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Distance, ambiguity and appropriation: Structures affording impression management in a collocated organization

Jeremy Birnholtz *, Graham Dixon, Jeffrey Hancock

Departments of Communication and Information Science, Cornell University, 336 Kennedy Hall, Ithaca, NY 14853, United States

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ABSTRACT

Communication and collaboration technologies have recently given rise to unprecedented flexibility in work arrangements, including telecommuting and virtual teams with geographically distributed participants. Much research has consisted of comparing distant and collocated teams, arguing that distance constrains communication opportunities, but this effect can be countered somewhat with communication media. In an "always connected" world, however, traditional conceptualizations of distance may be less useful in that communication opportunities are virtually constant for both distant and collocated teams. Working from an adaptive structuration perspective, we argue for a more nuanced treatment of distance, looking at its more specific effects, such as regulating the probability of unexpected face-to-face encounters, and affecting individuals' control over the release of information. We show that even in a collocated setting, members of the organization we studied enacted structures that reflected the effects of distance on their behavior, but also reflected social constraints that enabled control over information flow, and the use of language to explain their behavior and maintain positive impressions.

1. Introduction and background

Communication and collaboration technologies have recently given rise to unprecedented flexibility in work arrangements (e.g., Bailey, Leonardi, & Barley, 2011; DeSanctis & Monge, 1998; Olson, Zimmerman, & Bos, 2008). While the notion of working in an office clearly has not gone away as some once predicted, there is substantial evidence of people working together across distance in many ways, including teleworking from home (Dimitrova, 2003; Leonardi, Treem, & Jackson, 2010), distributed or virtual teams within organizations (DeSanctis & Monge, 1998; Jang, Steinfield, & Pfaff, 2002), and teams that span or transcend organizational boundaries to facilitate large, complex projects not previously possible (Cummings & Kiesler, 2007; Nentwich, 2003). Importantly, these same technologies – including conferencing systems, awareness tools (Tang, 2007), calendar/scheduling systems (Palen & Grudin, 2002), messaging (Handel & Herbsleb, 2002) – have also provided collocated work teams with unprecedented options and tools for communication and coordination.

As Leonardi et al. (2010) point out, a key assumption in the adoption of communication media in distributed groups is frequently that the technology will serve to decrease perceived distance between collaborators by affording awareness of each other's presence, availability and activities, and increasing opportunities for communication (Olson & Olson, 2001). An adaptive structuration approach, however, would suggest that users will also appropriate these technologies to achieve their own objectives (DeSanctis & Poole, 1994; Orlikowski, 2000).

More generally, adaptive structuration theory is concerned with the ways in which users appropriate technologies to accomplish goals that are specific to their environment, and that may not be congruent with those of the technology designers (DeSanctis & Poole, 1994). In this view, technologies act as structures that constrain individual agency, but social structures and recurring action patterns also shape and constrain behavior. Moreover, Orlikowski (2000) suggests that work practices and technology usage change over time, and that changes in both work practice and technology can yield unexpected outcomes.

Consistent with this approach, Leonardi et al. saw evidence of teleworkers using media to both increase *and* decrease perceptions of distance: by exploiting opportunities for mediated interaction, but also exploiting ambiguity afforded by distance to dissimulate; that is, create impressions of activities or work arrangements not actually taking place (e.g., saying one is too busy to talk, when this is technically not true). Leonardi et al. present these results in contrast to collocated teams, and suggest a more dynamic, nuanced conceptualization of "distance" that reflects notions of availability and controls over information flow.

We argue that a more nuanced treatment of distance should also force re-examination of media usage in collocated groups.

* Corresponding author. Tel.: +1 607 255 7819; fax: +1 607 254 1322.
E-mail addresses: jpb277@cornell.edu (J. Birnholtz), gnd5@cornell.edu (G. Dixon), jth34@cornell.edu (J. Hancock).

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After all, many collocated workers also report a sense of communication overload or being overwhelmed by opportunities to communicate, at the expense of time to get work done (Czerwinski, Horvitz, & Wilhite, 2004; Turkle, 2011; Whittaker & Sidner, 1996). There is also substantial emerging evidence that people in social settings exploit ambiguities afforded by media to craft sometimes-deceptive explanations for behavior that might otherwise seem rude or anti-social (e.g., texting "I'm on my way" before one has actually left home to explain impending tardiness) (Birnholtz, Guillory, Hancock, & Bazarova, 2010; Hancock et al., 2009; Reynolds et al., 2011).

