, it nonetheless enables us to conceptualize the linguistic parameters of email in terms of a common grid.

Our profile of email is divided into the same four major components we used in Fig. 1 for characterizing writing versus speech:

- Social dynamics—The social dynamics of communication define the relationship between participants in the exchange.
- Format—The format of communication defines the physical parameters of the message that result from the technology through which messages are formulated, transmitted, and recieved. Given the rapid evolution of computer technology over the past 30 years, some aspects of form (e.g. chunk size, editing) that were originally restricted by the technology are now, in principle, less constrained. However, earlier presuppositions (e.g. about the difficulty of editing emails) still color contemporary usage.
- Grammar The grammar of communication defines the lexical and syntactic aspects of the message.
- Style—The style of communication defines the choices users make about how to convey semantic intent. These choices are expressed through selection of lexical, grammatical, and discourse options.

Each of the four components is subdivided into a representative set of variables (i.e. linguistic features). An assignment is then made as to how each variable functions prototypically in written and spoken language. For example, in Fig. 5 (Email social dynamics), the variable 'Physical Proximity' has the value 'separated in time and/or space' for writing and 'face-to-face' for speech.

Next, each linguistic feature is analyzed with regard to how it functions in email. Initial assignments are made by placing a 'P' ('in principle') in the writing or speech column of the modality spectrum. These assignments are largely based upon the composite literature we have just reviewed (although a few judgements reflect the author's personal observations). For example, again in Fig. 5, email functions more like writing than like speech with regard to physical proximity, since email interlocutors, like participants in traditional writing, are separated in time and space.

Finally, to fine-tune the linguistic grid, two additional scoring mechanisms are added. The first is needed because some email variables don't function the same way as either speech or writing. In a number of cases, email edges towards the center of