MEDIATED COMMUNICATION IN ORGANIZATIONS

A Theoretical Framework and Research Agenda

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ABSTRACT

In this paper, we propose a theoretical perspective which posits mediated organizational communication as emerging from the interaction of human action and institutionalized properties of organizations. With respect to human action, three *domains of human action* are considered, namely, the choice and use of communication media, the structuring of messages, and the employment of language. Human action in these three domains occurs over time and within a particular context, hence, mediated communication will be influenced by the particular socio-historical context within which humans are situated. We discuss a number of contextual influences such as the properties of communication media available to humans and the properties of the organization within which humans act (size, business, structure, culture, resources, legislative requirements, division of labor, etc). Additional influences on human action are also posited, such as the personal characteristics, skills, experience, and preferences of the individuals, the particular task with which they are engaged, and the intent of their communicative action.

With respect to insitutionalized properties of organizations, our framework suggests that over time, the actions exercised by humans in the domains of media use, message structure, and language become habitual, and particular configurations of media, message structure and language emerge and are invoked in certain cirumstances to achieve some communicative intent. We term these configurations *patterns of mediated communication*, and suggest that they constitute aspects of an organization's institutionalized properties. Our framework distinguishes three kinds of mediated communication patterns based on the degree to which they have become institutionalized in an organization, namely, personalized communication patterns, customary communication patterns, and formalized communication patterns. Our framework also notes the special case of *genres* which are customary patterns of communication involving more than one domain and transcending individual organizations and sometimes even cultures.

In discussing the theoretical framework the paper presents a range of issues pertaining to mediated communication and suggests an interaction process over time that attempts to account for some of the conditions, factors and relationships that influence mediated communication in organizations. In proposing some implications for research, we emphasize the reciprocal influence of domains of human action and patterns of communication which we believe is critical to an understanding of mediated communication in organizations.

Introduction

This paper is concerned with communication in organizations and in particular, with the role of communication media in shaping such communication over time. Communication has always been a critical aspect of organizations, facilitating the social interaction that is the foundation of all organizational action [O'Reilly and Pondy 1979; Weick 1983]. Today, however, the introduction of various sophisticated electronic communication technologies [Culnan and Markus 1987; Rice 1984; Sproull and Kiesler 1986; Winograd and Flores 1986] and the diversity of institutional arrangements demanding faster and better forms of interaction [Applegate, Cash and Mills 1988, Drucker 1988; Kanter 1989; Miles and Snow 1986], are altering the nature of much organizational communication. These pressures are creating unprecedented and to date poorly understood, changes in what, how, when, why, and with what effect organizational communication occurs.

In this paper we provide a theoretical foundation for studying and understanding organizational communication as mediated by various communication media. Giddens [1979:103] notes that: "All social interaction involves mediation in so far as there are always 'vehicles' that 'carry' social interchange across spatial and temporal gaps." Communication media such as paper or electronic mail extend interaction in time (e.g., the emergence of texts facilitates access to the past), and in space (e.g., the exchange of letters or electronic mail bridges physical distance). When interaction is extended through use of communication media, the social relations of the interactants are altered, potentially leading to new modes of communicating, new ways of coordinating people, or even new social forms. The broad range of possible social changes warrants careful investigation of the nature of new communication media and the organizational implications of their use.

In this paper we explicitly focus on what we call *mediated organizational communication,* that is, communication that occurs in organizations and that is mediated by a transmission vehicle in some way (e.g., via paper, computers, telephone, etc.), as distinct from direct face-to-face interaction.[1] Further, we have initially decided to concentrate primarily on asynchronous written communication (including electronic mail, computer conferencing, and paper-based communication), and deal only tangentially with telephone conversations, voice mail, videoconferencing, and interactive computer messaging (for contrast and illustration). Finally, at this stage, we have focussed on verbal communication, omitting graphical elements. Once we have conceptualized the interactions and implications of this bounded area, we intend to incrementally expand our framework to encompass

[1] While we recognize that even face-to-face interaction is mediated by language and "the faculties of physical presence" [Giddens 1979:103], in this paper we exclude it from our definition of mediated organizational communication.

graphical and oral communication, and then relax the asynchronous constraint to include real-time, mediated interaction.

This paper explores the relationship between communication media and the nature of mediated organizational communication. We attempt to shed some light on how communication media shape organizational interaction, and reciprocally how organizational characteristics influence how media are deployed and used.

In the following section, we briefly examine the existing literature on mediated organizational communication, outlining some of the main findings and limitations of this work. In the next section we present a theoretical perspective on the role and nature of mediated organizational communication, and derive a conceptual framework within which some of the dimensions of mediated organizational communication can be described. We then examine factors affecting the dimensions of this framework, using both historical and contemporary findings about mediated organizational communication. We conclude with a research agenda for future investigations of mediated organizational communication.

REVIEW OF PRIOR RESEARCH

Even a cursory examination of the literature on the relationship between organizational communication and the media employed to carry the communication immediately reveals that research in this area has adopted numerous perspectives and focused on many different variables. Hence little consistency in findings or cumulative knowledge has been achieved. Three primary traditions of research into mediated organizational communication can be identified:

- *media choice and use,* which focuses on the appropriateness of various media for different types of communication, as well as the consequences of using these various media in different circumstances;
- *message structure,* which focuses on the factors influencing the form, content, and function of messages, as well as the development of structural message features in new communication technologies; and
- *language,* which explicates how social and contextual factors influence individuals' use of language and production of meaning during social interaction.

We examine each of these research traditions in turn.

Research on Media Choice and Use in Organizational Communication

Media choice research has its roots in the information processing model of organizations [Galbraith 1973; Tushman and Nadler 1978] and is essentially concerned with determining the most

appropriate communication medium given some information to communicate and certain environmental conditions. The central issue raised by this research is what media effective managers choose to communicate certain kinds of information or managerial strategies under various circumstances [Daft and Lengel 1986; Daft, Lengel and Trevino 1987; Huber and Daft 1987; Tyler, Bettenhouse and Daft 1989]. These researchers rank communication media on their ability to convey information that may reduce uncertainty and equivocality, using four criteria to characterize the information capacity of communication media [Huber and Daft 1987:152]: "(1) the opportunity for timely feedback, (2) the ability to convey multiple cues, (3) the tailoring of messages to personal circumstances, and, (4) language variety." This characterization leads to a ranking of communication media along a one-dimensional continuum which the researchers label the "information richness" of media. Media that facilitate feedback, convey multiple cues, are customizable, and encompass the variety offered by natural language are considered "information rich" media. This categorization ranks face-to-face interaction highest, the telephone relatively high, and written media lowest on the "information richness" scale. When this ranking has been extended to electronic mail, they have, by virtue of their written form, been scored low on the information richness scale [Trevino et al. 1987]. According to Daft and associates, the selection of communication media should be based on the ability of a medium to reduce ambiguity. Hence situations calling for communication of equivocal information are best handled with rich media such as face-to-face interaction and least well by written communication.

Empirical studies have investigated the relationship between the selection of variously "information rich" media and organizational variables such as task requirements, environmental conditions, business strategies, and managerial performance. Findings are varied, but some appear to support the contention that the face-to-face communication mode is best suited for equivocal and complex tasks in turbulent environments, with the media lowest in information richness being least appropriate in these circumstances. Other studies, however, have not supported these findings. Markus [1988], for example, found that senior managers, contrary to the predictions of information richness theory, used electronic mail more intensively than predicted by the theory and for tasks involving a high degree of ambiguity. Often they deliberately used electronic mail to avoid the social presence of face-to-face interaction. Research by Schmitz [1989] has attempted to reconcile these discrepancies by proposing that the information richness of a medium is less an objective characteristic of that medium than a perceived characteristic that people attribute to it. Thus, we might expect different media selections depending on how different individuals perceive media properties. Perception of media is influenced by individual differences, roles, tasks, computing and keyboard skills, and social information. While no systematic variation in

information richness of media was detected in Schmitz's [1989] study, individuals' perceptions of media richness were found to be important.

While we believe that media choice is an important aspect of organizational communication, we also believe that this research stream's sole focus on media richness or the information capacity of various communication media has limited our understanding. The media richness research is explicitly premised on the use of media to efficiently reduce ambiguity. While reducing ambiguity is an important consideration, particularly in the context of decision-making tasks, it is not clear that it should be the overriding issue of communication acts. Other factors, some of which have been identified by Murray [1985] and Reder and Schwab [1988], also influence choice of medium: the need for a written record, the ability to store and retrieve the communication at some future point, the desire to disseminate the information to multiple people at the same time, geographic location and accessibility of senders and receivers, task constraints, personal preferences and competencies, volume and complexity of information to be communicated, timeliness of the information, the speed of various media, and so on. We would suggest that while Daft and associates' focus on media richness may be a critical factor in media selection within decision-making situations (their original locale), it is only one factor among many others in organizational communication. As a result, media richness theory, as well as Schmitz's social information and perception extensions, cannot hope to fully explain media choice behavior in organizations.

Complimenting the research into selection of media is a stream of research that focuses on the consequences of using communication media once a medium has been chosen. A large body of research exists on the use of paper-based written communication, but little attention has been paid in this literature to the role of the medium (in this case, paper) in the communicative process. More recently, however, as more and more organizations introduce various electronic communication media such as electronic mail, computer conferencing, and group decision support systems, *media use research* has begun to pay attention to media. This stream of research examines socio-psychological variables that characterize the relationship between individuals and their use of different kinds of media. Comprehensive reviews of these studies can be found in Culnan and Markus [1987] and Steinfield [1986]. Many of the studies have focused on the obvious fact that electronic media filter out many of the cues - nonverbal, social context [Sproull and Kiesler 1986], social presence [Rice 1984; Short, Williams and Christie 1976] - that are associated with face-to-face interaction. Further research has examined the extent to which electronic media facilitate or discourage the emergence of consensus in groups [Hiltz and Turoff 1978; Kiesler, Siegal and McGuire 1982] and the emergence of leaders [Strickland et al. 1978].

While a considerable amount of research has been conducted in this area [Williams 1977], progress is limited by two problems [Reder and Schwab 1988:355], one methodological and the other conceptual. The **methodological concern** is raised by the dominance of the experimental research method in these studies. Laboratory experiments lack realism because participants are not known to each other and are unfamiliar with the task or communication media they use during the study [Reder and Schwab 1988]. Laboratory experiments also isolate the phenomenon of interest from any social-historical context, which in the case of communication in organizations must undermine the validity of the findings emerging out of such studies. Of **conceptual concern** is the underlying assumption of media substitutability, or what Reder and Schwab [1988:355] call "channel equivalence." Much of the literature assumes that communication media are substitutes for the real or ideal thing, face-to-face interaction. Face-to-face interaction is direct, immediate, intimate, unmediated (except by language), and rich. Communication media are then assessed in terms of how much they deviate from this ideal, and are consequently considered more or less adequate depending on how well or how poorly they support the ideal communication mode [Bair 1989]. While this view demonstrates restraint in not asserting too quickly new forms of social interaction, the conservatism of the substitution argument hinders our understanding of the deep and real effects of the new electronic communication media.

Positing face-to-face interaction as the standard against which all other communicative exchanges are to be assessed limits attention to those capabilities not found in face-to-face interaction, ignoring any unprecedented capabilities and effects of new communication media. For example, as Culnan and Markus [1987:431-434] illustrate, electronic media provide capabilities that have "virtually no analog in traditional communication modes," such as large-scale, synchronous conferencing; storage, manipulation, and retrieval of communication transcripts; different forms of addressing that facilitate communication patterns different from traditional ones [Feldman 1987; Zuboff 1988]; and the potential for organizational users to control and customize organizational communication in ways that are difficult with traditional media and face-to-face interaction. In a recent field study of managers' communication with new media, Markus [1989] explicitly rejects the "substitution logic" that underlies much research on communication media, arguing that electronic communication media, rather than emulating more traditional forms of social interaction, may create new patterns of communication not possible before the advent of computerized communication media. Summarizing her findings, Markus suggests that media perceptions and usage patterns may vary significantly from one organization to another, and that electronic media have new capabilities that people will use in unpredictable ways. Similarly, a field study by Reder and Schwab [1988] revealed that while electronic mail use did to some extent overlap functionally with use of telephone and face-to-face interaction, a considerable amount of electronic mail usage

was associated with what they call new "genres of communication," that is, new forms of social interaction with distinctive linguistic forms and discursive conventions [1988:359]. These findings that electronic media introduce complex changes to organizational communication which cannot be explained through conventional logic of augmentation and replacement need to be seriously investigated. Their research encourages a much greater appreciation of the complex and context-specific interactions that are generated by the introduction of electronic media into organizational communication systems.

Another research stream examining media use studies messages as concrete units of communication with physical, spatial, and linguistic features apart from the social, historical or psychological contexts of use [Krone, Jablin and Putnam 1987:22]. Much of the work in this area has attempted to classify organizational communication in various ways, and the outcome is hundreds of different typologies that describe various properties of messages that influence communication structure. Of the many different message properties assessed, medium is one. Stohl and Redding [1987:454] provide a useful overview of these various message categorization schemes, describing the current state of research in this area: "Although there is a proliferation of miscellaneous category schemes, nothing has yet emerged that would merit (in its technical sense) the label 'taxonomy'." Stohl and Redding suggest that messages be examined at different levels of analysis, so as to differentiate senders and receivers, and recognize the differences between "ostensively displayed" and "internally experienced" messages. They further propose greater attention to the actual content of ostensively displayed messages, suggesting that textual analysis of messages can be useful in exploring the relationship between actual messages and communication functions (whether individual, relational, instrumental, contextual, and structural).

