Organization Science
Vol. 23, No. 1, January–February 2012, pp. 98–117
ISSN 1047-7039 (print) | ISSN 1526-5455 (online)
http://dx.doi.org/10.1287/orsc.1110.0638

How Managers Use Multiple Media: Discrepant Events, Power, and Timing in Redundant Communication

Paul M. Leonardi
Department of Communication Studies, Department of Industrial Engineering and Management Sciences, Northwestern University, Evanston, Illinois 60208, leonardi@northwestern.edu

Tsedal B. Neeley
Harvard Business School, Boston, Massachusetts 02163, tneeley@hbs.edu

Elizabeth M. Gerber
Department of Mechanical Engineering, Northwestern University, Evanston, Illinois 60208, egerber@northwestern.edu

Several recent studies have found that managers engage in redundant communication; that is, they send the same message to the same recipient sequentially through two or more unique media. Given how busy most managers are, and how much information their subordinates receive on a daily basis, this practice seems, initially, quite puzzling. We conducted an ethnographic investigation to examine the nature of events that compelled managers to engage in redundant communication. Our study of the communication patterns of project managers in six companies across three industries indicates that redundant communication is a response to unexpected endogenous or exogenous threats to meeting work goals. Managers used two distinct forms of redundant communication to mobilize team members toward mitigating potentially threatening discrepant events—unforeseen disruptive occurrences during the regular course of work. Managers with positional power over team members reactively followed up on a single communication when their attempt to communicate the existence of a threatening discrepant event failed, and they determined that a second communication was needed to enable its joint interpretation and to gain buy-in. In contrast, managers without positional power over team members proactively used redundant communication to enroll team members in the interpretation process—leading team members to believe that they had come up with the idea that completion of their project was under threat—and then to solidify those interpretations. Moreover, findings indicate that managers used different types of technologies for these sequential pairings based on whether their motivation was simply to transmit a communication of threat or to persuade people that a threat existed. We discuss the implications of these findings for theory about, and the practice of, technologically mediated communication, power, and interpretation in organizations.

Key words: communication; multiple media; technology use; work practices; power; persuasion; project managers
History: Published online in *Articles in Advance* April 11, 2011.

Introduction

Managers spend the majority of their workdays communicating with others (Kurke and Aldrich 1983, Mintzberg 1971, Putnam et al. 1996, Tompkins and Wanca-Thibault 2001). In the early 1980s, Peters and Austin (1985) claimed that the most effective managers did this communication in face-to-face contexts, making famous the mantra that good managers "manage by walking around." Nearly a quarter century on, in addition to walking around, today's managers frequently manage by phone, e-mail, text messaging, instant messaging, and document sharing. Some research suggests that because managers have so many media available to them for communication purposes, they increasingly feel overloaded by information and fatigued by their interactions with others (Dabbish and Kraut 2006, Donabedian 2006). Other studies suggest that managers are becoming more adept users of information and communication technologies and that they are growing dependent on and even addicted to them (Mazmanian et al. 2005, Munkejord 2007). In both cases, it is clear that managers no longer use one medium in isolation from others. Instead, they frequently use multiple media conjunctively to communicate with others throughout their day (Stephens et al. 2008, Turner and Reinsch 2007, Watson-Manheim and Bélanger 2007).

More recently, studies of multiple-media use have begun to suggest that managers across a range of industries are not simply choosing *between* two possible media; rather, they are making determinations about *what combination of media* will allow them to achieve their goals (Bélanger and Watson-Manheim 2006, Stephens et al. 2008, Watson-Manheim and Bélanger 2007, Woerner et al. 2004). In this paper, we explore the use of multiple media for redundant communication. We define redundant communication as *sending the same message to the same recipient through two or more unique media sequentially.* For example, a manager may call a subordinate on the telephone and tell him to complete a report and then send the same

message later through e-mail. Alternatively, a manager may use a collaboration tool to communicate information that a subordinate should add to a presentation for a client and then later stop by her cubicle to communicate the same information. At first glance, redundant communication seems inefficient because if a manager were to effectively match a medium's characteristics to the importance and ambiguity of the information he or she needed to communicate, one medium should be sufficient for accurate message transmission (Donabedian 2006). Given the fact that most managers claim that they are overwhelmed by their daily communication requirements (Theobald and Cooper 2006), engaging in redundant communication would seem to be an extra source of exhaustion or even counterproductive. Moreover, research has shown that workers in knowledge-intensive organizations feel overwhelmed by the amount of information they receive from their managers and colleagues (Barley et al. 2011). Knowing this, it would also seem odd that managers would inundate workers with even more communications if they did not have to.

Rather than dismiss redundant communication as a foolish or ineffective practice a priori, we conducted an ethnographic investigation to learn why managers often communicate the same message through different media. Our study of the communication patterns of project managers in six companies across three industries indicates that redundant communication is a response to unexpected endogenous or exogenous threats to meeting work goals. Managers used two distinct forms of redundant communication to mobilize team members toward mitigating potentially discrepant threats. Managers with positional power over team members reactively followed a single communication attempt when their transmission that a threat existed failed to produce any change in subordinates' behavior, and they determined that a second communication was needed to persuade them that a threat really did exist. By contrast, managers without power over team members proactively used redundant communication to first enroll subordinates in the process of forming interpretation so that they thought they came up with the ideas of a threat on their own and then later reify that jointly created interpretation. Moreover, findings indicate that managers used different types of technologies for these sequential pairings based on whether their motivation was to simply transmit a communication of threat or to persuade people that a threat existed.

Theoretical Background

Prior Research on Multiple-Media Pairings

Recent research on multiple-media use has uncovered two broad ways in which managers pair media for communication purposes. The first way—*simultaneous pairing*—is most often referred to as multitasking or multicommunicating. Reinsch et al. (2008, p. 392) defined multicommunicating as the practice of engaging in at least two overlapping, simultaneous conversations with "nearly synchronous" media of different types (e.g., one communication was taking place over the phone, whereas another was taking place simultaneously with a different communication partner via e-mail). Turner and Reinsch (2007) found that multicommunicating was a very common practice in organizations, and Stephens and Davis (2009) concluded that multicommunicating was most often accomplished through the use of distinct media. Most research on simultaneous media pairing focuses on antecedents and consequences of multicommunicating in organizations. Some studies have shown that norms for immediate responses and short replies are growing common in organizations, which fuel multicommunicating behaviors (Cameron and Webster 2005, Watson-Manheim and Bélanger 2007), whereas other studies have demonstrated that the increasing geographic dispersion and mobility of employees in organizations mean that people can engage in multiple communications simultaneously without their partners knowing (Chudoba et al. 2005, Timmerman and Scott 2006). Scholars have linked simultaneous media use to fragmentation of managerial attention (Garrett and Danziger 2007, Reinsch et al. 2008) and, depending on the context, to feelings of heightened stress (Barley et al. 2011) or increased control over one's work (Bélanger and Watson-Manheim 2006).

We understand much less about the second type of multiple-media use—*sequential pairing*—despite the fact that, outside of meetings, sequential pairings are more common in organizations than simultaneous pairings (Stephens and Davis 2009, Stephens et al. 2008). In sequential use of multiple media, managers choose a medium for communication at one time and then follow with a second communication about the same issue at a later time. This temporal lag (as opposed to temporal overlap) is what differentiates a sequential pairing from a simultaneous pairing. Within the organizations literature, only work by Bélanger and Watson-Manheim (Bélanger and Watson-Manheim 2006, Watson-Manheim and Bélanger 2007) and Stephens and colleagues (Stephens 2007, Stephens et al. 2008) has focused on exploring sequential media pairings in any depth. These authors have examined the communication purposes that sequential media combinations can achieve. For example, Watson-Manheim and Bélanger (2007) found that sequential media pairings were particularly good at helping managers resolve conflicts and share knowledge but were not as effective as single-media use for coordination, relationship development, or information gathering. Building on this work, Stephens et al. (2008) showed that when a manager's goal was persuasion, he or she was more likely to sequentially pair media than if the goal was to seek information, in which

case he or she was more likely to use only one medium. These findings led the authors to conclude that "the single best reason for using sequences (here, a pair) of [media] is to *persuade*. . . . Alternatively, if one's primary reason is to *get information*. . . then one is equally likely not to use sequential (paired) media" (Stephens et al. 2008, p. 212, emphases in original).

In each of the papers reviewed above, the authors compared their findings to the long-standing predictions made by media choice models. From the vantage point of media choice theories, which postulate that managers should choose communications media by matching a particular medium to a specific task and to the degree of richness required by that task (Daft et al. 1987, Trevino et al. 1990), simultaneous media pairings seem to make more sense than sequential media pairings. When pairing media simultaneously, people are engaged in multiple conversations, each, presumably, to complete a specific task or accomplish a specific goal. Thus, a manager's decision to pair different media for simultaneous use with distinct partners would allow them to do the sort of strategic matching that media choice theorists suggest is optimal. In the use of sequential communication, it is less clear what benefit multiple-media pairings offer. Media choice theorists would suggest that if a manager were to effectively match a medium's characteristics based on the equivocality of the information he or she needed to communicate, one medium should be sufficient for the fidelity of information transfer (e.g., the message that was sent is the message that was received). To work around this issue, both Bélanger and Watson-Manheim (2006) and Stephens (2007) have suggested that people may pair multiple media sequentially because they have different goals beyond message fidelity.

In making these reactionary comparisons, both sets of authors identify one type of sequential media pairing that would not be predicted under a media choice model's assumption of message fidelity as a goal: *redundant communication*. As Bélanger and Watson-Manheim (2006) revealed, informants engaged in redundant communication with the goal of signaling a message's urgency and its salience to a receiver. They suggested that sending the same message through multiple media leads a receiver to think that the transmitted message must be more important than messages only communicated once. Stephens (2007) posited that when people receive a message through multiple media, they are likely to be more persuaded to agree with and act on that message than if they received it through only one medium; thus, persuasion might be one type of goal redundant communication can help managers to achieve.

We share Bélanger and Watson-Manheim's and Stephen's interest in redundant communication as an intriguing form of sequential media use for both theoretical and practical reasons. From a theoretical standpoint, redundant communication is somewhat puzzling. If someone wants to persuade another to change his or her course of action, why not just talk to the person in-depth one time and elicit compliance? We do not have a strong theoretical explanation for why someone would believe that redundant communication could be successful at persuasion, and it is difficult to specify, theoretically, why that person might develop such a perception. From a practical standpoint, redundant communication is increasingly common in today's organizations. Although it is not named explicitly as such, examples of redundant communication can be found in organizational ethnographies depicting the work of engineering managers (Kunda 1992), managers in investment banking firms (MacKenzie 2006), and even managers in atmospheric research centers (Fine 2007), just to name a few. Although the prevalence of redundant communication seems to be growing in a wide array of knowledge-intensive organizations (for a discussion, see Stephens and Rains 2011), it can take very different empirical forms. For example, sometimes managers send a particular message first through e-mail and later send the same message a second time by telephone. In other cases, they may communicate a message face-to-face and then later communicate the same message again though the use of a collaboration tool. This lack of continuity in how media are used is puzzling and may hint at important but heretofore unacknowledged affordances played by particular media. To explore these theoretical and practical issues in more depth, we turn to broader research on managerial action and media use in organizations.