1.1. Distance, ambiguity and appropriation

In most treatments of communication technology, perceived distance – frequently geographic – is treated as a constraint on awareness and communication opportunities, and one that technologies seek to bridge by affording opportunities to share awareness information and better coordinate opportunities for interaction (e.g., DeSanctis & Monge, 1998; Olson & Olson, 2001; Tang, 2007).

This relatively simple conceptualization of distance is challenged by many properties of the current technological environment. In the first place, distance certainly constrains the opportunity to interact with others face-to-face, but does not limit the opportunity to interact with them at all. Quite the contrary sometimes seems true, in fact, with many observers commenting that in an "always on" world, people feel overloaded by communication opportunities (Chen, 2011; Gonzalez & Mark, 2004; Turkle, 2011). Moreover, a recent Pew report (Smith, 2011) found that 29% of participants periodically turn off their phones simply to get a break from the interaction opportunities it provides. Thus, it is no longer the mere fact of geographic distance that constrains opportunities for interaction with others.

As a result, the distinction between "local" and "distant" workgroups or collaborators is becoming less useful. Indeed, it is a relatively small number of groups that experience the sort of "radical collocation" (e.g., Teasley, Covi, Krishnan, & Olson, 2002) that truly facilitates near-constant awareness and in which most interaction is likely to be face-to-face. Even groups working in the same building or site often consist of individuals who work in separate offices, have multiple simultaneous projects; and use media to communicate and coordinate a substantial fraction of the time (Tyler & Tang, 2003; Whittaker, 2005).

At the same time, there are clear differences between interacting with those who are physically close and those who are distant. Teasley et al. (2002) found radically collocated groups to be significantly more productive, for example; and Cummings and Kiesler, (2007) suggest that researchers on the same campus have fewer coordination problems and are often more productive. We argue here for a more nuanced treatment of distance that reflects two key traits that constrain behavior: (1) regulation of the likelihood of face-to-face interactions, and (2) ambiguity about others' behavior. We do so using an adaptive structuration approach (DeSanctis & Poole, 1994), suggesting that users will appropriate technologies in ways that are not always congruent with designers' intent, and that they do so by enacting structures that arise through continued practice and use of systems (Orlikowski, 2000).

1.2. Distance and face-to-face encounters

The first constraint of distance is that it serves as one key regulator of the probability of face-to-face encounters. Repeated studies have shown that people talk more to those who are physically closer to them (Allen, 1977; Kraut, Egido, & Galegher, 1990). It is easier to be aware of those who are physically proximate (Bellotti & Bly, 1996), to start conversations with them (Birnholtz, Gutwin, & Hawkey, 2007; Whittaker, Frohlich, & Daly-Jones, 1994), and to overhear or unexpectedly encounter others (Teasley et al., 2002). In other words, despite media that enable interaction with others, it is often simply easier to talk to others who are physically proximate.

At the same time, however, distance also regulates the probability of unexpected encounters, and this makes it more difficult to avoid others. In conversations with physicists who commuted between their home universities in the United States and the CERN particle accelerator in Geneva, Switzerland, for example, Birnholtz (2007) found that many thought it worthwhile to fly to Geneva once per month simply to increase the likelihood that they would receive responses to emails from colleagues at CERN (i.e., so they could see them in the cafeteria or knock on their doors).

In other words, it is easier for those who are physically distant to create false impressions online than it is for those who are physically proximate, because the probability that they will be seen or caught in the act is lower (Leonardi et al., 2010). A similar principle underlies self presentation in online environments. Early work on online identity suggested that people could deeply explore alternative identities online (e.g., Turkle, 1995), with few real constraints on their behavior. This early work, however, assumed a vastly distributed, global Internet user population; and that people were looking for online-only friends who they were unlikely to meet face-to-face. Increasingly, however, the rise of social networking and online dating sites means that boundaries between online and offline social worlds are blurred (Ellison, Hancock, & Toma, in press). People use the online environment to manage and expand networks of friends, many of whom they know or would like to meet offline. This increases the probability of face-to-face encounters, which constrains the extent to which people can manipulate their identity or other factors that affect others' impressions of them (Toma, Hancock, & Ellison, 2008). Face-to-face encounters constrain when and how people could use technology to manipulate others' impressions. Toma et al., for example, found that online daters were more likely to lie about their weight than their age, likely because weight is a variable trait that is difficult to verify.