Research on Message Structure in Organizational Communication

The second research tradition in mediated organizational communication has concentrated on the message, rather than on how people select or use certain media to accomplish some purpose. Much research on mediated organizational communication has tended to concentrate on the participants in the communicative encounter. That is, the spotlight has been on senders and receivers, their decisions about what and how to use media, their cognitive and affective responses, and the more general social implications of media use for communication flow and the interaction of organizational members. By and large, the messages themselves have not been the center of attention, and the units of analysis have tended to be individuals and larger social structures, such as groups or organizations. Messages, however, constitute the core of organizational communication [Stohl and Redding 1987], and thus need to be studied as a phenomenon in their

own right, rather than subsumed under studies working within socio-psychological or sociological perspectives.

Research from the burgeoning area of computer-supported cooperative work, which focuses on how to provide appropriate electronic support for coordinated activity among humans, attempts to remedy this complaint by deliberately focusing on messages themselves. In this research, computer-based communication systems are developed to implement certain assumptions and objectives in coordinated work. The systems are designed specifically to facilitate common tasks by providing electronic templates for frequently-used message types. Each template representing a different message type provides a standard form, with standard design, headings, and set of predefined fields, each of which are associated with a set of default values. These templates are intended to improve efficiency by eliminating "reinvention of the wheel" in communication, and to facilitate coordination by providing predefined values, linkages to other users' calendars, and a set of standard message types that through habitual use come to define norms for communicating within a particular group.

Research examples include the Cosmos project [Bowers and Churcher 1988] with its support for *communicative practices,* the Coordinator system [Flores et al. 1988] with its support for *speech acts,* the Information Lens project [Malone et al. 1987] with its support for *semi-structured messages,* and the Notes system [Kawell et al. 1988] with its support for *document replication* and *sharing*. While the notion of structured message types and standard templates is intuitively and theoretically appealing, the implications of these systems for social interaction have yet to be thoroughly evaluated in empirical settings. Preliminary studies [Bair and Gale 1988; Flores et al. 1988; MacKay 1988; Sutherland and Pearl 1989] indicate mixed results and ambiguous consequences. Structure has always been an important dimension in communication [Yates 1989a, 1989b], but in the context of computer-based communication systems, decisions about what structure, how much, where, how provided, and defined by whom, become particularly salient. For communication to be mediated by software routines the exact nature and extent of message structuring, as well as the authority relations surrounding the definition and manipulation of communication structure, have to be carefully and explicitly articulated.

Some of this research is based on theories about human communicative behavior [Bowers and Churcher 1988; Flores et al. 1988]. This raises two problematic issues with regard to mediated organizational communication. First, is structure something that can be defined abstractly and imposed on a group of communicating individuals? This assumes that the contours and nuances of social interaction are universal, that they can be articulated explicitly, built into information

technology without distortion or compromise, and used with little change over time. A number of researchers have expressed serious doubts about the possibility and utility of attempting this kind of *a priori* systems design and implementation [Suchman 1985; Woolgar 1987]. The argument is made that social interaction is too complex, indeterminate (varies by context), and dynamic (varies over time) for designers to be able to define a stable set of communication requirements (even if theory based) that could be translated into useful technology. Second, this research presumes unproblematically that people's effectiveness in organizational communication will inevitably increase if communicative practices are made more explicit and less ambiguous. But this begs the question, effectiveness from whose point of view? Who decides how much structure is appropriate, and what constitutes effective communication? Often imposing a standardized structure on a task implies sacrificing some richness of information. Who should decide the tradeoff between more efficient but less valuable communication, and richer but slower communication? Reder and Schwab [1988:367] note that: "Automated attempts to "pin people down" and thereby enhance accountability may not bring about better communication or enhanced productivity. It is very likely such attempts, if they are accepted by users, will change the "rules of the game," and certain types of critical conversations will move to contexts in which the tool will not be used, thereby altering the nature of the communication which does take place through the new technology."

Research on Language in Organizational Communication

This stream of research is primarily concerned with the language or symbol system[2] of organizational communication, that is, the research focuses on unravelling the influence of certain media on the use and meaning of various symbols in different contexts. Some of the research in socio-linguistics is relevant here, in particular, the work on *speech communities* [Gumpertz 1971; Hymes 1974]. This concept is used to express the fact that language inheres in a community, and that "... speakers do use linguistic characteristics to achieve group identity with, and group differentiation from, other speakers" [Wardhaugh 1986:114]. The notion of speech communities attempts to relate the social cohesiveness and social norms of a group to the particular language patterns characteristic of the group. The research on speech communities has focused on oral interaction rather than written, but there is nothing inherent in the concept that would preclude extending it to language users who interact primarily or additionally via written media. Faigley [1985] has attempted such an extension, developing the concept of *discourse communities* to refer to language users interacting via an array of media, direct interaction as well as written

[2] By symbols we mean not only conventional letters and numbers, but also icons and signs used to convey specialized meanings.

communication. In his research, Faigley seeks to understand how certain groups develop their own specialized forms of language, and when, why, and with what effect these are used in various communication media. The important aspect of discourse communities is, as Faigley [1985:238] notes that: "... people acquire specialized kinds of discourse competence that enable them to participate in specialized groups." Intrinsic to this notion of discourse communities is the recognition that they overlap, may take on multiple forms, and that they change over time and with varying participation.

Bernstein [1964, 1973], a British socio-linguist, investigated the relationship between the specialized language (or linguistic code) of a group and its social characteristics. Bernstein proposes that groups tend to develop one of two different linguistic codes, *restricted* or *elaborated,* depending on the different social norms and interaction patterns characterizing the group. He suggests that in a group where the members share basic assumptions, a specialized or distinctive language - a restricted linguistic code - will arise that embodies many taken for granted assumptions about the life, interaction, purpose and functioning of the group. The meaning of communications is not explicitly articulated, and relies on the shared understandings and context to make sense. An elaborated linguistic code, on the other hand, emerges in a situation when individuals do not interact regularly or purposefully, and hence do not share a context of interaction and fundamental assumptions and norms. Because there is no shared reality or purpose, every act of communication requires extensive elaboration and interpretation of basic positions, making explicit the underlying concepts and premises, in order to bridge any existing "cognitive gaps." While Bernstein did not study mediated communication per se, his concepts have been employed in studies of communication technology. Orlikowski [1988] for example, found that the restricted categories and operations of some electronic media constituted a restricted linguistic code that, while making social interaction within a group more efficient, also served to remove from deliberation several key issues and assumptions about the work jointly being performed.

Other relevant socio-linguistic research has examined the manner in which the labels used in language influence thinking and action. The linguistic structuring or categorization of real world events and problems can have a significant effect on the way in which those events and problems are understood and dealt with. The distinctive concepts and categories made by members of certain groups, occupations, professions or organizations are instrumental in the conduct of work, they increase the efficacy of interaction, and they also influence and sustain the world-view of those members [Evered 1983]. To the extent that communication media influence the language used in a discourse community, they will condition the meanings that are created, transmitted, and preserved, and can be expected to influence the action and interaction of the members.

In focusing on the symbols that constitute the social interaction, researchers are also concerned with how communication media intervene to shape the nature and content of interaction. Sproull and Kiesler [1986] reported that the language used in electronic communication media was much less inhibited than that of paper-based communication, and included many instances of what they call "flaming" (e.g., emotional outbursts, name-calling, exaggerated emphasis, inappropriate innuendos or sarcasm, and obscene language). A supporting study [Siegel et al. 1986] found that computer-mediated communication encouraged inflammatory expressions in groups. They speculated that a process of *deindividuation* may be at work here; that is, that the social anonymity and reduced presence of social controls, standards, and norms of computer-mediated communication may lead to loss of identity and nonconforming behavior [Siegel et al. 1986:183].

While these are interesting findings we suggest that there may be other, equally plausible hypotheses for why electronic media display greater incidence of uninhibited language. For example, the lack of nonverbal and social context cues in electronic mail puts more weight on the language itself than in face-to-face or even paper-based communication. Thus users may resort to "flaming" language as a way of conveying their thoughts and feelings forcefully, since they cannot use tone of voice or facial expression or even pen and ink to aid them. This effect could be exacerbated if they are not skilled in the use of written language. Another possible interpretation is that the lack of well-established norms for the new medium leads people to present a less inhibited version of the self [Goffman 1959] or persona, than in better established media. Neither of these interpretations assumes any loss of individuality or identity by the message sender or receiver as perceived by the sender. Finally, laboratory studies may not be able to answer many questions about the use of language, since they abstract the participants from any normal social context and from the discourse communities and organizational networks within which they function. In laboratory settings, participants have no social ties, no relations beyond the experiment, no past and no future together. As a result, they have little investment in their interactions with other participants, no incentive to maintain cordial relations, and so they may abandon the social restraint they would normally show in organizational settings. Studies of language use in electronic media within real organizations may further illuminate both the phenomenon observed in these laboratory studies and the interpretation of that phenomenon.

Review of Prior Research: Assessment

Prior research into organizational communication and media may be grouped into three different streams of research, each of which has made progress on its own, but when looked at as a whole, reveals some gaps, inconsistencies, and conceptual difficulties. Numerous commentators on

organizational communication [Krone, Jablin and Putnam 1987; Weick 1983] have pointed out that there is no clear organizational perspective on the nature and role of communication media in social interaction. As a consequence, conflicting assumptions, worldviews, and approaches abound. From the point of view of mediated organizational communication, we believe that an understanding of the nature and implications of mediated organizational communication is constrained by the following general limitations of the prior research:

i. Conceptual Inconsistency in Definitions of Communication Media

So far in the discussion we have not tried to define "communication media" treating the concept, as do most researchers in this field, as if it were unproblematic and well-understood. However, this is not the case. The notion of communication media is used variously and inconsistently by different researchers in different contexts, and while there is some overlap in the various senses employed, we believe that the subtle differences are sufficiently significant that not articulating them clouds our understanding of mediated communication. The multiple senses of communication media are difficult to disentangle, and these different strands are highly interdependent in practice. The distinctions we make between various media thus, are merely analytic, yet we believe they are necessary so as to differentiate the various effects media have on communication in organizations.

Analytically, media can be distinguished by the communicative intent with which individuals choose to use them. The following distinctions are illustrative not comprehensive. We distinguish among the following asynchronous, written communication media types:

(i) media for the *creation* of communication messages (such as pen and paper, typewriters, electric/electronic typewriters, electronic mail, and electronic text processors);

(ii) media for the *transmission* of communication messages (such as mail, telegraph, facsimile transmission [fax], and electronic mail);

(iii) media for the *storage and retrieval* of communication messages (such as bound volumes, vertical paper files, electronic text files, electronic mail, and electronic formatted files[3]).

There are further distinctions that can be made, such as media for processing communication messages and media for duplicating communication messages, however we have chosen to focus on the above three distinctions as we believe those are the most relevant to mediated communication in organizations. Researchers studying media have not clearly distinguished

3 By electronic fomatted files we mean electronic files whose contents are arranged in a way that facilitates manipulation by computer software e.g., spreadsheets and database files. These files differ from electronic text files whose contents cannot be manipulated in any sophisticated way by special software.

between these various types of media, for example, comparing handwritten paper communication (a medium of creation and storage/retrieval) with electronic mail (a medium of creation, storage/retrieval, and transmission). Further, there has been confusion around the concept of medium and genre. Genre is a literary concept that describes widely recognized types of messages - such as letters, memos, or reports - which not only transcend any one organization, but often span societies and eras. For example, researchers have compared memos (a genre of communication) with electronic mail (a medium of transmission), assuming that both are communication media. Genres, however, may be physically represented and transmitted in multiple media. For example, a memo may be typewritten and sent via mail or internal organizational mail, it may be created in an electronic text processor and transmitted via electronic mail, it may be handwritten or typed and transmitted via fax or telex. Thus comparing memos with electronic mail confounds the concept of communication media with that of communication genre.

In this paper we distinguish between genre and media. When we use the generic term communication media, we will mean any or all of the activities of creation, transmission, and storage and retrieval. We will present a more comprehensive discussion of communication genres as part of our theoretical framework.

ii. Determinism in Organizational Communication Research

Some of these traditions are rooted in various forms of determinism, by which we mean that some of the research studies assume that communication media inherently affect social interaction. Communication media are portrayed and studied as fixed, independent variables, that constitute causes having universal effects on communication in organizations. There is only limited recognition that the effects of communication media depend on human action and the social context, that is, that communication media may also be conceived as dependent variables [Markus and Robey 1987; Orlikowski 1989; Poole and DeSanctis 1989]. Some of the research in these traditions does not acknowledge that the manner and circumstances in which communication media are designed, deployed, controlled, and used are choices made by organization decision makers, such as the managers, system developers, and media users. Research studies that seek uni-dimensional tendencies of communication media without attending to human strategies and the various contexts of media development and use, may misrepresent the nature and influence of communication media in social interaction.

