

# Geographic Dispersion in Teams: Its History, Experience, Measurement, and Change

by  
Michael Boyer O’Leary

B.A., Public Policy Studies  
Duke University, 1991

Submitted to the MIT Sloan School of Management in partial fulfillment of the requirements for  
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Signature of Author.....  
MIT Sloan School of Management  
August 23, 2002

Certified by .....  
Wanda Orlikowski  
Eaton-Peabody Chair of Communication Sciences & Professor of  
Information Technologies and Organization Studies  
Committee Co-Chair

Certified by .....  
JoAnne Yates  
Sloan Distinguished Professor of Management & Professor of  
Communication, Information, and Organization Studies  
Committee Co-Chair

Accepted by .....  
Birger Wernerfelt  
Professor of Management Science  
Chair, Doctoral Program Committee

## Dissertation Committee

**Wanda Orlikowski, Committee Co-Chair**

Eaton-Peabody Chair of Communication Sciences and  
Professor of Information Technologies and Organization Studies  
MIT Sloan School of Management

**JoAnne Yates, Committee Co-Chair**

Sloan Distinguished Professor of Management and  
Professor of Communication, Information, and Organization Studies  
MIT Sloan School of Management

**Lotte Bailyn**

T. Wilson (Class of 1953) Distinguished Professor of Management and Organization Studies  
MIT Sloan School of Management

**J. Richard Hackman**

Cahner-Rabb Professor of Social and Organizational Psychology  
Harvard University  
Department of Psychology

# **Geographic Dispersion in Teams: Its History, Experience, Measurement, and Change**

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Michael Boyer O’Leary

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## **ABSTRACT**

This thesis begins with the simple argument that geographic dispersion has gone surprisingly unexamined despite its role as the domain-defining construct for geographically dispersed teams (a.k.a. “virtual teams”). The last few years have seen slow but steady growth in field studies of such teams, but our understanding of geographic dispersion and the role it plays in work is still quite limited. The thesis attempts to open the “black box” of geographic dispersion, show that it is far from a new phenomenon in organizations, understand the ways in which it is experienced, propose ways in which it can be measured, and understand the effects of doing work at increasing degrees of dispersion. It does so through three studies which combine qualitative and quantitative methods, and draw on archival, survey, observational, and interview data.

Study 1 uses rich archival data covering more than two centuries (1670-1950) of the life of one firm – i.e., the Hudson’s Bay Company – to understand its far-flung managers’ experience of dispersion. It shows that the managers experienced their dispersion through a combination of coordination, communication, isolation, and control challenges. It also serves as a “typifier,” showing that modern “virtual” teams have deep historical roots. Study 2 proposes a multi-dimensional definition of dispersion, including spatial-temporal distance and configuration, as well as a series of new measures to capture those dimensions. It explores the measures and their relationship to communications frequency in a sample of 115 dispersed project teams from a Fortune 500 company. Study 3 is based on field research with nine geographically dispersed internal consulting teams in a large, national humanitarian aid organization. It follows them from the inception to the completion of their work and compares two teams in detail. One team was moderately dispersed and one was a pilot for a more fully dispersed approach to the internal consulting projects. It finds that perceptions about timing and dispersion differ from more objective measures like those in Study 2. It also shows how dispersion is a challenge for team boundaries and calls for more attention to the weighting of different team effectiveness criteria.

Keywords: geographic dispersion, teams, virtual teams, effectiveness, communications, history

Thesis Co-Supervisor: Wanda Orlikowski

Title: Eaton-Peabody Chair of Communication Sciences & Professor of Information Technologies and Organization Studies

Thesis Co-Supervisor: JoAnne Yates

Title: Sloan Distinguished Professor of Management & Professor of Communication, Information, and Organization Studies

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Chapter 3 began as an attempt to characterize the changing patterns of geographic dispersion in the Hudson's Bay Company over its long history. Reconnecting with former classmate and fellow researcher Jonathon Cummings helped shift it from that narrow initial goal to a broader attempt to understand and measure geographic dispersion. Our collaboration over the last two years has been instrumental in the development of my thinking about the construct that lies at the heart of this dissertation. Like the teams in Chapter 4, our work together began at a distance. I look forward to it continuing at closer proximity.

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\* \* \* \* \*

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\* \* \* \* \*

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# CHAPTER 1

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## INTRODUCTION

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## 1.1 Motivation and Overarching Questions

In this thesis, I begin with the simple argument that the notion of geographic dispersion has gone surprisingly unexamined despite its role as the domain-defining construct for geographically dispersed teams (GDTs)<sup>1</sup> and other increasingly common manifestations of dispersed or “virtual” work.<sup>2</sup> The last few years have seen slow but steady growth in field studies of such teams (e.g., Cramton, 2001; Maznevski & Chudoba, 2001), but our understanding of geographic dispersion and the role it plays in work is still quite limited. This thesis attempts to open the “black box” of geographic dispersion, articulate some of its dimensions, propose ways in which it can be measured, and explore its effects on communication and coordination in work teams. It does so through a series of three studies which combine qualitative and quantitative methods, and draw on survey, archival, observational, and interview data.

In my first study, I use archival and interview data covering over two centuries of the life of one widely dispersed firm – i.e., the Hudson’s Bay Company (HBC). With these data, I explore three questions: 1) How did dispersion influence the emergence of the work practices in the HBC? 2) How did HBC managers’ work practices affect their experience of dispersion? and 3) Beyond the simple physical aspects of dispersion, what other factors affected their experience?

My second study shifts to quantitative data and focuses on the structural aspects of dispersion. By structural, I refer to the spatial-temporal *distances among* and *configuration of* team members (in relation to each other and to key external entities). This second study addresses two basic questions: 1) How can we measure the geographic dispersion of teams? 2) How do varying levels or degrees of geographic dispersion across teams relate to those teams’ communication and performance?

My third study builds on the fact that many teams employ a mixture of face-to-face (FTF) and distant or “mediated” interaction (Sessa *et al.*, 1999), as well as the unsurprising, but rarely addressed, idea that people learn and adjust their ways of working at a distance (Walther, 1995). Unlike the many studies that have made static horse-race comparisons between FTF and computer-mediated teams (reviewed recently in Scott, 1999), this study looks across two teams within one organization (and one project type) to ask how shifts to more dispersed modes of interaction affect the nature of the teams’ work and team members’ interactions.

Without a deeper understanding of the nature and influences of dispersion, better approaches to measuring it, and a better sense of what happens when dispersion changes, our ability to inform discussions of how dispersed teams work will be severely limited. In the following three chapters, I present the three studies described above. A fifth and final chapter is devoted to conclusions and integration across the studies. Before turning to those chapters, however, I address several key aspects of dispersion, including the prevalence of geographically dispersed teams (GDTs) and the related literatures.

## 1.2 The Prevalence of Geographically Dispersed Teams

Geographically dispersed work is not new (King & Frost, 2002; Moore & Lewis, 1999; O’Leary *et al.*, 2002). Two millennia ago, the Roman Empire spanned a considerable part of the globe and geographic dispersion was one of its major challenges (Brytting, 1986). Several centuries later, the Catholic Church emerged as another major “virtual” organization (Harris, 1996). The postal service, Wells Fargo, the Forest Service, and other relatively “old”

organizations also worked across considerable distances (Fradkin, 2002; John, 1986; Kaufman, 1960). Furthermore, distance and proximity among people more generally have been the subjects of research for decades (Festinger *et al.*, 1950; Maisonneuve *et al.*, 1952; Stewart, 1942).

However, such work is increasingly important as organizations become more global, and geographically dispersed teams become more common. As Gephardt (2002) writes, electronic work and self-managed teams are two of the four most salient characteristics of the “brave new workplace.” While we lack consistent data on the prevalence of dispersed teams (Brown & Duguid, 2000, p.68), a recent survey found that 15% of employees’ time was spent working with others in different places at the same time and 30% was spent working with those in different places and times (Gartner Group, 2001). By 2010, those percentages are projected to rise to 25% and 40%, respectively. The Gartner Group surveys also estimate that 60% of professional and managerial work at Global 2000 firms will be done by geographically dispersed teams by 2004. A more academic (but still problematic<sup>3</sup>) survey of 103 firms, found that 49 percent were using single-country dispersed teams and 14 percent were using multi-country dispersed teams for new product development (NPD), with respondents projecting an 8% increase in their use of multi-country dispersed teams over the next three years (McDonough *et al.*, 2001).

Following the tragic events of September 11<sup>th</sup> (9-11), anecdotal evidence suggests that there have been even more rapid increases in work at a distance (Clark, 2001; Harmon, 2001). This appears to be the result of two different effects of 9-11. First, teams that had been working primarily at a distance are now travelling less and holding occasional FTF meetings less frequently if at all. Second, teams that had been working primarily FTF, but commuting to do so, are now travelling less as well. In both cases, the anecdotal data suggest that dispersed work is on the rise.

Anecdotal data about increasing prevalence of dispersed work are supported by trends in the sales of technologies to support such work. For example, in 2000, companies spent a reported \$175m on video conferencing (not including the toll charges themselves) and predicted that that figure will rise to \$400m in 2002 (Biersdorfer, 2001). Although this growth had begun even before 9-11 (Millman, 2001) due to constrained corporate travel budgets (McDowell, 2001) and enhanced and less expensive technologies (Chesler, 2001; Millman, 2001), it appears to be increasing at a faster pace since 9-11. As noted by McGuire (2001, p.17),

*The recent reluctance to fly, whether from inconvenience or fear, has propelled the adoption of e-conference technology ... Though suddenly sexy, [web-based audio and video] conferencing, and streaming technologies at large, have been on the rise for some time. And the industry is growing with them: The \$2.9 billion global teleconferencing market, which includes e-conferencing, is growing at almost 48% each year, and will reach almost \$10 billion in 2005.*

McGuire goes on to note that hi-tech companies are among the heaviest users (as well as parties with vested interests in the conferencing technology). While some of the post 9-11 growth may be a one-time spike, there does seem to be evidence of a sustained boost to the use of conferencing technology, and thus to work at a distance. According to Shillingford (2001), the 25-30% spike in US videoconferencing equipment sales and services during the six months after 9-11 will be followed by “a compound annual growth rate of 27 percent a year – up from an earlier forecast of 17-18 percent.”

In addition to the post 9-11 fear and inconvenience, geographically dispersed teams are also being used for a variety of more proactive reasons.<sup>4</sup> Some describe considerable cost savings as one motivating factor. For example, BP claims to have saved \$30m in the first year after it

began using video conferencing (Dixon, 2000). Geographically dispersed teams are also used to accomplish the following (Carmel, 1999; Gonchar & Roe, 2000; Herbsleb *et al.*, 2000):

- Access dispersed expertise;
- Accommodate employees who don't want to move or want to work from home;
- Manage fluctuations in workload better by accessing a larger pool of talent;
- Compress work time by passing projects around the globe (a "follow-the-sun" approach which appears to be especially common in software development);
- Develop and enhance expertise;
- Manage mergers and acquisitions;
- Navigate conflicting government regulations; and,
- Get closer to important markets or production facilities.

As Kiesler & Cummings (2002) note, the use of dispersed teams may also be growing unintentionally, as a result of mergers, acquisitions, and organizational restructuring. Regardless of why it is growing and even if many of the old rules still apply (and may even apply to a greater degree) as Hackman (2002) notes, work in geographically dispersed teams appears increasingly common and strategically important.

### 1.3 Related Literatures and the Black Box of Dispersion

Despite the high and increasing use of geographically dispersed teams, dispersion itself has almost universally been a black box for researchers. It has been a domain-defining condition rather than a variable (control, dependent, or independent) of direct interest. The fact that dispersion has been taken for granted is the consequence of at least three factors. First, research on geographically dispersed teams is still in its youth and the domain is still being mapped (Maznevski & Chudoba, 2000). Second, the majority of research on geographically dispersed teams has been done in laboratory or controlled field settings with teams that lack an organizational history or context (Maznevski & Chudoba, 2000; Scott, 1999). As a result, variations in dispersion have actually been controlled away in an attempt to focus on other important factors. The dominant view of dispersion remains dichotomous – teams are either dispersed or not, with little gray area in between. Third, there is no framework for characterizing degrees of geographic dispersion in work teams, nor is there a clear theoretical basis for understanding the role of geographic dispersion in teams. I elaborate on each of these three factors in the subsections that follow.

#### 1.3.1 Research on Dispersed Teams – A “Youth” Entering Its Second Decade

Use of the term “virtual” in regard to organizations began in the early 1990s, with writing on “virtual corporations” and “virtual organizations” (most notable among that early work is Davidow & Malone, 1992). However, the term “virtual team” did not emerge until several years later. As shown in Figure 1.1, its early use began in 1992, but it began to burgeon during the 1995-98 period and has continued to be the subject of increasing academic and general attention.

Figure 1.1: Emergence of the Term “Virtual Team”\*

Types of Articles	'86-92	'93	'94	'95	'96	'97	'98	'99	'00
All	3 <sup>5</sup>	3	13	27	55	99	123	157	177
Peer Reviewed <sup>6</sup>	0	1	4 <sup>7</sup>	6 <sup>8</sup>	17	30	44	53	74

\* based on ProQuest's indices<sup>9</sup>

In addition to articles noted in Figure 1.1, an increasing number of books have also addressed the topic from various angles:

- Under the general moniker of virtual teams (Bellinger, 2001; Beyerlein *et al.*, 2001; Duarte & Snyder, 1999; Fisher & Fisher, 2000; Haywood, 1998, 2000; Henry & Hartzler, 1997; Hoefling, 2002; Jude-York *et al.*, 2001; Kostner, 2001; Lipnack & Stamps, 1997; Mayer & Pinto, 1999);
- Regarding global or international teams (Davison & Ward, 1999; Kostner, 1994, 2001);
- More specifically, regarding global software development teams (Carmel, 1999; Karolak, 1998); and,
- Dealing with virtual, dispersed, and distributed *work* in general (Bredin, 1996; Cascio, 1999; Cooper & Rousseau, 1999; Crandall & Wallace, 1998; Hinds & Kiesler, 2002; Igarria & Tan, 1998; Jackson, 1999; Kostner, 1994; O’Hara-Devereaux & Johansen, 1994)

The more general literature on virtual organizations also occasionally addresses geographically dispersed teams (e.g., Grenier & Metes, 1995).