In this way, there are clear differences between the telecommuters studied by Leonardi et al. (2010) and those who work together at the same site, but we would still expect those who are at the same site to engage in some dissimulation. We would expect, however, that they would do so differently, because the probability of encountering colleagues is higher. Thus the first research question being asked here is:

> RQ1: How do people at the same site appropriate technologies and enact structures that enable them to manage others' impressions of them, even when the probability of encounter is high?

1.3. Distance and ambiguity

In addition to the probability of encounter, distance also affects the visibility of behavior (Herbsleb, Mockus, Finholt, & Grinter, 2000; Hinds & Bailey, 2003). Distance mediates a critical balance between transparency and ambiguity. When people are radically collocated (and distance is close to zero), others are readily visible. While there are strategies people use in these environments (e.g., putting on headphones or focusing intently on work, as detailed in Birnholtz et al., 2007) to signal their availability or activities to others, it is more difficult to hide or give the impression that one is doing things not actually taking place. As distance increases beyond the radical collocation of a shared room, however, people are no longer constantly visible to each other and there is some ambiguity about others' attention or activities (Boehner & Hancock, 2006).

The ambiguity that results from this uncertainty about behavior can be strategically exploited to create the appearance of normative behavior even when it is not taking place. This is similar to what (Aoki & Woodruff, 2005) refer to as technology "making space for stories" (e.g., using technological failure as an excuse for potentially anti-social behavior) and what Hancock et al. (2009) refer to as "butler lies." In Hancock et al.'s study, participants were observed to draw frequently on the ambiguity associated with different media in the generation of sometimes-deceptive explanations for unexpected or potentially rude behavior.

Many technologies have been developed that are intended to reduce ambiguity about the behavior of others. As Clark and Brennan (1991) point out, media have different features that can constrain or afford grounding, the process by which conversants come to mutually understand one another well enough for current purposes. We are not interested in grounding, per se, but the variation in available contextual information changes the amount ambiguity about others' context and nonverbal cues varies. In a video conference where a camera reveals some aspects of the background, for example, it is more difficult to plausibly argue that one is in an inappropriate setting for conversation, although as Aoki and Woodruff note such an excuse can even more easily be made by telephone where it is more difficult to verify.

In addition to ambiguity about the immediate context of communication, there are also systems that reduce ambiguity about others' behavior more generally. Some recent messaging systems such as Blackberry Messenger and Apple's new iMessage app, for example, have features that enable message senders to see when their message has been received and, presumably, read. Similar features are available on proprietary corporate email systems such as Lotus Notes. This eliminates ambiguity about whether the message has been delivered or if the receiver has checked their messages since it arrived. There is some limited evidence to suggest that people confronted with this threat to ambiguity will alter their behaviors in ways that restore it, such as delaying the opening of messages (Reynolds et al., 2011).

Calendar systems also serve reduce ambiguity about others' schedules to make coordinating available meeting times easier, though these systems were slow to gain popularity (Grudin; Palen & Grudin, 2002). The easy availability of location data with the spread of GPS-enabled devices has also given rise to a series of systems that reduce ambiguity about others' locations, either by giving others the ability to see one's location any time (e.g., Google Latitude), giving them a limited time horizon for doing so (e.g., Glympse) or allowing people to "check in" at certain locations to indicate to certain members of their social network that they are there (e.g., Facebook locations, Foursquare) (Arminen, 2006; Barkuus & Dey, 2003; Consolvo et al., 2005; Lindqvist, Cranshaw, Wiese, Hong, & Zimmerman, 2011).

Other systems have attempted to combine these details to reduce ambiguity further. The Palm Pre, for example, had a feature that used a combination of GPS and calendar data to send an automated "I'm running late" message when somebody's current location was sufficiently far from the location of their next meeting. This feature was met with public skepticism, however; as have many location-sharing systems (Buchanan, 2009).

This skeptical reaction to features that threaten ambiguity highlights the importance of ambiguity in maintaining impressions and relationships, as well as the value of being able to use language to explain one's behavior and ensure that it is being interpreted in a positive light (e.g., Cody & McLaughlin, 1990; Scott & Lyman, 1968). Simply sharing information without explanation cedes some control over interpretation, which can have significant relational consequences if the message is perceived negatively.

We would therefore expect people in an organizational setting to respond to systems that threaten ambiguity by enacting structures that both preserve ambiguity and their ability to explain their behavior and manage others' impressions of them. Thus, the second question to be addressed here is:

> RQ2: How do people in a co-located organizational setting appropriate technologies and enact structures that enable them to retain ambiguity and control over others' impressions of them? If so, what is the nature of these structures?