Similarly, these studies tend not to differentiate among the various commercial offerings of a particular communication medium. Because different communication media embody different technological capabilities and assumptions about organizations, individuals, and social interaction,

these differences are ignored when researchers do not distinguish among various commercial media products. Variations in technological capabilities and assumptions do make a difference in terms of how communication is mediated. For example, studies of electronic mail rarely describe the features of the particular electronic mail system/s being used by the study participants. A generic electronic medium is often assumed in the discussion. Findings emerging from studies of highly particularistic systems are then presumed to extend unproblematically to all electronic mail systems. However, the differences among the various electronic mail systems in use today (or under development for use tomorrow) are sufficiently substantial to require careful delineation. Some electronic mail systems, such as IBM's *PROFS*, provide little structure or direction for the users. In contrast other systems, such as the *Coordinator* system from Action Technologies, provide users with an explicit communication structure within which they may organize their interaction. However, in arguing against undue abstraction and the search for universal, generalized rules, we are not advocating the opposite extreme, particularistic research studies with detailed, unique descriptions that only generate idiosyncratic results. While rich in detail and yielding insight into the workings of a specific medium in a specific organization, such studies limit our understanding of mediated communication beyond the particular setting.

We believe that communication media can be studied at a level of abstraction that assures fidelity to the nuances of a particular site, while also facilitating the emergence of patterns of mediated social interaction that apply beyond the immediacy of a given communication medium and a particular organization. Use of different communication media will have different organizational implications by the very nature of the different capabilities and assumptions built into the media. Recognizing, elaborating, categorizing, and abstracting from these different capabilities and assumptions is essential if we are to understand the reciprocal relationship between communication media and social interaction.

iii. Inadequate Attention to the Social Context of Organizational Communication

Many of the research traditions do not posit the social context as a central element within which mediated organizational communication takes place. Yet social interaction does not occur in a vacuum; it is influenced by the characteristics, procedures, and social norms of the organization. For example, the task or functional context within which communication occurs will influence the form that that communication takes. The choice and use of media will be influenced by organizational experiences with various media, the social norms surrounding their use in different circumstances, and the established procedures and routines that have been built up around certain media. Researchers that are not sensitive to the role of social context in shaping mediated

organizational communication may not investigate how social norms, organizational characteristics, institutionalized procedures, and the experience of users with various media moderate the selection, use, and implications of such media. As a result they may make inappropriate generalizations about communication media from their studies.

To illustrate the acontextual nature of some of the research, studies into the use of electronic communication media attribute lack of use, low use, or inappropriate use to an inadequacy on the part of the new medium to simulate the "ideal" communicative encounter (which, as we saw above, is presumed to be face-to-face interaction). What is not recognized here, however, is that the use of a new and unfamiliar communication medium such as electronic mail or computer conferencing requires experience, motivation, and appropriation on the part of a critical mass of organizational users [Markus 1987]. Only then will the appropriate social norms and procedures develop within the organization to moderate the sanctioned and routine use of the medium in social interaction. Bair [1989] has pointed out, for example, that meetings are often the medium of choice only because people are comfortable and experienced in that medium. Hence people are often reluctant (at least initially) to move to new or different communication media even though these may be more efficient or effective.

iv. Inadequate Attention to the Historical Context of Organizational Communication

Just as social interaction can be seen to be located in a social context, so too is it situated historically. Many research traditions, however, have ignored history in two senses. First, they disregard history in that they disregard accounts, interpretations, or analyses of the past, and in our case, specifically those accounts that analyze past uses of communication media in organizations [e.g., de Sola Pool 1977; Yates 1989]. These analyses are useful for contemporary studies of mediated communication as they provide a rich set of concepts and analogies to ground the research. The analyses can also provide insight into past uses of communication media and how these prior organizational experiences influence current uses of communication media. Second, most of the research traditions do not recognize that social interaction inevitably occurs in time, and hence that social interaction as mediated by communication media will vary over time. Most researchers, by abstracting time from their models, implicitly assume that the relationship between individuals or organizations and communication media is unvarying and stable over time. By definition, this eliminates the issue of social change from consideration, and equates stability with timeliness. Yet, as Giddens [1979:198] notes: "To speak of social stability *cannot* involve abstracting from time, since 'stability' means continuity over time." Thus whether confronting

apparently stable or dynamic patterns of mediated communication, the interaction of media and human action must be understood in relation to time.

The above assessment of the prior research literature into mediated organizational communication has revealed certain difficulties with the underlying assumptions and conceptualizations adopted by the researchers. In the following sections we provide a theoretical perspective and framework on mediated organizational communication that is intended to overcome some of these difficulties.

THEORETICAL FRAMEWORK ON MEDIATED COMMUNICATION

In this paper we propose a framework, based on Giddens' structuration theory [1976, 1984], that we believe can inform research into mediated communication within organizations. In particular, we believe that it can ameliorate some of the limitations of prior research identified above: conceptual inconsistency, determinism, ahistorical and acontextual models of interaction. Structuration theory "... aims to trace the processes by which organizations are created and maintained in interaction while they simultaneously shape and channel that interaction" [Poole and McPhee 1983:210]. Structuration (see Figure 1) posits social systems or organizations as constituted over time through the ongoing action of knowledgeable, intentional humans who draw on the system's institutionalized rules and resources to accomplish their action. The theory does not reify social structure or technologies, and neither does it assume that human action is unconstrained by social structures or technologies. It does this by (i) recognizing the role of humans in producing and reproducing institutional properties, (ii) recognizing that all human action occurs in historically situated social contexts, and that these contexts shape the action and ongoing interaction of humans over time, and (iii) acknowledging the reciprocal influence of human action on the very contexts and institutional properties that gave it form.

Giddens' theory of structuration has been adopted by a number of organizational researchers and used in their analyses of organizational processes [Barley, 1986; Manning, 1982; McPhee, 1985; Pettigrew, 1985; Poole, 1985; Ranson, Hinings and Greenwood, 1980; Riley, 1983; Roberts and Scapens, 1985; Smith, 1983; Spybey, 1984; Willmott, 1987]. Some of this work has dealt with issues related to organizational communication such as organizational climate and formal structure [McPhee 1985; Poole 1985], but none has explicitly addressed the nature and role of communication media. More recently, attempts have been made to apply structuration theory to the issue of technology in general [Orlikowski 1988, 1989]. We will draw on this research to posit a structurational account of mediated communication in organizations.

A structurational perspective on communication media recognizes the mutually interdependent subjective and objective aspects of communication media as they are used in organizations. The synthesis of these aspects may be achieved through integrating two areas of organizational analysis: the realm of human action and the realm of institutional properties. Both of these realms need to be considered in any analysis of mediated communication, for neglecting either only reveals part of the phenomenon. For example, if the realm of human action is neglected, then communication media will be conceived and studied as fixed aspects of an organization, having deterministic effects on communication media selection, use, and message structuring. This denies the exercise of human will and the ability of humans to choose to act differently. On the other hand, if the realm of institutional properties is neglected, then communication media will be conceived and studied as completely malleable tools in the hands of organizational actors. In this case the constraining and structural aspects of communication media will not be recognized or understood. Our framework of mediated organizational communication integrates both these two realms of analysis in organizations.

i. Realm of Human Action

This refers to the processes by which communication media, in their development and use, are shaped by the intentions and actions of human actors. These human actors, however, do not act in a vacuum, but draw - intentionally or unintentionally - on the historical and institutional characteristics of their organizations (strategies, resource allocations, past design decisions, mechanisms of control, culture, levels of participation, nature of expertise, patterns of communication, and so on). For example, an electronic mail system deployed in an institutional context that values communication efficiency will tend to emphasize limited user choice, technical control, process rationalization, and standardization of communication inputs and outputs. Alternatively, an electronic mail system deployed in an institutional context that endorses communication flexibility, will tend to emphasize user choice, autonomy, and customization of inputs, outputs and processes.

In our framework we focus on three domains of human action that are associated with mediated communication, each reflecting different dimensions of the interaction between humans and communication media in organizations, and how this action is influenced by the social and historical characteristics of the organization: media use, message structure, and language.

Media Use: This domain encompasses the human choice and use of media to convey communication. The issues addressed here include how and why message senders use certain communication media for particular messages. We attempt to avoid the uni-dimensionality and

determinism of some of the media choice and use literature discussed above. In our later discussion of factors influencing media use, we address the multiple factors that may lead to a particular choice and use of a medium, and note the interactions between this domain of mediated communication and the institutional properties of the organization.

Message Structure: Another domain of human action includes the creation of the physical and logical skeleton of the message itself, that is, the "ostensively displayed" message, in the terminology of Stohl and Redding [1987]. Human use of various media features (whether mandated or discretionary) such as fields, subheadings, and layout, which restrict or determine the acceptable content of designated sections, are examples of message structuring. Fields, one type of formatting designating the precise type and sometimes exact form of content to be inserted, can be widely varied in type, including, for example, fields of data in a computer report or paper-based form, the To, From, and Date fields of a memo heading, the date and inside address fields - designated implicitly by positioning rather than explicitly by a label - of a letter, and even the orally designated name and date fields of a voice mail system. Other structuring devices include subheads (which loosely reveal and restrict the content of what follows), lists (which reveal and restrict the relationship of the items to each other and to what precedes them), and layout of symbols and white space on the page or screen (which also conveys information about the organization of the message). Punctuation marks or special characters used on a computer screen to indicate formatting devices that cannot be directly replicated from print text (e.g., *word* to indicate **word** or word) are also structuring devices.

Language: The third domain of human action that we believe is critical to an understanding of mediated communication is the kind of language that humans use in their messages. This focus on language does not refer to the grammatical or linguistic features of the language as a whole, but to specialized words or stylistic features that reflect organizational norms or professional practices (e.g., marketing jargon, medical terms, passive voice in technical writing). In language application we try to understand how human use of a particular communication medium influences the language the humans adopt, and in turn, how the language used in the messages reflects individual motivations, organizational contexts, and the characteristics of the communication media.

ii. Realm of Institutional Properties

This realm refers to the processes by which communication media, once they are developed, adopted, and used regularly, become institutionalized, and hence serve to facilitate as well as

constrain social interaction. In examining this realm we are interested in understanding how communication media - which are not natural objects but artifacts, constructed, implemented, appropriated, and used by humans with certain intentions, goals, interests, and capabilities - tend to become objectified, having structural implications that yield unpredictable and often unintended consequences. For example, when communication technology is used, the invocation of built-in routines, norms, format, language, and so on, ensures that it is used in ways that reflect its implementors' goals, hence reinforcing the priorities and values that it embodies [Manning 1988]. That is, a communication technology, in shaping communicative action, also reaffirms the existing institutional context of which it is a part. Sometimes, however, a communication technology may be used in ways that were not intended by its implementors. In this deviation from sanctioned use, users of the communication technology are not reaffirming their institutional context, but are challenging it. If such a challenge is substantial, widespread, and sustained over time, it may eventually change the institutional properties of the organization.

We suggest that as humans engage in mediated communication, various choices of media, message structure, and language become habitual through repeated use. Mediated communication is habitualized when it is repeated frequently enough that it becomes cast in a pattern [Berger and Luckmann 1967:49]. As patterns of media use, message structure, and language emerge over time they become institutionalized, forming part of the institutional properties of an organization. We find it useful to distinguish between three patterns of mediated communication in organizations, personalized, customary, and formalized. These patterns vary according to the degree to which they are institutionalized and their scope of influence (that is, whether they are rooted in individual, group, or organizational frames of reference).[4] Each is explained below.

Personalized communication patterns are formed by a human actor through his or her discretion in the choice and use of media, as well as the kind of message structuring, and language applied. For example, an individual may have a distinctive pattern of communicating policy to subordinates - a paper-based memo with a particular format, standardized heading, and style of language. The personalized patterns may initially be introduced on an ad hoc basis, but become habitual to a person over time. Often the personalized patterns are recognized by recipients as representative of that sender, but sometimes, particularly in the case of infrequent interactants, the pattern may not be identifiably distinctive. A person may

[4] While these three patterns can be seen to be related to the three levels of analysis typical of organizational studies, individual, group, and organizational, the overlap is not exact, as the basis of the classification is different. We differentiate our three patterns on the basis of *degree of institutionalization*, while the differentiation into levels of analysis is based on *size of units* studied or *level of effect* at which a phenomenon operates.

even embed aspects of a habitual pattern within a personal form or electronic mail template. As long as these patterns of media use, message structuring, and language application are utilized only by one person, rather than shared within a community or mandated by some organizational fiat, they are personalized communication patterns. These personalized communication patterns are the least institutionalized of the three we propose; however, the fact that they are habitual to particular actors indicates that, at least from the perspective of the actors, these patterns are somewhat (although never fully) objectified.

Customary communication patterns transcend the purely personal realm and are recognized and shared by a community of users. Customary communication patterns are used by a group, community, or organizational unit, but their use is not mandatory. The patterns of media use, message structuring, and language application utilized here reflect and sustain the social norms that constitute a community. For example, members of a group may typically use a certain format and style of language to announce meetings, with standard fields for designation of time, date, and location. Individuals often adopt and use customary patterns of media use, message structuring, and language application to signal membership in a group, while a community may endorse certain forms of structuring and language use to convey a distinctive identity. Customary patterns of communication are partially institutionalized, and thus partially constrain human actors in their interactions with others. They are more constraining than personalized patterns in that their creation, maintenance, and change are not solely individual decisions and actions.