While the attention from the popular and trade press is larger than from the academic press, both have grown at quite comparable rates over the 1995-2000 period (Figure 1.1). Based on the number of Ph.D. theses recently written on the topic (Figure 1.2), there is also evidence of a growing “pipeline” of potential academic publications.

Figure 1.2: Doctoral Theses Regarding Geographically Dispersed Teams, 1995-2000<sup>10</sup>

Years	Count	Authors
1995	2	(Brown, 1995; Gluessing, 1995)
1996	2	(Meadows, 1996; Taylor, 1997)
1997	2	(Gould, 1997; Kock, 1997)
1998	5	(Bandow, 1998; Hornett, 1998; Lurey, 1998; Nemiro, 1998; Yager, 1998)
1999	2	(Olson, 1999; Prabhakar, 1999)
2000	13	(Bonnevier, 2000; Dehler, 2000; Galvin, 2000; Gorelick, 2000; Hugli, 2000; Knoll, 2000; LeMay, 2000; McHorney, 2000; Mishler, 2000; Piccoli, 2000; Powell, 2000; Switzer, 2000; Workman, 2000)

Recent conference presentations and symposia (e.g., at the 2001 and 2002 Academy of Management meetings) are further indications of the probable pipeline of work on this topic.

### 1.3.2 GDTs Research – A Youth, but with Clear Ancestors

If one goes beyond research dealing directly with virtual or geographically dispersed teams, and includes literatures on closely related topics, there is a considerably larger corpus of relevant research. Although use of the term “virtual team” is only a decade old, groupware,<sup>11</sup> computer-supported collaborative work (CSCW),<sup>12</sup> and group decision support systems (GDSS) are all much older topics, which address (at least indirectly) team members working at a distance. To some extent, research on email,<sup>13</sup> computer-mediated communication (CMC),<sup>14</sup> video- and tele-conferencing,<sup>15</sup> and tele-commuting<sup>16</sup> also anticipated the increasing prevalence of work in dispersed teams. Sessa et al. (1999) capture some aspects of these related literatures,



as do McGrath & Hollingshead (1994) and more recent reviews (e.g., Baltes *et al.*, 2002). I address them in more detail in Chapter 3.

### ***1.3.3 Research on GDTs – Largely Lab-Based***

The majority of scholarly work on teams (including geographically dispersed ones) has been done in laboratory studies. For example, a recent review of 88 journals from 1995-1998 found that three quarters of 3,111 articles regarding organizational work group behavior were empirical, but only one third of those were field-based (Greenbaum & Query, 1999). Other recent reviews bolster this characterization of work group research in general (Arrow *et al.*, 2001; Bettenhausen, 1991; Cohen & Bailey, 1997; Guzzo & Dickson, 1996; McGrath & Hollingshead, 1994) and GDT research in particular (Maznevski & Chudoba, 2000). A recent review and annotated bibliography of approximately 100 studies and articles on GDTs found only a half-dozen in real-world teams (Sessa *et al.*, 1999).

As was the case with “traditional” FTF teams research, the majority of research on dispersed teams has been based on laboratory or controlled field studies with student teams (Maznevski & Chudoba, 2000; Scott, 1999; Sessa *et al.*, 1999; Shachaf, 2002). There is still relatively little empirical evidence drawing on teams working in organizational settings, facing real rewards and consequences for their work. Figure 1.3 summarizes the field studies of dispersed teams that have appeared in academic journals. Although there are hundreds of published studies on CMC, CSCW, and related topics, there are only 15 published articles based on field studies of dispersed teams working in real organizations (i.e., not including student teams).

Figure 1.3: Journal Articles Based on Field Studies of Geographically Dispersed Teams<sup>17</sup>

Study	Sample*	Setting	Variables of Interest
(Carletta <i>et al.</i> , 2000)	1x8, 1x4	Survey of automotive supply chain teams, including members from OEM and parts suppliers	Sociability, solidarity, status and functional differences, technology use
(Govindarajan & Gupta, 2001)	70	Unspecified beyond “global business teams”	Performance in general and challenges faced by such teams; team membership and processes
(Lurey & Raisinghani, 2001)	12 (67)	Survey of teams in eight high tech, agriculture, and professional service firms	Internal team dynamics, external support, and team performance
(Majchrzak <i>et al.</i> , 2000a) and (Majchrzak <i>et al.</i> , 2000b) <sup>18</sup>	1 x 8	Rocket design NPD engineering team	Knowledge sharing, collaborative tool use, task ambiguity
(Malhotra <i>et al.</i> , 2001)	1 x 8	Boeing Rocketdyne NPD team	Successful managerial practices
(Maznevski & Chudoba, 2000)	3 x 8, 9, 12	Global NPD and sales teams	Decision processes and outcomes; structural characteristics; timing
(McDonough & Cedrone, 2000)	1 x unspecified	Case study of one GDT manager’s experiences	Motivation, management of electronic workplace, and creation of “safe” team environment
(Mortensen & Hinds, 2001)	12 geographically dispersed teams, 12 co-located ones (221)	Product development teams across five companies	Affective and task conflict
(Pauleen & Yoong, 2001a) and (Pauleen & Yoong, 2001b)	7 facilitators of 7 teams	Teams were in trading, consulting, and advertising companies, as well as government; diverse tasks	Team facilitation, relationship building, and boundary crossing
(Pawar & Sharifi, 1997)	2 x unspecified	UK manufacturing NPD team and a Pan-Euro research team	Teaming in product design and impact on use of concurrent engineering principles
(Robey <i>et al.</i> , 2000)	3 (22)	Process reengineering teams in a softgoods company	Demands of dispersed work, situated learning, use of technology, role of FTF meetings, and management
(Sole & Edmondson, 2002, forthcoming)	7 x unspecified <sup>19</sup>	Polymer NPD teams	Awareness, appropriability, knowledge sharing
(Suchan & Hayzak, 2001)	1 x 31	Customer service team	Communication technology use, organizational support for GDTs, attitude toward communication, trust
(Vickery <i>et al.</i> , 1999)	84 (273) <sup>20</sup>	USAF systems acquisition teams	Parent organization architecture, member allegiance, control climate, “virtual position,” task complexity, performance
(Zack & McKenney, 1995)	1 x 14, 1 x 15	Newspaper editorial management groups	Social context and structure; communication and performance

\* Teams x members per team; numbers in parentheses indicate total members across all teams

While these studies represent a wide range of industries and, to some extent, team types, the vast majority of the studies have been based on small sample sizes. Of the 15 studies in Figure 1.3, only 5 had samples with more than three teams. With small sample sizes, it is relatively easy to describe the nature of subject teams' dispersion [as, for example, Majchrzak et al. (2000) do]. However, for studies with larger sample sizes, it becomes considerably more difficult to characterize the teams' dispersion in ways that allow meaningful quantitative comparisons. Furthermore, current descriptions of teams' dispersion are insufficient for cross-case studies or meta-analyses.

In addition to the organizational field studies, there are a number of studies that have employed samples of student project teams working outside the confines of a laboratory. Such studies are reviewed by Maznevski (2000) and Scott (1999). Since those reviews, two other student-based studies have been published (Cramton, 2001; Walther *et al.*, 2001).

While these laboratory and student-based field studies have contributed to our understanding of dispersed teams, they have skewed that understanding as well. By controlling the nature and degree of dispersion *ex ante*, they have implicitly taken dispersion off the table as a variable of interest. For example, the teams studied by Cramton (1998) were all dispersed in the same way – i.e., six students from three universities, with two per university. And the teams studied by Jarvenpaa & Leidner (1999) had four to six members, where each member was from a different country. This constraint is reasonable given these researchers' desires to focus on other uncontrolled factors (e.g., trust, communication, and interaction processes). In addition, their designs include several other assumptions that this thesis aims to address.

Past studies tend to assume (implicitly if not explicitly) that dispersion is uni-dimensional, objective, and unchanging. At most, some authors address dispersion as two dimensional, noting both temporal and spatial dimensions (Cramton, 2001; Griffith & Neale, 2001; Maznevski & Chudoba, 2000), but none address its subjective, contextual, or experiential elements, and none address changes in dispersion across or within teams. Furthermore, except for the work of Jarvenpaa and colleagues (Jarvenpaa *et al.*, 1998; Jarvenpaa & Leidner, 1999), research is generally not specific about the “age” of teams under study – i.e., when the teams were formed in relation to the period of research. Given what is known of the importance of early interactions in teams (Gersick, 1988, 1989; Ginnett, 1993), knowing whether or not these interactions are captured in a study is critical to understanding teams' dynamics.

Knowing whether the team has worked together before is also important given the potential for teams to learn and adapt their approach to managing dispersion and using new technologies (Majchrzak *et al.*, 2000b). The vast majority of research has been done with teams of strangers (or at least relative unknowns), despite the importance of prior experience and reputation effects (Williamson, 1991), both of which are common in naturally occurring work teams. It also often goes unspecified whether members have any previous experience working with the relevant technologies, or with geographically dispersed teams in general.

From the standpoint of the technology used in studies of geographically dispersed teams, the dominance of laboratory studies assumes that the technology is common, equally accessible, and unproblematic. However, this contrasts sharply with the findings of researchers studying naturally occurring teams (Kayworth & Leidner, 2000, p.188; Rennecker, 2000), who point out that familiarity with technology is often low, access to it is quite variable, and the technologies themselves are often highly problematic. Furthermore, naturally occurring dispersed teams generally employ several different technologies to do their work. In most controlled studies, there is only one technology (most commonly e-mail or web-based chat) available to teams in

the dispersed condition. For cost, logistical, and research design reasons, subject teams rarely have access to telephone or tele-conferencing, despite their heavy (if not predominant) use by naturally occurring dispersed teams. Conversely, there is often no technology available to teams in the FTF condition, despite the fact that co-located individuals are known to interact via e-mail and chat even when their colleagues are within the same building (Levina, 2001; Robey *et al.*, 2000).

Finally, most research is predicated on the assumption that dispersed teams offer many advantages to organizations, but that dispersion itself is a negative thing and that simulating FTF interaction is the gold standard.<sup>21</sup> Despite the fact that researchers and practitioners have been struggling to overcome problems with FTF teams for decades (Cartwright & Zander, 1953; Hackman, 1990, 1998; Homans, 1951; Roethlisberger *et al.*, 1939), such teams have suddenly become the unproblematic object of emulation for dispersed teams. In particular, the majority of CSCW and related technology design research has taken simulating FTF interaction as the goal to which new, enabling technologies must aspire. This fact alone suggests how powerful distance is. Only a few commentators hold out the possibility that distant interactions could, in some ways, be *superior* to FTF ones (Dowling & St. Louis, 2000; Hollan & Stornetta, 1992).<sup>22</sup>

As provocatively described by Hollan & Stornetta (1992, pp.119-21), the “efficacy of imitating face-to-face communication is an unquestioned presupposition of most current work on supporting communications [with] electronic media,” but this presupposition is problematic. Most research and tool development is based on “the implicit assumption that there is a natural and perfect state – being there – and that [this] state is in some sense broken when we are not physically proximate.” They argue for reconceptualizing “physical proximity as simply *a medium*” among many possible ones (*italics original*). On this point, also see Culnan & Markus (1987). Although co-location offers many affordances (Gaver, 1992), co-located teams are not without their problems. For example, co-location can engender negative intergroup effects between sub-teams (Polzer *et al.*, 2002). For this and other reasons, the FTF gold standard warrants more skeptical consideration.

Finally, the degree of interdependence in teams has often been lost or gone unmentioned in research on dispersed teams, despite the sense that it is a critical variable for understanding such teams. Since the work of Woodward (1965) and Thompson (1967), interdependence has been seen as a critical factor in organizational work (Wageman, 1995). Strong division of labor and modularization with clear specifications and stable plans is commonly advocated as a way to manage dispersed work (Grinter *et al.*, 1999, p.312). However, this undercuts one of the very reasons for which organizations use geographically dispersed teams – i.e., gaining access to and cross-pollination among a wider and more diverse array of expertise.

### ***1.3.4 Research on GDTs – Lacking a Framework for Dispersion***

In addition to its relative youth and predominantly controlled nature, research on dispersed teams has taken a limited view of dispersion because there has been no conceptual framework – or even vocabulary – for discussing dispersion in teams. Absent such a framework, most studies have addressed dispersion in side-by-side comparisons of dispersed *versus* FTF teams (e.g., Warkentin *et al.*, 1997).<sup>23</sup> These comparisons have been reinforced by reviews which use the dispersed/FTF dichotomy as an organizing device (e.g., Scott, 1999).

These dispersed vs. FTF comparisons have persisted despite the fact that both “dispersed” and “FTF” are somewhat ambiguous terms referring to a broad continuum of ways in which people interact (Sessa *et al.*, 1999). This was noted as early as 1994, when McGrath &

Hollingshead wrote that “Research to date has certainly not covered, systematically, the range of possible combinations of time and space dispersion.” Five years later, this had changed little, with Sessa et al. (1999) writing that “Current research looks only at the ends of the continuum [but naturally occurring work] teams are rarely completely co-located or completely dispersed;” and Scott (1999) noting that “Clearly, not enough emphasis has been placed on what it means to be dispersed.” Even more recently, Griffith & Neale (2001) commented that “While the bulk of CMC research focuses on the dichotomy of FTF vs. distributed work ... groups that meet FTF as well as virtually seem to predominate in organizations.” Nonetheless, only a handful of researchers (Cramton, 2001; Cummings, 2001; Griffith & Neale, 2001; Knoll, 2000; McDonough *et al.*, 2001) have taken up these repeated challenges to include teams’ dispersion as a variable of interest, rather than just a vaguely operationalized domain-defining condition.

In addition to not addressing dispersion, most studies fail to note that even co-located teams vary in the degree to which their members actually work along side each other. Ostensibly co-located teams often have members spread across opposite sides of large buildings, dozens of floors in a high-rise office tower, or several buildings in a corporate office park (Olson & Olson, 2000, 2002). Given Allen’s (1977) seminal findings that relatively small distances clearly affect the workers’ communications, such ostensible co-location may actually be more like dispersion. I return to Allen’s (1977) work as well as the broader literature on proximity in Chapter 3, as part of my development of a framework, vocabulary, and approach to operationalizing dispersion.