2. Research context and methods

Between July–October 2010, semi-structured interviews lasting 30–45 min were conducted with 23 employees (six female, 17 male) of a technology-based corporate research lab in the Northeastern United States. Participants included 19 research scientists, one administrative assistant, and three department heads. Female participation in our study was low, but this was consistent with female presence in the organization we studied, likely due to historically low numbers women with advanced degrees in science and engineering fields. Additionally, participants had a wide range of general work experience, ranging from 2 to 37 years (median: 19 years), and had varied levels of seniority and leadership within the organization.

Interviews were conducted face-to-face in a conference room at the organization, with the exception of three conducted by phone. Participants were selected using a combination of convenience and snowball sampling. An email was sent to all researchers in the facility that briefly outlined our study and encouraged participation. Interested participants contacted an administrative assistant who scheduled the interviews. Interviews were exploratory in nature at first, but the protocol and questions were iteratively refined as we learned more about the nature of communication and work in the company. All interviews were fully transcribed.

Analysis of qualitative data consisted of careful review and coding of interview transcripts. Two of the authors and two research assistants read the transcripts using constant comparison, making notes throughout and independently listing important themes (Huberman & Miles, 1994). Reading of transcripts was guided by our research questions, but we were alert to unexpected findings. Conversations throughout this process aided iterative open coding.

As this process progressed, categories were expanded and refined, and data were re-coded to fit the latest scheme. Compilations of transcript-fragments representing the different categories were reviewed for coherence, and these were used in selecting quotations to use in the paper. While it is unclear whether we reached true theoretical saturation, there was repetition in what participants told us by the end of the data gathering, and we feel we have sufficient data to make our claims. The themes identified in coding are used in organizing the results below.

2.1. Research context

Participants were employees of a corporate research lab involved in studying and developing digital products for the global consumer marketplace. The lab employs about 100 individuals, a small fraction of the 20,000 people employed by the entire company. The lab is divided into three divisions with which researchers are affiliated: materials, computational sciences, and devices. In addition to their divisional affiliation, researchers are typically involved with two or more research projects. Project teams consist of multiple researchers, and team members may come from multiple divisions. Many projects also involved collaborators outside the research lab. Some are in other parts of the company, while others are academics or vendors affiliated with other organizations. The style of work and collaboration on these projects varies

substantially with the specific subject matter, but most were characterized by independent work by researchers punctuated by periodic project meetings.

The research facility is comprised of two interconnected buildings that hold offices, labs, and conference rooms. Employees are typically assigned to either a shared office, open work space, or a private office. Lab spaces are also used for work, though this depends on the nature of the work being done. Computer scientists, for example, do their research by writing software in their offices, so do not need physical labs in the way that material and device researchers do.

As is typical in corporate environments, lab researchers have a range of communication and collaboration tools at their disposal. Face-to-face communication was reported as occurring frequently, both in formally scheduled meetings occurring once or twice per day for most participants, and informally in people's offices and hallways or common areas. Email was also reported as extremely common, and this was typically facilitated by the Lotus Notes (''Notes'') system installed throughout the company. Notes supports email in addition to a shared calendar/meeting scheduling system, and instant messaging. Participants reported that they sent and received email primarily using Notes, but occasionally used private accounts to facilitate easier access from outside the company's network firewall. The calendar system is widely used and, as we will discuss in much more detail below, is considered the standard way of scheduling meetings and locating colleagues. The IM feature, however, was reported to be used much less frequently, with many participants reporting they were unaware of it or that they felt their colleagues were unaware of it, such that it was not perceived as useful.

People also reported frequent use of the telephone in communicating with colleagues. This was discussed at length by our participants because of a recent shift in company policy. Previously, all employees were provided with a telephone equipped with a typical corporate voicemail system. About a year and a half prior to our study, however, company management decided to drop voicemail access for all non-managerial employees. This means that callers to these employees cannot leave them a message, which has affected telephone usage.

3. Results

3.1. Managing impressions with minimal distance

The first question we aimed to answer was how people working at the same facility appropriated technology and enacted structures that enable them to manage others' impressions of them, even when physical proximity renders the probability of encounters higher. We saw several examples of this.

One particularly clear illustration was the way in which participants responded to email. Email was widely used in the organization, and most participants felt that prompt response was normatively expected. When they received a message they could not attend to right away or that was simply lower priority for them than for the sender, many participants reported that they avoided potential conflict due to slow response by sending a short email to the sender indicating when a longer reply could be expected. Raymond, for example, said:

> Like if I can't get to their response quickly and I know that it's important to them but not quite as important to me I'll come back and say ''I am jammed; right now I can't do it. I can get to it by a certain time.''