Formalized communication patterns are standardized and mandated patterns of communication for members of a group or community. Formalized patterns of media use, message structuring, and language application are often instituted to increase efficiency in handling highly routinized tasks. Formalized communication patterns are made mandatory for members of a group either by executive fiat or by being embedded in a medium. For example, a printed form - with specific fields to be filled in and specific language to be used - may be required for certain purposes within an organization, such as job applications or reimbursement requests. Or a project leader may dictate that all requests for vacation time must be made via a particular electronic mail template, and that requests via other media or in some other structure will be rejected. Formalized communication patterns are fully institutionalized, and thus constrain how human actors interact with others through communication media. Of course, an individual human actor may always choose not to act within the institutionalized constraints, but he or she should expect some sort of organizational repercussions from this choice.

Some institutionalization occurs by external mandate, as when mediated communication patterns become formalized because they need to conform to external requirements (e.g., legislated reporting). Institutionalization may also occur by internal mandate, based on the needs of a powerful organizational actor. Other institutionalization occurs by diffusion when a mediated communication pattern, that may have begun as a personalized or customary habit, becomes sufficiently widespread and accepted, that it is formalized for all organizational members. Still other institutionalization of mediated communication can be traced to efficiency concerns, tradition, managerial idiosyncrasy, or particular quirks of a communication technology. Often, the reasons for such institutionalized patterns of mediated communication, while rational at the point of creation, have disappeared over time and with geographic dissemination, yet formalized patterns of mediated communication continue with no apparent rationale. Once institutionalization has occurred, it often influences personalized and customary communication patterns, as for efficiency or effectiveness reasons, people carry over a familiar communication pattern into other areas of interaction.

Integrating Human Action and Institutional Properties

As noted above, any framework based on the structurational perspective has to integrate the two domains of human action and institutional properties. To do this, one can examine each of these domains in turn, being mindful of the other when doing so. On the one hand, when studying mediated communication in the realm of human action, we can examine the extent to which media use, message structuring, and language application are employed by human actors, and how these actions create, reinforce, or modify personalized communication habits, customary communication norms of a group, and the formalized prescriptions of organizational rules and routines. On the other hand, when studying mediated communication in the realm of institutional properties, we can examine how the patterns of personalized, customary, and formalized communication patterns facilitate and constrain the interaction of humans via mediated communication.

Figure 2 summarize the results of integrating the three types of human action associated with mediated communication, and the three patterns of communication institutionalization. While the range of mediated communication outcomes possible in organizational interaction is represented, Figure 2 does not indicate the reasons or pressures behind particular outcomes. For such an understanding we need to turn to various social, cultural, functional, technological, and personal factors that influence the interaction of human action and institutional properties in the context of mediated communication. This is the discussion we present in the next section. We posit four primary classes of factors that we believe shape mediated communication in organizations:

characteristics of the organization, task, medium, and individual. These four classes of factors are relevant for each of the three areas of human action associated with mediated communication, and we discuss each of them in turn, drawing on both historical and contemporary examples to illustrate our points. We do not presume to present a comprehensive list of factors, but believe that the ones we discuss are significant in the context of mediated communication.

FACTORS INFLUENCING MEDIA USE, MESSAGE STRUCTURE and LANGUAGE IN MEDIATED COMMUNICATION WITHIN ORGANIZATIONS

In this section we explore the four classes of factors that shape and are shaped by mediated communication. These factors interact with personalized, customary, and formalized patterns of institutionalization. Individual characteristics are most relevant in personalized communication patterns, though the individual preferences of someone with considerable status or power also shape customary and formalized patterns. Similarly, organizational characteristics are most relevant in customary and formalized patterns, but still affect choices in personalized patterns. Characteristics of the task or message and of the medium are relevant to all patterns, though in customary and formalized patterns, message types, more than individual messages, are influential. We do not claim to cover all possible factors within any given domain. Moreover, the categories interact in any given instance. Still, the four types of factors provide a useful framework for considering what influences human actors engaging in mediated communication. In the discussion below, we consider each of the four types of factors as they pertain to each of the three domains of human action.

Media Use

Media use refers to the use of a medium for creating, transmitting, processing, or storing a specific message or task. The four types of factors may be considered from the sender's point of view, the receiver's point of view, and the receiver's point of view as perceived by the sender.

Media Use: Individual Characteristics

The sender's or receiver's individual **preferences** play a role in media use. For example, some people do not like leaving oral messages on telephone answering machines or voice mail systems, and will use an alternative whenever possible; conversely, some people do not like writing, and thus choose any mode of oral communication over writing a document or electronic mail message. Similarly, receivers may have (or be perceived to have) preferences about how they like to receive messages, as when a boss prefers an employee to send electronic mail messages for routine matters, rather than calling, to minimize telephone interruptions.

The preference may be based on **abilities** or **prior experience**. Some people are better capable of projecting a personal tone in writing than others, and thus may feel more comfortable using electronic mail for informal and somewhat sensitive messages. Others may feel they can convey their feelings much better orally, and thus prefer to leave a voice message even when other factors might point to a written message. Inexperienced computer users may avoid electronic mail because they are intimidated by the technology. The known or assumed preferences of the receiver for receiving messages in a certain mode (e.g., someone who always likes to see things in writing) may also influence senders.

Media preferences may be shaped by the sender's **self-image** or **desired effect** on the receiver(s). People who see themselves (and/or who want to come across to others) as modern and high tech may prefer such media as electronic mail and fax, while someone who scorns the new and technologically advanced may choose a fountain pen and heavy cream-colored paper to convey a traditional image. During the late nineteenth century, the older generation of the du Pont family, who controlled the Du Pont firm, were very conservative and resisted the adoption and/or use of new communication technologies such as the telephone and the typewriter, while the younger generation were often early adopters of such technology.[5] Even after the younger generation installed a telephone exchange in 1880 to connect the Du Pont office to other company buildings, General Henry du Pont refused to use it and continued to send messengers between buildings and to insist on daily face-to-face meetings of the senior and junior partners.

Finally, a person's **affect** towards a specific communication partner may shape media use. While some have suggested that electronic mail increases social distance [Kiesler, 1986] in comparison with media such as the telephone, it may be equally true that social distance shapes media choice. For example, a sender may choose an asynchronous medium such as electronic mail over a synchronous one such as the telephone when communicating with someone he or she does not like very well or does not want to have a long conversation with [Markus, 1989]. Similarly, lack of trust in a communication partner may suggest use of a communication medium that preserves the message in an easily accessible form.

Media Use: Organizational Characteristics

The **culture** of an organization influences the **formality** of communication within it. For example, in an organization that values informality, written memos might be viewed as more

[5] This and all other historical references in this section (except as otherwise cited) are drawn from Yates [1989a], where they are fully documented.

bureaucratic and thus less desirable than telephone and voice mail for many tasks that in other organizations might be handled via the written document. Throughout the nineteenth century, Du Pont's culture valued historical documentation, even before the owner-managers had any notion of using recorded information in managing the firm; consequently they used and preserved written documents for many types of messages that, in many other firms of the period, were handled orally or via informal and immediately discarded notes.

The **established uses** of existing media can also influence how a new medium is perceived and utilized. In an organization that relies heavily on formal communication and documentation, electronic mail might be introduced as a way of speeding the transmission of formal communications, and users might write and format messages to resemble formal memos and intend them to fulfill the same purposes. In an organization that has tended towards informal communication, electronic mail might be introduced as a way of exchanging informal, almost telephonic messages, and individuals, following that norm, might send messages written with little regard for the conventions of mechanics (e.g., spelling, punctuation, grammar), structure, logic, or formatting expected of formal written documents.

Organizational norms about **availability** and use of technology and about **division of labor** in the office may also have a strong effect on media use. An organization makes a medium more or less accessible to users, thus affecting choices to use it. Those who have to go down the hall to a shared terminal to use electronic mail are less likely to use it than those who have instant access to it on their desks. In organizations where managers typically have computers on their desks and "keyboarding" is seen as a normal part of managerial activity, managers may use electronic mail themselves (without secretarial mediation), and may use it more often and for more informal messages. In organizations where support staff are more likely to have computers than managers and where "typing" is seen as a secretarial activity, electronic mail, when used, is more likely to be entered by a secretary and printed out at the receiving end. This norm, then, changes the characteristics of the medium for users, affecting, for example, style, tone, and confidentiality.

An **organization's business** may also influence media use. In computer firms, for example, access to computers and/or to software is widespread and keyboarding is an accepted activity. Electronic mail is much more likely to be used for routine communication in such cases. In the mid-nineteenth century, telegraph wires were generally strung along the railroad right-of-way, and in exchange, railroads were given easy and cheap access to telegraphic communication. Railroads thus used telegraphic communication much more often than most manufacturing firms. Similarly, in a geographically dispersed organization, media use may be influenced by the need to span

distances quickly. Moreover, significant differences in time zones increase the incentive for people to use rapid, asynchronous media such as fax, express mail, or electronic mail.

Media Use: Characteristics of the Task or Message

Many characteristics of the communication task or the message itself play a role in media use. As predicted by media choice theorists, the **ambiguity** or **sensitivity** of a message may influence the sender towards what they term "richer" (i.e., closer to face-to-face) media. While only the synchronous media (e.g., telephone) allow the immediate feedback and discussion that might be desirable in such messages, even an asynchronous oral medium such as voice mail transmits the information in voice tones that cannot be conveyed in writing. Since its introduction in the late nineteenth century, the telephone has often been used for sensitive discussions that were then documented in writing.

In other cases, material is **complex** and **precise** in its details, but not necessarily ambiguous. In these cases, a written message, on paper or electronic mail, may be preferable so the sender can edit the message to make it as accurate as possible, and the receiver can study the message in a precisely recorded form. For example, one turn-of-the-century manager who initiated and presided over a period of great change in his company explained his heavy use of written instructions (at a time when the introduction of private branch exchanges had made telephonic communication within his firm's facilities easy) by pointing to the tendency of each employee "... to interpret the new instruction so as to make the least alteration in his existing pattern" [Yates, 1989a, p. 175]. Thus, he noted, all instructions were not only written, but written with great care to state them unequivocally and precisely. At the same time, many written reports were being instituted in his and other firms to convey operating information precisely and consistently. Today, anyone who has used voice mail knows the difficulties that sometimes arise in conveying or receiving even limited specific details such as telephone numbers and names in voice messages.

The **frequency** and **routineness** of a task also affect media use and formalization. If a certain type of message is sent out frequently or at regular intervals, the sender(s) may value convenience, consistency, and efficiency of the medium (for sender and/or for receiver) more highly. Moreover, frequency increases the efficiency incentives (for senders and receivers) to embed the task in a medium, thus formalizing it. For example, in the Illinois Central Railroad in the 1870s, the four-page handwritten daily letters reporting operating information were converted to printed forms with blanks to be filled in, greatly reducing the amount of work needed at the sender's end to compile them and the receiver's end to locate key information. Today, similar motives encourage the development of electronic spreadsheets and templates to convey routine information.

When a message is intended for a **large number of recipients**, certain media become more attractive. A printed announcement might not be the best way to handle a sensitive message such as a layoff, but if there are hundreds or thousands of recipients, it may be the most practical medium. In the late nineteenth century, the railroads with their shallow but wide hierarchies used relatively expensive printed notices much more than smaller manufacturing firms with narrower and deeper hierarchies, which generally waited for the emergence of cheaper in-house duplicating technologies to begin sending large numbers of notices. Today, when a message needs to go to a dozen or so recipients, a sender may choose electronic or voice mail rather than making separate telephone calls.

For **urgent** messages, the telephone has traditionally been considered the most rapid medium. As telephone tag has become more prevalent, however, electronic mail and voice mail have become more attractive for urgent messages. Certainly the appeal of fax is its ability to deliver written messages extremely rapidly. When the telegraph first made almost instantaneous communication feasible in the mid-nineteenth century, it was widely used for urgent messages, in spite of greater cost and less convenience than the mails, but rarely used for routine communication. The **confidentiality** of a message also affects media use. Fax communication may be rapid, but if the receiver's machine is located in a public area, a sender may choose another medium for a confidential communication. Similarly, electronic mail is more likely to be chosen for a highly confidential communication when it is unmediated by a secretary. As a centralized technology dependent on telegraph company operators, the telegraph initially created confidentiality risks. Many firms responded to this perceived problem by buying or creating telegraph codes.

When a message needs to be **legally binding**, the legal status of communication via a particular medium may become a factor in media use. As vendors and users of electronic communication media seek agreement on protections to replace signatures and as the legal status of such protections are debated and litigated, other media may be preferred for legally binding communications. In the late nineteenth and early twentieth centuries, the legal standing of carbon copies (as compared to the older press copies that were impressions of a final, signed document) was extensively debated; this issue delayed the U.S. government's switch to the newer, cheaper, and more convenient carbon copying technology.

In addition to immediate task needs, subsequent **reference needs** affect choice of medium. If a sender or receiver wants a message to be available for later reference, the sender must use a medium that allows for a storable and readily retrievable message. For example, a paper or

electronic mail message may be preferable, in place of or in addition to a telephone or voice mail message, for sending a request that must be documented. The systematic management philosophy that spread among U.S. firms around the turn of the century heavily emphasized the need to record all sorts of operating information, draw it up the hierarchy, store it, analyze it, and make decisions on the basis of it. Managers formalized elaborate systems of written reports to gather such information and of files to make it accessible. Pundits of systematic management also advocated the written documentation of instructions and procedures, both to convey them precisely and to have them available for later reference.

Media Use: Characteristics of the Medium

Many characteristics of communication media - as implemented at any given time -also play an important role in media use. These characteristics can, of course, change depending on technological advances and different organizational choices.