The absence of a framework for dispersion is also due to the small sample sizes of most field-based studies. In studies covering only a few teams, the need to characterize and compare teams’ dispersion is less pronounced. With single case studies, one can be extremely descriptive of a team’s dispersion, as Majchrzak et al. (2000b) were in their recent study of technology adaptation in one dispersed team. They characterized their subject team as follows:

*Two members were located in different ends of the same building, three other members were each one mile away in different buildings; one member of a second organization was located 100 miles away; and two members of the third organization were located 1,000 miles away in different buildings. [Team] members limited their travel since they were involved with many different teams within their company. As a result, all members were together only once – at the end – although there were three other formal meetings held in which some members attended. (p.574)*

Unfortunately, even among small-sample studies, this description of the extent and configuration of a work team’s geographic dispersion is a rarity. Figure 1.4 presents the same studies as Figure 1.3, but adds the extent to which each article describes its teams’ dispersion.

Figure 1.4: Field Studies of Virtual Teams and the Nature of Their Dispersion

Study	Sample*	Nature of Dispersion
(Carletta <i>et al.</i> , 2000)	1x8, 1x4	Automotive supply teams. Team A “involved a large international supplier two and a half hours distant from the OEM.” They had monthly FTF meetings, plus technology-mediated meetings (of unspecified frequency and duration). Team B included a “small, local supplier which was heavily dependent on the OEM.” Team B meetings included only one member from the supplier and one from the OEM at a time.
(Lurey & Raisinghani, 2001)	12 (67)	“Many different company sites” in the U.S. and several countries in Europe and SE Asia. Twenty-one of the 67 respondents were from transnational teams. The rest were on U.S. national teams.
(Majchrzak <i>et al.</i> , 2000a) and (Majchrzak <i>et al.</i> , 2000b) <sup>24</sup>	1 x 8	Quoted above
(Maznevski & Chudoba, 2000)	3 x 8, 9, 12	“Global” teams. The first team was led by a senior manager from the eastern U.S. company’s (pseudonym MTI) headquarters (HQ). Six others were from that company as well, with three of them from HQ and one each from France, England, and Benelux. Two partner company members were from France and England. The second team had six members from HQ (of whom led the team), two from other U.S. cities, two from east Asia, two from Benelux.” The third team included four from MTI, two of whom at HQ, one in Scandinavia, and one in England, plus five from a partner company, of which four were at the partner’s northern European HQ and one was in the U.S. They provide excellent additional details about members’ language abilities, cultural diversity, and the specific nature of contact (FTF and CMC) for all three teams. They also note major sub-group issues (p.482).
(McDonough & Cedrone, 2000)	1 x unspecified	“globally distributed” ... from “different countries” ... “widely separated geographically and this in very different time zones” ... “met face-to-face as a team very infrequently” Mentions at least one member in Massachusetts (headquarters) and one in Geneva.
(Mortensen & Hinds, 2001)	12 GDTs, 12 co-located ones (221)	Of the 24, 12 teams were collocated; of the remainder, 7 “were domestically distributed (all members within a single country) and the members of the remaining five teams were internationally distributed (distributed across national borders).” (p.219)
(Pauleen & Yoong, 2001a) and (Pauleen & Yoong, 2001b)	7 facilitators of 7 teams	“... virtual team project tasks ranged from managing a political campaign <i>on the other side of the world</i> to developing and running a <i>national</i> web-based academic assessment center.” (emphasis added) One team had “members in Southeast Asia [SEA], New Zealand [NZ] and Australia [AU].” Another had members in China, NZ, and AU. A third had members in NZ and CA. A fourth had members in NZ and AU. A fifth was “local, Wellington (NZ) based.” A sixth was also within NZ with “representatives from government departments and (Liden <i>et al.</i> ) claimant group.” The seventh was “global,” as part of an international advertising partnership.
(Pawar & Sharifi, 1997)	1 GDT	The GDT was a “Pan European consortium of eight members.” No further information.
(Robey <i>et al.</i> , 2000)	3 (22)	“Each team included ... personnel from one cosmopolitan northern U.S. city ... and [other] personnel from the division headquarters, located in a small town in the Southern U.S. Each virtual team also included people located in other places, such as geographically remote sales personnel, customers, and suppliers.” (p.55)

Study	Sample*	Nature of Dispersion
(Sole & Edmondson, 2002, forthcoming)	7 x unspecified <sup>25</sup>	“multinational company ... staffed from different research centers, production sites, and commercial offices around the world ... all included key participants from three or more location.” Regarding specific teams, they note that their Bianco team had seven members dispersed across five sites on three continents; Grosso team had six members across four sites and two continents; and Nero team had four members across three sites. No further details on the dispersion of those or the other four teams. Does describe the variety of interaction – FTF and distant. Functional areas are specified, but not languages, countries, ethnicities, etc., and not the specific locations of individual team members.
(Suchan & Hayzak, 2001)	1 x 31	Eighteen of 31 team members were interviewed. They were located at the company’s HI, PA, VA, FL, CA, and WA branch offices. Several “tele-commuted full-time from their homes in California and Virginia; other members telecommuted part-time” (p.178).
(Vickery <i>et al.</i> , 1999)	84 (273) <sup>26</sup>	No information
(Zack & McKenney, 1995)	1 x 14, 1 x 15	The groups work for two different newspapers. Although not specific, the article suggests that the groups members are actually in the same building, although they use email as well as FTF to interact. Details of the building’s size and layout are not given.

\* Teams x members per team; numbers in parentheses indicate total members across all teams

As the table makes clear, even small sample studies vary considerably in the degree to which they characterize geographic dispersion. Maznevski & Chudoba (2000) are among the best, detailing the structural dispersion of their teams, as well as the language, cultures, contact, sub-group issues the teams faced. Others provide details about only some team members’ characteristics, or provide no such information at all.

These descriptions offer a widely varied view of geographic dispersion “in the wild” and, taken together, challenge our predominantly uni-dimensional view of geographic dispersed teams. Just as one would be surprised if all FTF teams with widely varying degrees of social distance (i.e., demographic diversity) performed the same, I argue that we should not expect teams with widely varying degrees and configurations of geographic distance to perform the same.

## 1.4 Research on “Traditional” Teams

Before moving on to the experience of geographic dispersion, I turn to the literature on “traditional” (i.e., FTF) teams. Over the last 40+ years, this literature has ebbed and flowed (Arrow *et al.*, 2001; Cohen & Bailey, 1997; Guzzo & Dickson, 1996), but it includes several critical points for the study of geographically dispersed teams. These points relate to the definition of “team” itself, as well as of the team’s context, membership, boundaries, temporality, and performance. These are by no means the only important areas of teams research, but they provide an important foundation on which this thesis builds.

### 1.4.1 Definition of a Team

For this thesis, I use Hackman’s (1990) definition of “team,” which in turn draws on Alderfer (1972). He established the following defining characteristics: boundedness, stability of

membership, commonality and interdependence of task, and authority to manage its own internal processes. As I discuss later in this section, some of these characteristics are being called into question as geographically dispersed teams push elements of the traditional definition of “a team.” This is especially true with boundedness and stability, because many geographically dispersed teams tend to have more permeable boundaries and changing membership.

Although some have drawn distinctions between “teams” and “work groups” (e.g., Hare, 1992, pp.15-21; Johnson & Johnson, 1994, pp.503-4)), I use them interchangeably (Hackman, 1990, p. 14, note 1). Most of those who distinguish between “team” and “group” privilege teams on the basis of an arbitrary and usually unstated normative judgment that teams are more cohesive or interdependent than “mere” groups. Guzzo & Dickson (1996) and Cohen & Bailey (1997, pp.237-9) provide concise reviews of this definitional issue.

### ***1.4.2 Teams’ Context***

The idea that context is important for team performance is not a new one (Gladstein, 1984; Hackman, 1983), but context is often given short shrift in research on geographically dispersed teams. This is true at the level of the team as a whole, as well as for the local and often conflicting contexts of individual team members (Rennecker, 2000; Shapiro *et al.*, 2002). By drawing attention to dispersion itself, I am heeding Rousseau & Friend’s (2001) call to contextualize organizational research more carefully and attend to realtors’ famous mantra of “Location, location, location.” Like Rousseau & Friend, Hackman (1999) also advocates strongly for enhanced attention to groups’ contexts and notes how powerfully physical settings and temporal rhythms entrain group behavior (p.237). However, Hackman’s comments on spatial contexts have more to do with the work or office *space* available to (implicitly co-located) teams. Furthermore, aside from these points by Hackman, an entire volume devoted to the role that *context* plays in teams and work groups fails to mention place/space (Wageman, 1999a).

### ***1.4.3 Teams’ Membership and Boundaries***

One artifact of the long line of laboratory-based studies is a focus on teams with relatively fixed membership. Some studies deal with the issue of newcomers (Arrow, 1998; Moreland & Levine, 1989), but only a handful address membership change per se (e.g., Arrow & McGrath, 1993). In practice, however, teams vary from those whose members never change to those in which members come and go on a task-by-task basis. At the latter end of the continuum, and especially in geographically dispersed teams, it is often unclear who is on a given team, and team identity itself can become a key factor in team performance (Mortensen & Hinds, 2001; Mortensen & Hinds, 2002; Rennecker, 2000; Shapiro *et al.*, 2002). The membership of naturally-occurring work teams (especially dispersed ones) may also stretch the definition of team beyond Alderfer’s three-decade-old criteria (1972), which include stability and “knowability” (i.e., team members recognize each other as members of the team). Thus, being sensitive to the malleability of teams’ membership is likely to be especially important for research on dispersed teams.

Just as membership change encourages us to be mindful of team boundaries in geographically dispersed teams, so does the work of Ancona (Ancona, 1990; Ancona & Caldwell, 1992). She and her colleague, David Caldwell, have shown that paying attention to teams’ boundaries and relations with those beyond the boundaries can have a positive impact on teams’ performance. As team membership becomes more fluid, and as dispersed teams are used to access widely dispersed expertise or “get closer” to customers, attention to boundaries is also



likely to be especially important. Depending on the configuration of a given dispersed team, some members may be physically closer to key constituents outside the team itself. By the very nature of their physical location, certain team members may be more or less able to serve in one of Ancona's boundary-spanning roles (e.g., as scouts or ambassadors).

#### **1.4.4 Teams' Temporality**

There is a relatively large and growing body of literature on the temporal aspects of FTF teams (Ancona & Chong, 1996; Arrow *et al.*, 2001; Gersick, 1989; McGrath & O'Connor, 1996; Waller, 1999). Recently, a few authors have also begun to address the role of timing within geographically dispersed teams (Jarvenpaa *et al.*, 1998; Jarvenpaa & Leidner, 1999; Maznevski & Chudoba, 2000). This thesis builds on that literature, but shifts the focus from the timing of teams' work to time zone *differences* as a descriptor of teams themselves. It addresses time and timing as a challenge that is especially acute for geographically dispersed teams. Indirectly, it also encourages those studying time and timing who "do not view organizations as time-space configurations" to "make the spatial aspects of organization explicit" (Schultze & Boland, 2000, p.189, emphasis added). In addition to timing, tenure with and duration of teams have only been addressed by a few researchers (Cummings, 2001; Walther *et al.*, 2001), and warrants more careful consideration given the ability of members to learn and the importance of relationship development, for which time is critical.

#### **1.4.5 Teams' Performance and Effectiveness**

Either implicitly or explicitly, most studies of teams have some aspect/s of their performance and effectiveness in mind. And most of these studies rely on several hallmark models of group effectiveness (Gladstein, 1984; Hackman, 1983; Hackman & Morris, 1975; McGrath, 1984). While they vary in important ways, all of these models have some form of an input-process-output approach at their core and all acknowledge the potential for process losses (Steiner, 1972). Building on these models, most of the academic literature and popular press on geographically dispersed teams has presented them as prime candidates for process losses.

Dispersion is seen most commonly as a challenge to communication, coordination, control, decision-making, and other information-related processes; to intermediate outcomes, such as consensus, trust, and commitment; and to teams' final product/s and performance. However, there are few empirical studies documenting negative relationships between dispersion, team processes, and/or performance. Keeping this in mind, it is important for researchers to be alert to a built-in version of the Hawthorne effect. Because organizations view dispersed teams as more challenging than co-located ones, they may implicitly or explicitly provide them with more management attention and more resources. They may be more careful in the choice and training of members for dispersed teams. For this reason, geographically dispersed teams may actually perform *better* on average than FTF teams.

### **1.5 Theoretical Conceptions of Space/Place and Distance**

Having outlined several aspects of the dispersed and traditional teams literature that are foundational for this thesis, I now turn to the literatures on space, place, and distance, which have also been critical for my work. While the literatures on computer-mediated communication and geographically dispersed teams have relied on and occasionally tested several important theories

(e.g., social presence and media richness), they generally have not addressed the broader and more basic theoretical issues of space/place and distance.

### 1.5.1 *Place and Space (or Place in Space)*

People have long recognized that what you think and do depends in large part on “where you sit.” People’s perspectives tend to be quite localized, that is quite strongly influenced by their local context and its language, culture, norms, etc. Your thoughts and behavior also depend on your location *in relation to others*. However, those “others” are increasingly not seated nearby.

As architects and urban planners are well aware, place and space are not synonymous. *Space* typically refers to the “objective” 3D structure or arrangement of the world in which people work and live. Space’s properties include layout, proximity, orientation, direction, distribution, etc. Early social geographers were primarily interested in space. More recently, and more closely tied to my focus on teams, researchers have also built a fairly extensive body of literature dealing with micro-level analyses of work space (e.g., Oldham *et al.*, 1995). There is also a variety of work dealing with the effects of the ambient environment on groups (see Hackman, 1992) and, as I described earlier, Hackman (1999) and others (in Wageman, 1999b) have also encouraged greater attention to context. Hackman (1999) focuses on space as a resource within which teams work, and the spatial configurations of teams’ physical surroundings in the way that Hall (1959, 1966), Steele (1973), Baron (1994), and Oldham *et al.* (1995) do. This attention to space is extremely important, especially in relation to the shifts in philosophy and practice of office environments (Deutsch, 2001).<sup>27</sup> However, it neglects *place*.