They described a clear need not just to send a message indicating when they would reply, but also to explain why the reply would be delayed. In many cases, these explanations were true and relatively straightforward. In others, however, participants described using deception to explain slow response to a message or to handle differences in priorities. These explanations often relied on factors that would be difficult to verify even by physically proximate colleagues. Clyde, for example, said:

> I'll convey a sense of urgency that I have of other tasks that I really probably don't. So I'll say, ''oh, you know I'll get this to you really soon'' or ''I'm definitely working on this and it will be done really soon'' when it's something that I've put lower in the queue.

Deception works here because the fact that Clyde is at work and engaged in work activities may be visible to colleagues, but the details of that work likely are not. Most participants reported that they are involved in multiple projects with different teams, and that they trust their colleagues and accept their explanations as true, but also noted that they generally do not have a way to verify these messages and sometimes do suspect deception. Christine, for example, explained:

> So when they say, ''I am very busy with another project'', there is no way to verify this way or that way whether they are really busy with the other project, or each project that they say they are doing the other one. So basically, after waiting for a certain time, that is when I try to follow it up. Otherwise, I just take it at face value when they say they are working on the other one.

Thomas explained how he reacts to people that he suspects are not being truthful in explaining their behavior:

> there's not really much that you can do about it. You just kind of accept it...but you cannot call them a liar so you have to just assume that they're telling you the truth and find other avenues.

Participants essentially describe a physical environment that structurally affords some visibility of colleagues' behavior and the possibility of interaction. Social structures exist, however, that preclude close observation of others' detailed activities (i.e., if they are working on something as promised) or confronting them if one suspects deception. Thus, participants reported crafting explanations that acknowledged the probability of low-fidelity observation or encounters, but would be difficult to verify in socially acceptable ways.

3.1.1. Shared calendars and real time availability

As noted above, the Lotus notes shared calendar system was the commonly accepted way to schedule meetings in the organization. The calendar tool was also appropriated, however, by some participants as a sort of real-time awareness tool to see if colleagues were likely to be in their offices. Open calendar slots were often taken as a sign that somebody was available and likely to be in their office. At the same time, though, an open calendar slot did not necessarily mean somebody was available; it actually meant only that the participant had not been invited to attend any meetings at that time. Barry explains how this affects his perception of people's location and availability:

> If I check that they are not in a meeting, I take that as a low probability that they will actually be in their office because even if they are not in their meeting they could just be out and about somewhere not documented....I mean that's the case all the time,. I would say if someone's calendar looks like they are open, I would say I have less than a 50 percent chance of finding them in their office.

Interestingly, the physical environment affords behavior that allows people to exploit the uncertainty of the calendar, while

further reducing the possibility of unexpected encounters with others. Lawrence, for example, will leave his calendar space open and "available," but will physically relocate to an empty room on another floor to do his individual work. He readily acknowledges that he does this to reduce unexpected encounters or interruptions, saying "[N]o one even knows where I am and I am certainly not checking email." Lawrence's behavior relies on both physical constraints of the environment in that he relocates to a space where he is less likely to be seen or observed by others, and on a social structure that acknowledges the calendar to be an imperfect indicator of his location. This strategy would not be feasible in an organization where social structures reflected an expectation of accurate calendars or shared locations.

3.2. Distance and ambiguity

Our second research question asked about whether and how people balance the tension between transparency and ambiguity, and whether they enact structures that allow them to retain ambiguity and control over others' impressions of them. We saw evidence of this in several respects.

First, we noticed how people reacted to the "return receipt" feature of the Lotus Notes email system, which affects ambiguity by providing notification when a message has been opened. Without return receipt, email does not give any information about when or whether a message has been attended to, so that information is essentially ambiguous. In using email, it is normatively accepted that people regularly check their incoming messages, but there are few norms for exactly when or how often this will occur. While prompt response was generally expected in the organization we studied, Bernard explained that "no one expects an instant reply from email unless you are working on your computer all the time."

This ambiguity means that, without return receipt, people can read and respond to messages when they wish, with the exact time of these activities left ambiguous. Many felt this was one of the strengths of email. Thomas, for example, explained that "one positive feature of having email is that I can look at [messages] at my convenience." And Bernard said:

> I don't generally read [email] as it comes in, I wait till when I come up for air and look... If you constantly check your email, you are interrupting yourself, so if I am busy, the email stays and I do my stuff and I go back and check my email.