Discrepant Events as Triggers for Persuasive Communication

As a good deal of research has shown, most of a manager's day is spent trying to convince employees to get things done quickly, to help those employees see the importance of particular problems, and to persuade them to take the best paths to solve those problems (Cialdini 2001a, Kurke and Aldrich 1983, Pfeffer and Sutton 2006). This is especially true for middle managers who are responsible for the successful completion of particular projects (Dunne et al. 1978, Sheremata 2000). Thus if we follow previous studies of multiple-media use and begin with the assumption that managers choose to engage in redundant communication because their goal is to signal urgency and to persuade people to do what they say, we are compelled to ask why they do not engage in redundant communication exclusively. Even if redundant communication is common in managerial work, it is certainly not the norm. If we speculate that managers would not purposefully communicate the same message numerous times through multiple media when a single communication through one medium would suffice, it seems plausible that discrepant events might arise in which managers find it exceptionally important to signal urgency and persuade people to act.

Discrepant events—unforeseen disruptive occurrences during the regular course of work—often shape the way that people use communication technologies (Leonardi 2007, Majchrzak et al. 2000, Tyre and Orlikowski 1994). Because discrepant events (endogenous or exogenous) are endemic to organizations, one of managers' most important charges is to constantly address these disruptions (Nadler and Tushman 1980). Majchrzak et al. (2000, p. 590) characterized discrepant events as circumstances that "explicitly [call] into question an existing structure." In their study of a virtual team, they found that discrepant events forced members to respond to barriers that existing organizational structures had not predicted. Often, the engineers that Majchrzak and her colleagues studied shifted how they used a shared collaboration technology so that they could respond to events that threatened to disrupt the collaborative design of a novel rocket. More recently, Leonardi (2007) showed how technicians shifted their use of a knowledge management system in response to discrepant events that threatened their ability to provide technical support to desktop computer users.

In the studies by both Majchrzak et al. and Leonardi, disagreements often erupted among team members about whether or not a discrepant event actually threatened the normal flow of work. Research shows that such different opinions about the existence of threat following a discrepant event are common: some people will interpret an event as a severe threat whereas others will not (Cohen 1978, Goldberg et al. 1991, Stephan et al. 1999). Managers are perhaps more likely than workers on a team performing technical tasks to make sense of a discrepant event as a threat because they spend a significant portion of their time scanning the environment for possible threats (Anderson and Nichols 2007, Thomas et al. 1993). Because attention guides interpretation (see Rozin 2001), workers who are not looking for threats may not be easily convinced that discrepant events are potential problems for their work. Therefore, it seems possible that discrepant events that trigger threat perception may ultimately require that managers not simply communicate (transmit) the presence of threat to others but find *ways* of communicating that are helpful at persuading people that a threat exists. The empirical upshot of this theoretical discussion is that if redundant communication is used for persuasion, we may see it most easily following discrepant events that compel managers to convince others that a threat is impending.

Power, Communication Timing, and Media Choice

Research on power in organizational settings complicates the neat and tidy picture presented above of managers reacting to discrepant events by attempting to persuade others that a threat exists. Decades of study show that managers have vastly different perceptions of their own role vis-à-vis subordinates depending on whether or not they believe they have what French and Raven (1960) called "positional power"—formal authority associated with holders of a particular position. The reality of most organizational life is that managers vary greatly in terms of the positional power they hold. Some managers have positional power because they directly control subordinates' pay, job assignments, or vacation time. Other managers manage without formal positional power: they direct subordinates who report to them, but they do not control key employment resources that subordinates seek (Pfeffer 1994, Yukl 1989). As research documents, managers with positional power are more likely to assert their goals and expectations than those who lack positional power (Galinsky et al. 2003, Keltner et al. 2003). Consequently, the notion that she might have to "convince" or "persuade" a subordinate to agree with her perception of an event does not often enter the calculus of a manager with positional power (Dunne et al. 1978, Thamhain and Gemmill 1974). Instead, managers with positional power are often blind to the fact that others may see things differently than they do and simply assume that their version of reality is shared by all (Magee and Galinsky 2008). By contrast, managers who lack positional power are often very aware that subordinates have differing perceptions of events and typically take an active role in trying to persuade those subordinates to adopt their way of seeing things (Belbin 2001, McGregor 1960).

If we follow the basic assumption that, as opposed to instances of simple message transmission, effective persuasion requires contexts where the persuader can actively respond to others' concerns and react immediately to their varied interpretations and subsequent behaviors (Miller et al. 1975, 1996; O'Keefe 2002), it would seem likely that managers who lack positional power would choose different media for communication than managers who have such positional power; they would search for media that offered characteristics particularly useful for the particular goals they were trying to achieve. In other words, the immediacy of feedback afforded by the technology may be critical to the ability of managers to achieve their respective goals. Messages communicated by a manager at one time and received by a subordinate at another would seem sufficient for achieving the goal of message transmission held by managers with positional power. By contrast, messages communicated by a manager and received by a subordinate instantaneously such that the two could enter into real-time conversation would seem to better enable the goal of persuasion held by managers without positional power.

Computer-mediated communication researchers have, for many years, classified media in terms of whether they afford instant or delayed information transfer (Cornelius and Boos 2003, Dennis et al. 2008, Valacich et al. 1994). Media that enable *instant* communication, such

as the telephone, instant messaging, and group decision-support systems, allow senders to receive immediate feedback on their message, to reduce ambiguity on the spot, and to change message content on the fly. Media that communicate information in a *delayed* fashion, such as e-mail, text messaging, and electronic documents, allow senders to rehearse messages before they are sent and to provide receivers the opportunity to respond at their leisure. Delayed communication requires some form of documentation that can be referenced at a later time. Most information transferred through instant media is ephemeral (e.g., face-to-face, telephone), and even most media that support delayed message transfer in text form (e.g., written letters, collaboration tools) do not permanently store the exchanged information after a communication session is over (Nardi et al. 2000).

Research has led to some speculation about how different types of media (e.g., instant or delayed) may be useful for different levels of persuasion. Instant media may be useful in contexts where managers have to do more "convincing" because media of this type more easily afford relational communication than delayed media (see, for a discussion, Walther 1995). Relational communication has been shown to be effective for persuading people to commit to certain actions (Yukl et al. 1995). In addition, ingratiation is an important tactic for generating buy-in (Cialdini 2001b, Jones 1964), and studies have shown that instant media are normally more effective for this purpose than are delayed media (Cornelius and Boos 2003). Delayed media may be useful for simply communicating important information if a manager already feels that people have bought in. This is because managers often walk a fine line—too few persuasive messages, and people will not commit because they do not understand the importance of the task; too many, and people will become annoyed with the sender and will not prioritize the message (Schriesheim and Hinkin 1990, Singh 1988). To save time and appear less obtrusive, managers may try to use a delayed medium for urgent and important things—even though this may not be ideal.

Although the reviewed literature allows us to stitch together some tentative speculations about the relationship between managers' power and their use of different types of media, it is unclear exactly how managers' power influences their choice of communication timing (instant or delayed) in general, let alone in the context of redundant communication. In fact, in one of the few studies of sequencing influence attempts, Yukl et al. (1995) showed that relational persuasion (telling people that something is doable and outlining a specific plan for how to accomplish it) is an effective means by which people without power can gain commitment from others. The authors showed empirically that people without power tend to use relational persuasion tactics in an initial communication more often than they do in a follow-up communication. However, this study and others like it fail to examine what media choices managers make when communicating redundantly or how and why they place those media into particular sequences.

As our review makes clear, to provide a more robust understanding of multiple-media use in general and redundant communication more specifically, we must explore how discrepant events, power, and communication timing influence managers' decisions to pair particular media. Although the existing literature shows that managers' positional power might influence their media choices, we know very little about the conditions that affect the combinations and timing of media following a discrepant event. Thus, we have focused our study around the following research question: *How do discrepant events, power, and communication timing affect the use of redundant communications?* To explore these uncharted waters, we turn to our empirical research on project managers' use of redundant communication.

Methods

Data Collection

The data presented in this paper were collected from ethnographic observations of project managers conducting routine work. All of the informants were enrolled in an executive education course for project managers at a major research university in the San Francisco Bay Area. At the conclusion of the course, we invited students to participate in a study on project management. The 13 people (7 women and 6 men) who volunteered worked in six companies distributed across the computing, telecommunications, and health-care industries.

The experience of project managers presents an extreme case that allows a better understanding of the phenomenon and concordant theory building rather than those examinations in which specific effects may be more difficult to tease apart (Eisenhardt 1989). We chose project managers for several reasons. First, project managers occupy a central role in communications networks within organizations (Pich et al. 2002). A number of studies have shown that project managers regularly use technologies to communicate important information to the project team members they manage (Davidson 2002, Tractinsky and Jarvenpaa 1995). Second, it is commonly documented that project managers are very busy and work under tremendous time pressure (Sheremata 2000, Staudenmayer et al. 2002). Therefore, we would expect that if project managers did engage in a significant amount of redundant communication, they must believe that doing so benefitted their work in some way. Third, project managers make an ideal subject group to study because they are likely to encounter discrepant events that threaten the timely completion of their discrete project goals. Fourth, project managers have varying levels of authority over their project team members, depending on the structure of the organization in which

they work. Some managers have direct authority over team members via a formal reporting structure. These managers contribute to the employee's evaluation and, often, promotion and salary increases. However, even though they have direct authority, most project managers share it with other project managers for whom their team members also work. Thus, although they are the boss, they are not the only one. Other project managers who sit at the confluence of a matrix-reporting structure assemble teams of individuals from diverse functional groups within the organization. These project managers have no direct authority over the team members (they cannot hire or fire team members, and they are not responsible for determining salary, promotion, and other benefits).

Of the 13 project managers who participated in our study, 8 had direct authority (positional power) over their project team members and 5 did not. Table 1 summarizes informants' demographics. All project managers across industries and degree of authority worked in similar ways. Each informant was responsible for completing a project in a bounded time period. Projects ranged in duration from nine months to over two years. Our observations with all informants started in the midst of their projects. We did not collect data during team formation or adjourning. Because all the projects began before we initiated our observations, we did not capture informants establishing working relationships with team members. Apart from developing and delivering presentations to upper management, informants rarely did any tactical work themselves (e.g., writing reports, writing code, etc.). Instead, they spent their time coordinating, monitoring, and helping project team members who were working on various parts of the project.