Place is “space plus” – i.e., the physical and geographic arrangement of our world “plus” the culturally-based social meanings, conventions, roles, etc. In this sense, place is the more immediate framer of our everyday behavior. It is akin to “home,” whereas space is akin to a “house.” The latter is the container; the former is the socially situated experience of being in that container. Goffman’s (1959) theatrical metaphors of frontstage and backstage implicitly address place and Giddens’ (1984) concept of “locales” closely parallels the meaning of place. As Harrison & Dourish (1996) note, locales or places can usually be “designate[d] in terms of their physical properties ... but it is an error to suppose that locales can be described in those terms alone” because places include the “cultural understandings which help us frame our behavior.” Insofar as “space is the opportunity and place is the understood reality” (Harrison & Dourish, 1996), the space/place distinction shares similarities with the distinction between technologies and technologies-in-practice (Orlikowski, 2000).

The shift in focus from place to space was articulated by Rayport and Sviokla in a series of influential articles in 1994 and 1995. More recently, some have gone beyond simply focusing on space, to exalting it as a triumph of technology. The title of Weill & Vitale’s recent book (2001) – *From Place to Space* – exemplifies this exaltation. As Schultze & Boland (2000, p.187) point out, such conceptions of space treat it “as a guiding image bring[ing] the hope of making an organization more flexible by freeing it from the constraints of place.” Boland (2001) calls this the “tyranny of space” and, in an attempt to balance out such “tyranny,” Cohen & Prusak (2000) advocate for the “power of place” and its role in the development of social capital. In an entirely different field, Harrison & Dourish (1996) have tried to make the same case, arguing that place rather than space should be the focus of CSCW design.

Rather than accept a false dichotomy or artificial tradeoff, social geographers have begun to argue that “the *subjective* component of human spatial existence [is] as important as the

*objective* component” and have become more interested in the “dialectical relationship” between the objective realities of space and the more perceptual, cognitive, ideological, philosophical, and sociological aspects of place (Golledge & Stimson, 1997, p.8). Schultze & Boland (2000) have called for a similar shift (or expansion) in the focus of IS researchers, writing that “Place and space form a duality [whose] meanings are mutually constituted and dialectically intertwined” (p.191). Following their lead, I argue that we need to understand: 1) the spatial-temporal and configurational characteristics of teams, 2) the situated, lived, and experienced (call it “platial”) aspects of teams, and 3) the connections between the two. As I have described earlier in this introduction, research on geographically dispersed teams has yet to articulate those teams’ structural characteristics or connect their structure with the experience thereof.

### 1.5.2 *Distance (and Proximity)*

Distance and its obverse, proximity, are one aspect of space. Other fundamental aspects include separation, openness or closure, and clustering (Golledge & Stimson, 1997). I deal with these and other aspects of space in Chapter 3, but I address distance here because it is so closely tied to modern discussions of virtual work. I also address it here because research on distance is somewhat like research on space; it favors the objective physical aspects over the experienced individual and socio-cultural aspects and suffers from a false dichotomy.

On one hand, there is a widely held view of distance as having died (Cairncross, 1997) or been conquered (Taylor, 2000). On the other, some argue that the rumors of distance’s death are premature (Olson & Olson, 2000, 2002), and that new technology will not get us past the challenges of dispersed work (Hallowell, 1999; Handy, 1995).<sup>28</sup> In fact, there are as many authors offering dismal forecasts (Shapiro *et al.*, 2002) as there are offering bright ones.

Communications and travel speeds have certainly increased rapidly (Barley, 1998) and more places are now accessible than ever before. In some ways, this gives us the sense of having “conquered” distance. However, speed is far from the only relevant measure of communication, and access to “distance-reducing” transportation and communications technology is far from universal or even. Thus, distance is both dead *and* alive. In fact, in many ways, it is more alive than ever. Precisely because more of the world is accessible (or we think it should be), the distances between places are more salient. A century ago, distance was somewhat less salient simply because fewer people expected to travel or communicate across great distances.

This issue of experienced distance and of distance’s salience, subjectivity, and experienced elements is surprisingly overlooked in research on geographically dispersed teams. As with many of their other points, however, Armstrong & Cole (1995) were on target nearly a decade ago. After following a dozen dispersed teams, they identified the importance of psychological closeness or “experienced proximity.” They noted that this experienced proximity or closeness is the result of many interrelated variables including: the degree of identification with group membership; the similarity of work goals, norms, role, and procedure expectations (task cohesion); the accuracy of mutual comprehension; the degree of motivation toward shared goals; the amount of interdependency and mutual trust; and the frequency of communication among members.

To this list, I would add cultural and individual differences in how people perceive and experience distance. As shown by Harrison-Hill (Harrison-Hill, 1997, 1999, 2000) in a series of intriguing studies, people’s perceptions of distance vary greatly based on culture and previous travel experience. Australians, Americans, and Italians, for example, estimate travel differences with widely varying degrees of accuracy. Just as people’s conceptions of place are socially

shaped, cognitive (or perceived) distance “is a mental representation of actual distance moulded by an individual’s social, cultural, and general life experiences” (Golledge & Stimson, 1997; Harrison-Hill, 1999, p.371).<sup>29</sup> Thus, although there is a considerable body of literature on the effects of distance and proximity (for a review, see Kiesler & Cummings, 2002), distance in these studies has always been operationalized in relatively uni-dimensional terms. In the next chapter, I show how the *experience* of distance in the HBC was affected by weather, technology, culture, etc.

## 1.6 Organization of the Thesis

With these elements (i.e., extant research on virtual and FTF teams, as well as theoretical conceptions of space, place, and distance) serving as my motivation and foundation, I now turn to the three empirical studies that comprise the heart of this thesis. As mentioned in the beginning, Chapter 2 presents historical data that show how the experience of dispersion affected and effected managers’ coordination and communication practices, and how coordination and communication in turn affected their experience of dispersion. It also discusses the role that isolation and control played for these managers. In brief, it presents a more multi-dimensional view of dispersion than most previous research, and encourages us to consider the aspects of dispersion that are not evident in simple physical distance; and to understand the HBC managers’ sense of place, as well as their more objective physical locations.

Chapter 3 moves from the historical to the modern and begins to operationalize a more multi-dimensional view of dispersion. In addition to providing a series of new measures to characterize degrees of dispersion, it draws attention to teams’ configuration – i.e., the arrangement of members in relation to each other and key resources, independent of distance. Finally, it employs a series of hypothetical teams to explore these measures and the relationships between spatial-temporal distance, team configuration, communications, and performance.

Even though they characterize dispersion robustly and holistically, the measures employed in Chapter 3 give no sense of 1) the challenges faced by teams in which members move back and forth between dispersed and FTF work, or 2) the challenges of moving from moderately to completely dispersed work. To shed light on these dynamics, Chapter 4 follows two project teams in detail, as they move from moderately virtual work (three major conference calls and four evenings of FTF meetings) to more completely dispersed work (six major conference calls and two FTF meetings). Chapter 5 concludes the thesis, drawing common themes from across the three studies, acknowledging their limitations, highlighting key contributions, and pointing toward promising areas for future research.

## 1.7 References

- Abrahamson, E. (1996). "Management fashion," *Academy of Management Review*, 21(1): 254-285.
- Alderfer, C. P. (1972). *Existence, Relatedness, and Growth: Human Needs in Organizational Settings*. NY: Free Press.
- Allen, T. J. (1977). *Managing the Flow of Technology*. Cambridge, MA: MIT Press.
- Ancona, D., & Chong, C.-L. (1996). "Entrainment: Pace, cycle and rhythm in organizational behavior," *Research in Organizational Behavior*, 18: 251-284.
- Ancona, D. G. (1990). "Outward Bound: Strategies for Team Survival in an Organization," *Academy of Management Journal*, 33(2): 334-365.
- Ancona, D. G., & Caldwell, D. F. (1992). "Bridging the boundary: External activity and performance in organizational teams," *Administrative Science Quarterly*, 37(4): 634-665.
- Anonymous. (2001). "Manufacturing Holds Back on Making Virtual Teamwork a Reality," *The Engineer*: 10.
- Armstrong, D. J., & Cole, P. (1995). "Managing Distances and Differences in Geographically Distributed Work Groups," In S. Jackson, & M. Ruderman (Eds.), *Diversity in work teams: Research paradigms for a changing workplace*, pp. 187-216. Washington, D. C.: American Psychological Association.
- Arrow, H. (1998). "Standing out and fitting in: Composition effects on newcomer socialization," In M. A. Neale, E. Mannix, & D. H. Gruenfeld (Eds.), *Research on Managing Groups and Teams*, Vol. 1, pp. 59-80. Greenwich, CT: JAI Press.
- Arrow, H., & McGrath, J. E. (1993). "How member change and continuity affects small group structure, process, and performance," *Small Group Research*, 24(3): 334-361.
- Arrow, H., McGrath, J. E., & Berdahl, J. L. (2001). *Small Groups As Complex Systems : Formation, Coordination, Development, and Adaptation*. Thousand Oaks: Sage Publications.
- Bafoutsou, G., & Mentzas, G. (2002, in press). "Review and Functional Classification of Collaborative Systems," *International Journal of Information Management*.
- Bailey, D. E., & Kurland, N. B. (2002). "A Review of Telework Research: Findings, New Directions, and Lessons for the Study of Modern Work," *Journal of Organizational Behavior*, 23: 383-400.
- Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002). "Computer-Mediated Communication and Group Decision Making: A Meta-Analysis," *Organizational Behavior & Human Decision Processes*, 87: 156-179.
- Bandow, D. (1998). *Behind the Mask, Across the Miles: Defining and Using Trust in Geographically Dispersed Work Groups*. Unpublished Ph.D. thesis, Human and Organizational Systems, Fielding Institute, Santa Barbara, CA.
- Barley, S. R. (1998). "What can we learn from the history of technology?," *Journal of Engineering & Technology Management*, 15(4): 237-255.
- Barley, S. R., & Kunda, G. (2001). "Bringing Work Back In," *Organization Science*, 12(1): 76-95.
- Bellinger, R. (2001). *The Manager's Pocket Guide to Virtual Teams*: Human Resources Development Press.
- Bettenhausen, K. L. (1991). "Five years of groups research: What we've learned and what needs to be addressed," *Journal of Management*, 17: 345-381.

- Beyerlein, M. M., Johnson, D. A., & Beyerlein, S. T. (Eds.). (2001). *Virtual Teams*. (Vol. 8). Greenwich, CT: JAI Press, Inc.
- Biersdorfer, J. D. (2001). "Taking a meeting over the Internet," *New York Times*, June 13, p.3.
- Boland, R. J., Jr. (2001). "The Tyranny of Space in Organizational Analysis," *Information and Organization*, 11(1): 3-23.
- Bonnevier, B. J. (2000). *The social construction of self in virtual teams*. Unpublished Ph.D. thesis, Fielding Institute, Santa Barbara, CA.
- Bredin, A. (1996). *The virtual office survival handbook : what telecommuters and entrepreneurs need to succeed in today's nontraditional workplace*. New York: J. Wiley.
- Breu, K., & Hemingway, C. (2001). "Cranfield study and data on virtual teams," personal correspondence, via e-mail, July 3 and August 10, 2001.
- Brown, A. A. (1995). *Proximity and Product Development: A Study of Problem-Solving in a United States and a Japanese Firm*. Unpublished Ph.D. thesis, Stanford University, Palo Alto, CA.
- Brown, J. S., & Duguid, P. (2000). *Social Life of Information*. Boston: HBS Press.
- Brytting, T. (1986). "The Management of Distance in Antiquity," *Scandinavian Journal of Management Studies*, November.
- Cairncross, F. (1997). *The Death of Distance: How the Communication Revolution Will Change Our Lives*. Boston: HBS Press.
- Campbell, T. (1998). "The First E-Mail Message: Who Sent It and What It Said." *PreText Magazine*, <http://www.pretext.com/mar98/features/story2.htm>, last accessed June 26, 2002.
- Carletta, J., Anderson, A. H., & McEwan, R. (2000). "The effects of multimedia communication technology on non-collocated teams: a case study," *Ergonomics*, 43(8): 1237-1251.
- Carmel, E. (1999). *Global Software Development Teams: Collaborating across Borders and Time Zones*. Upper Saddle River, NJ: Prentice Hall.
- Cartwright, D., & Zander, A. F. (1953). *Group Dynamics: Research and Theory*. Evanston, IL: Row, Peterson & Co.
- Cascio, W. F. (1999). "Virtual Workplaces: Implications for Organizational Behavior," In C. L. Cooper, & D. M. Rousseau (Eds.), *Trends in Organizational Behavior, Volume 6: The Virtual Organization*, pp. 1-14. NY: John Wiley & Sons.
- Chesler, C. (2001). "Compressed Data: May the Force/Boss Be With You, in 3-D," *New York Times*, November 5, 2001, p.4.
- Clark, D. (2001). "Video, Audio Conferencing Rises Sharply," *Wall Street Journal*, September 18, 2001, p.7.
- Cohen, D., & Prusak, L. (2000). *In Good Company*. Boston: HBS Press.
- Cohen, S. G., & Bailey, D. E. (1997). "What makes teams work: Group effectiveness research from the shop floor to the executive suite," *Journal of Management*, 23(3): 239-290.
- Cooper, C. L., & Rousseau, D. M. (Eds.). (1999). *The Virtual Organization*. (Vol. 6). NY: John Wiley & Sons.
- Cramton, C. D. (2001). "The Mutual Knowledge Problem and Its Consequences for Dispersed Collaboration," *Organization Science*, 12(3): 346-371.
- Crandall, F. N., & Wallace, M. J. (1998). *Work & Rewards in the Virtual Workplace*: AMACOM.