This manner of using email also affords the types of explanations that we saw above, in that language can be used to explain delays in responding to messages in ways that make the delays likely to be socially acceptable, even if the explanations are deceptive.

With return receipt, on the other hand, this ambiguity – and the ability to explain oneself – is lost, and many participants reported quite visceral reactions to this feature; often perceiving it as a threat to their autonomy or privacy. Leon, for example, said:

> I view that whole return receipt, almost as an invasion of privacy. I think people have the right to manage their messages the way they want to manage them. I don't want to be informed that someone saw this message a day ago and just chose not to respond to it. I don't want that information because I want to assume the best of people and I don't want any evidence that someone is ignoring me. I find it an invasion of privacy actually.

Leon's reaction highlights several important factors. The belief that people can and should be able to manage their messages as they wish highlights the social structures that make it normatively acceptable to check and respond to messages when people want, and not on a fixed schedule or at others' bidding. The notion of return receipt as an invasion of privacy – or threat to autonomy – shows the value of this. Second, Leon's saying that he wants to "assume the best of people" highlights the importance of maintaining social relationships, and the role that ambiguity plays in doing so. If Leon had evidence he was being ignored, his implication is that the quality of his work relationships with others would suffer.

Similarly, Terrance felt that return receipt was used by some message senders to see if somebody is in their office or not, which affected his response behavior:

> Well for individuals who generally [do return receipt], that will negatively impact my response time because people do that because they are testing whether I'm there. And if I respond to that, then they will call...they are pinpointing me by doing that. So if I can't be interrupted, I won't answer their email because I know they'll have return receipt. I rarely use it, I don't do it that much.

This reaction is interesting in that it suggests return receipt is being used by some of his colleagues as a presence awareness tool. By seeing if he has accessed a message, they are essentially trying to circumvent the usual ambiguity and see if he is available. His reaction is to adapt his behavior in a way that preserves the ambiguity around his activity.

Indeed, the use of return receipt was reported to be rare among our participants, sometimes as an option of last resort or in cases where a response was needed for highly time sensitive reasons. Clyde, for example, said:

> I know how to do it, so I must have used it..um...I think the situation was where I emailed someone three or four times and got silence, so I need to verify that something's happening on the other end.

Participants' reactions to return receipt with email shows a desire to avoid technical structures that constrain potentially useful ambiguity around communication behaviors, some evidence of appropriating the technology to further the goal of being left alone (i.e., in Terrance's case), and the apparent enactment of a social structure in which it is not generally acceptable to use return receipt, even though it is available.

3.2.1. Ambiguity about activity and location

Another interesting source of ambiguity we observed was ambiguity about people's actual location or activities, relative to information provided about these details via systems such as the widely used Lotus calendar system. As noted above, the calendar was considered by most participants to be a valuable source of information about others' availability both in the present and for scheduling future activities such as meetings. At the same time, however, people acknowledged that the calendar was imperfect in that it did not always provide reliable or accurate information. Alexandra explained:

> Some people don't use the calendar well at all. They won't put their vacation, if they have a doctor's appointment, or they're going to be out of the office...I could set up a meeting and assume that they were free, and then they'll decline it and say "oh! Um, I'm going to be out that day" or I'm going to be here, I'm in training" and then they didn't go as far to put it in their calendar.

This occasional disconnect between actual activities/availability and what was on the calendar was an important source of ambiguity that many participants described exploiting frequently. There were several ways this occurred.

The first and most interesting of these occurred in the scheduling of meetings. It is common practice in this organization to schedule meetings via the online calendar, simply by checking to see if all participants have a particular time slot free, and then have the calendar system automatically email an invitation to all participants (that is typically accepted) once a suitable slot has been identified. As scheduling is a common practice and meetings are frequent, participants described the importance of maintaining positive impressions with colleagues by not making it difficult for them to schedule meetings. One way they did this was to treat the calendar primarily as a way to schedule activities that involved others (and indicate vacation or time out of the office), but not to schedule time for doing independent work. As Leon pointed out:

> If I have something to do that I want to work on I don't put it on Lotus Notes because if somebody wants to schedule a meeting, I want the [the meeting time] to be available, I can always find a different block for [my own project].

At the same time, however, some participants also indicated that – even though it was important not to make it difficult for others to schedule meetings – actually attending these meetings was not always as important. Several participants said that when a meeting was on their calendar, it was not uncommon to skip it. As Chris pointed out:

> Rarely do I block off time [for my own work]. Instead what I do, if I need to do an experiment and it's going to take a certain length of time and I don't have time to do it, I skip meetings, and I get the work done. ...I skip probably 20% of the meetings I'm invited to, minimum.