Our strategy was to collect data on the routine work of informants through detailed observations. With the exception of one project manager who we only observed once, each informant was observed at least three times. We scheduled observations at different times of day and on different days of the week with the same informant to capture variations in practice. Typically, observations lasted from three-and-a-half to seven hours. In total, we conducted 61 observations with 13 informants, totaling 256 research hours. A breakdown of the number of observations conducted with each informant and the duration of those observations is presented along with the demographic data in Table 1.

After compiling a complete list of all the project managers who had volunteered to be observed, we divided the informants amongst the members of the research team. One member of the research team was responsible for completing all observations with a given informant. The research team met weekly to share insights and learning from the observations so we would all focus our attention on similar actions. The goal of our ethnographic observations was to compile a complete record of the tasks informants conducted and the technologies they used to conduct them. To do so, we relied heavily on the construction of field notes. During our observations we kept a running narrative of all of the actions informants took. We described the types of technologies they used, and we summarized the contents of documents, charts, and e-mails they read and sent. We also described in as much detail as possible the phone conversations and face-to-face meetings. Our notes indicated with whom informants interacted and the activities they conducted immediately prior to and subsequent to those interactions. We followed informants when they left their desks and walked down the hall. We occasionally went out of the office with them to meetings. We also spent many hours sitting behind informants at their desks, watching them work with various applications on their computers. We recorded all of these activities in great detail so we could later determine what they did at any given moment during the day and, by looking at the activities they conducted before or after a particular task, why informants did those things.

Table 1 Summary of Informants and Observations

Informant	Gender	Company	Industry	Authority (Y/N)	No. of observations	Hours of observation
1	F	1	Health-care	Y	1	4
2	M	2	Computing	Y	3	8
3	M	2	Computing	Y	5	26
4	F	3	Computing	Y	4	9
5	M	3	Computing	Y	4	11
6	F	1	Health-care	Y	3	18
7	F	3	Computing	Y	5	22
8	F	1	Health-care	Y	4	14
9	M	4	Computing	N	7	35
10	F	5	Telecommunication	N	8	42
11	M	6	Health-care	N	5	18
12	F	3	Computing	N	5	19
13	F	2	Computing	N	7	31
Total					61	256

Every 10 minutes, we made a time-stamp notation in our field notes so we could later determine the order and sequence of events and how long certain activities took to complete. We were silent observers who instructed informants to go about their daily tasks as if we were not there, although we occasionally asked informants for clarification if we did not understand something they said or did. Like other ethnographers, we found that informants had relatively little trouble acting as if we were not there because the demands of their work were such that they could devote little time to entertaining us (see Becker 1996).

After each session of observation, we immediately returned from the field and typed our handwritten notes. As we typed, we expanded our notes with additional information about the context in which an interaction occurred, and we also made analytic memos summarizing interesting activities that took place during that session. We made sure to write up the field notes for one observation before moving on to another observation to avoid confusion about what occurred when. We refer to a complete set of field notes for one observation as an "observation record." Upon completing a write-up of our observation records, we passed them along to other members of the research team for review. If another researcher could not easily read and follow the running narrative of events, we modified our observation record with more detail. A typed observation record for one observation spanned 10–20 pages of single-spaced text. Apart from our fieldwork with Informant 1, whom we were only able to observe once because of scheduling conflicts, we normally ended our observations with a particular informant when we felt the observations began to yield few new insights (Lincoln and Guba 1985). Specifically, we stopped when we had a clear understanding of tasks she engaged in, the people with whom she normally talked, the types of technologies she used, and, furthermore, when we could explain reasonably well why she did all of these things.

Data Analysis

At the end of our period of data collection, we submitted all of our field notes to ATLAS.ti©, a software program useful for coding ethnographic data. Our analysis procedure consisted of five steps. Steps 1, 2, 4, and 5 employed various qualitative coding and analysis techniques on our ethnographic data to uncover instances of media use and for determining why managers used their chosen media. Step 3 employed quantitative analysis techniques to statistically confirm patterns that we observed through Steps 1 and 2 and to explore whether or not other patterns existed that our qualitative analysis could not reveal.

In Step 1, we were interested in what kind of media managers normally chose to communicate important information to team members. To learn this, we began a process of *selective coding* (Strauss and Corbin 1998) in which we flagged each instance in which informants communicated with someone else. We looked specifically for instances where managers initiated the transmission of a message as opposed to responding to a message initiated by someone else. Because we focused on communication events, our analysis excluded the use of technologies that did not involve communication with others. For example, instances in which informants searched the Web for data or used a text-editing program to type notes were not included in our analysis.[1] After identifying all of the instances of communications managers used (including, of course, face-to-face communication), we analyzed the full host of media managers used to communicate with others. Across all of the observations, we found that project managers made use of 12 distinct media. These media are presented in Table 2, along with a raw count of how many

Table 2 Summary of Media Used for Single and Redundant Communications During Observations

Media used	Classification of instant (I) delayed (D)	No. of times used across 61 observations
Single communications[a]		
Face-to-face	I	378
E-mail	D	353
Telephone	I	230
Spreadsheet (e.g., MS Excel, Lotus Symphony)	D	84
Voice mail	D	70
Instant message (e.g., AIM, ICQ, Skype)	I	68
Database (MS Access, user-modified intranet)	D	64
Electronic document (e.g., editable MS document, internal wiki)	D	63
Cell phone	I	62
Written document (e.g., notepad, notebook, whiteboard)	D	51
Collaboration tool (e.g., Lotus Notes, BMC Dashboard)	I	26
Text message	D	23
Redundant communications[b,c]		
Face-to-face → e-mail	ID	27
E-mail → face-to-face	DI	21
Telephone → e-mail	ID	15
E-mail → telephone	DI	13
Telephone → face-to-face	II	12
Face-to-face → spreadsheet	ID	11
Telephone → e-document	ID	11
Face-to-face → telephone	II	10
Instant message → e-mail	ID	9
Electronic document → face-to-face	DI	8

[a]Not including media used for redundant communication.
[b]Sample of 10 most common types of redundant communication.
[c]Combinations of two media (e.g., face-to-face and e-mail) counted as one instance of redundant communication.

instances in which we saw managers using a particular medium across the 61 observation records. We classified each medium in terms of whether it provided capabilities for instant or delayed communication (also shown in Table 2).

In Step 2, we constructed codes for all the hypothetical pairings of media that a project manager could choose. Given our definition of redundant communication, we did not include in our list of hypothetical pairings combinations where the first and second media were the same, such as telephone → telephone. We chose not to include such pairings in our analysis because previous studies of sequential media use have shown that they are not very common (Stephens et al. 2008). In consort with past research, we found that less than 3% of all pairings involved the use of the same medium twice. This is not entirely surprising given the literature suggesting that a reason to choose to pair media sequentially is that different technologies offer distinct affordances for message transmission. We did, however, construct temporally ordered codes reflecting the fact that a manager would choose to communicate a message through one of the 12 media first and a different medium second. In total, we created codes for 132 possible pairings. Using our classification summary indicating whether each medium supported instant or delayed communication, we also classified each pairing in terms of whether it was a combination of (1) *instant* → *delayed*, (2) *instant* → *instant*, (3) *delayed* → *instant*, or (4) *delayed* → *delayed*. Because our observations spanned time periods of eight hours at the most, we decided only to code for pairings involving two media, although it is possible that the informant could have engaged in redundant communication using more than two media sequentially. To qualify, the first and second media use had to occur within one period of observation.

In Step 3, we took the 132 codes for possible media pairings and identified, from the field notes, which pairings project managers actually used. Because we started with a hypothetical list, this process of *theoretical coding* (Strauss and Corbin 1998) was different from the selective coding process we used to uncover the 12 media choices. We went back through the notes to look for each instance of media use that we identified in our selective coding phase. We then looked to the use of whatever media came before and after the code we were examining to see the content that was communicated through it. To make the determination about whether a communication was redundant, the message had to contain the same general information as the initial communication, it could not contain new information, and it could not ask the receiver to engage in any new activity. Most messages did contain slightly different wording and use phrasing from the original—phrasing such as "as I mentioned before" or "please remember" that indexed the second communication to the communication that came before. Our general rule of thumb was that a communication was redundant if the message passed the three tests outlined above and contained roughly 80% of the same information from the first message. If this quantity of information was the same, we coded both instances of media use together as a redundant communication and applied one code to it. For example, if we found that a manager used the telephone to call a team member and give him some figures to include in a report and later in the same observation that informant sent those same figures to the same team member via e-mail, we coded the entire redundant communication episode as telephone → e-mail. If we did not find a redundant communication, we simply classified the communication event as a single communication. We then calculated the percentage within each observation that an informant engaged in redundant communication as well as the percentage of each pairing used. Any communication occurrence included in our redundant communication score (which entails two communications—the first and the second) was not also included in our individual communication score. On average, observation sessions (of which we had 61) lasted 4 hours and 38 minutes. We found that informants engaged in 25.07 individual communications per observation and 4.23 redundant communications per observation. In other words, in roughly a four-and-a-half-hour time period, 14% of all informants' communication was redundant communication. Next, we split our data into categories representing whether informants did or did not have positional power over team members. We used t-tests to determine whether the patterns identified in Steps 1 and 2 were correlated with managerial authority.

Step 4 was conducted to determine why a manager selected multiple media for redundant communication. In the field notes, we looked for activities informants performed or things they said that indicated why they chose to use the medium they did to communicate a particular kind of information. We applied codes linking reasons (those ascribed by the coder or those given directly by the informant) for which a project manager used a particular medium and a particular episode of redundant communication. This process of *axial coding* (Strauss and Corbin 1998) allowed us to generate a number of categories that helped explain why informants engaged in redundant communication and why they chose certain media to accomplish these goals. In performing this analysis, we isolated two events that commonly disrupted project managers' work and encouraged them to engage in redundant communication: *work delays* and *changes in requirements*. To effectively manage the unexpected, project managers had to determine what sorts of discrepant events posed legitimate threats to the success of the project. Because they perceived that these events threatened the project's viability, informants viewed such disruptions as necessitating changes

in the way team members worked. We then explored whether these discrepant events were also catalysts for single communications or whether they were more likely to precede only redundant communications.