- Culnan, M. J., & Markus, M. L. (1987). "Information technologies," In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of Organizational Communication*, pp. 420-443. Newbury Park: Sage.
- Cummings, J. N. (2001). *Work Groups and Knowledge Sharing in a Global Organization*. Unpublished Ph.D. thesis, Carnegie-Mellon University, Pittsburgh, PA.
- Davidow, W. H., & Malone, M. S. (1992). *The Virtual Corporation: Structuring and Revitalizing the Corporation for the 21st Century*. New York.
- Davison, S. C., & Ward, K. (1999). *Leading International Teams*. London: McGraw-Hill UK.
- Dehler, C. M. (2000). The effects of group membership and task experience on asynchronous computer-mediated group performance, group competencies and group member reactions. Unpublished Ph.D. thesis, Concordia University, Montreal.
- Deutsch, C. H. (2001). "New Economy: I.B.M. and Steelcase lay out their vision of the office of the future," *New York Times*, January 14, 2002, p.4.
- Dixon, N. M. (2000). *Common Knowledge: How Companies Thrive by Sharing What They Know*. Boston: HBS Press.
- Dowling, K. L., & St. Louis, R. D. (2000). "Asynchronous Implementation of the Nominal Group Technique: Is It Effective?," *Decision Support Systems*, 29: 299-248.
- Duarte, D. L., & Snyder, N. T. (1999). *Mastering virtual teams : strategies, tools, and techniques that succeed* (1st ed.). San Francisco: Jossey-Bass.
- Espinosa, J. A. (2002). *Shared Mental Models and Coordination in Large-Scale, Distributed Software Development*. Unpublished Ph.D. thesis, Graduate School of Industrial Administration, Carnegie Mellon University, Pittsburgh, PA.
- Festinger, L., Schachter, S., & Back, S. (1950). *Social Pressures in Informal Groups: A Study of Human Factors in Housing*. Palo Alto, CA: Stanford University Press.
- Fisher, K., & Fisher, M. D. (2000). *The Distance Manager: A Hands On Guide to Managing Off-Site Employees and Virtual Teams*: McGraw Hill.
- Fradkin, P. L. (2002). *Stagecoach: Wells Fargo and the American West*. NY: Simon & Schuster.
- Galvin, J. E. (2000). The effect of trust, experience, and communication media use on an individual's cooperation with virtual teams: A dispositional and situational view. Unpublished Ph.D. thesis, Florida State University, Tallahassee, FL.
- Gartner Group. (2001). "The Rise of Virtual Teams," *Workforce*, 80(6): 65.
- Gaver, B. (1992). *The Affordances of Media Spaces for Collaboration*. Proceedings of the ACM Conference on Computer Supported Collaborative Work, Toronto, Canada,
- Gephart, R. P., Jr. (2002). "Introduction to the Brave New Workplace: Organizational Behavior in the Electronic Age," *Journal of Organizational Behavior*, 23: 327-344.
- Gersick, C. J. G. (1988). "Time and Transition in Work Teams: Toward a New Model of Group Development," *Academy of Management Journal*, 31(1): 9-41.
- Gersick, C. J. G. (1989). "Marking Time: Predictable Transitions in Task Groups," *Academy of Management Journal*, 32(2): 274-309.
- Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Berkeley: University of California Press.
- Ginnett, R. C. (1993). "Crews as Groups: Their Formation and Their Leadership," In E. L. Wiener, B. G. Kanki, & R. L. Helmreich (Eds.), *Cockpit Resource Management*. Orlando, FL: Academic Press.
- Gladstein, D. (1984). "Groups in Context: A Model of Task Group Effectiveness," *Administrative Science Quarterly*, 29: 499-517.

- Gluessing, J. C. (1995). *Fragile Alliances: Negotiating Global Teaming in a Turbulent Environment*. Unpublished Ph.D. thesis, Anthropology, Wayne State University, Detroit, MI.
- Goffman, I. (1959). *Presentation of Self in Everyday Life*. NY: Doubleday.
- Golledge, R. G., & Stimson, R. J. (1997). *Spatial Behavior: A Geographic Perspective*. NY: Guilford Press.
- Gonchar, J., & Roe, A. G. (2000). "Global Teams Allow Firms to Rock around the Clock: Web-based Tools Help Quicken Project Tempo," *ENR*, 245(12): 79-83.
- Gorelick, C. K. (2000). Toward an understanding of organizational learning and collaborative technology: A case study of structuration and sensemaking in a virtual project team. Unpublished PhD thesis, The George Washington University, Washington, DC.
- Gould, D. A. (1997). *Leadership in Virtual Teams*. Unpublished Ed.D. thesis, Seattle University, Seattle, WA.
- Govindarajan, V., & Gupta, A. K. (2001). "Building an Effective Global Business Team," *Sloan Management Review*, 42(4): 63-71.
- Greenbaum, H. H., & Query, J. L., Jr. (1999). "Communication in Organizational Work Groups: A Review and Analysis of Natural Work Group Studies," In L. R. Frey, D. Gouran, & M. S. Poole (Eds.), *The Handbook of Group Communication Theory and Research*, pp. 539-564. Thousand Oaks, CA: Sage.
- Grenier, R., & Metes, G. (1995). *Going Virtual: Moving Your Organization into the 21st Century*. Upper Saddle River: Prentice Hall Computer Books.
- Griffith, T. L., & Neale, M. A. (2001). "Information processing in traditional, hybrid, and virtual teams: From nascent knowledge to transactive memory," *Research in Organizational Behavior*, Vol 23, 23: 379-421.
- Grinter, R. E., Herbsleb, J. D., & Perry, D. E. (1999). *The Geography of Coordination: Dealing with Distance in R&D Work*. Proceedings of the GROUP 99 Conference of the ACM, Phoenix, AZ, 306-315.
- Guzzo, R. A., & Dickson, M. W. (1996). "Teams in Organizations: Recent Research on Performance and Effectiveness," *Annual Review of Psychology*, 47: 307-338.
- Hackman, J. R. (1983). *A Normative Model of Work Team Effectiveness*, Technical Report No.2. New Haven, CT: Yale School of Organization and Management, Research Program on Group Effectiveness.
- Hackman, J. R. (1990). *Groups That Work (and Those That Don't): Creating Conditions for Effective Teamwork*. San Francisco: Jossey-Bass.
- Hackman, J. R. (1992). "Group Influences on Individuals in Organizations," In D. Hough (Ed.), *Handbook of Industrial and Organizational Psychology*, Vol. 3, pp. 199-267.
- Hackman, J. R. (1998). "Why Teams Don't Work," In R. S. e. a. Tindale (Ed.), *Theory and Research on Small Groups*, pp. 245-267. NY: Plenum Press.
- Hackman, J. R. (1999). "Thinking Differently about Context," In R. Wageman (Ed.), *Research on Managing Groups and Teams*, Vol. 2, pp. 233-247. Greenwich, CT: JAI Press.
- Hackman, J. R. (2002). *Leading Teams: Setting the Stage for Great Performances*. Boston, MA: Harvard Business School Press.
- Hackman, J. R., & Morris, C. G. (1975). "Group tasks, group interaction processes, and group performance effectiveness: A review and proposed integration," In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*. NY: Academic Press.



- Hallowell, E. M. (1999). "The Human Moment at Work," *Harvard Business Review*, Jan-Feb: 2-8.
- Handy, C. (1995). "Trust and the Virtual Organization," *Harvard Business Review*, 73(3): 40-50.
- Hare, A. P. (1992). "Group and Team Development," In A. P. Hare (Ed.), *Groups, Teams, and Social Interaction: Theories and Applications*, pp. 23-30. NY: Praeger.
- Harmon, A. (2001). "Remote Rendezvous: Worried Travelers Warm Up to Videoconferencing," *New York Times*.
- Harris, S. (1996). "Confession-building: Long-Distance Networks and the Organization of Jesuit Science," *ESM*, 1(3): 284-318.
- Harrison, S., & Dourish, P. (1996). *Re-Place-ing Space: The Roles of Place and Space in Collaborative Systems*. Proceedings of the CSCW'96 Conference, Boston.
- Harrison-Hill, T. (1997). *The Tyranny of Distance: A Cross-Cultural Comparison of Tourists' Perceptions*. Proceedings of the Sixth Symposium on Cross-Cultural Consumer and Business Studies, Honolulu, HI, 371-376.
- Harrison-Hill, T. (1999). *How Far Is a Long Way? Contrasting Two Cultures' Perspectives of Travel Distance*. Proceedings of the Seventh Cross Cultural Research Conference, Cancun, Mexico.
- Harrison-Hill, T. (2000). "Investigating Cognitive Distance and Long-Haul Destinations," *Tourism Analysis*, 5: 83-90.
- Haywood, M. (1998). *Managing Virtual Teams: Practical Techniques for High-Technology Project Managers*. Boston: Artech Publishers.
- Haywood, M. (2000). *Managing Virtual Teams: Practical Techniques for High-Technology Project Managers*. Boston: Artech House.
- Henry, J. E., & Hartzler, M. (1997). *Tools for Virtual Teams: A Team Fitness Companion*. Milwaukee: American Society for Quality.
- Herbsleb, J. D., Mockus, A., Finholt, T. A., & Grinter, R. E. (2000). *Distance, Dependencies, and Delay in Global Collaboration*. Proceedings of the CSCW Conference, Philadelphia, PA, 319-328.
- Hinds, P., & Kiesler, S. (2002). *Distributed Work*. Cambridge, MA: MIT Press.
- Hoefling, T. (2002). *Working Virtually: Managing the Human Element for Successful Virtual Teams and Organizations*: Stylus Publications.
- Hollan, J., & Stornetta, S. (1992). *Beyond Being There*. Proceedings of the CHI '92 Conference, 119-125.
- Homans, G. C. (1951). *The Human Group* (1st ed.). London: Routledge & Kegan Paul.
- Hornett, A. (1998). *Power and a Virtual Team: Modernist and Postmodernist Perspectives*. Unpublished Ed.D. thesis, The George Washington University, Washington, DC.
- Hugli, W. G. (2000). *Teams, training and trust in the virtual environment*. Unpublished Ed.D. thesis, University of West Florida, Pensacola, FL.
- Igbaria, M., & Tan, M. (1998). *The Virtual Workplace*. Hershey, PA: Idea Group.
- Jackson, P. (Ed.). (1999). *Virtual Working: Social and Organisational Dynamics*. London: Routledge.
- Jarvenpaa, S. L., & Ives, B. (1994). "The global network organization of the future: Information management opportunities and challenges," *Journal of Management Information Systems: JMIS*, 10(4): 25-57.

- Jarvenpaa, S. L., Knoll, K., & Leidner, D. E. (1998). "Is Anybody Out There? Antecedents of Trust in Global Virtual Teams," *Journal of Management Information Systems*, 14(4): 29-64.
- Jarvenpaa, S. L., & Leidner, D. E. (1999). "Communication and trust in global virtual teams," *Organization Science*, 10(6): 791-815.
- John, R. R. (1986). "Private Mail Delivery in the United States during the Nineteenth-Century: A Sketch," *Business and Economic History*, Vol. 15, 1986, pp. 135-147.
- Johnson, D. W., & Johnson, F. P. (1994). *Joining Together: Group Theory and Group Skills*. Boston: Allyn & Bacon.
- Johnson-Lenz, P., & Johnson-Lenz, T. (1994). "Groupware:Coining and Defining It (response to an inquiry from the Oxford English Dictionary, April 1994)." <http://www.awakentech.com/AT/Awaken1.NSF/Papers?OpenView>, last accessed April 4, 2002, 2002.
- Jude-York, D., Davis, L. D., & Wise, L. D. (2001). *Virtual Teaming : Breaking the Boundaries of Time and Place*: Crisp Publications.
- Karolak, D. W. (1998). *Global Software Development: Managing Virtual Teams and Environments*. Los Alamitos, CA: IEEE Computer Society.
- Kaufman, H. (1960). *Forest Ranger : A Study in Administrative Behavior*. Baltimore: Johns Hopkins University Press.
- Kayworth, T., & Leidner, D. E. (2000). "The Global Virtual Manager: A Prescription for Success," *European Management Journal*, 18(2): 183-194.
- Kiesler, S., & Cummings, J. N. (2002). "What do we know about proximity and distance in work groups? A legacy of research," *Distributed Work*, pp. 57-82. Cambridge, MA: MIT Press.
- Kiesler, S., Siegel, J., & McGuire, T. W. (1984). "Social Psychological Aspects of Computer-Mediated Communication," *American Psychologist*, 39: 1123-1134.
- King, J. L., & Frost, R. L. (2002). "Managing Distance Over Time: The Evolution of Technologies of Dis/Ambiguation," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 3-26. Cambridge, MA: MIT Press.
- Knoll, K. E. (2000). *Communication and Cohesiveness in Global Virtual Teams*. Unpublished Ph.D. thesis, University of Texas, Austin.
- Kock, N. F. (1997). *The Effects of Asynchronous Groupware on Business Process Improvement*. Unpublished Ph.D. thesis, University of Waikato, Hamilton, New Zealand.
- Kostner, J. (1994). *Virtual Leadership: Secrets from the Round Table for the Multi-Site Manager*. NY: Warner Books.
- Kostner, J. (2001). *Bionic eTeamwork*. Chicago, IL: Dearborn Trade Publishing.
- Leidner, D. E., & Jarvenpaa, S. L. (1995). "The use of information technology to enhance management school education: A theoretical view," *MISQ*, 19(3): 265-291.
- LeMay, E. A. (2000). *Virtual teams: Work processes, communication, and team development*. thesis, Colorado State University, Fort Collins, CO.
- Levina, N. (2001). *Multi-party Information Systems Development: The Challenge of Cross-Boundary Collaboration*. Unpublished Ph.D. thesis, Sloan School of Management, Information Technology Department, MIT Sloan School of Management, Cambridge, MA.
- Liden, R. C., Wayne, S. J., A, T., Sparrowe, R. T., & et al. (1999). "Management of poor performance: A comparison of manager, group member, and group disciplinary decisions," *Journal of Applied Psychology*, 84(6): 835-850.