The **transmission capabilities** of a medium are obviously important in determining the range of possible uses. For example, electronic mail currently only transmits text composed of alpha-numeric characters; that text can, however, be manipulated by the receiver (though compatibility problems in current systems often complicate this task). Fax or paper-based mail can transmit diagrams and pictures in addition to text, but cannot be manipulated electronically by the receiver. Telephone and voice mail transmit voice, but nothing visual. The options for integrating such media are currently being experimented with, but at present most systems are limited by these characteristics.

The **transmission speed** of the medium, especially in relation to the urgency of the message, affects media use. The telegraph transformed communication in the mid-nineteenth century by making it possible to send brief messages practically instantaneously, rather than only as fast as a person could travel. That quality was particularly valuable to organizations with time-sensitive products or processes such as Swift and Armour, which used telegraph extensively to coordinate shipments of perishable meats [Chandler, 1977]. Since the nineteenth century, speed gains have come in the form of increases in the amount of information that can be transmitted in a given period of time [Yates and Benjamin, in press]. For example, long documents in electronic form can now be transmitted as fast as a single word could be telegraphed.

Another obvious factor in media use is **cost**, which can make a medium less desirable in certain situations. For example, in academic organizations where long distance telephone calling is discouraged because of the cost, many people turn to Bitnet, an inter-university electronic mail

system that is not billed to users. The recent drop in fax costs (both the cost of the equipment and, because of increased speed, the cost of transmission over telephone lines) has rapidly increased its popularity as a transmission medium. During the nineteenth century, the high cost of rapid telegraphic communication limited its use for routine matters. Only the railroads, which received large amounts of low cost or free telegraphing, and a few firms such as Swift and Armour, used the telegraph extensively for routine matters.

Convenience plays an important role in media use. Some aspects of convenience are determined primarily by how an organization has chosen to implement a technology. People who have to use a shared terminal not on their own desk are much less likely to be regular email users than are those with access to it on their own desks [Eveland and Bikson, 1986]. Similarly, in the mid-nineteenth century, the first telegraph office in Wilmington, Delaware, was located several miles from the Du Pont Company's gunpowder plant, so initially the firm used it only rarely. A few years later the firm erected a private telegraph line from its offices to the Wilmington telegraph office, making that medium much more convenient. After that time, the firm's use of the telegraph for sending and receiving messages increased dramatically. Convenience is, of course, defined by the user, and thus is also affected by personal preferences (e.g., relative reaction to the interruptions of the telephone versus the potential delay of an electronic mail message).

The **availability of a medium** to receivers affects a sender's media choices. A sender may prefer to use electronic mail for a particular message, for some combination of the factors already discussed, but may not be able to use it because one or more message recipients are not regular users of electronic mail. On a larger level, a medium's usefulness obviously increases with the number of potential communication partners reachable through it, as Markus [1987] notes in her critical mass theory. A century ago, the telephone posed a situation similar to that of electronic mail and fax today: it gained in usefulness as the number of people with access to it increased.

Finally, one important characteristic that differentiates between media such as voice mail and electronic mail in their most common forms today is the ease with which messages can be **stored** and **retrieved**. Today voice storage tends to be more costly and limited in size and less readily searched for a particular message than electronic mail storage. Ease of storage and retrieval also varies among electronic mail systems, differentiating them on this dimension. A widely praised feature of the *Coordinator* electronic communication system, for example, is its linking of messages within a "conversation" to make them readily retrievable in sequence [Flores et al. 1988].

The Interaction of Factors in Media Use

As we have just shown, a wide range of individual characteristics, organizational characteristics, characteristics of the task or message, and characteristics of the medium influence human actors choice and use of communication media. At the level of individual action, personalized communication patterns emerge as senders decide how to use various media for various tasks by weighing the factors more or less explicitly. In making the tradeoffs, some senders pay more attention to perceived receiver-related factors than others. For example, a sender may choose to focus on his or her own convenience and not even consider factors such as the receiver's need for a message that can be stored and retrieved at a later time. Moreover, the sender's perception of the relative importance of the receiver may affect how the sender weighs perceived receiver factors against his or her own needs.

Media uses may become widely adopted--customary--because groups of people agree on the tradeoffs between the various factors for certain types of messages. Alternatively, if a powerful or influential person uses different media in a certain way, others may simply emulate that person, regardless of personal tradeoffs. In either case, the widespread adoption of certain norms of media choices may itself change the tradeoffs. If electronic mail becomes popular for certain types of announcements, people who never or rarely used the system may start using it. That in turn makes the medium more efficient for communicating such messages. Thus the movement from personalized to customary media use may gain momentum over time. Once norms are established, however, they may be difficult to change when a new medium is introduced or when some other development in the task, organization, or personal preferences of a key player changes the tradeoffs. At any given time, the norms may reflect the medium that is currently the most appropriate, or it may reflect what was the most appropriate at some previous time.

A formalized pattern of media use may emerge for a particular type of message for various reasons. A task customarily done through a particular medium, for whatever reasons, may be embedded in that medium (e.g., by creating an electronic template for a routine report) to make it even more convenient for senders and/or receivers. Alternatively, someone can mandate a new use of a medium based on his or her own preferences as sender or receiver. For example, a group leader who disseminates announcements may simply state that henceforth, announcements will be issued only electronically and that everyone in the group is expected to log on regularly to read them. Of course, that method works best if the one who issues the mandate has the hierarchical authority necessary to enforce it, or has information or rewards of such value to the others that they will not risk losing them by rejecting the formalized pattern.

Message Structure

Message structure within messages refers to the physical highlighting or isolating of content elements or segments in a message, frequently referred to as formatting. Formatting influences the layout as well as the content of messages. Elements of message structure may specify the nature and form of the content more or less specifically. For example, date fields on computerized reports may require the date to be entered in MM/DD/YY form; at the other extreme, subheads such as "Summary" or "Investigation" may designate the nature of the content very vaguely, leaving the length and form open to the person creating the message. In general, the more specifically the content form is specified, the more efficient it is for machines or humans to process the information. On the other hand, richness of information may be lost as specificity is gained.

Message structure can be designed by the originator of the message, by the recipient of the message, or by someone having authority over one or both of the parties, such as a higher level executive or a regulatory body that designates the structure of messages that have legal standing. Personalized patterns of message structure are usually designed by the sender, while formalized patterns of message structure are more likely to be designed by the receiver or by someone at a higher level. Also, in some cases the designer(s) of the medium may embed structural elements right into the medium, as when the designer of an electronic mail system embeds heading fields into messages or when forms designers designate the fields on a form. As with media use, we can analyze four types of factors affecting and affected by message structure.

Message Structure: Individual Characteristics

Message structure affects the efficiency and effectiveness of the sender and the receiver of the message, and of people transmitting, storing, retrieving, or processing the information. Such effects as well as simple personal preferences of these parties may influence message structure.

Sender

Structure (whether designed by the sender, the receiver, or another party) may function as a **heuristic device** to help the sender generate and organize appropriate content. For example, people composing documents on word processors frequently design a set of subheads as an outline to be filled in as they compose the message. A form (either on paper or electronic) or a report with required sections has a mandated structure. For many routine tasks, the sender may view this structure as an efficient device freeing him or her from the cognitive labor necessary to generate content and create a new structure. In other cases (e.g., when the sender resists or has trouble fitting rich information into a fairly rigid structure, or when information is collected in a different form from that demanded by the structured form) such a structure may make the sender's task less

efficient and possibly less effective. As a manager in a late nineteenth century Du Pont mill wrote to his boss when forms for expense reporting were instituted, "We do not seem able to make head or tail of them according to the way we have the charges made on our books" [Yates, 1989a, p. 218].

The sender's choice of structure for message types lacking formalized structures may also be shaped by the individual's **desire to imitate** someone of higher status. Thus if someone important uses lots of subheads and lists, or habitually uses a particular sequence of subheads, an individual may adopt similar uses of structuring devices. Finally, a sender's **ability** to create structure in messages shapes that sender's preferences. In a university setting, students adept at using modern personal computers (especially the Macintosh) seem more likely to use and experiment with personalized patterns of structuring using devices such as boldface, underlining, italics, and indenting than students who lack skills in this area.

Receiver

Structure also aids the receiver of a message. Structural indicators signal the recipient what content to expect in the designated section or, if the receiver is skimming it for particular pieces of information, where to find them. Recent research in document design has shown that visual indicators of a document's organization (e.g., table of contents, subheads, lists) help readers **understand and remember** material [Felker, 1980; Felker et al, 1981]. Such structural indicators may be designed by a sender to make the document seem more appealing or accessible to the receiver (and thus to improve its chances of being read), or by the receiver to make it more efficient to read.

A receiver (or someone in authority over the receiver) may also design a structure as a **control** mechanism, to guarantee that the sender includes all desired information, and in an appropriate form for any planned analysis. This factor played a role in the many forms created in American firms around the turn of the century. The systematic management philosophy promoted the regular collection and comparison of information as an important aid to decision making, a relatively novel idea in most manufacturing firms of the time. Since data had to be standard and comparable to fulfill this function for receivers and their superiors, reports often consisted of printed forms that guided the sender to fill in blank spaces or lines with specific pieces of information expressed in a uniform way [Yates 1989a].

People Handling the Document

Finally, message structure has an important effect on those producing (e.g., typing or entering on a word processor, but not composing), transmitting, processing, storing, or retrieving the information in the message. Sometimes structures were mandated at high levels of the organization to aid the **efficiency** of these document handlers. When the memo form evolved from the older letter form in the early twentieth century, the now-standard To, From, Date, and Subject fields were labeled and placed at the beginning (as opposed to letters where the sender's name came only at the very end and a subject was not typically declared) mainly to aid file clerks. In form reports and other documents containing pieces of information to be extracted and combined or processed, structure located the key pieces of information for the clerks assigned to process the data. With newer media, it is often computers rather than people that use structure to aid in processing messages.

Message Structure: Organizational Characteristics

Organizational factors also shape choices about message structure. **Cultural norms** within an organization or a profession can shape the perceived desirability of structuring devices. For example, in a marketing department, extensive formatting of memoranda may be seen as quite desirable, while in an engineering department it might be viewed as too "slick" and not serious enough. Similarly, in organizations that view themselves as quite informal, extensive message structuring may be seen as too formal or elaborate. Even in cases where formatting helps reader comprehension, organizational norms may be such that it hurts sender credibility [Suchan and Colucci, 1989].

Organizational policies about resources also affect message structure. If a firm makes technology for creating elements of message structure widely available (e.g. personal computers and laser printers today or typewriters in the late nineteenth century), such elements are more likely to be used. Similarly, if an organization adopts a storage or processing technology that works better with more structured messages (e.g., vertical filing at the end of the nineteenth century), it shapes personalized, customary, and formalized choices of structure.

Message Structure: Characteristics of the Task or Message

The nature of the task or message obviously has a major effect on the amount and nature of structure desirable (to sender, receiver, or others) in a message. If the task involves **rich and complex information**, highly specified structuring devices (such as restricted fields) may make a message less effective (even if more efficient for some of the parties involved). Alternatively, if the task does not require that richness and diversity in data be preserved, a specifically structured

message type that is easier and more efficient to handle may be appropriate. For example, hotel reply cards [Culnan, 1989] often sacrifice richness to efficiency on the assumption that the real "messages" emerging from such cards are basically simple and straightforward. Some organizations have computerized call-in services that allow a caller to accomplish certain tasks (e.g., buying an airline ticket or registering a problem with a telephone service) through a highly structured series of questions and simple answers, keyed in via the telephone buttons. At certain points, however, the systems may create an option to insert a human into the communication process to deal with more complex problems or exceptional issues.

In late nineteenth century firms, the number of internal written messages increased enormously. While the reports, memoranda, and other documents took many forms, highly structured messages (such as forms, tabular reports, etc.) proliferated most rapidly. The primary factor behind this trend was the changing nature of managerial tasks and the increasing emphasis on collecting and **comparing data** as an aid to management. The level of structuring in routine reports varied by the nature of the operations being reported on. For example, the routine progress reports used in Du Pont's Experimental Station (an R & D facility) in the early twentieth century were much less specifically structured than routine reports used in operating units. Except for a few specified header fields (e.g., the name and number of the research project), the structure consisted of a standard set of subheads that left the sender considerable freedom in shaping the content, to fit the relatively unstandardized nature of research work. In operating parts of the firm where tasks were standardized, regular reports of operating statistics were much more specifically structured, generally by tabular forms into which numbers and occasional words were inserted.

Beyond the richness or necessity for comparability of the information in a message, several other characteristics of messages or tasks also shape choices of message structure. If a certain type of message is used **frequently**, convenience, consistency, and efficiency in communication (for any or all involved parties) are likely to be highly valued, and messages may be more specifically structured. Conversely, unique or infrequently used types of messages may be less highly structured, both because developing a useful highly specified structure takes time and effort and because the content may be more idiosyncratic and richer. For example, the annual reports from various units of Du Pont's Experimental Station were long and unstructured, while the weekly and monthly progress reports, as noted above, had a mandated (though still relatively unspecified) structure.

The **number** and **nature of message recipients** plays a role in shaping message structure. If a message will be sent to a number of recipients with different needs for structure, the sender must

balance these differing needs. Very structured financial information may be included for one audience of a proposal, while rich, less heavily structured information on need and benefits may be included for another. The number of recipients may also affect the relative importance of sender and receiver(s) in determining structure. If structuring a nonroutine message to aid the receiver takes time and effort, a sender may choose to do so only when the message will be widely disseminated. As Eleuthere Irenee du Pont noted in response to an efficiency analysis of internal correspondence at Du Pont in the early twentieth century, the proposed norms of structure and language were more efficient for the reader but not necessarily for the writer. Thus it was worth the writer's time to follow such time consuming guidelines only when many recipients were involved.