Finally, in Step 5 we used our axial coding to interrogate all of the redundant communications in the data to uncover whether any differences existed in managers' decisions to pair multiple media in response to a discrepant event, based on whether they did or did not have authority over project team members. We also explored in detail our informants' own reflections on their actions to uncover what project managers believed redundant communications did for them in their work. In the next section, we present our findings on project managers' use of redundant communication.

Findings

Responding to Discrepant Events

As previous literature suggested, our data showed that project managers were often confronted with events that they believed threatened to disrupt the on-time and quality completion of their projects. Events such as the departure of a team member threatened the viability of a project by introducing work delays. Given that project managers spent so much time putting together project plans and mapping out detailed timelines for deliverables, it is not surprising that they viewed work delays as serious threats to the successful completion of a project. As several project managers noted, the project plan was the most important device they had to ascertain whether the project was on the right track. Work delays that dragged the pace of work away from its planned execution were thus seen as tremendous threats to the successful completion of the project. As one informant noted, "The timeline . . . I set out at the beginning of a project . . . is the major tool for knowing if the project is on track. If we get delayed from what's on it, the project could fail." Of course, project managers were especially sensitive to events that caused delays to team members' tasks because team members typically worked on interdependent tasks (sometimes those tasks were sequentially interdependent, but more often they were reciprocally interdependent). Consequently, a work delay by one team member often immediately delayed the work of others on the team, which could then lead the project to stray from its end goals. For these reasons, informants viewed work delays as events that posed a serious threat to the successful completion of their projects.

In addition, events such as a CEO's mandate for a new software module changed the requirements of a project drastically, thereby also threatening successful on-time completion. Many informants in our study viewed changes in requirements as direct threats to their projects. As one informant noted, "If we have to add new features it could destroy our project," whereas another lamented, "If I knew these requirements at the beginning, I would have developed a different [project] plan. This is bad. Are we going to be done in time?" Thus, by adding extra work to an already tightly scheduled project, project managers viewed requirements changes as events that threatened a project's success without altering its time frame to counterbalance the added complexity and effort.

Project managers actively worked to mitigate the threats they believed that work delays and changes in requirements created. Leah, a project manager at a large telecommunications company, noted quite colorfully that communication was the vehicle through which such threats were best resolved:

> If you're project isn't going good, if you're not going to meet your deadlines, that's a fire. You have to put it out. My fire hose is filled with e-mails and meetings and conference calls and chats to put it out. That's really all I can do—coordinate people to get them back on track to get the work done.

As Leah observed, project managers could use any number of media to communicate a sense of urgency and direct changes in people's work practices so as to obviate imminent threats. To analyze the communications that project managers initiated after experiencing a discrepant event, each communication in our data set (1,787 in total) was reviewed to determine whether that communication did or did not occur in response to a work delay or a change in requirements. The results show that 79% (204/258) of all redundant communications occurred in response to a discrepant event, whereas only 6% (92/1,529) of single communications did.

A comparison of informant attributes of gender, company worked for, industry worked in, and positional power over team members (see Table 1) revealed that the only attribute associated with differences in the frequency of redundant communications was positional power. Project managers with positional power (e.g., were direct supervisors, approved hours, were responsible for evaluations and promotion decisions) engaged in an average of 27.07 single communications and 3.29 redundant communications per observation, whereas project managers without positional power (e.g., team members reported to functional managers and not project managers) engaged in 23.36 single communications and 5.03 redundant communications per observation. t-Tests show that the difference in the proportion of single communications per observation between project managers who had positional power and those who did not was not significant, $t(59) = 0.96$, $p =$ N.S., but the difference in the proportion of redundant communications was significant, $t(59) = -4.76$, $p < 0.01$. Each of the 92 single communications following a discrepant event was analyzed to determine whether project managers with positional power were engaging in as many redundant communications following a discrepant event as

their counterparts without power. The data showed that project managers with positional power were responsible for 86% (79/92) of single communications following a discrepant event, whereas project managers without power were only responsible for 14% (13/92). In summary, informants were likely to respond to a discrepant event by initiating a redundant communication, but those project managers without positional power were even more likely to respond without initiating a discrepant event than project managers with positional power.

Our coding of the qualitative data suggested that project managers who had positional power engaged in more instances of redundant communication that began with a delayed communication and followed with an instant communication than project managers who did not have such power. By contrast, managers who did not have positional power seemed to lead with an instant communication and follow with a delayed communication. To test this qualitative finding, we calculated, within each observation session, the percentage of redundant communications in which informants (1) led with an instant communication and followed with an delayed communication, (2) led with an instant communication and followed with a delayed communication, (3) led with a delayed communication and followed with a delayed communication, and (4) led with an instant communication and followed with an instant communication. The results, presented in Table 3, confirm that project managers who had positional power were more likely to engage in redundant communications that led with a delayed communication followed by an instant communication than were managers who were not in positions of direct authority. By contrast, the data indicate a negative relationship between positional power and redundant communications that lead with an instant communication and follow with a delayed communication. This result suggests that project managers without positional power were significantly more likely to use this media pairing than managers with authority. Both results coincide with our qualitative finding that managers who have positional power pair media for redundant communication differently than managers without it. The findings of the quantitative analysis also provide more nuances about redundant communication as a practice of managerial media choice. The results also suggest that managers with positional power were not prone to using redundant communications that paired two media for instant communication. They were, however, likely to pair two media that enabled delayed communication.

Differing Intentions: Transmission vs. Persuasion

Our qualitative analysis evinced different communication patterns following a discrepant event between managers who had and did not have positional power. Project managers with power often started out with the goal of communicating the presence of a threat to team members only once. Believing that team members would share their interpretation that a discrepant event posed a threat to the project, they chose a delayed medium (e.g., e-mail) as an easy modality by which to simply *transmit the message that a threat existed*. However, those project managers often found that team members did not perceive a discrepant event as a threat, as the project managers had assumed they would. To communicate the sense of threat, project managers with power *reactively* followed the initial delayed communication with an instant communication aimed at persuading team members that a discrepant event was a threat that required swift action. By contrast, project managers without power were aware that just because they interpreted a discrepant event as a threat did not mean that team members would. Furthermore, unlike their counterparts who had power, they were not confident that simply telling team members that an event threatened the project would suffice to have them change their work. Instead, they believed they had to first *persuade team members to view a discrepant event as a threat*. Consequently, project managers without power planned to *proactively* engage in redundant communication. That is, they knew from the start that they were going to communicate the same message twice, through different types of media. The first communication was often instant, so as to enroll team members in their way of seeing the world, whereas the second communication was normally

Table 3 Proportion of Media Pairings for Redundant Communication

	With positional power	Without positional power	*t*-Statistic
Proportion of redundant communication leading with *delayed* and following with *instant* medium	0.470 [0.286]	0.135 [0.151]	5.49***
Proportion of redundant communication leading with *instant* and following with *delayed* medium	0.213 [0.198]	0.537 [0.212]	−6.10***
Proportion of redundant communication leading with *instant* and following with *instant* medium	0.217 [0.252]	0.094 [0.129]	2.31*
Proportion of redundant communication leading with *delayed* and following with *delayed* medium	0.100 [0.218]	0.235 [0.175]	−2.61*

Notes. Two-sided *p*-values. Numbers in brackets are standard deviations; *t*-tests are robust to unequal variances between groups.
*$p < 0.05$; ***$p < 0.001$.

delayed, serving as an unobtrusive reminder, to further solidify the severity of the threat in the eyes of team members.

Managers with Power: Failed Transmission and Reactive Redundant Communication. Project managers who held positional power recognized that they were the primary bosses over their subordinates, who were part of a matrix organization. Whereas employees were burdened with responsibilities for several projects at once, managers with power were secure in knowing that ultimately their subordinates had to do what they asked. One manager put it forcefully:

> At the end of the day I'm their boss, so there's no question that they're going to do the work I assign them. Sure, they're working on other projects too, but ultimately I get them. I've worked on teams before where I didn't have control and it's tough. This is a much better job. That's the position that the other managers are in that are asking my guys to do things.

Because project managers with power were confident that they already had, as many informants called it, "buy-in" from their team members on a particular project, they often dispensed with pleasantries when assigning work, taking for granted that their requests would be met.

Project managers with power not only believed that their team members ultimately had to do what they were asked but that team members also shared in their interpretations about what counted as a threat to the project. Bridget, a manager with power who worked for a major health-care company, was typical in her attitude; she said most requests to subordinates could be quickly executed via written communication: "When you've got a job that needs to be done you should just shoot an e-mail or assign it in the project spreadsheet. It's quick and easy 'cause you just say what needs to be done and it's clear." Bridget routinely assigned her subordinates tasks using a home-grown software application that was stored on a shared server, which included information on the scope and due dates of the project. Project managers like Bridget were convinced that in the presence of a discrepant event, quick e-mails were most effective: "If it's urgent to meeting the deadline, get the message out there fast so people can act."

Given this logic, our analyses indicate that project managers with power normally followed a discrepant event with a delayed communication media, rather than an instant one (e.g., e-mail versus telephone). Of the 79 single communications that project managers with power initiated in response to a discrepant event, 72% (57/79) were delayed communications sent through media such as e-mail. Often, project managers with power were correct in their assumption that team members would interpret a work delay or a change in requirements as a threat and alter their work to ensure successful project completion in the given time frame. Put another way, they were able to transmit their interpretation of a discrepant event as a threat through a single delayed communication. However, our analyses suggest that project managers with power may have often overestimated the extent to which they could simply transfer the perception of a threat through a single communication.

We found numerous instances where project managers interpreted a work delay or a change in requirement as a threat and used a single delayed communication to convey that sense of threat to team members, but the team members did not share in their manager's view that the event actually threatened the project. In these situations, team members did not acknowledge the project manager's communication nor change their practice in a way that would suggest that they were working to overcome a threat. Project managers discerned at that point that their initial and singular communication failed to convey the threat. Consequently, they launched a secondary and redundant communication to persuade their subordinates of the discrepant event that threatened the normal flow of their work. As one project manager put it, "I have to go on sales mode to get people on the same page." We noted in our observations, however, that these attempts were not always met with eager attention.

Consider, for example, the case of Amanda, a project manager with power at a large health-care company. Early on a Tuesday morning, Amanda learned at an all-team meeting that, effective immediately, her company was changing its policy for insurance reimbursements for patient care providers. Amanda had been working on a project to update the reimbursement forms for providers and to ensure that they were being used. This newest change to requirements meant that her team would have to recontact all of the providers to whom they had given the new forms and replace those new forms with an even newer version reflecting the information she had learned in that morning's meeting. Amanda sighed and rolled her eyes nervously upon hearing the new information and mentioned that it was "really going to set us back." Amanda returned to her desk after the meeting at 10:50 A.M., and we observed her entering job assignment information into an electronic document on the shared server. Our field notes captured her work:

> She adds a new row to the bottom of the spreadsheet and fills out today's date. She then writes "provider form update" in the third cell from the left in this new row. The description says that the provider needs to be contacted to find out whether they've changed to the new reimbursement form. She assigns this job to Tim by writing his name in the "assigned to column." She adds a due date of Friday 2/23 [One week from the date of this observation].