What is interesting here from the standpoint of ambiguity is that the calendar is functioning less as an indicator of people's availability to attend meetings (and their intent to do so, once a meeting is on the calendar) but rather as a system that provides them with the option to attend meetings at times when their actual availability is ambiguous. This ambiguity stems primarily from the social norm that only certain work activities – those that involve others – are listed on the calendar, and partly from the apparent acceptability of skipping certain meetings.

Most participants who skipped meetings were also cognizant of the potential social impact of this. They did not report skipping all meetings or doing so in a way that could be perceived as capricious. Rather, they carefully considered which meetings to attend, and also had strategies for mitigating the possible negative effects of this. Raymond, for example, said that he will sometimes let others know that he is not planning to go to a meeting, or suggest the possibility to the meeting leader:

> I might tell some people who are attending the same meeting, " Hey I am not going to go in case anybody asks." But depends on the level of importance of the meeting. If it's a fairly important meeting, but what I am doing is edging it out, I'll contact the person who is in charge of the meeting and say, "Look, is it okay if I don't show?"

Interestingly, some participants also reported that one-on-one meetings were treated differently. When Clyde discussed using people's calendars to find a mutually agreeable time to stop by for a one-on-one conversation, for example, he reported that:

> I find that most of their engagements are not marked...so I will say "oh you have a hole in 1:30, can I come by?" They will answer, "no, I'm busy with such and such."

What all of this means is that a valuable strategy for having ample time to do one's independent work was not to simply block off time for this work on the calendar, but rather to leave the time open. That way others could schedule meetings easily (and relationships could be preserved), and one could later decide independently how to actually spend the time. This strategy works because of the ambiguity inherent in the social structures surrounding calendar usage and meeting attendance, and the imperfect nature of the calendar as a technical indicator of activity.

4. Discussion

We began with questions about how certain effects of distance – namely a reduced probability of face-to-face encounters and ambiguity afforded by the use of mediated communication – affect the structures enacted by collocated workers in an organizational setting.

With regard to our first research question, people did enact novel structures that enabled them to achieve their own objectives within the structural constraints of their work environment. Unlike Leonardi et al.'s (2010) telecommuter participants, who were not directly observable at all and could create impressions of activities completely different from those actually taking place, however, our participants could be directly observed by their colleagues. Rather than try to create the impression of completely different activities, therefore, they tended to rely on explanations implying that they were doing other work. This reflects that their colleagues could see them in the office and knew they were doing some sort of work, but that it would not be socially acceptable to look over one's shoulder to verify the details of a current task or workload (Birnholtz et al., 2007). In other words, the details of visible work are rendered effectively invisible by social structures that constrain observation, and this invisibility was used strategically in explaining behavior. Indeed, receivers of such explanations felt they had no real recourse for verifying them, and had to accept them at face value even when they suspected deception.

This is interesting in that it reflects the importance of language use in managing others' impressions of oneself, even when behavior is directly observable. This is similar to what has been referred to by communication researchers as account-giving –that is, crafting explanations for potentially rude behavior (Cody & McLaughlin, 1990; Scott & Lyman, 1968). What is unique here is that our participants' explanations relied on a social structure that renders the details of their work behavior invisible.

This is further reflected in participants' reaction to technology features that constrained ambiguity about their work behavior, such as "return receipt." The effect of return receipt was to render typically invisible behavior (i.e., the details of reading and responding to email) as visible, which affected people's control over this information and, thus, how others' used it in forming impressions. Participants tended to dislike this feature, viewing it as a violation of privacy and enacting a social structure deemed by most to be normatively unacceptable (or at least uncommon). Instead, they preferred to offer their own explanations for the details of their behavior and message response.

Their explanations bear some similarity to what Isaacs and Clark (1990) have referred to as ostensible speech acts. Such acts are referred to as "ostensible" because they are not intended to be interpreted literally, but rather serve an "off-record" tacit purpose (e.g., the exchange of "How are you?", "I'm fine" with an acquaintance is not intended as a real query about one's state, but as a ritual greeting). Isaacs and Clark identify five critical attributes of ostensible acts: pretense (A pretends to make a sincere proposal), mutual recognition (A and B recognize the pretense in A's proposal), collusion (B responds appropriately), ambivalence (A cannot seriously respond to the question 'Do you really mean it?', and an off-record purpose.