When a message needs to be **legally binding** or to **fit regulatory demands**, it may need to follow a standard and often highly specified structure. For example, individual tax returns are filed on very specifically structured forms. When the form is filled in and transmitted electronically, as is now possible, the electronic structuring via computer-readable fields elicits the same information, but allows for much more rapid, electronic processing. Similarly, firms have to report certain standard pieces of financial information to regulatory agencies on structured forms. When the Interstate Commerce Commission (ICC) was created in 1887, it began demanding that railroads report certain standard information in a specifically structured form at prescribed intervals. The Illinois Central Railroad then revamped its internal reporting system so it could routinely generate the data to fill in the structured ICC reports.

As noted above, message structure can facilitate or hamper efforts to **store, retrieve,** and **process** messages or information in messages. If a message is likely to be consulted often, providing structure to facilitate these clerical or computerized operations is more important. The fields in the memo heading were adopted in the early twentieth century to facilitate access to the growing number of internal messages spurred by the systematic management movement. Today, regular reports that transmit data to be fed into further calculations and processed in other ways can be submitted in electronic form to allow efficient computerized extraction and processing of data.

Message Structure: Characteristics of the Medium

Many characteristics of communication media--as the media are implemented at any given time--play an important role in shaping message structure.

The medium's **capabilities** and **convenience** for creating and transmitting elements of structure make these devices more or less attractive in the medium. For example, the addition of tabs to

typewriters around the turn of the century--in reaction to demand from systematic managers desiring an increasing number of structured documents--made it quicker and easier to type lists and tables and to fill in forms. These structural devices became increasingly commonplace after that time. Similarly, increasing use of computers and laser printers have made creating personalized patterns of message structure in documents easier and thus more common in recent years.

Fax allows ready **transmission** of visual formatting to aid a human receiver in processing it, though it cannot yet transmit computer-readable format. Computer spreadsheets, on the other hand, have made it easier to create, process, and transmit (between compatible systems) computer-readable structure. Voice mail generally does not allow much structuring of messages. The sender cannot, for example, structure a voice message in a way that can help the receiver jump to a desired point in a long message.

Most electronic mail systems do not have very good editing facilities or screen display, making it inconvenient for an email sender to **create** or **transmit** structured elements beyond the header fields embedded in the system (and thus formalized). These headers can generally accommodate some customization, but only within limited bounds. As noted earlier, users have created some new devices to replace structuring devices unavailable in electronic mail, but they are often less visually salient (and thus presumably less helpful) to the receiver. Other types of structuring (e.g., indenting) are possible but difficult to create (like indenting on typed documents before tabs), and may not be received in the same form. Structured templates can be created for transmission of routine message types within a certain electronic mail system, though not generally between two different systems.

Incompatibilities between media may also discourage structuring in certain types of messages. When a jointly authored document is written on incompatible systems (as is the case with this paper), these incompatibilities may make it very difficult to transmit structural elements. Transfers via diskette or electronic mail often handle straight text, but lose all formatting devices. Similarly, when structured templates created within a single electronic mail system are sent into another, incompatible system, their structure may not be transmitted intact.

Certain aspects of message structuring have been heavily influenced by **storage** and **retrieval** issues. In the mid-nineteenth century, outgoing messages were copied and stored in bound volumes organized chronologically and sometimes indexed by addressee; at the same time, incoming messages were stored in letter boxes, organized by sender and/or by chronology, and internal messages were handled in a variety of ways. This system became severely dysfunctional

in many firms around the turn of the century when the volume of external messages increased, internal messages exploded in volume, and systematic managers desired ready access to all these messages. Vertical files (of the type still predominant in most offices today) and new, often subject-based indexing systems were introduced to improve access and to allow the combining of outgoing, incoming, and internal correspondence on the same subject in a single, easily retrieved file folder. The structure of internal correspondence underwent a transformation to facilitate filing and retrieving. A new standard header placed the names of sender and receiver at the top, and a new field for subject was added.

Storage and retrieval capabilities of media continue to interact with message structure today. Voice mail is more difficult to store in large amounts and retrieve readily. The heading of an electronic mail message, on the other hand, structures standard fields (sender, receiver, date) to aid retrieval of messages. Also, the sender or receiver can generally group related messages into the equivalent of file folders to allow retrieval of groups of related messages. While the field designating the "folder" does not generally show up in the message as displayed on the screen, it is attached to the message as stored in the system. Storage systems for longer documents such as technical reports make use of structural elements such as key word fields or abstract fields (which can be searched for combinations of words) to aid retrieval.

Processing capabilities also influence structure in messages. The more structured a message is, in general, the more readily it can be processed. In the past, this processing was primarily by people, who extracted data from the fields of a form, for example, and performed calculations with it. For decades, computers have made it possible to process information in restricted fields rapidly and easily. Today, spreadsheets, for example, can be transmitted from one computer to another with structured data ready to be processed. Recently, increased computer power has made it possible to process less precisely defined information (e.g., to perform key word searches with Boolean logic on enormous files of text). Perhaps even more interesting is the new capability offered by some electronic communication systems to add some additional restricted fields to relatively unstructured messages, and then to use them for processing that information. Lotus Corporation's *Notes* and *Information Lens* [Malone et al., 1987] both provide tools or capabilities for creating and processing message types with specific, user-defined fields wherever they might be useful. Thus a meeting announcement format might have defined fields for room, date, time, attendees, and meeting convener. These embedded fields could then be used to have the recipient's computer automatically perform certain functions on receipt of the message (e.g., putting the meeting directly onto the recipient's calendar if he or she has designated the convener as high priority). With the massive growth of computer power and drop in cost to transmit and process

messages in recent years, more of what Malone et al [1987] call "semi-structured messages" are developing. These message types use computer-defined fields beyond simple addressing and storage information to enable computers to process parts of more open-ended messages.

If creating or transmitting elements of message structure in a certain medium changes the costs, these costs may change incentives for using structured messages. Until 1845, U.S. Mail rates were charged by the sheet of paper, and were quite high, up to 25 cents per sheet. Consequently, messages transmitted via mail tended to be dense and long, wasting no space on structural devices even so basic as paragraph breaks. When postal rates were cut and restructured to 3 cents an ounce around mid-century, senders started writing multiple shorter letters with more paragraph breaks, making the messages easier for the receiver to read and for clerks to store and retrieve. Today, as fax costs have plummeted, messages requiring virtually instantaneous transmittal can be transmitted in structured form via that medium.

The costs of receiving or processing messages may also influence message structure. Systematizers of the early twentieth century urged the careful design of structured forms to reduce the time and thus cost of clerks consolidating and/or processing the data on forms. Today, computer processing is much less expensive than human processing, making it increasingly advantageous to have messages and data structured in forms that a computer can recognize and process. At the same time, increased computer power and communication bandwidth may make it possible to use less specifically structured data with a cost and speed not much greater than that used to process more specifically structured data. For example, the Abstract field for a report is very vaguely structured, but today's powerful computers can easily search that loosely defined field for various combinations of words.

Interaction of Factors in Message Structure

We have seen that message structure makes routine types of messages more efficient and more effective by aiding senders, receivers, and clerical staff or computers involved in producing, transmitting, storing, retrieving, and processing messages. In addition, organizational, group, and personal norms may affect structural choices, as well. Personalized message structure is likely to be shaped by the sender's characteristics (e.g., desire for a heuristic device) and/or by the sender's perceptions of the receiver's actual characteristics or needs. Task and media characteristics and organizational factors such as culture and occupational norms will likely also play a role in shaping individual decisions about message structure.

Patterns of message structure (e.g., use or omission of greetings and signoffs in electronic mail) become customary when they are widely adopted within a unit. This adoption can occur through agreement on senders' characteristics (e.g., the value of typical headings as heuristic devices to aid in writing certain types of documents), common perceptions of receivers' characteristics (e.g., the sense that highly formatted documents are more likely to be read by others), or by emulation of role models. Organizational factors (such as a culture that values informality or external appearances) affect the emergence of such customs, as do, task (e.g., routineness of work) and media characteristics (e.g., nature of embedded headers or formatting capabilities).

Formalized patterns of message structure may be mandated through exhortation, but often are embedded in the medium itself (e.g., headers in electronic mail), or in a task embedded in a medium (e.g., a form or computer template for a task). The characteristics of those receiving and/or handling the messages are often significant in the formalization of message structure. Widespread customary use of some message structure because of its usefulness to the sender may be formalized when someone embeds it in a medium for efficiency or convenience. In some cases, message structure is embedded in a medium, so an organization's decision to adopt a medium simultaneously formalizes certain message structures (e.g., the *Coordinator* system's message designations).

Recent changes in technology seem to be increasing the incentive towards personalized, customary, and formalized use of certain types of message structure. Message types that developed in the nineteenth and early twentieth centuries tend to be structured in one of two ways: (1) the very specifically structured forms, tables, and punch cards used to report data for analysis and comparison; and (2) the much more loosely structured documents that have specific header fields to aid in transmission, storage, and retrieval, but that otherwise only have formatting devices such as subheads that provide general guidance to the sender and/or receiver. With the massive growth of computer power and drop in cost to transmit and process messages in recent years, more of what Malone et al. [1987] call "semi-structured messages" are developing. These message types use computer-defined fields beyond simple addressing and storage information to enable computers to process parts of more open-ended messages.

Language

In our framework, language refers to symbols, words, and syntactic patterns that reflect tasks, organizational contexts, and group affiliations. Specifically, we are interested in what language patterns are associated with mediated communication in organizations. These language patterns,

whether personalized, customary, or formalized, are shaped by individual and organizational characteristics as well as by characteristics of the task or message and of the medium.

Language: Individual Characteristics

A sender who desires **efficiency** and **precision** in communicating may choose technical terms and acronyms as a precise form of shorthand within a community that shares that language. The computer terms "virus" and "worm," for example, have precise meanings for someone familiar with the field--meanings that would take many words to express in common language. The term "leveraged buyout," further compressed to LBO, has an exact meaning in the financial community. Acronyms may also be used to shorten non-technical terms such as the names of organizations or projects (e.g., EPA for the Environmental Protection Agency). Such technical terms and acronyms are examples of Bernstein's [1964, 1973] *restricted linguistic code*. Within the group sharing this code, such language is more efficient for message recipients as well as for senders.

People also make language choices based on signals they want to send about themselves, rather than about the subject of the message. For example, they may use the technical terms and acronyms discussed above in part (or entirely) to signal their **affiliation** with a work group, organization, or profession. Similarly, people may use passive voice in a technical document to signal their acceptance of a set of professional norms and assumptions about personal agency, as well as to convey particular meanings in context. Business jargon--such as "We are in receipt of yours of the 31st inst." in the nineteenth century and "How will this impact the bottom line?" today--conveys affiliation with the wider business community.

Individuals may also use patterns of language to convey signals about the **formality** of the message as well as the **sender's personality** and **relationship** with the **recipient**. A person may compose an informal message with lots of contractions and colloquial language to signal that the message is not to be received as an official document, but as an informal communication. The language of the informal message may also suggest (whether consciously or unconsciously on the part of the sender) an image of the sender as a casual person. Finally, it may signal that the sender is on comfortable terms with the receiver. Stylistic choices may also reflect hierarchical relationship, with upward communications conveying respect and deference, for example, and downward ones authority.

In traditional media, these functions of language are supplemented by other physical cues (e.g., a handwritten note on informal "From the Desk of ..." stationery vs. a typed letter or memo with the standard header on official stationery). With new media such as electronic mail, most such cues

are lost. Systems generally have a standard embedded header which can be personalized for the user, but which is not normally altered for each message. Thus the language of the message itself has to carry more of the burden of signalling level of formality, individual personality, and relationship with the recipient.

A **sender's skill** in using language (especially written language) in asynchronous messages, without the aid of nonverbal and social context cues, affects the sender's ability to send such personal and social signals intentionally and in such a way that they have the desired influence on the recipient. The greater emphasis that electronic mail tends to place on language because of the reduction of other cues may place a greater premium on skill in using language to convey signals. People with good skills in this area may be more comfortable and more successful in using the medium for a range of message types.

Of course, a **recipient's response** to language is not fully predictable, since it is conditioned by individual personality and experience, introducing another complicating factor for the sender. In particular, the humor that often plays a role in informal messages is often harder to convey in written than oral form. Orally, facial expression and tone of voice make clear that something is to be taken humorously, not seriously. In writing, that intention can be more difficult to convey unambiguously, especially for the unskilled writer, leading individuals to adopt the signalling conventions often observed in computer-linked communities, such as the sideways smiley face (: to make humorous intent clear.

Language: Organizational Characteristics

As the preceding section has already indicated, language patterns are clearly shaped by organizational, professional, and group norms. Speech and discourse communities - based on such factors as physical proximity, shared professional norms (inculcated through education and professional meetings), shared organizational culture, and shared tasks - are characterized in large part by the language patterns that are customary or formalized within them. We noted above the **efficiency, precision,** and **affiliation** that specialized language can achieve for communicators within such an organization, group, or professional community. These functions often lead to widespread adoption of distinctive language norms, or customary language, within groups. Some of these language norms are mandated and/or embedded for certain types of messages, such as the specialized language of medical prescriptions or the use of a limited set of keywords to tag reports for easier retrieval.