At noon, Amanda commented that she had not heard anything from Tim: "Why hasn't he responded yet to say he'll do it?" For the next hour, Amanda worked on

a related project. At 1:10 P.M., our field notes captured her initiating an IM chat with Tim:

Amanda (A) opens her IM and begins a chat with Tim (T)

A: I assigned the reimbursement forms to you.
T: I saw. Working on them.
A: Pls check with providers to see they are using the new forms.
T: Will do.
A: When?
T: Probably by Mon.
A: OK.

Amanda turns to me and says, "Sometimes a little prod is good. Tim knows what to do. I just want him to remember to do it soon. It's good he'll get it done by early next week . . . . It's important so we can get the forms in order with the new requirement."

At 2:00 P.M., Amanda was walking to a meeting and ran into Tim in the hall where they had a brief exchange:[2]

A: Thanks for doing that.
T: No problem. I've got a lot going on, but I'll get it done soon.
A: Great, thanks.
T: Sure . . . .
A: It's a timely thing like you know.
T: Yeah, I didn't realize that I guess. OK. Sure it will get done.

As these excerpts from our field notes demonstrate, Amanda initiated a single and delayed communication with Tim in response to a change in requirements because she knew that, as his direct supervisor, she had the authority to demand work from him. However, Tim did not respond or indicate in any way that he understood the urgency of the request. Amanda grew nervous at the lack of a response and realized that Tim would be busy working on other projects. Thus, to reinforce the importance of the work she assigned him and to underscore its urgency, she followed her single delayed communication with a new instant communication. In other words, after receiving no reply, she reactively turned her single communication into a redundant communication. The instant follow-up signaled to Tim that this project was important and distinguished it from competing assignments. As Tim's comments in their chance hallway encounter suggest, he did not initially understand that this change in requirements was a threat to the project. It was only after the follow-up communication from Amanda that he came to see the discrepant event as a threat, as she did.

Project managers with positional power made sense of a discrepant event as a threat. To mitigate that threat, they had to convince team members to change their work practices. Project managers then normally initiated a single delayed communication to convey their sense of threat to team members. The fact that project managers with positional power normally operated under the assumption that a single delayed communication was sufficient for transmitting the existence of a threat explains the higher rate of individual communications they initiated (as opposed to project managers without authority) following a discrepant event. These project managers did not initially plan to engage in redundant communication; they planned to engage only in a single communication from the start. Sometimes this strategy worked: after the single communication, the project manager believed that team members adequately understood the severity of the situation. If this understanding occurred, project managers did not feel they needed to communicate it a second time. However, in more than 72% of the cases we observed, project managers with positional power sent that single communication and afterwards developed the perception that the team member who received it had not made sense of the discrepant event as a threat as he or she had expected. These perceptions were most often generated by silence (an absence of response from the person to whom they sent the initial communication), further reflection that the initial communication was not worded correctly, or receipt of the communication by team members but no sign of a change in their work. To adequately convey their sense of threat, project managers followed their initial delayed communication with an instant communication. The instant and real-time nature of the second communication allowed the project manager to use more cues to convey his or her sense of threat and to help the team members to make sense of the event as their own. As Markeza, another project manager with authority, observed, "First you prime them [subordinate team members]. Send it to them in a memo, don't bother calling. But if you need them to act on it now, call them, talk to them . . . . Then you can help them understand for themselves why it's important."

As we have shown, project managers typically believed that team members either interpreted discrepant events as threats just as they did, or that simply learning that their project manager interpreted a discrepant event as a threat would be enough to convince team members that a threat existed. However, as we have also shown, these beliefs were often wrong: project managers with positional power were not able to impose their interpretations of the world effortlessly on others. As they discovered that simple transmission of the threat message through a delayed communication did not work, project managers reacted by following their initial communication with a persuasive appeal through an instant communication where they could interact with team members in real time and convince them that a threat actually existed. Robin, a particularly reflective project manager at a computer company, summarized her learning:

> I've started to notice that if you tell people what to think about things they sometimes get kind of pissed at you. If you try to do that and fail and then you've gotta go

> back and try to convince them later they start to think you're incompetent, like, "She's not a very good leader 'cause I told her no and now she's got to beg me." So I'm trying to learn to be more persuasive and get them to think that they thought of it rather than it's me telling them. But that takes more time and more communication and you've got to engage them in direct conversation.

As Robin illustrates, project managers took a gamble each time they decided to try and simply transmit their perception of threat following a discrepant event through a single communication. If the gamble paid off, they would be able to impose their interpretation on others with minimal effort. If the gamble did not, they would have to engage in a second, more time-intensive instant communication and run the risk of teammates thinking that the project manager was incompetent or did not really have sufficient power to exercise his or her will. Thus, a reactive redundant communication, although necessary to get the job done if the intent to simply transmit failed, was not without its social costs.

Managers Without Power: Proactive Redundant Communication for Persuasion. Although eight of the project managers who were observed for this study worked with team members who reported to them directly, the remaining five did not. Their matrixed organization of work left these project managers without direct reporting authority over any employees. As a result, project managers often "stole" or "borrowed," as they called it, members of different teams in order to advance project imperatives. Just as the project managers normally juggled multiple projects concurrently, team members from the functional units were also working on a variety of project teams at any given time. These project managers constantly sought commitment from people they had no power over. They could not take for granted, as could their counterparts with positional power, that team members would, in due time, do what they asked. Instead, project managers without positional power worked strategically to "get people on board," as they frequently called it.

This absence of authority meant that when project managers encountered a discrepant event and made sense of it as a threat to the project, they were confident that they would need to convince team members that their interpretation was accurate. As Leah noted,

> When you don't have authority over your team nothing is ever totally for sure. I mean, you can't just tell them something's important 'cause they'll just say, "Well, Leah thinks this is important, but I've got some other manager whose project I'm working on and he says his stuff's important too." So what you've got to do is get them to where *they* think it's important. So if there's some sort of crisis and I say, "It's a crisis so you need to do *X*," they might say, "No, this isn't a crisis so *X* can wait." But if you can get it to the point where they think they decided it was a crisis then they'll say, "Hey, I need to be doing *X* 'cause this is a crisis" and they'll actually do it, which is what you want.

Put another way, project managers without positional power did not feel that they could easily transfer their interpretation of a threat through simply communicating it once to their team members. Instead, they had to find ways to engage team members in the decision to interpret a discrepant event as a threat and then act to resolve it.

As the data presented above show, project managers without positional power rarely responded to a discrepant event by initiating a single communication. Unlike project managers with positional power, project managers without power proactively engaged in redundant communication. That is, they decided on experiencing a discrepant event to communicate their interpretation that the event was a threat through two different media from the start. As Munir, a project manager at a computer services firm, commented, "If you're in a bind you want to get people on board and follow-up right away to solidify it."

Our data were replete with cases of project managers manipulating the timing of their communication to enroll team members with a pattern of using an instant medium to engage team members and then "following-up" with a delayed communication. Greg's interaction with his team members on a Wednesday morning provides a compelling example of how project managers without positional power used this *instant* → *delayed* redundant communication proactively. At 8:30 A.M., Greg arrived at a special meeting he had called for all of his project team members. Fourteen of 15 of the team members showed up at the conference room at the software company's main office building. The team had fallen behind schedule on the remediation and release of a new graphics application. Greg viewed this work delay as a major threat to the success of the project because the newest version of the application was already promised to several customers by a certain deadline. If Greg's team did not meet its deadline, the next software development team could not meet theirs, and the customers would receive the software behind schedule, which, based on contractual agreements, would result in a large financial penalty to his company. Thus, in an attempt to put his project team back on track, Greg decided to make use of a new corporate innovation for release projects called a "Design for Excellence Review" (DER).

Greg called the meeting to order and presented the guidelines for the DER to the team. Many of them were visibly annoyed; they rolled their eyes and whispered to one another while shaking their heads in dismay at yet another "best practice" for doing their job. Greg explained that a key tenet of the DER was that the team needed to complete a questionnaire, which would essentially certify that the team members were following the correct product development process. Greg did not go over the questionnaire but spent several minutes

stressing the importance of it for the team's progress. Greg explained that the DER would help them to overcome the threat of a missed deadline. Several team members indicated that they did not see why their current work delays were so problematic. Greg was able to provide them with several improvised explanations. Another team member indicated that he was not sure how the DER would help to get the team back on track. Again, Greg was able to talk through his reasoning and help the team members to see why the deadline posed a threat and how the DER would help them to meet the deadline. The meeting ended at 10:10 A.M.

At 11:00 A.M., Greg returned to his desk. At 11:25 A.M., he opened a new e-mail message. This excerpt from field notes captures the care with which he crafted it:

> Greg swivels his office chair to the left and launches an Outlook message. He clicks on the "To" button and gets a dialogue box. He scrolls down and clicks on the distribution list for the 15 people who are on his team. He composes an e-mail attaching an Excel file of the company's Product Development Process. In his e-mail, he writes, "As you are all aware, part of the Product Development Process that we're transitioning to requires that we complete a design for excellence review questionnaire." He continues to write, "There are pre-established set of questions that we need to go through as a cross-functional group." He requests that his team complete their respective sections on the questionnaire.

Greg labored for nearly 20 minutes on an e-mail (delayed communication) that redundantly communicated information discussed earlier in the face-to-face (instant communication) staff meeting and in individual face-to-face meetings with project team members. By first sending the message through an instant medium, Greg was able to secure a verbal commitment from his team members that they would complete the questionnaire. As he noted, "If you don't get a yes to your face, you never know if it'll get done. You don't want to be unsure." Greg was able to secure this verbal agreement despite initial opposition from his team because the instant face-to-face meeting allowed him to talk through and respond—in real time—to the concerns of his team members. In so doing, Greg was not simply telling them to buy his interpretation of a threat, but he was able to persuade them by linking the work delay to a possible missed deadline.