We argue that the explanations our participants described exhibit many of these properties, and that this helps explain the structures they have enacted. When explaining why they have not attended to a task, participants offered explanations that they knew to be difficult to verify, and with which the recipients were likely to collude, even if they suspected the explanation was not strictly true. The purpose of the exchange, moreover, was not to list all of the things people had to do, but rather to communicate the implied social message of "You and your task are not unimportant to me. I really will get to it."

Our second research question concerned structures enacted to manage the balance between transparency and ambiguity. This was highlighted most clearly in the ways the shared calendar system was used by participants. In this case, the calendar was perceived as a system primarily intended to simplify the scheduling of meetings, a goal facilitated by reducing ambiguity about others' schedules. Participants' use of the calendar reflects these goals in several respects.

First, people reported that using the calendar in ways that impede easy scheduling (i.e., by including individual activities, as opposed to just group meetings; or by not listing time away from the office) was frustrating and not normatively acceptable. This social structure had the effect of both satisfying the overall goal of simplifying the coordination of meeting times and also enabled participants to retain some control over information about the details of their individual schedule and location. They relied on this ambiguity in that most participants recognized that the calendar was a useful, but imperfect, indicator of others' location. This echoes Mynatt and Tullio's (2001) suggestion that people do not attend all events on their calendar, but suggests further that there are enacted social structures in this environment that enable this non-attendance.

Second, the calendar's imperfect accuracy as an indicator of behaviors was further reflected in several participants saying they viewed it as more important to facilitate the easy scheduling of meetings than to necessarily attend them. Some participants said they frequently had meetings added to their calendars that they had no intent to attend, but that it was more acceptable simply to accept the meeting invitation and explain their non-attendance later, rather than impede scheduling the meeting in the first place. This reflects the appropriation of the calendar primarily as a meeting coordination device that gives people the option to attend meetings, rather than a tool facilitating the sharing of detailed schedule information (as in, e.g., Palen & Grudin, 2002). In some ways, this is also similar to the notion of ostensible speech acts described above, though in this case the detailed language is implicit in the actions of sending and accepting a meeting invitation. The off-record message in this case is something akin to "I need to schedule this meeting. If you don't plan to be there, please just accept it anyway."

From the standpoint of adaptive structuration theory and notions of distance, we believe our results echo recent calls for a more nuanced treatment of distance. Rather than viewing distance as an impediment to communication that must be bridged via information and communication technologies (e.g., DeSanctis & Monge, 1998; Olson & Olson, 2001; Tang, 2007), we argue that researchers should attend to the specific effects of distance as they are manifested in different environments. These effects, such as constraining the probability of encounters and visibility of behavior, and affecting the balance between transparency and ambiguity, moreover, can result not only from physical structures that constrain the flow of information, but also from social structures that restrict the range of normatively acceptable behaviors.

Even among colleagues located at the same facility, we saw substantial evidence of enacting social structures that enabled people to retain control over information about the details of their behavior and scheduling, while still satisfying higher level goals of behaving in acceptable ways (i.e., maintaining positive impressions) and easily coordinating activities such as meetings. We also saw the importance of language – and control over language – as a strategy for accomplishing these goals. Explanations that drew on the invisibility of certain behaviors and others' willingness to collude in arguably ostensible acts were described as important behaviors. Thus, people do not just need to have control over information and how it is released to others, as has been suggested in other treatments of information flow in distributed groups (e.g., Boyle & Greenberg, 2005; Leonardi et al., 2010; Nissenbaum & Inc, 2010), but must also retain the capacity to explain its meaning and limit the space of possible interpretations. We urge further examination of technical, physical and social structures that facilitate such collaboration, and the role of explanation in managing impressions.

4.1. Limitations and future work

While we believe this work accurately represents behavior in the environment we observed, there is ample reason to interpret these results with caution. Interview results are inherently limited by individual recall and a small sample size, though these limitations are common to all studies of this nature. We believe, however, that consistency across participants and their detailed descriptions of specific scenarios improves validity. Furthermore, we looked at one part of one organization, so it is not clear what these behaviors would look like in organizations with different norms and technologies. One could imagine, for example, very different results in an organization where autonomy is not as highly valued as it is in a research environment, or where there are strong expectations for behavior around certain media (e.g., IM or email) that are different from those we observed.

Drawing from these limitations, we propose continuing this work in two ways. First, we aim to conduct similar interview or observational studies in other organizations for comparative purposes. Second, we would like to validate these interview results via a combination of email log studies and observations of people in their day-to-day management of tasks and messages.

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