- Lipnack, J., & Stamps, J. (1997). *Virtual Teams: Reaching Across Space, Time, and Organizations with Technology*. New York: Wiley.
- Lurey, J. S. (1998). *A Study of Best Practices in Designing and Supporting Effective Virtual Teams*. Unpublished Ph.D. thesis, California School of Professional Psychology, Los Angeles, CA.
- Lurey, J. S., & Raisinghani, M. S. (2001). "An empirical study of best practices in virtual teams," *Information & Management*, 38(8): 523-544.
- Maisonneuve, J., Palmade, G., & Fourment, C. (1952). "Selective Choices and Propinquity," *Sociometry*, 15(1/2): 135-140.
- Majchrzak, A., King, N., Ba, S., Rice, R. E., & Malhotra, A. (2000a). "Computer-Mediated Inter-Organizational Knowledge-Sharing: Insights from a Virtual Team Innovating Using a Collaborative Tool," *Information Resources Management Journal*, 13(1): 44-53.
- Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. L. (2000b). "Technology adaptation: The case of a computer-supported inter-organizational virtual team," *MISQ*, 24(4): 569-600.
- Malhotra, A., Majchrzak, A., Carman, R., & Lott, V. (2001). "Radical innovation without collocation: A case study at Boeing-Rocketdyne," *MISQ*, 25(2): 229-249.
- May, A., & Carter, C. (2001). "A case study of virtual team working in the European automotive industry," *International Journal of Industrial Ergonomics*, 27(3): 171-186.
- Mayer, M., & Pinto, J. K. (1999). *The Virtual Edge : Embracing Technology for Distributed Project Team Success*: Project Management Institute Publications.
- Maznevski, M. L., & Chudoba, K. M. (2000). "Bridging space over time: Global virtual team dynamics and effectiveness," *Organization Science*, 11(5): 473-492.
- McDonough, E. F., III, & Cedrone, D. (2000). "Meeting the challenge of global team management," *Research Technology Management*, 43(4): 12-17.
- McDonough, E. F., III, Kahn, K., & Barczak, G. (2001). "An Investigation of the Use of Global, Virtual, and Colocated New Product Development Teams," *Journal of Product Innovation Management*, 18: 110-120.
- McDowell, E. (2001). "No Hype: Four Web Tools That Work and Save Money," *New York Times*, June 13, 2001, p.3.
- McGrath, J. E. (1984). *Groups: Interaction and Performance*. Englewood Cliffs, NJ: Prentice Hall.
- McGrath, J. E., & Hollingshead, A. B. (1994). *Groups interacting with technology: ideas, evidence, issues, and an agenda*. Thousand Oaks, CA: Sage Publications.
- McGrath, J. E., & O'Connor, K. M. (1996). "Temporal issues in work groups," In M. A. West (Ed.), *Handbook of Work and Group Psychology*, pp. 25-52. London: John Wiley & Sons.
- McGuire, C. (2001). "Stream of Conferences," *PR Week*: 17.
- McHorney, D. E. (2000). The effectiveness of team building activities and technology workshops as mandatory preparation for an online graduate degree program. Unpublished Ed.D. thesis, Pepperdine University, Malibu, CA.
- Meadows, C. J. (1996). *Globework: Creating Technology with International Teams*. Unpublished D.B.A. thesis, Harvard University, Cambridge, MA.
- Millman, H. (2001). "The Videoconference as a Bicoastal Pas de Deux," *New York Times*, July 12, 2001, p.5.

- Mishler, J. W. I. (2000). *Re-organizing the Naval Air Systems Command*. Unpublished Ph.D. thesis, The George Washington University, Washington, DC.
- Moore, K., & Lewis, D. (1999). *Birth of the Multinational: 2000 Years of Ancient Business History -- from Ashur to Augustus*. Copenhagen: Copenhagen Business School Press.
- Moreland, R., & Levine, J. (1989). "Newcomers and Oldtimers in Small Groups," In P. Paulus (Ed.), *Psychology of Group Influence*, 2nd ed., pp. 143-185. Hillsdale, NJ: Erlbaum.
- Mortensen, M., & Hinds, P. (2001). "Conflict and Shared Identity in Geographically Distributed Teams," *International Journal of Conflict Management*, 12(3): 212-238.
- Mortensen, M., & Hinds, P. J. (2002). "Fuzzy Teams: Boundary Disagreement in Distributed and Collocated Teams," In P. J. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 283-308. Cambridge, MA: MIT Press.
- Nemiro, J. E. (1998). *Creativity in Virtual Teams*. Unpublished Ph.D. thesis, Claremont Graduate University, Claremont, CA.
- Nilles, J. M., Carlson, F. R., Gray, P., & Hanneman, G. J. (1976). *The Telecommunications-Transportation Tradeoff: Options for Tomorrow*. New York: Wiley.
- O'Hara-Devereaux, M., & Johansen, R. (1994). *Globalwork: Bridging Distance, Culture, and Time* (1st ed.). San Francisco: Jossey-Bass.
- Oldham, G. R., Cummings, A., & Zhou, J. (1995). "The Spatial Configuration of Organizations: A Review of the Literature and Some New Research Directions," *Research in Personnel and Human Resource Management*, Vol. 13, pp. 1-37. Greenwich, CT: JAI Press.
- O'Leary, M. B., Orlikowski, W. J., & Yates, J. (2002). "Distributed Work over the Centuries: Trust and Control in the Hudson's Bay Company, 1670-1826," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 27-54. Cambridge, MA: MIT Press.
- Olson, G. M., & Olson, J. S. (2000). "Distance Matters," *Human-Computer Interaction*, 15(1): 139-179.
- Olson, G. M., & Olson, J. S. (2002). "The (Currently) Unique Advantages of Collocated Work," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 113-136. Cambridge, MA: MIT Press.
- Olson, J. D. (1999). What is the impact of telephones and synchronous computer-mediated collaboration on the work of virtual teams? Unpublished Ph.D. thesis, Colorado State University, Fort Collins, CO.
- Orlikowski, W. J. (2000). "Using technology and constituting structures: A practice lens for studying technology in organizations," *Organization Science*, 11(4): 404-428.
- Orlikowski, W. J., & Iacono, C. S. (2001). "Research Commentary: Desperately Seeking the "IT" in IT Research -- A Call to Theorizing the IT Artifact," *Information Systems Research*, 12(2): 121-134.
- Pauleen, D. F., & Yoong, P. (2001a). "Facilitating virtual team relationship via Internet and conventional communication channels," *Internet Research-Electronic Networking Applications and Policy*, 11(3): 190-202.
- Pauleen, D. J., & Yoong, P. (2001b). "Relationship building and the use of ICT in boundary-crossing virtual teams: a facilitator's perspective," *Journal of Information Technology*, 16(4): 205-220.
- Pawar, K. S., & Sharifi, S. (1997). "Physical or virtual team collocation: Does it matter?," *International Journal of Production Economics*, 52(3): 283-290.

- Piccoli, G. (2000). Virtual teams: An investigation of the determinants of team effectiveness and the contribution of managerial behavior control. Unpublished Ph.D. thesis, Louisiana State University, Baton Rouge, LA.
- Poltrock, S. E., & Engelbeck, G. (1999). "Requirements for a Virtual Collocation Environment," *Information and Software Technology*, 41: 331-339.
- Polzer, J. T., Crisp, C. B., Jarvenpaa, S. L., & Kim, W.-Y. (2002). *Geographical Diversity in Globally Dispersed Teams: A Test of the Faultline Hypothesis*. Presented at the VirtualTeamsResearch.org Tele-Conference, April 5, 2002.
- Powell, A. L. (2000). *Antecedents and outcomes of team commitment in a global, virtual environment*. Unpublished Ph.D. thesis, Indiana University, Bloomington, IN.
- Prabhakar, B. K. (1999). *Internet-Based Collaboration Software: A Study of Impacts on Distributed Collaborative Work*. Unpublished Ph.D. thesis, Mississippi State University, Starkville, MS.
- Rayport, J. F., & Sviokla, J. J. (1994). "Managing in the marketspace," *Harvard Business Review*, 72(6): 141-150.
- Rayport, J. F., & Sviokla, J. J. (1995). "Exploiting the virtual value chain," *Harvard Business Review*, 73(6): 75-85.
- Rennecker, J. (2000). *The Myth of Spontaneous Connection: An Ethnographic Study of the Situated Nature of Virtual Teamwork*. Unpublished Ph.D. thesis, Sloan School of Management, Organization Studies Group, MIT, Cambridge, MA.
- Robey, D., Khoo, H. M., & Powers, C. (2000). "Situated learning in cross-functional virtual teams," *IEEE Transactions on Professional Communication*, 43(1): 51-66.
- Roethlisberger, F. J., Dickson, W. J., Wright, H. A., & Western Electric Company. (1939). *Management and the Worker: An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago*. Cambridge, MA: Harvard University Press.
- Rousseau, D. M., & Fried, Y. (2001). "Location, Location, Location: Contextualizing Organizational Research," *Journal of Organizational Behavior*, 22: 1-13.
- Scandura, T. A., & Williams, E. A. (2000). "Research methodology in management: Current practices, trends, and implications for future research," *Academy of Management Journal*, 43(6): 1248-1264.
- Schultze, U., & Boland, R. J., Jr. (2000). "Place, Space and Knowledge Work: A Study of Outsourced Computer Systems Administrators," *Accounting, Management & Information Technology*, 10: 187-219.
- Scott, C. R. (1999). "Communication Technology and Group Communication," In L. R. Frey, D. Gouran, & M. S. Poole (Eds.), *Handbook of Group Communication Theory and Research*, pp. 432-474. Thousand Oaks, CA: Sage.
- Sessa, V. I., Hansen, M. C., Prestridge, S., & Kossler, M. E. (1999). *Geographically Dispersed Teams: An Annotated Bibliography*. Greensboro, NC: Center for Creative Leadership.
- Shachaf, P. (2002). "Virtual teams field studies: Summary of responses to ISWORLD ListServ Query." <http://www.isworld.org/isworldlist>, last accessed February 15, 2002,
- Shapiro, D. L., Furst, S. A., Spreitzer, G. M., & von Glinow, M. A. (2002). "Transnational Teams in the Electronic Age: Are Team Identity and High Performance at Risk?," *Journal of Organizational Behavior*, 23: 455-467.
- Shillingford, J. (2001). "Technology makes vital eye contact easier than ever," *Financial Times*, December 5, 2001, p.6.

- Shultze, U., & Orlikowski, W. J. (2001). "Shaping the Reality of Virtuality: Metaphors for New Organizations," *Information and Organization*, 11(1).
- Sole, D., & Edmondson, A. (2002, forthcoming). "Situated knowledge and learning in dispersed teams," *British Journal of Management*.
- Steiner, I. D. (1972). *Group Process and Productivity*. NY: Academic Press.
- Stewart, J. Q. (1942). "A Measure of the Influence of a Population at a Distance," *Sociometry*, 5(1): 63-71.
- Suchan, J., & Hayzak, G. (2001). "The communication characteristics of virtual teams: a case study," *IEEE Transactions on Professional Communication*, 44(3): 174-186.
- Switzer, J. S. (2000). *Virtual teams: Profiles of successful leaders*. Unpublished Ed.D. thesis, Pepperdine University, Malibu, CA.
- Taylor, G. (2000). "Conquering Distance," *The Beaver*: 56-65.
- Taylor, T. R. (1997). Factors Influencing the Effectiveness of Cross-Functional Work Teams in a Research and Development Organization. Unpublished Ed.D. thesis, University of San Francisco, San Francisco, CA.
- Thompson, J. D. (1967). *Organizations in Action*. NY: McGraw-Hill.
- Vickery, C. M., Clark, T. D., & Carlson, J. R. (1999). "Virtual positions: an examination of structure and performance in ad hoc workgroups," *Information Systems Journal*, 9(4): 291-312.
- Wageman, R. (1995). "Interdependence and group effectiveness," *Administrative Science Quarterly*, 40(1): 145-180.
- Wageman, R. (1999a). "Introduction: Groups in Context," In R. Wageman (Ed.), *Research on Managing Groups and Teams*, Vol. 2. Greenwich, CT: JAI Press.
- Wageman, R. (1999b). *Research on Managing Groups and Teams, Vol.2: Groups in Context*. Greenwich, CT: JAI Press.
- Waller, M. J. (1999). "The timing of adaptive group responses to nonroutine events," *Academy of Management Journal*, 42(2): 127-137.
- Walther, J. B. (1995). "Relational Aspects of Computer-Mediated Communication: Experimental Observations over Time," *Organization Science*, 6(2): 186-203.
- Walther, J. B., Slovacek, C. L., & Tidwell, L. C. (2001). "Is a picture worth a thousand words? Photographic images in long-term and short-term computer-mediated communication.," *Communication Research*, 28(1): 105-134.
- Warkentin, M. E., Sayeed, L., & Hightower, R. (1997). "Virtual teams versus face-to-face teams: An exploratory study of a web-based conference system," *Decision Sciences*, 28: 975-996.
- Weill, P., & Vitale, M. R. (2001). *Place to Space: Migrating to E-Business Models*. Boston: HBS Press.
- Williamson, O. E. (1991). "Comparative Economic Organization: The Analysis of Discrete Structural Alternatives," *Administrative Science Quarterly*, 36(2): 269-296.
- Woodward, J. (1965). *Industrial Organization: Behaviour and Control*. London: Oxford University Press.
- Workman, M. D. (2000). The effects of cognitive style and communications media on commitment to telework and virtual team innovations among information systems teleworkers. Unpublished Ph.D. thesis, Georgia State University, Atlanta, GA.

- Yager, S. E. (1998). *The Role of Information Technology Support Mechanisms in Coordination Management for Virtual Teams*. Unpublished Ph.D. thesis, University of North Texas, Denton, TX.
- Zack, M. H., & McKenney, J. L. (1995). "Social context and interaction in ongoing computer-supported management groups," *Organization Science*, 6(4): 394-422.

## 1.8 Endotes

<sup>1</sup> Throughout this thesis, I will use the terms “geographically dispersed team” (GDT) and “virtual team” interchangeably. I do so primarily for simplicity of phrasing, despite the fact that “virtual team” is less precise and is used variously to describe teams with permeable organization boundaries, non-traditional employment relationships, and temporary membership (Shultze & Orlikowski, 2001). In addition, I will use “team” interchangeably with “work group” (Hackman, 1990).

<sup>2</sup> In this sense, geographic dispersion is akin to information technology, which has ironically been overlooked in IT research (Orlikowski & Iacono, 2001), and work itself, which Barley & Kunda (2001) argue has been noticeably absent from recent research on organization theory.

<sup>3</sup> In addition to being limited to one type of teams (i.e., new product development), there were also major sampling and response rate problems with this study. Also note that there is variation by industry in terms of the use of geographically-dispersed teams. For example, “the virtual team is virtually unheard of” in manufacturing, according to a survey of 540 UK companies by Cranfield School of Management (UK) (Anonymous, 2001; Breu & Hemingway, 2001).

<sup>4</sup> Kiesler & Cummings (2002) refer to this as “intentional” vs. “unintentional” (and thus often undesirable) “distribution” of team members.