Following up the initial message through a delayed medium had two distinct advantages. First, managers who used this tactic could once again signal the importance of the message but could do so less obtrusively than through an instant medium. Second, use of a delayed medium to follow up on an initial message typically provided written documentation that had a permanence that instant voice-dependent communications lacked. An e-mail that sat in someone's inbox was a visual reminder that some task had yet to be accomplished. Following an episode of joint interpretation, the delayed summary of that initial preview served to reify it. Seneca, a project manager at a telecommunications company, reviewed the persuasion advantages that a manager without authority could accrue by redundantly communicating through an *instant → delayed* media pairing:

> When you're out to get buy-in from people, there's a fine line between too much and too little. You've got to talk to them. They've got to hear your voice so you can get the "yes." Once they've said "yes," they're compelled to do it. But you can't bother them too much or they may end up not doing it or doing a bad job. But you can circulate the information to them in other ways. Send them an e-mail or, you know, document what you want them to do in a [collaboration tool] or something. Then it's like there's this information environment out there where they see it over and over again and they remember they said "yes" to your face, and then they see all these things reminding them what they have to do so they feel guilty and they eventually do it to relieve that pressure.

Rebecca, another project manager at a computer software company, explained that one key difference between managing with and without positional power was the need for justification:

> I've been in jobs before where I directly supervised the project team. In those types of environments people don't question so much why you asked them to do something. But here in this job [where I don't have direct authority] they always ask "why?" So I have to make more justifications for why they should do something. They ask "why, why, why?" and if you can answer them right away instead of letting some time drag, then you look more competent. Later you can just fill in the details.

By communicating a message first through an instant medium, project managers without positional power could respond to questions from team members and, in so doing, provide clear justifications for the tasks they were assigning. Project managers felt that providing these clear justifications led to initial commitment through the fact that team members felt ownership over determining that the discrepant event was indeed a threat to the project. This ownership could then be reinforced via a delayed medium.

In summary, project managers without positional power engaged in proactive redundant communication to persuade their team members—that is, to get them to buy into changing their work to mitigate a threat and then to reify the importance of that change. Gaining this initial buy-in was crucial because without it, project managers felt that team members would be reluctant to complete assigned tasks. Initiating with an instant medium also allowed project managers to adjust their persuasive campaigns on the fly, enabling them to quickly justify their requests. Following up with

a medium that afforded delayed communication provided substance to previously communicated ephemeral messages. It also provided project managers with an additional opportunity to remind team members of the importance of the task, but it allowed them to do so in a less intrusive way, as receivers could access the message at their leisure and did not have to provide immediate answers.

Discussion

Research has shown that people feel increasingly overwhelmed by the amount of workplace communication they receive (Barley et al. 2011, Dabbish and Kraut 2006, Donabedian 2006). However, at the same time, research on multiple media use has shown that managers will engage in redundant communication with their subordinates: they send the same message to the same recipient through two or more unique media at multiple points in time (Bélanger and Watson-Manheim 2006, Stephens et al. 2008). Why would managers purposefully communicate nearly the exact same message a second time through a different medium when they know workers can barely keep up with their current volume of messages? Our findings provide a possible answer to this question as they unravel the relationships between discrepant events, power, and communication timing in the use of redundant communication.

All of the managers we studied communicated redundantly to their subordinates, but not all managers planned to do so. When confronted with a discrepant event that threatened to disrupt their project plans, managers with positional power chose media they believed were quick, efficient, and unobtrusive to transmit a message to subordinates that they had to change their work routines. When managers with power did not hear any reply from their subordinates or did not see any evidence of changed work routines, they grew worried that those subordinates did not fully appreciate the threat that this discrepant event posed. These communication breakdowns compelled managers with power to reactively initiate a second communication with the same message as the first, but through a medium that allowed them an opportunity to persuade subordinates that their project was under threat. By contrast, many of the project managers we studied without positional power were proactive in their use of redundant communication. From the onset of a discrepant event, they planned to communicate the same message twice because they realized, unlike their counterparts with power, that they were competing in a market for subordinates' time and attention. They were under no illusion that subordinates would believe the project was under threat just because a manager told them so. Consequently, managers without power used multiple media for communication to first enroll subordinates in interpretive behavior and persuade them that a discrepant event was indeed a threat, and, second, to reify that sensemaking and remind them that swift action had to be taken.

Our study suggests that managers without power were strategic users of redundant communication. They believed that sequential communications enacted through media with different affordances enabled them to generate buy-in from subordinates and also to keep their issues salient in an environment otherwise saturated with communications. In situations where managers do not have power, they strategically engage in sequential communication, and in situations where they have positional power, they do so only when necessary and in a reactive fashion. Their reactive use of redundant communication demonstrated that they often initially overestimated the extent to which they could easily and effortlessly foist their interpretation of events onto others. Realizing that a simple transmission of their own beliefs was not enough to provoke a change in action, they then shifted into persuasion mode by using a medium that allowed them to communicate interactively with subordinates to generate buy-in. Thus, we found that all although managers engaged in redundant communication, some used it as a strategic tool whereas others happened into its use in ways that simply added more weight to subordinates' communication load. These findings have important theoretical implications for the emerging body of work on multiple-media use in organizations.

Multiple Media: Power, Interpretation, and Persuasion

The study of multiple-media use in the organizations literature is in its infancy. Existing theories of media choice provide little guidance for explaining when, why, and how people use multiple media. Only in the last five years have scholars begun focusing on this increasingly common managerial practice in real depth. Our study has pushed this burgeoning line of research past its current focus on simultaneous media pairing (multitasking or multicommunicating) toward a deeper understanding of the more common practice of sequential media pairing, and for sure, the more vexing practice of redundant communication.

Our research clearly demonstrates that events disrupting the normal practice of work can be catalysts for witting (proactive) or unwitting (reactive) redundant communications. In our particular study with project managers, changes in work requirements or delays were two types of discrepant events. By their disruptive nature these events lead managers to believe that their goal is under threat. As numerous studies across a wide range of disciplines have shown, the perception of threat is more often a motivator of changes in the course of action than is the actual threat (Cohen 1978, Goldberg et al. 1991, Stephan et al. 1999). However, research also shows

that threat perception is not unilateral: some people can interpret an event as a severe threat whereas others do not. In discussions more specific to managerial behavior, research shows that middle managers (much like the project managers we studied) often view certain events as threats but have a hard time convincing superiors and subordinates alike that their interpretation is correct (Rouleau 2005, Waldron et al. 1993). Therefore, as our findings show, discrepant events that trigger threat perception may ultimately require that managers not simply communicate (transmit) the presence of threat to others but find ways of communicating that are helpful at convincing people that a threat exists.

To convince people that a threat existed, managers in our study ultimately had to enroll team members in the sensemaking process. That is, managers had to help team members come to believe that they (the team members) played a significant role in arriving at the conclusion that a discrepant event threatened the success of the project. Managers are perhaps more likely than workers on a team performing technical tasks to make sense of a disruptive event as a threat because they spend a significant portion of their time scanning the environment for possible threats. As research shows, scanning and interpreting the results of scanning (what Weick 1995, p. 35, called "bracketing and punctuating") are core to interpretation processes (Anderson and Nichols 2007, Thomas et al. 1993). Without engaging in these practices, workers on a team are less likely to quickly come to the belief that a disruptive event is a threat. We found evidence that team members pushed back against managers who simply told them that a threat existed because acknowledging that a discrepant event was threatening meant that they would have to change their work practice. Changing work practices on one project could affect their work on other projects, and consequently, they ran the risk of making a second or third manager unhappy by pleasing the first. For this reason, team members were not immediately apt to believe a threat existed if simply told; rather, they wanted information to make that determination on their own.

Thus, to persuade team members that a threat existed, project managers in our study had to jointly enroll them in the interpretation process. When team members felt like they contributed to the determination of whether or not a threat existed they were more likely to adapt their practices to mitigate it. Incidentally, we found that this joint interpretation occurred best through technologies that afforded instant communication. Although media richness theory suggests a link between media and ambiguity, no research explicitly documents the link between interpretation formation and instant communication. We believe that this relationship is compatible with Weick's (1995, p. 174) claim that interpretation is a process of "interactive intersubjectivity" that "takes place in interactive talk" (Weick et al. 2005, p. 413). Instant communication affords the interactivity—the back and forth or the coorientation—necessary to come to joint understanding. Given that managers have an agenda—they want team members to come to view particular discrepant events as threats—instant communication also allows them to defend their position, to add further evidence to assertions, and to steer conversations in new directions subtly to achieve their goals. Eventually, most managers in our study ended up employing instant media to enable joint interpretation about the existence of a threat.

What these findings suggest is that eventually all managers, regardless of type, end up using redundant communication in an attempt to persuade subordinates. Previous work on multiple-media use has suggested that managers use multiple communications to either seek information or persuade other to act (Stephens 2007, Watson-Manheim and Bélanger 2007). In these previous studies, researchers examined both simultaneous and sequential media pairings but did not draw distinctions as to whether one type of pairing was chosen for information seeking and another type for persuasion. We found no uses of redundant communication for information-seeking purposes, only for persuasion. Had we included in our sample instances of sequential communication that included communication of the same message again through the same media at a later time, it is possible that we would have found information-seeking practices. For example, a manager wants information about the status of a project and sends an e-mail to procure it; after hearing no response, he sends another e-mail asking for it again. We believe we did not uncover such information-seeking behaviors in the use of redundant communication studied here because the act of choosing a new medium for communication was a deliberate attempt to procure a particular type of response. In other words, the second communication was meant to do something different from the first.

Across our study, media that afforded instant communication were nearly always used for joint interpretation formation and generating buy-in. This pattern held regardless of whether or not a manager had power and regardless of whether the instant communication was the first or second communication in a sequence. However, we found marked differences in how managers used media that afforded delayed communication. Managers with power attempted to use delayed media for message transmission. These managers felt that their positions afforded them the power to force their interpretations on others; thus, they planned to follow a discrepant event by simply transmitting a message that a threat existed. Research shows that this is a common perception: managers with power and authority feel that they can simply pass on their own interpretations to lower-status employees and that those employees will agree (Bartunek et al. 1999). Sometimes managers with authority were correct in their assessment: their position

gave them the ability to simply shape team members' interpretations through message transmission. However, more often than not, managers with power overestimated their ability to get people to do what they wanted without proper motivation—a finding not particular to our study (Galinsky et al. 2006). In such cases, managers with authority then had to reactively use a second, instant communication to enroll team members in the interpretation process. Managers without power never believed that they could make people do what they wanted simply by telling them to do so. They began their communications with media that afforded instant communication to actively enroll team members in the interpretation process, thereby motivating those team members to act. Their use of a second, delayed communication was for confirmation and reification of that interpretive process.