The language customs characteristic of a discourse community are not static. Vocabulary, for example, may be supplemented by terms created to express new knowledge or describe new things (e.g., "byte" and "hacker"). Technical terms may also be transferred by analogy into nontechnical contexts (e.g., "interface" used in relation to people rather than computer equipment). **New language uses** of these and other types may start with a single person but spread through the community as people adopt them, based on the seeming suitability of the new use or on the adopters' desire to affiliate themselves, initially with the original user and later with the group as a whole. Eventually some new language uses become embedded into tasks or media (e.g. "byte" becoming the standard measurement embedded within computer product descriptions), thus moving from customary to formalized language.

One type of discourse community particularly relevant to mediated communication is that which emerges primarily through use of a common communication medium. Earlier in this century, distinctive language customs developed among users of media such as ham radios and citizens band radios (CBs). More recently, **networked communities** have emerged via electronic mail, computerized bulletin boards, and computer conferencing [Hiltz and Turoff, 1978]. The earliest of these may be the communities created through the exchange of synchronous computer messages (via a mainframe) by programmers or hackers in university and industrial research settings. More common now are the communities created through asynchronous electronic media. These communities may cross organizational and professional boundaries (e.g., users of bulletin boards on public networks such as CompuServe) or may exist within them (e.g., electronic mail or computer conferencing within large organizations or professional communities), but they create groupings of people many of whom might not otherwise communicate with each other [Feldman, 1988].

Within these networked communities new language customs may arise, or language customs brought by an individual into the community may be widely imitated to become customary. For example, in some computer networks, a norm of informal language laced with slang and profanity has emerged [Sproull and Kiesler, 1986]. Shortly after the establishment of IBMPC, an internal computer conferencing system at IBM in 1981, rules were established for it, forbidding "ethnic slurs, personal insults, obscenities," and strongly discouraging sarcasm and irony [HBS Case #9-188-039]. These rules, though formally mandated, initially served as unenforced norms, more customary then formalized in their implementation. Eventually someone was put in charge of monitoring the conference and removing contributions that violated the rules, thus formalizing the sanctioned language.

Language: Characteristics of the Task or Message

The nature of the task or message has an obvious impact on the language of messages. A person may adopt the vocabulary and syntax characteristic of one discourse community in writing a technical report (e.g., passive voice and the terminology of mechanical engineering) and that of another in communicating with workers about administrative matters (e.g., active commands and the terminology of the organization's bureaucracy). Similarly, a computer systems analyst may use very abstract and general language at the systems design phase and extremely concrete and specialized language during the actual programming.

Specific language for a particular task is often embedded in the medium. Paper forms replaced totally handwritten documents for many of the routine internal reports established in the mid and late nineteenth century. In recent decades, computerized report generators or templates have replaced forms for many such tasks. In both cases, the language of the task and message is embedded in the medium. Several factors may affect the relationship between task and language as it is manifested in mediated communication. Tasks or message types used **frequently** are more likely to have specific language norms associated with them or to have language for them embedded into a medium. If the **same sender** issues many messages to different receivers to achieve the same task (e.g., responding to complaints), he or she is likely to use fairly standard personalized language to avoid having to reinvent it each time. Computer technology has simplified the use of standard language (it is easy to store and retrieve standard paragraphs or to take a message sent to one person and modify it for another) and thus made such personalized patterns of standard wording more likely even when frequency is relatively low. The language of such standardized messages may, however, create comprehension problems for some receivers if they do not share the norms or knowledge reflected in this language.

In message types issued frequently to the **same receiver**, either by one person (e.g., the daily reports for the Illinois Central Railroad) or by many people needing to accomplish the same task (e.g., requests for a parking pass), the task and its language is often embedded in a medium by--and reflects the needs and biases of--the receiver. Many people have had the experience of filling out forms (e.g., IRS forms) in which the language is confusing or ambiguous to them, though presumably not to the receiving party. Sometimes specific language is demanded to fulfill **legal** or **regulatory obligations**. Such language can be embedded in a form (as in standard contracts) or in software that allows a sender to make certain choices and then generates legal language to reflect those choices (as in will-writing software). Legal language has been widely criticized for its incomprehensibility to the lay person, but U.S. law's heavy reliance on precedent makes such language hard to change.

Sometimes language choice is shaped by needs to **store, retrieve,** and **process** messages. Subject-based filing systems, which became common around the turn of the twentieth century, depended on subject lines or special file designations with standard wording to help the filers store and retrieve a given message correctly. Today, longer documents such as technical reports or articles are often retrieved by means of keyword searches, and restricted sets of keywords are available for various subject areas. Specific wording may also be the basis of some message processing today. For example, in the Information Lens system [Malone et al., 1987], each user can set up rules by which a personalized information manager processes messages with certain words in certain fields in a specific way, or by which it retrieves certain items from a common data base (e.g., messages from certain people can be discarded or given highest priority).

Language: Characteristics of the Medium

As noted above, some studies have already highlighted and attempted to interpret differences in language use in electronic mail [Sproull and Kiesler, 1986; Siegel et al., 1986). There are also several other ways in which the medium may shape the language of a message.

Obviously tasks or messages that are **embedded in a medium** via a form, an electronic template, or even a standard voice mail message played to those calling into a voice mail system, have their language shaped to fit the medium. The embedded language may be more or less distinctive or specialized. The language embedded in many forms (e.g., "name" and "address") does not differ from common language except in its formulaic use. In the *Coordinator* system, however, the language used to designate conversation and message types (e.g., "conversations for action," "request," and "declare complete") reflects a very specialized view of the nature of discourse and of action [Flores and Winograd, 1986]. Indeed, the designers of this system hope that the speech act language they use will influence both the language and the actions of users [Flores et al., 1988].

Language may be embedded in such a way that it cannot be changed as long as that particular embodiment of the medium is used, as is the case with a pre-printed form or with the language of messages on the *Coordinator* system. In other cases, embedded language is a default that may be changed more or less easily. In general, electronic media offer much flexibility in this area. For example, word processors make it easy to alter standard messages to suit the circumstances. Electronic templates and mail headers may also be altered within bounds, though these alterations generally take time and knowledge of the software. In the case of embedded but alterable

language, its default status increases the likelihood of its use, but does not make that use mandatory.

Even when language is not embedded, **editing capabilities** of a medium affect how language is used in messages. Until recently, oral messages could never be edited. Now voice mail systems give the sender of a message a chance to do some "editing" of their oral messages. While typewritten documents could only be edited via messy corrections or total retyping, wordprocessing systems allow infinite editing. The existence of the capability does not, of course, mean that it is always used. We have already noted that needs for storage, retrieval, and processing are an important task characteristic affecting language choice. Intertwined with this issue are the medium's capabilities in these areas. The filing systems for storing paper-based messages put emphasis on the language of the subject line. Minor variations in language were easily handled by the human clerks, but major variations from standard terms might lead to misfiling. Computer software can readily deal with restricted language in designated fields for storage, retrieval, and processing. More extensive searches for language in large and loosely defined fields or in straight text have been possible for quite a while, but they take more time and power. Yet from the user's point of view, as computer power and speed have increased, these searches have approached the ease and speed of the former.

Cost plays a role in language as in media use and message structure. When the telegraph was introduced as a communication medium, cost was a major factor in shaping language. Because cost was relatively high and figured on a per-word basis, a "telegraphic" style developed in which the number of words was minimized to limit charges. This style contrasted markedly with the verbose phrases of typical business correspondence of the era. In modern electronic media such as electronic mail, costs for composing and transmitting messages are low and not figured on a per-word basis, thus creating no incentives to limit words.

Interaction of Factors in Shaping Language

All of the factors discussed above may interact in determining language in specific cases. An individual may be affected by his or her own characteristics and motives in communicating, by multiple discourse communities, by the task at hand, and by the medium used. As a result various personalized uses of language develop and often become identifying indicators of the individual. Changes in the language of an organizational or occupational community occur at a varied pace. While the adoption of new words or the spread of distinctive phrases or metaphors often occurs quickly, changing existing language norms can be slow and difficult. Both customary and formalized patterns of language use are often difficult to modify quickly, as they have become

institutionalized and hence comfortable, familiar, and efficient. For example, a study of ways to improve efficiency in internal communication at Du Pont in the early twentieth century recommended changes in language use from the norms of polite external business correspondence [Yates, 1989a: 252]. It advocated reducing the number of words (to improve the reader's efficiency) by "... eliminating the use of the traditional expressions and phrases of oldfashioned business correspondence," such as "We are in receipt of a request from St. Louis office for ..." and replacing them with simple phrasing such as "St. Louis asks for...". The report's authors recognized that this repudiation, for internal purposes, of the customs of business correspondence was controversial:

> "To alter one's point of view regarding the ponderous phrases and expressions of commercial correspondence is necessary. It may be difficult, in some cases more than in others, to overcome the inertia of our long-standing habit of clinging to the traditional forms and usage, but after the right attitude is attained, there should be little difficulty, and a constantly diminishing tendency on the part of the recipient of a letter to "get sore" at the terseness or bluntness of the communication." [Quoted in Yates, 1989a: 252-253.]

This passage acknowledges that the more direct language proposed would initially be resented by many message recipients, until a new norm evolved, making that language acceptable. While the report, endorsed by the president of the firm, apparently formalized new language customs by mandate, enforcing such a broad change was virtually impossible, and a glance at internal correspondence from this era still shows considerable variation in style from person to person. Only with an enforcement mechanism such as that used for the IBMPC computer conference, which may have other organizational consequences, could such a change in language norms be effected.

Media Use, Message Structure, Language, and Genres

We have now looked separately at media use, message structure, and language in mediated communication in organizations. The three domains are not, however, independent. In fact, widely recognized genres of communication - such as the memorandum and the research report - are characterized by patterns across more than one of these domains. The memo as a genre, for example, has traditionally used paper as the medium. Structurally, it has a more or less standard set of heading fields (To, From, Subject, Date), and frequently uses subheads or lists. In this genre, language is not necessarily specialized, but it tends to be somewhat less formal and polite than in external letters. The report is characterized by more formal and analytic language than the memo, as well as greater length, more use of internal message structure, and - at least initially - by the paper medium. Similar clusters of characteristics in the three domains would identify other genres.

Within genres, there are many subgenres or message types that are customary or formalized within given environments (e.g., the trip report, condolence letter, or resignation notice).

The concept of genre is especially useful in tracing the ways in which changes in patterns in one domain may be related to changes in other domains. We can see this interaction over time in the gradual evolution of the memo genre (internal correspondence) away from the letter genre (external correspondence) in the late nineteenth and early twentieth centuries [Yates, 1989b], and in its recent extension into electronic mail. Initially, correspondence between members of the same firm existed primarily to bridge physical distances. Intra-firm letters used the same message structure as letters to external parties, though shared knowledge and assumptions were reflected in the language of internal letters. A number of factors led to a number of small changes in the customary and formalized structure and language of internal correspondence, differentiating it from external letters, which continued to follow the old customs considered appropriate in business letters.

Internal correspondence in manufacturing firms increased enormously in volume between 1880 and 1920, driven both by the tremendous firm growth of the period and by the new ideology of systematic management. The growth and expanded functions of internal correspondence put new demands on the technologies of written communication. The typewriter, which greatly improved the efficiency of producing documents, was introduced in the 1870s and widely adopted in large firms by the 1880s. Typewriters made certain building blocks of structure (e.g., underlining, capital letters) easy to produce, thus opening the way for increased use of such features as subheads. Tab stops were added to typewriters around the turn of the century, making lists easier to type. Moreover, the new occupational group of typists who quickly emerged to "operate" this new technology served as agents of document standardization across and within firms.

Such changes to customary practice did not come unopposed. For example, when Scovill Manufacturing Company adopted vertical files, they explained the new filing system in correspondence with their New York store and issued very specific requirements that each letter cover only one subject, to be designated at the top of the sheet. One week after this letter, headquarters wrote to reprimand some lapses in providing the requested subject lines, ending with this statement: "We are changing our system of filing, and we must INSIST that you pay particular attention to this matter" [Quoted in Yates, 1989a, p. 184]. Through such monitoring and exhortations, headquarters finally achieved general usage of this new element of structure in its internal correspondence.

The need for improved systems of storage and access to documents encouraged the development and adoption of vertical filing systems, described above, which in turn shaped message structure by introducing new forms of structured headings [Yates, 1982]. Initially the exact form of such headings varied from person to person. Then, either by mandate from management or by growing socialization among typists, the order and placement of heading elements were standardized within firms. Some firms instituted further changes in internal correspondence. Du Pont's efficiency study attempted to change language as well as message structure. The study suggested cutting the traditional phrases of polite business correspondence to improve efficiency. The link with efficiency was much less clear in language than in message structure, since it may take the sender more time to eliminate excess words than to use them, thus forcing a trade-off between the sender's and the receivers' time savings. This change was also much more difficult to enforce than the changes in message structure, both because the simplified style was not essential to transmitting, storing, and retrieving the correspondence, and because it was less clear cut, involving judgement in its implementation. As far as surviving evidence indicates, the recommended heading became standard in the firm's internal correspondence; language and style, however, remained more variable among individuals, with some retaining the oldfashioned phrases much longer than others. While changes in message structure were more significant than changes in language in distinguishing the memo genre from the letter, both played a role in differentiating the two genres.