<sup>5</sup> All three were written in 1992; the database coverage begins in 1986.

<sup>6</sup> Note that the designation of article as “peer reviewed” is based on ProQuest’s categories; these peer reviewed journals include a wide variety of publications, some of which are more practitioner- or trade-press oriented than “peer reviewed” might connote. In this sense, these counts overstate the number of articles in “A” or “B” journals.

<sup>7</sup> None of the 1993-94 articles was empirical, and only one of them was a full-length article in an academic journal – i.e., Jarvenpaa & Ives (1994).

<sup>8</sup> Only one of these six was empirical – i.e., Leidner & Jarvenpaa (1995).

<sup>9</sup> Note that ProQuest is, by no means, a complete or completely accurate index of all publications, but searches of ProQuest’s or similar collections (e.g., ABI) are common barometers of published coverage on a topic (e.g., Abrahamson, 1996; Scandura & Williams, 2000). Because ProQuest does not cover published conference proceedings at all and includes only partial coverage of major IT/IS journals, these counts underrepresent such work (but there is no reason to believe that the general trends would differ if they were added). Although ProQuest’s coverage and full-text indexing increases every year (from the beginning of its coverage in 1986), some of the increased “use” of the term virtual is attributable simply to the increased size of ProQuest’s underlying databases. Also, some of the recent volume of articles may not reflect the full volume, since there is a lag between a publication and its appearance in Proquest. Finally, note that the addition of the terms “geographically dispersed team” or “geographically distributed team” does not change the general pattern shown in the table and does not significantly increase the number of additional articles identified (2 references in 1986-2, 12 in 1993-5, 23 in 1996-97, 12 in 1998, and 28 in 1999-2000). Furthermore, it shows that the term “virtual team” has become dominant despite (or perhaps because of) its more ambiguous definition.

<sup>10</sup> These counts are based on searches in Dissertation Abstracts index and UMI’s Digital Dissertations, as well as my own collection of theses. Data for 2001-02 are incomplete, not fully indexed, and thus, not included in the table, despite the fact that there have been noteworthy field-based theses of dispersed teams during these years (e.g., Cummings, 2001; Espinosa, 2002; Prabhakar, 1999; Rennecker, 2000).

<sup>11</sup> The term “groupware” was coined in October 1978 by Peter and Trudy Johnson-Lenz (Johnson-Lenz & Johnson-Lenz, 1994).

<sup>12</sup> The term “CSCW” received its first public debut at a workshop in 1984 and as the title of a conference jointly sponsored by Xerox-PARC and MCC in 1986.

<sup>13</sup> The first e-mails were sent in 1971 (Campbell, 1998).

<sup>14</sup> Use of the term and interest in the topic of “computer-mediated communication” appears to have begun in earnest in the late 1980s, but it was used in print earlier in the decade (e.g., Kiesler *et al.*, 1984)



<sup>15</sup> According to the *OED*, the term “teleconference” was first used in 1953. By 1973, the *Times* wrote that “The prospect of similar teleconference equipment in every main commercial or industrial building just like the telephone on the business desk is no longer a pipe dream” and two years later a paper was being presented on the psychological and travel-replacement aspects of teleconferencing. In 1970, the commercial PicturePhone debuted and, in 1983, the *New Scientist* (7 Apr) noted that British Telecom had been running video conferencing studios for the past 12 years.

<sup>16</sup> The term “telecommuting” was coined in 1973-4 by Jack Nilles (Nilles *et al.*, 1976), who was working on NASA satellite communications projects in Los Angeles. Fed up with L.A. traffic, he went on to become a telecommuting booster, writing and consulting on the subject. By 1978, Blue Cross/Blue Shield had started one of the first organized tele-commuting projects in the workplace, which they called the “cottage keyer” program. See Bailey and Kurland (2002) for a recent review of telework/telecommuting research.

<sup>17</sup> Note that several field studies were excluded from this table because the subjects of the studies were not necessarily members of teams themselves. For example, in May *et al.* (2000) and May & Carter (2001), the focus was on computer-support for virtual teams, but the subjects were European auto industry design engineers who acted as trial users for a new system, but whose membership on a team or teams was not specified. Similarly, McDonough *et al.* (2001) looked at three different degrees of dispersion in NPD teams, but their 103 respondents were not necessarily members or leaders of specific teams. Also note that this table does not include conference proceedings (e.g., HICCS, ICIS, and CHI).

<sup>18</sup> Both Majchrzak *et al.* (2000) studies are based on the same “SLICE” team.

<sup>19</sup> Three teams are described as having 7, 6, and 4 members respectively; the sizes of the other four are not specified.

<sup>20</sup> Survey respondents = 273 across 84 teams; no data on response rate or number of teams from which the sample was drawn.

<sup>21</sup> Poltrock & Engelbeck (1999) is just one of many “FTF gold standard” approaches to supporting dispersed teams.

<sup>22</sup> Dowling and St. Louis (2000, pp.244-5) argue (perhaps more forcefully than data from student groups allow) that “organizations are wasting substantial economic resources in the form of travel expenditures and time spent arranging, travelling to, and participating in meetings” even though they found that asynchronous computer-assisted groups using the nominal group technique “generate more and better ideas, and do it in less time” than non-computer assisted synchronous groups do.

<sup>23</sup> The commonality of such horse-race comparisons is captured in Warkentin *et al.*’s title, but they have considerable company, as all reviews of CMC and group and decision support systems research make (implicitly) clear.

<sup>24</sup> Both Majchrzak *et al.* (2000) studies are based on the same “SLICE” team.

<sup>25</sup> Three teams are described as having 7, 6, and 4 members respectively; the sizes of the other four are not specified.

<sup>26</sup> Survey respondents = 273 across 84 teams; no data on response rate or number of teams from which the sample was drawn.

<sup>27</sup> Recent news regarding the Enron and Andersen investigations also highlights how proximity and spatial configurations played a role in the companies’ travails. As quoted in the *Wall Street Journal* (April 15, 2002, p.A1, “On Camera, People at Andersen, Enron Tell How Close They Were,” by I.K. Duggan, D.K. Berman, and A. Barrioneuvo) Enron President Jeffrey Skilling said that Andersen’s accountants needed to be right in Enron’s offices because, “You just don’t have the time anymore to make the phone calls ... It’s moving too quickly, you have to have people close, they have to be involved in the business.” According to the *Journal*, Andersen eventually had more than 100 people working in Enron’s Houston headquarters. The attention to spatial configuration at close quarters was not limited to Andersen’s movement into Enron’s offices. In September 2001, Andersen “overhauled its Dallas office, clustering auditors, tax people, and consultants – who were previously on separate floors – together to focus on clients jointly.”

<sup>28</sup> For a good, recent review of several dozen systems to support collaborative group work (both co-located and dispersed), see Bafoutsou and Mentzas (2002, in press).

<sup>29</sup> In general, people are able to produce better estimates of actual distance in temporal terms (e.g., guessing that Sydney and Los Angeles are 14 hours apart) than they can in miles or kilometers. The few people who are able to produce reasonably accurate mileage estimates are those who report extensive use of frequent flier miles! (Harrison-Hill, 1999).

## CHAPTER 2

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### **HISTORICAL ROOTS OF VIRTUAL TEAMS: DISPERSION AMONG SENIOR MANAGERS IN THE HUDSON'S BAY COMPANY, 1670- 1950**

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We know it is impossible at this distance to give such orders as shall answer every occurrence and be strictly observed in all points, so that when we have said all, we must leave much to your prudent conduct, having always in your eye the true interest and advantage of the Company, [which has] chosen and trusted you in the chief command [it has] to bestow (From the annual letter of the London-based Executive Committee of the Hudson's Bay Company to one of its North American post managers, 1679, transcribed in Rich, 1948, p.10<sup>1</sup>).

I must pay tribute to the devotion to duty of its staff, who are, indeed, the Company. Scattered as they are between latitudes 74 degrees North and 30 degrees South, some forming members of a team of two or three, others of a team of several thousand, all have been imbued with the great traditions of this Company. The study of how effectively to apply the enthusiasm and goodwill which springs from this loyalty for the joint benefit of the Company and its Staff is the constant preoccupation of those responsible for its management, from the Board itself to the manager of the smallest post. In our Company, more than in most, responsibility devolves on individual managers often remote from central control and I am sure that it would be your [i.e., the shareholders'] wish that I should send to these [managers] a message of confidence in their ability to meet whatever situation may arise. (Hudson's Bay Company chief executive Patrick A. Cooper in the Company's *Annual Report*, 1950, p.9, §4).\*

\* Unless otherwise noted, this and all other Hudson's Bay Company quotes are from original records kept by the Hudson's Bay Company Archives (HBCA), Winnipeg, Manitoba, Canada

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## 2.1 Introduction

At its most general level, this chapter poses the following question: What can we learn about dispersed work from a company whose operations have spanned more than a million square miles for more than three centuries?<sup>2</sup> Perhaps the most obvious answer is the one implied by the question itself – i.e., that dispersed or “virtual” work is not new, even if the term is. The senior management team of the Hudson’s Bay Company (HBC) began doing geographically dispersed work in 1670 and, as this chapter’s epigram attests, recognized dispersion as a critical issue.

Still in business today, the HBC was established when the English king chartered a group of London-based businessmen known as “The Governor and Company of Adventurers Trading into Hudson’s Bay.” As the official name implies, the Company was founded to trade furs in the area of North America then known as Rupert’s Land. This vast territory was larger than the Roman Empire at its peak and was equivalent to 75% of modern Canada. It made the HBC the de facto civil and commercial ruler of approximately one-twelfth of the earth’s land mass.

The HBC’s London-based “Governor” (i.e., CEO) and seven-member executive committee financed and coordinated the establishment of posts 3,800 miles away in Rupert’s Land. From those posts, the Company’s employees traded guns, knives, blankets, and other European goods for beaver, marten, fox, and other furs trapped by Indians.<sup>3</sup> The furs were then shipped back to England each year to be sold at auction.

The Company’s posts (also known as factories, forts, and houses) and their trade were run by complements of 3 to 100 men. Until well into the 20<sup>th</sup> century, most of the posts were at least 10 days apart — by canoe, dog sled, and/or snowshoe (depending on the season and terrain). Given the distance between London and the Bay, and among the Company’s North American posts, the HBC’s managers are a quintessential example of a dispersed team.

Application of the term “team” to the early HBC managers requires some retrospective license. The term “team” was not used by senior company officials until 1950, when the Governor referred to post managers working in teams dispersed across wide ranges of latitude (*Annual Report*, 1950, p.9). Thus, my use of the term to describe the managers prior to 1950 is, strictly speaking, an anachronism. However, the managers constituted an identifiable, bounded, and interdependent group long before the term “team” existed to describe them (Alderfer, 1972; Hackman, 1990). In this sense, the HBC is a “typifier” (Barley, 1998), cautioning us against interpreting “modern” dispersed teams as a new, atypical, Internet-spawned phenomenon.

In addition to making the basic point that dispersed work is not new, this chapter addresses three questions: 1) How did dispersion influence the emergence of the work practices in the HBC? 2) How did HBC managers’ work practices affect their experience of dispersion? and 3) Beyond the simple physical aspects of dispersion, what other factors affected their experience? On occasion, the managers would address their experience of dispersion directly, but dispersion was so inherent in their daily lives that it rarely warranted explicit mention. In this regard, dispersion is like religion in early colonial America – it “was simply too basic, too much an assumed constant of life to be rendered fully visible and self-conscious. It registered largely as a kind of underlying presence” of the HBC managers’ lives (Demos, 1970, p.12). Given the difficulty of understanding something that was “part of the very atmosphere which surrounded and suffused all aspects” of life on the Bay, I describe the dispersion-related challenges faced by the managers themselves, and the work practices that they developed to deal with those challenges (sometimes successfully, sometimes not so successfully).

Through an historical exploration of the dispersion-related challenges faced by HBC managers, and of the work practices they developed to address those challenges, I hope to make the experience of dispersion “more fully visible.” This historical exploration is possible, in part, because the Company’s extensive archives contain centuries’ worth of daily journals and regular correspondence among the dispersed HBC managers and their distant leaders in London. Such detailed longitudinal data offer a rare picture of a far-flung company’s internal operations and its dispersed managers’ communications over three centuries.

Despite my use of historical data, this chapter is not intended as history per se. Rather, it adopts an “historical perspective” (Lawrence, 1984, p.307), applies historical methods, and attempts to learn something about where we are and “how we got here” from the predecessors of today’s dispersed teams. In this sense, “Historical perspective differs from history in that the object of historical perspective is to sharpen one’s vision of the present, not the past” (Lawrence, 1984, p.307). The chapter is predicated on my belief that our understanding of new “virtual” forms of work will be incomplete without a better understanding of historical forms of dispersed work. This is especially true given the long tradition of geographically far-flung organizations like the HBC, other trading companies, the Catholic Church, and various military organizations.

As many authors have pointed out (Aupperle, 1996; Goldman, 1994; Goodman & Kruger, 1988; Hargadon & Douglas, 2001; Kieser, 1994; Lawrence, 1984), there are few studies employing history or historical perspective in management research. However, the historical method for management research has been described as especially valuable in cases of “modern” phenomena (Barley, 1998). Geographically dispersed teams (and technology-enabled “virtual” work more generally) are just the kind of phenomenon that Barley (1998) describes as vulnerable to the “typifying” powers of an historical perspective. Barley notes that history often shows us how seemingly modern phenomena are often much more typical (and much less novel) than the business and academic presses make them out to be. Aldrich & Mueller (1982) also wrote that organizational behavior researchers “certainly need more historically sensitive research” (p.81). They continued by noting that, “Business historians have bequeathed a wealth of material to us, mostly ignored, and organizations’ archives contain information almost completely ignored by organizational researchers.” This chapter responds to calls like Barley’s and Lawrence’s for a more historically-informed perspective on organizations, and draws on exactly the archival data that Aldrich & Mueller (1982) describe as “almost completely ignored.”