These findings point to the importance of incorporating notions of power and technology affordances into research on multiple-media use. Our research suggests that managers, regardless of whether they have power or not, perceive instant media as useful for persuasion. However, their differences with respect to power account, in a substantial way, for how they perceive the utility of media that enable delayed communication. Power, it seems, makes it difficult for managers to recognize that they face a situation where persuasion is necessary. Thus, their initial perception of a medium that supports delayed communication is that it is useful for quick and effortless message transmission. However, when a communication breakdown occurs, the blinders of power come off, and managers begin to perceive the utility of a medium useful for delayed communication as a tool that allows them to concretize a persuasive attempt. Thus, our findings add to the literature on multiple-media choice the notion that managerial power conditions perceptions of useful media combinations and that not all combinations of media into patterns of redundant communication look alike. Based on differences in how their features are perceived, managers arrange particular media into distinct combinations that afford different action possibilities.

We have also shown that theories of media use that describe people actively *choosing* to use multiple media for sequential communication (e.g., Bélanger and Watson-Manheim 2006, Stephens et al. 2008) may not be entirely accurate. Managers in powerful positions did not actively choose to use multiple media because they made two perceptual mistakes. First, they believed that their sensemaking and subsequent interpretation of an event as a threat was the only plausible interpretation. Second, they believed that because theirs was the only interpretation, people in lower power positions than they would believe it and act on it. Managers without power did not suffer these two illusions. Instead, they proactively used multiple media to engage in sensemaking and to reify that sensemaking. Although some studies of single media use show that people with different positions of power often choose to use different media (Rice et al. 1992, Saunders et al. 1994), most have linked these differences in choice to symbolic aspects of the medium (Trevino et al. 1990) or of time available for reflection about communication (Timmerman 2002). Our study posits an alternative for considerations of multiple-media use: people with different positions of power have distinct understandings of how certain media are useful for sensemaking versus sensegiving. Thus, our study encourages researchers to incorporate notions of sensemaking and power into theories of media choice. Moreover, it points to the need to augment studies showing that people engage in interpretive behaviors to determine what a new technology is good for (Leonardi 2009, Orlikowski and Gash 1994), with an understanding that people use new technologies because they are perceived to provide some affordances for engaging others in sensemaking about work-related issues or they are perceived to afford easy message transmission.

Limitations and Conclusion

Like all studies, our choice of data collection and analysis procedures limit the type of claims that we can make. However, the limitations of this particular study provide the basis for future research in this area. Our decision to capture the redundant communication practices of project managers by using ethnographic methods, while helping us uncover behavioral patterns in a natural setting, limits our ability to generalize broadly across functional areas. To try to overcome this limitation, we studied and documented the same project manager behavioral patterns across several companies and industries. Nevertheless, additional inquiry using survey research might help to determine how widely redundant communication is practiced and if similar sequential pairings of technology are used to achieve the influence goals we discovered. Our findings may guide deductive undertakings by sharpening relationships related to delayed and instant media, and power in media use, as well as compliance outcomes.

Although project management work offers a fruitful functional context in which to study redundant communication practices, our study was limited in at least two ways. First, we began our data collection during ongoing projects, which precludes us from understanding how initial media-use inclinations characterized the patterns we recorded midprocess. A related concern involves the extent to which project team members may have set the delayed/instant patterns at the onset. Furthermore, our focus was on the work of project managers, not the people they managed. Therefore, we can claim with confidence that project managers paired media in such ways so as to simply transmit their interpretations or to enroll others in the process of interpretation formation, but we do not know whether these media pairings

actually allowed them to achieve their goals—we know only project managers' own perceptions of whether their goals were achieved or not. To make such a determination, research would be needed that tests the level of action taken by message receivers and the commitment they exhibited to a manager's plans upon receiving redundant communications through multiple media. Future studies that attend to both sender and receiver behaviors may shed light on the recursive dynamics between collaboration and leadership.

Because we coded only for two instances of media use within a redundant communication, we also do not know whether project managers with power who reactively used an instant medium to follow up a failed transmission attempt then communicated one more time with a delayed communication to reify that interpretation as their counterparts without power did. Studies that examine redundant communication specifically, or multiple-media use more broadly, with more than two media involved may be able to add more nuance to our findings and determine whether there is a point at which emergent redundant communication activity actually becomes strategic. Furthermore, because we did not focus on the work of those managed by our informants, we do not know whether a workers' simultaneous involvement in more than one team at a time may affect their willingness to do what one manager asks of them and/or to makes sense of disruptive events as threat. Thus, it would seem that future research might also want to consider the effects that multiteaming (e.g., Chudoba et al. 2005) may have on people's willingness to interpret information and, consequently, managers' beliefs that they must engage in redundant communication to appropriately convince them. We offer this study as an important first step toward understanding the implications of redundant communication in an increasingly mediated world.

Acknowledgments

The authors thank Steve Barley for his support, encouragement, and good ideas throughout the development of this paper. Senior Editor Ann Majchrzak and three anonymous reviewers provided very helpful comments that have improved this paper immensely. The authors are also grateful to Ingrid Erickson, Ralph Maurer, Michael Helms, Jyoti Rahi, Dede O'Mara, and Olivia Williamson for their assistance in data collection.

Endnotes

[1]Note that the decision to code only the use of communications media (as opposed to every information communication technology used by informants) along with our selection only of instances of redundant communication (outlined in the next paragraph of the Data Analysis section) distinguished our approach from that taken by Stephens et al. (2008).

[2]This hallway encounter was not coded as part of a redundant communication because it was a reflection on the previous communication event. It is provided here only to illustrate how the informants' thoughts were changed through the redundant communication event.

References

Anderson, M. H., M. L. Nichols. 2007. Information gathering and changes in threat and opportunity perceptions. *J. Management Stud.* **44**(3) 367–387.

Barley, S. R., D. E. Meyerson, S. Grodal. 2011. E-mail as a source and symbol of stress. *Organ. Sci.* **22**(4) 887–906.

Bartunek, J. M., R. M. Krim, R. Necochea, M. Humphries. 1999. Sensemaking, sensegiving, and leadership in strategic organizational development. J. A. Wagner III, ed. *Advances in Qualitative Organization Research*, Vol. 2. JAI Press, Greenwich, CT, 37–71.

Becker, H. S. 1996. The epistemology of qualitative research. R. Jessor, A. Colby, R. Schweder, eds. *Essays on Ethnography and Human Development*. University of Chicago Press, Chicago, 53–71.

Bélanger, F., M. B. Watson-Manheim. 2006. Virtual teams and multiple media: Structuring media use to attain strategic goals. *Group Decision Negotiation* **15**(4) 299–321.

Belbin, R. M. 2001. *Managing Without Power*. Butterworth-Heinemann, New York.

Cameron, A. F., J. Webster. 2005. Unintended consequences of emerging communication technologies: Instant messaging in the workplace. *Comput. Human Behav.* **21**(1) 85–103.

Chudoba, K. M., M. B. Watson-Manheim, C. S. Lee, K. Crowston. 2005. Meet me in cyberspace: Meetings in the distributed work environment. Paper presented at the Academy of Management Conference, Honolulu, August 5–10.

Chudoba, K. M., E. Wynn, M. Lu, M. B. Watson-Manheim. 2005. How virtual are we? Measuring virtuality and understanding its impact in a global organization. *Inform. Systems J.* **15**(4) 279–306.

Cialdini, R. B. 2001a. Harnessing the science of persuasion. *Harvard Bus. Rev.* **79**(9) 72–79.

Cialdini, R. B. 2001b. *Influence: Science and Practice*. Allyn & Bacon, Boston.

Cohen, R. 1978. Threat perception in international crisis. *Political Sci. Quart.* **93**(1) 93–107.

Cornelius, C., M. Boos. 2003. Enhancing mutual understanding in synchronous computer-mediated communication by training: Trade-offs in judgmental tasks. *Comm. Res.* **30**(2) 147–177.

Dabbish, L., R. Kraut. 2006. Email overload at work: An analysis of factors associated with email strain. *Proc. ACM Conf. Comput. Supported Cooperative Work* (*CSCW* 2006), ACM, New York, 431–440.

Daft, R. L., R. H. Lengel, L. K. Trevino. 1987. Message equivocality, media selection, and manager performance: Implications for information systems. *MIS Quart.* **11**(3) 355–366.

Davidson, E. J. 2002. Technology frames and framing: A socio-cognitive investigation of requirments determination. *MIS Quart.* **26**(4) 329–358.

Dennis, A. R., R. M. Fuller, J. S. Valacich. 2008. Media, tasks, and communication processes: A theory of media synchronicity. *MIS Quart.* **32**(3) 575–600.

Donabedian, B. 2006. Optimization and its alternative in media choice: A model of reliance on social-influence processes. *Inform. Soc.* **22**(3) 121–135.

Dunne, E. J., Jr., M. J. Stahl, L. J. Melhart Jr. 1978. Influence sources of project and functional managers in matrix organizations. *Acad. Management J.* **21**(1) 135–140.

Eisenhardt, K. M. 1989. Building theories from case study research. *Acad. Management Rev.* **14**(4) 532–550.

Fine, G. A. 2007. *Authors of the Storm: Meteorologists and the Culture of Prediction*. University of Chicago Press, Chicago.

French, J. P. R., Jr., B. Raven. 1960. The bases of social power. D. Cartwright, A. Zander, eds. *Group Dynamics*. Harper & Row, New York, 607–623.

Galinsky, A. D., D. H. Gruenfeld, J. C. Magee. 2003. From power to action. *J. Personality Soc. Psych.* **85**(3) 453–466.

Galinsky, A. D., J. C. Magee, M. E. Inesi, D. H. Gruenfeld. 2006. Power and perspectives not taken. *Psych. Sci.* **17**(12) 1068–1074.

Garrett, R. K., J. N. Danziger. 2007. IM = interruption management? Instant messaging and disruption in the workplace. *J. Comput.-Mediated Comm.* **13**(1) 23–42.

Goldberg, A. I., E. M. Dar-El, A.-H. E. Rubin. 1991. Threat perception and the readiness to participate in safety programs. *J. Organ. Behav.* **12**(2) 109–122.

Jones, E. E. 1964. *Ingratitation: A Social-Psychological Analysis*. Appleton-Century-Crofts, New York.

Keltner, D., D. H. Gruenfeld, C. Anderson. 2003. Power, approach, and inhibition. *Psych. Rev.* **110**(2) 265–284.

Kunda, G. 1992. *Engineering Culture: Control and Commitment in a High-Tech Corporation*. Temple University Press, Philadelphia.

Kurke, L. B., H. E. Aldrich. 1983. Mintzberg was right!: A replication and extension of *The nature of managerial work*. *Management Sci.* **29**(8) 975–984.

Leonardi, P. M. 2007. Activating the informational capabilities of information technology for organizational change. *Organ. Sci.* **18**(5) 813–831.

Leonardi, P. M. 2009. Why do people reject new technologies and stymie organizational changes of which they are in favor? Exploring misalignments between social interactions and materiality. *Human Comm. Res.* **35**(3) 407–441.