Initially, both letters and memos used paper as the medium in which they were created, transmitted, and stored. With the advent of electronic mail as a new medium for creating, transmitting, and storing written communication, the structure and visual layout of the memo heading was embedded into the new medium. In this case, computers rather than people handle the messages, so the fields of the memo heading are computer-readable, not just formatted for easy human reading. Still, the typical memo layout of the fields shows a tendency to retain elements of an existing genre in moving to a new medium. Similarly, when the Illinois Central Railroad converted its daily letter reports into highly structured forms in the 1870s, it initially reproduced the standard letter salutation and opening sentence of the handwritten letters on the new printed form.

In spite of the memo-like machine-readable header of electronic mail messages many messages deviate significantly from other aspects of the memo genre. In terms of media use, electronic mail messages are often used to accomplish tasks that would not typically be handled through memos (e.g., a two-line invitation to meet for lunch). Also, users seem less concerned with making electronic mail messages stand alone, as is more often the case with memos, which typically provide enough information so that they can be used by other people or at other times. In

electronic mail, exchanges occur in which responses to a question can be a single word or sentence. On paper, that kind of response would typically be hand written onto the original message, rather than being sent as a new message.

As for structure, some users ignore the system header and insert their own headers and sign-offs, which sometimes resemble those of a letter (e.g., "Dear Jane" and "Sincerely, Tom") and sometimes those of an informal note (e.g., just "-- Bill --" and "Paula"), within the message itself. Other variations from the structure of the memo genre include the less frequent use of subheads and lists to structure the body of the message, reflecting in part the greater difficulty of creating such formatting features within most electronic mail systems. In contrast, there are also the newer electronic communication systems - such as Lotus Corporation's *Notes* or *Information Lens* - that add capabilities for creating new elements of structure. Finally, the language of electronic mail messages in many organizations and networks often incorporates much more colloquial language than a memo does, as well as symbols such as the sideways smiley face that are not characteristic of the memo genre. In many settings, the language norms reflect much less concern for correct grammar, spelling, and syntax than is the case with memos. In explaining such norms, users often comment that the medium is informal, with messages serving more like telephone messages than written documents.[6]

These deviations in media use, message structure, and language reflect the various factors in our framework operating over time. New genres may be in the process of emerging, particularly given the many innovations in electronic media, but have not yet reached the widespread recognition of norms common to the letter and memo genres. The development and diffusion of these new genres will require close empirical investigation.

IMPLICATIONS FOR FUTURE RESEARCH

In the above sections we have constructed a theoretical framework that describes some of the important dimensions of mediated communication in organizations. We have also outlined some of the factors that will, in varying situations, influence the use of media, the structuring of messages, and the language used by individuals, groups, and organizations (see Figure 2). In this section we

[6] An interesting debate about the status of electronic mail is currently pending in a U.S. District Court, where the National Security Archive is claiming that the electronic mail messages exchanged in the White House substitute for memos and hence constitute part of the presidential records. The Justice department in contrast, is arguing that electronic mail messages are surrogates for telephone calls, personal notes, or face-to-face visit, and hence are not intended to be used as permanent records [Kaplan 1989].

wish to reiterate our key conceptual contributions and suggest some implications for research that emerge out of the conceptual apparatus we have constructed.

We have suggested that mediated communication in organizations is best understood in terms of the interaction of human action and institutional aspects of organizations. Over time, human communicative action becomes established as patterns of mediated communication. These patterns are both outcomes of human action in the domains of message use, message structure and language, as well as facilitators of further human action. The interaction of human action and mediated communication patterns over time has implications for the creation of organizational or cultural norms of communication and for the ability of groups to adopt new or different communication modes. Patterns of mediated communication, once established and used regularly, begin to influence the actions of humans with respect to the same or new communication media.

Besides making a conceptual contribution, our theoretical framework and description of historical and contemporary experience suggest a number of specific relationships that require further empirical investigation. Three implications of our framework are highlighted below:

(1) Our framework integrates various domains of human action that have been treated separately in the literature. We suggest that media use, message structuring, and language use by humans are interdependent domains of action, and that focusing on one without regard for the others may be misleading. The interdependence of these domains of action is manifested at the organizational level in the emergence of personalized, customary, and formalized patterns of mediated communication, and manifested across organizations in the widely accepted customary patterns of communication known as genres. For example, a researcher studying media use may notice that many individuals do not put opening salutations and closing sign-offs in electronic mail messages. Seen in isolation, this fact may be attributed to the depersonalizing influence of electronic media. Seen in relation to message structure and language, this fact may be attributed to the influence of the memo genre which has norms that inhibit the use of such openings and closings, or even to the influence of a formalized communication pattern that reflects an organization's general prohibition on "superflous" salutations and endings.

(2) Our framework suggests that historical and organizational factors have a significant influence on human action. Any time a new communication medium is introduced into an organization, we expect that patterns of communication in existing communication media will influence the patterns that emerge for the new communication medium. Established patterns of communication are easily applied to new media whereas establishing new patterns when a new medium becomes available takes time and effort. Thus, for example, when electronic mail is

introduced into an organization, people tend to transfer patterns of message structuring and language use from other media (such as paper or telephone) and genres (such as memos or personal notes), and will use these until they prove ineffective and a customary or formalized pattern for electronic mail emerges within their community.

(3) Our framework suggests that under different social and historical conditions, different factors will be more relevant and more effective in influencing the domains of action. For example, in times of increased information availability and exchange, as happened in the U.S. during the period from 1880 to 1920 [Yates 1989a] and as is happening today, the storage and retrieval of communication messages becomes critical. As a result, media that support easy storage and retrieval may be more frequently used, and decisions about message structuring and language use are often shaped by the knowledge that the messages will be stored and retrieved. In addition, messages will more often be structured a certain way (e.g., heading fields - to, from, date and subject - can be readily indexed and searched in most electronic mail systems), and language employed in a certain way (e.g., keywords) so as to allow for easier storage and retrieval in the future. This tendency in turn may lead to innovations in the storage and retrieval capabilities of communication media (e.g., support for semi-structured messages and for chaining related messages into conversations). Over time, storage and retrieval capabilities may become well established, taken for granted, and institutionalized in customary or formalized patterns of communication.

    Similarly, to the extent that communication across organizational and national boundaries is increasing, the timely transmission of communication messages is critical. As a result, media that support rapid transmission become more important and more frequently used, and decisions about message structuring and language use are shaped by the knowledge that the messages are to be transmitted across boundaries. For example, messages will be structured a certain way (with headers for receiver identification and location information), and in a "universal" language (such as English) so as to allow for easier transmission. Reciprocally, the ability to transmit messages across boundaries quickly and easily encourages such communication. This effect occurred with the telegraph in the mid-nineteenth century [Yates, 1989a] and is occurring today with fac and electronic networks.

We believe the issues we have highlighted and the general theoretical framework we have discussed may serve as a useful starting point for understanding the phenomenon of mediated communication in organizations. Figure 2 outlines some of the influences that bear further empirical investigation. The various boxes in figure 2 may be studied separately; however, this is only an investigative convenience, and eventually each box must be related to others, and to the historical and social context. For example, someone may choose to investigate how the use of particular media becomes formalized in organizations, and its implications for patterns of communication among individuals. However, while each box may - for analytic purposes - be

studied in isolation, results must always be related to the whole, reflecting the interdependence of all the dimensions. The domains of media choice, message structure, and language are interdependent, and their influence mutually interacts with patterns of communication - personalized, customary, and formalized - over time. For example, message structure may be formalized at the organizational level, but that formalized message structure will have no force unless individuals choose to employ it. Such action by individuals, in turn, reinforces the formalized nature of the message structure, and has implications for choice of medium and language use. In reinforcing the existing formalized message structure, individuals are unwittingly shaping the use and development of future communication media.

One of the ways in which empirical studies can avoid the pitfalls identified in the prior research is to employ appropriate research designs and methods. For example, if social context is critical to the nature and implications of mediated communication in organizations, then laboratory experiments alone have only limited value because they remove much of the relevant organizational context. They must be combined with field studies embedded in organizations. If history and the temporality of social interaction are important dimensions of mediated communication, then longitudinal studies premised on the interaction of media and their use over time are appropriate. To avoid technological determinism, researchers need to posit and expore the reciprocal interaction of media and human action. Field studies seem appropriate here in that they are able to investigate the ongoing interaction between media and human use, without constraining the direction of effects examined. Laboratory experiments and even survey methods are less useful here as they are unable to study mutual causation. Such research methods, by definition, posit a fixed and predefined stimulus, the communication medium in our case, and examine a fixed and predefined set of responses. As Rowan [1973:210] notes: "Research can only discover one-sided things if it insists on setting up one-sided relationships ... You only get answers to those questions you are asking."

Finally, we believe that the framework of mediated communication patterns within messages can be extended to relationships among messages, for analyzing groups or chains of messages. Such between-message links are particularly relevant in the context of electronic media which facilitate the linking of messages into a chain or "conversation." This chain can then be stored and retrieved and the course of the conversation traced. In this case, the communication media is not merely facilitating the exchange of messages, but is also maintaining relationships among messages, in effect supplying the necessary context of interaction within which messages occur. As with our within-messages framework, the among-messages framework will embody three domains of human action and three patterns of communication. More theoretical work, and much empirical investigation are clearly needed here.

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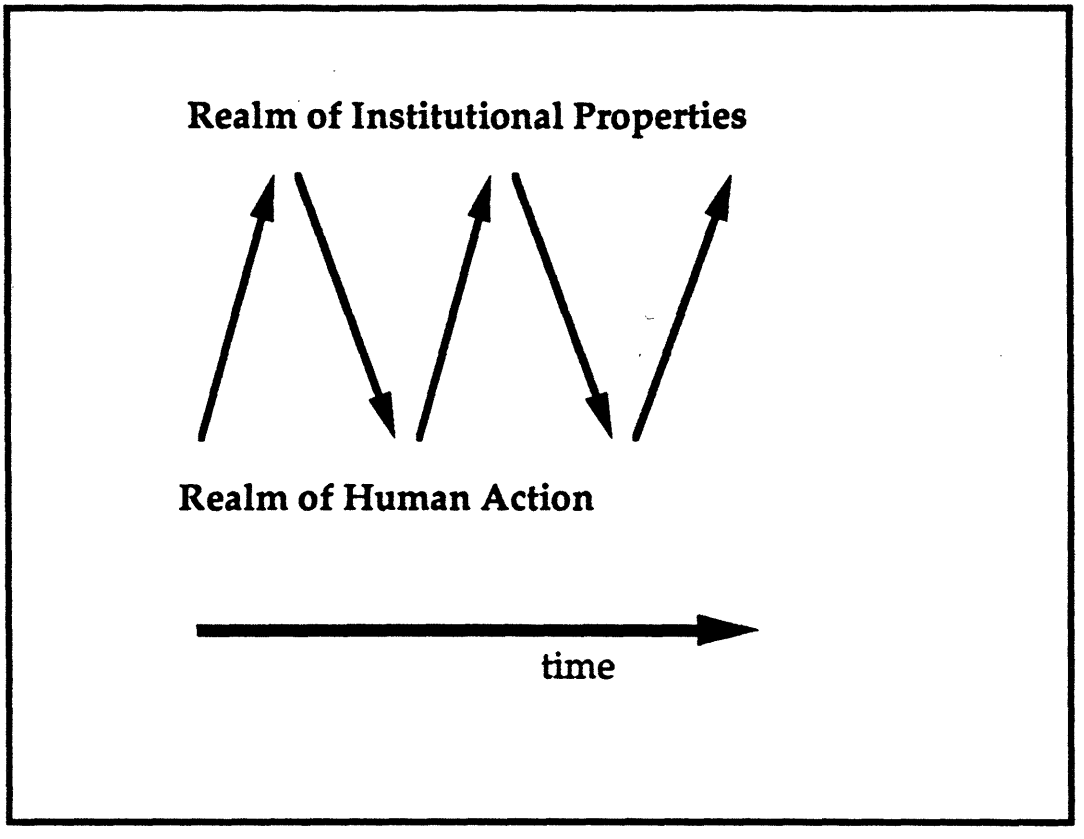

Figure 1: Relationship between Human Action and Institutional Properties in the Theory of Structuration [Giddens 1984]

Figure 2: COMMUNICATION PATTERNS (WITHIN MESSAGES)

	MEDIA USE	MESSAGE STRUCTURE	LANGUAGE
Formalized	Medium for a specific task is mandated, e.g. paper forms elecronic templates (IRS, ATM) voice mail	Form, layout and use of specific fields in the message is mandated by organizational fiat or is embedded in the medium e.g. standardized forms, email headers	Certain language is mandated by the institution, e.g. keywords or use of certain headings in reports such as "recommendations"
Customary	Customary uses of different media, e.g. bulletin boards for party announcements, email for routine inquiries, fax for speed	Form and layout of the message is shaped by the shared norms and practices of a group (local or macro), and typically are motivated by tradition, convention, & efficiency	Certain language identifies you as a member of a certain group, e.g. legal or scientific jargon
Personalized	Individuals choose to use different media for various tasks, e.g. I tend to use email for routine messages, but would use telephone for more urgent or private matters	Form and layout of the message is decided by an individual, and occurs ad hoc, habitually, or all the time	Specific language that an individual uses reflects personal idiosyncracies, e.g. "ciao"