Lincoln, Y. S., E. G. Guba. 1985. *Naturalistic Inquiry*. Sage, Beverly Hills, CA.

MacKenzie, D. 2006. *An Engine, Not a Camera: How Financial Models Shape Markets*. MIT Press, Cambridge, MA.

Magee, J. C., A. D. Galinsky. 2008. Social hierarchy: The self-reinforcing nature of power and status. *Acad. Management Ann.* **2** 351–398.

Majchrzak, A., R. E. Rice, A. Malhotra, N. King, S. L. Ba. 2000. Technology adaptation: The case of a computer-supported inter-organizational virtual team. *MIS Quart.* **24**(4) 569–600.

Mazmanian, M. A., W. J. Orlikowski, J. Yates. 2005. Crackberries: The social implications of ubiquitous wireless e-mail devices. C. Sørensen, Y. Yoo, K. Lyytinen, J. I. DeGross, eds. *Designing Ubiquitous Inform. Environments: Socio-Technical Issues Challenges*, *IFIP International Federation for Information Processing*, Vol. 185. Springer, New York, 337–343.

McGregor, D. 1960. *The Human Side of the Enterprise*. McGraw-Hill, New York.

Miller, R. L., P. Brickman, D. Bolen. 1975. Attribution versus persuasion as a means for modifying behavior. *J. Personality Soc. Psych.* **31**(3) 430–441.

Miller, S., D. Hickson, D. Wilson. 1996. Decision-making in organizations. S. R. Clegg, C. C. Hardy, W. R. Nord, eds. *Handbook of Organizational Studies*. Sage, London, 293–312.

Mintzberg, H. 1971. Managerial work: Analysis from observation. *Management Sci.* **18**(2) B-97–B-110.

Munkejord, K. 2007. Multiple media use in organizations: Identifying practices leading to an alignment paradox. *J. Inform., Inform. Tech., Organ.* **2** 95–118.

Nadler, D. A., M. L. Tushman. 1980. A model for diagnosing organizational behavior. *Organ. Dynam.* **9**(2) 35–51.

Nardi, B. A., S. Whittaker, E. Bradner. 2000. Interaction and outeraction: Instant messaging in action. *Proc. 2000 ACM Conf. Comput. Supported Cooperative Work*, ACM, New York, 79–88.

O'Keefe, D. J. 2002. *Persuasion: Theory and Research*, 2nd ed. Sage, Thousand Oaks, CA.

Orlikowski, W. J., D. C. Gash. 1994. Technological frames: Making sense of information technology in organizations. *ACM Trans. Inform. Systems* **12**(2) 174–207.

Peters, T., N. Austin. 1985. MBWA (managing by walking around). *Calif. Management Rev.* **28**(1) 9–34.

Pfeffer, J. 1994. *Competitive Advantage Through People: Unleashing the Power of the Work Force.* Harvard Business School Press, Cambridge, MA.

Pfeffer, J., R. I. Sutton. 2006. Evidence-based management. *Harvard Bus. Rev.* **84**(1) 63–74.

Pich, M. T., C. H. Loch, A. De Meyer. 2002. On uncertainty, ambiguity, and complexity in project management. *Management Sci.* **48**(8) 1008–1023.

Putnam, L. L., N. Phillips, P. Chapman. 1996. Metaphors of communication and organization. S. R. Clegg, C. C. Hardy, W. R. Nord, eds. *The Sage Handbook of Organization Studies*. Sage, Newbury Park, CA, 375–408.

Reinsch, N. L., Jr., J. W. Turner, C. H. Tinsley. 2008. Multicommunicating: A practice whose time has come? *Acad. Management Rev.* **33**(2) 391–403.

Rice, R. E., S.-J. Chang, J. Torobin. 1992. Communicator style, media use, organizational level, and use and evaluation of electronic messaging. *Management Comm. Quart.* **6**(1) 3–33.

Rouleau, L. 2005. Micro-practices of strategic sensemaking and sensegiving: How middle managers interpret and sell change every day. *J. Management Stud.* **42**(7) 1413–1441.

Rozin, P. 2001. Social psychology and science: Some lessons from Solomon Asch. *Personality Soc. Psych. Rev.* **5**(1) 2–14.

Saunders, C. S., D. Robey, K. A. Vaverek. 1994. The persistence of status differentials in computer conferencing. *Human Comm. Res.* **20**(4) 443–472.

Schriesheim, C. A., T. R. Hinkin. 1990. Influence tactics used by subordinates: A theoretical and empirical analysis and refinement of the Kipnis, schmidt, and Wilkinson subscales. *J. Appl. Psych.* **75**(3) 246–257.

Sheremata, W. A. 2000. Centrifugal and centripetal forces in radical new product development under time pressure. *Acad. Management Rev.* **25**(2) 389–408.

Singh, B. P. 1988. Behaviuoral strategies for influencing immediate superiors. *Psychologia* **31**(1) 34–41.

Staudenmayer, N., M. Tyre, L. Perlow. 2002. Time to change: Temporal shifts as enablers of organizational change. *Organ. Sci.* **13**(5) 583–597.

Stephan, W. G., C. W. Stephan, W. B. Gudykunst. 1999. Anxiety in intergroup relations: A comparison of anxiety/uncertainty management theory and integrated threat theory. *Internat. J. Intercultural Relations* **23**(4) 613–628.

Stephens, K. K. 2007. The successive use of information and communication technologies at work. *Comm. Theory* **17**(4) 486–507.

Stephens, K. K., J. Davis. 2009. The social infleunces on electronic multitasking in organizational meetings. *Management Comm. Quart.* **23**(1) 63–83.

Stephens, K. K., S. A. Rains. 2011. Information and communication technology sequences and message repetition in interpersonal interaction. *Comm. Res.* **38**(1) 102–122.

Stephens, K. K., J. O. Sornes, R. E. Rice, L. D. Browning, A. S. Sætre. 2008. Discrete, sequential, and follow-up use of information and communication technology by experienced ICT users. *Management Comm. Quart.* **22**(2) 197–231.

Strauss, A., J. Corbin. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 2nd ed. Sage, Thousand Oaks, CA.

Thamhain, H. J., G. R. Gemmill. 1974. Influence styles of project managers: Some project performance correlates. *Acad. Management J.* **17**(2) 216–224.

Theobald, T., C. L. Cooper. 2006. *Shut Up and Listen: The Truth About How to Communicate at Work*. Kogan Page, London.

Thomas, J. B., S. M. Clark, D. A. Gioia. 1993. Strategic sensemaking and organizational performance: Linkages among scanning, intepretation, action, and outcomes. *Acad. Management J.* **36**(2) 239–270.

Timmerman, C. E. 2002. The moderating effect of mindlessness/mindfulness upon media richness and social influence explanations of organizational media use. *Comm. Monogr.* **69**(2) 111–131.

Timmerman, C. E., C. R. Scott. 2006. Virtually working: Communicative and structural predictors of media use and key outcomes in virtual work teams. *Comm. Monogr.* **73**(1) 108–136.

Tompkins, P. K., M. Wanca-Thibault. 2001. Organizational communication: Preludes and prospects. F. M. Jablin, L. L. Putnam, eds. *The New Handbook of Organizational Communication: Advances in Theory, Research, and Methods*. Sage, Thousand Oaks, CA, xvii–xxxi.

Tractinsky, N., S. L. Jarvenpaa. 1995. Information systems design decisions in a global versus domestic context. *MIS Quart.* **19**(4) 507–534.

Trevino, L. K., R. L. Daft, R. H. Lengel. 1990. Understanding managers' media choices: A symbolic interactionist perspective. J. Fulk, C. Steinfield, eds. *Organizations and Communication Technology*. Sage, Newbury Park, CA, 71–94.

Trevino, L. K., R. Lengel, W. Bodensteiner, E. Gerloff, N. Muir. 1990. The richness imperative and cognitive style: The role of individual differences in media choice behavior. *Management Comm. Quart.* **4**(2) 176–197.

Turner, J. W., N. L. Reinsch Jr. 2007. The business communicator as presence allocator: Multicommunicating, equivocality, and status at work. *J. Bus. Comm.* **44**(1) 36–58.

Tyre, M. J., W. J. Orlikowski. 1994. Windows of opportunity: Temporal patterns of technological adaptation in organizations. *Organ. Sci.* **5**(1) 98–118.

Valacich, J. S., J. F. George, J. F. Nunamaker Jr., D. R. Vogel. 1994. Physical proximity effects on computer-mediated group idea generation. *Small Group Res.* **25**(1) 83–104.

Waldron, V. R., M. D. Hunt, M. Dsilva. 1993. Towards a threat management model of upward communication: A study of influence and maintenance tactics in the leader-member dyad. *Comm. Stud.* **44**(3/4) 254–272.

Walther, J. B. 1995. Relational aspects of computer-mediated communication: Experimental observations over time. *Organ. Sci.* **6**(2) 186–203.

Watson-Manheim, M. B., F. Bélanger. 2007. Communication media repertoires: Dealing with the multiplicity of media choices. *MIS Quart.* **31**(2) 267–293.

Weick, K. E. 1995. *Sensemaking in Organizations*. Sage, Thousand Oaks, CA.

Weick, K. E., K. M. Sutcliffe, D. Obstfeld. 2005. Organizing and the process of sensemaking. *Organ. Sci.* **16**(4) 409–421.

Woerner, S. L., W. J. Orlikowski, J. Yates. 2004. The media toolbox: Combining media in organizational communication. Paper presented at the Academy of Management Annual Conference, New Orleans, August 6–11.

Yukl, G. 1989. Managerial leadership: A review of theory and research. *J. Management* **15**(2) 251–289.

Yukl, G., P. J. Guinan, D. Sottolano. 1995. Influence tactics used for different objectives with subordinates, peers, and superiors. *Group Organ. Management* **20**(3) 272–296.

Paul M. Leonardi is an assistant professor in the departments of communication studies and industrial engineering and management science at Northwestern University, where he holds the Allen K. and Johnnie Cordell Breed Junior Chair in Design. He explores how organizations can employ advanced information technologies to more effectively create and share knowledge. This focus draws attention to the processes through which technological artifacts and informal communication practices coevolve.

Tsedal B. Neely is an assistant professor of organizational behavior at the Harvard Business School. She received her Ph.D. in organization studies from Stanford University's Management Science and Engineering department. Her research focuses on the challenges that collaborators face when attempting to coordinate work across national and linguistic boundaries, with special emphasis in the impact of language and communication on social dynamics.

Elizabeth M. Gerber received her Ph.D. in management science and engineering from Stanford University. She is currently assistant professor of mechanical engineering at the Segal Design Institute at Northwestern University. Her research investigates design and innovation work, technology, and organization.