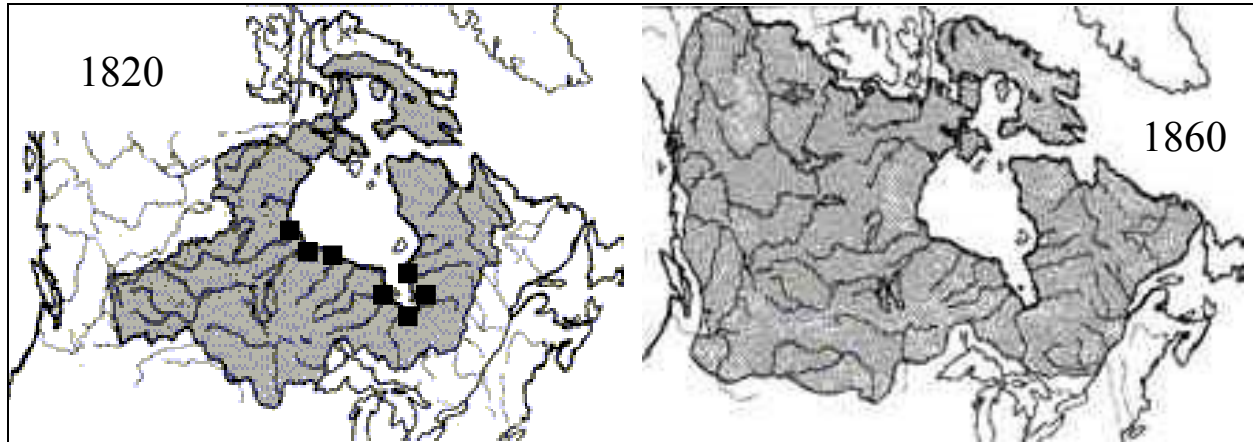
To provide some background and chronological sense of the Company before moving into the challenges of dispersed work, I present a brief overview of its business, key roles, and annual cycle. Those already familiar with the basic history and business of the Company may skip to Section 2.3 and a description of the methods and data on which I relied.

## **2.2 Company Overview – History, Roles, and Annual Cycle**

For the first century of its operations, the HBC’s most significant posts were limited to the shores of the Bay at Moose, York, Albany, Prince of Wales/Churchill, Severn, Rupert, and Eastmain. Moose and York were the destinations of the two annual Company ships, as well as the primary entry and exit points for all supplies and furs. After a century of fighting with the French and maintaining only this handful of posts on the shores of the “frozen sea,” the Company began to expand both the number and nature of its operations in 1774, establishing dozens of new inland posts along the rivers that drained into the Bay. By 1819, its operations had grown from the original seven bayside posts to 36 posts across Rupert’s Land. By 1860, it encompassed nearly all of modern Canada (Figure 2.1).

Figure 2.1: Original Seven HBC Bayside Posts and Size of HBC Empire in 1820 and 1860

The original seven (i.e., pre-1774) posts are shown as square boxes. The HBC empire is shown as the gray-shaded territory. For simplicity of presentation, posts built after 1773 are not shown in either map because they were so numerous.



By expanding inland from the Bay, the Company hoped to meet its Indian suppliers closer to their trapping grounds and, thus, to fight competition from French and independent traders working out of Montreal. Despite (and in some ways because of) this massive expansion, competition continued to be fierce. In the late 18<sup>th</sup> century, many of those previously independent competitors came together to form the Montreal-based North West Company (NWC). After several decades of fierce competition and expansion by both companies, the NWC's rapid expansion and long communication routes proved too costly to maintain and they agreed to a merger with the HBC in 1820. While known as the "Great Amalgamation" then, under today's standards it would be considered an acquisition of the NWC by the HBC. The HBC name, charter, and many senior managers carried over to the new firm.

To implement the merger, the Governor and Committee called on George Simpson and William Williams, governors of its Northern and Southern Departments, respectively. Williams was the senior of the two, but Simpson had the favor of leaders in London. He had only been in the Company's employ since 1819, but was tapped early on as the man to consolidate the two companies' operations. With only one year of fur trade experience, he brought little of the baggage accumulated by other HBC and NWC managers who had fought fiercely during the pre-mergers years. He also brought a laser-sharp focus on thrift and careful management. His initial appraisal of one trading district is typical:

Everything appears to me ... on too extended a scale *except the trade* ... Mismanagement and extravagance has been the order of the day. It is now however necessary that a radical change should take place and we have no time to lose in bringing it about. (Cole, 1979, p.105)

In three short years, Simpson orchestrated the closure of dozens of redundant posts and reduced the staff count dramatically. Simpson would not gain the formal title of Governor-in-Chief until 1839, but he became the de facto CEO in residence in 1826 when he took over the two original departments (Northern and Southern). He would remain in charge and build his reputation as the little "Emperor of the Fur Trade" until his death in 1860 (Galbraith, 1976).

Shortly after Simpson's death, the Company began considering: 1) its relationship with the new Confederation of Canada (formed in 1867), 2) the effect that increasing westward settlement would have on the fur trade, and 3) the double taxation it faced from the British and Canadian governments. In 1870, to position itself better for the broad changes sweeping across Canada and to reduce its tax burden, the HBC signed the Deed of Surrender, relinquishing its monopoly rights in return for a cash payment of £300,000, ownership of all of its posts, 50,000 acres of land surrounding them, and one-twentieth of the arable land being settled in Canada's so-called Fertile Belt.<sup>4</sup> Following the "surrender," with land to sell and settlers to serve, the Company began to diversify.<sup>5</sup>

Its first major path of diversification was selling real estate to the more than 2 million people who began settling the Canadian West between 1870 and 1900. While it had no particular experience in land sales, Company posts were strategically located and sales of land surrounding them would ultimately generate considerable profits.<sup>6</sup> The posts also acted symbiotically to create markets for retail stores which the Company would soon open.

In a number of cases, the posts had already expanded their role to become general stores for the communities that surrounded them. And, after some experience running these "saleshops" in the 1870s, the Company opened its first dedicated retail store in Winnipeg in 1881. As the Governor said in the 1882 annual meeting:

The directors had [the store] under consideration put up as the new railway advanced – fresh shops in new localities, in addition to those already dotted about in the small country towns, in order to meet the demand of the settlers going in. (*HBC Annual Report, Proceedings*, 1882, p.2).

Reflecting the Company's increasingly dual role in merchandise and furs, the front of the Winnipeg store was for retail, while the back and upper floors were used for fur storage, grading, etc. Over the next decade, as settlement pushed westward, additional stores were opened in Calgary (1884), Vancouver (1887) and Edmonton (1890). After World War I ended, the Company opened its next two stores in Victoria (1921) and Saskatoon (1922).<sup>7</sup> In 1910, the smaller saleshops were also given departmental status, recognizing their shift closer to the core of the Company's business (Harris, 1994). By 1940, the Company had established six large stores and eight smaller stores (*Annual Report*, 1940). Then, during the 1950-80s, the Company greatly expanded its retail empire through the acquisition of the Morgan's, Zeller's, Simpson's, and Field's retail chains.

Under the tradenames *The Bay*, *Zellers*, *Fields*, and *Hudson's Bay Outfitters*, the Company's stores now account for approximately one-third of all retail sales in Canada (*Annual Report*, 2000). Today, it is Canada's largest retailer, with 39 percent of Canadian department store sales in 545 stores across all Canadian provinces (Anonymous, 2000).<sup>8</sup> In addition to its sheer size, the Company and its famous "point blankets" have become widely recognized symbols of the Canadian north (Kyle, 2000). Now, in its 333<sup>rd</sup> year of operation, the HBC is the longest continually operating company in North America, and among the few companies in the world that have been in continuous operation for more than three centuries.<sup>9</sup>

### ***2.2.1 Roles of HBC Executives, Managers, Staff, and Indians Suppliers***

In London, the Company was led by a governor, deputy governor, and the seven-member Executive Committee. In some respects, the Committee resembled modern corporate boards, but it met more frequently (i.e., at least weekly) and played a more hands-on role in Company



operations. In addition to the weekly work of the whole Committee, individual Committee members and subcommittees worked between general meetings on specific issues such as recruitment and fur auctions. The Governor and Committee also contracted with various vendors and depended heavily on a small staff in London. The small London office included a secretary, accountant, warehousekeeper, and three assistants/clerk. It remained this size until early in the 19<sup>th</sup> century when it began to expand its warehouses and auction business, adding fur graders and other staff.

Each of the Company’s posts included a contingent of salaried staff and managers (or “servants” and “officers,” as they were known). Posts ranged in size from small, temporary ones operated by only a couple employees to large, permanent ones with upwards of a hundred employees. The larger posts generally had several officers (e.g., the “chief factor” or “chief trader,” his second in command, a clerk, an interpreter, and a sloopmaster), as well as an apprentice or two. These officers made up the post’s “Council” or management committee. Officers could all read, write, and maintain the post’s financial and personnel records. They were responsible to the Company’s Executive Committee in London and served at its pleasure. Typically, officers served under three to five year contracts and most made the Company their career, serving in various capacities for several decades (Goldring, 1985; Nicks, 1978; Rich, 1958-59; Williams, 1983). Some worked their way up from apprentice clerks; others began their service as officers. Of critical importance for this study, few managers had any face-to-face contact with the Committee in London and virtually no Committee men visited the Bay. This exacerbated the problem of distance and forced the Committee to fill the “information vacuum” with extensive record-keeping and correspondence between London and the Bay (Brown, 1980).

Early on, the most senior post manager also served as “bayside governor,” but his power was only nominal until after a “radical Retrenchment” in 1810 (see Figure 2.2 and Figure 2.3).

Figure 2.2: High-Level HBC Organization circa 1774\*

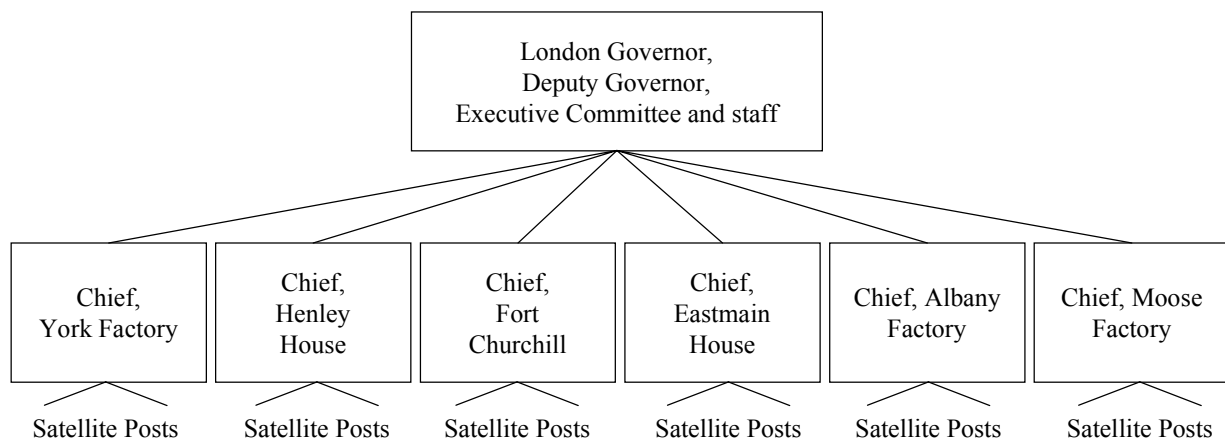
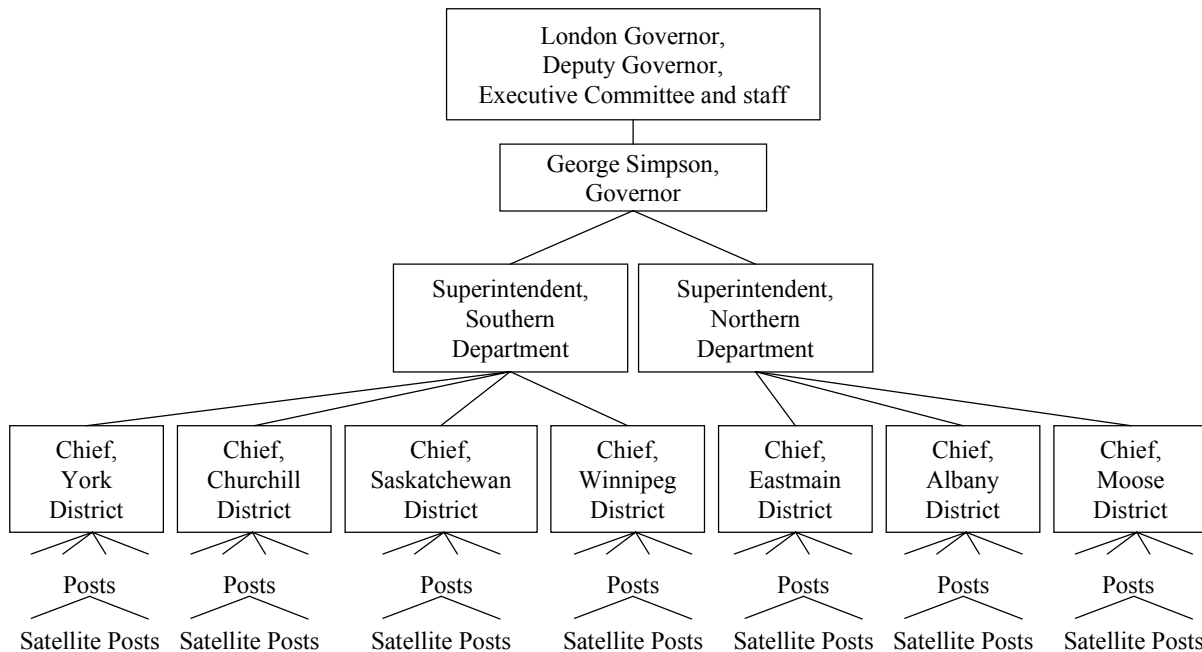


Figure 2.3: High-Level HBC Organization Circa 1826\*



\* The number of posts and satellite posts varied by factory; lines shown above are representational only

As part of the Retrenchment plan, the Committee created a clear hierarchical organization nearly half a century before such structures became common in American railroads (Chandler, 1977). The Retrenchment plan divided operations into Northern and Southern Departments, with districts in each department, individual posts assigned to the districts, and smaller posts known as “houses” affiliated with a larger post. A superintendent was placed in charge of each department. Each post continued to be led by a chief factor, who oversaw the traders running nearby trading houses. However, the factor for the largest post in each district also took on new oversight responsibilities for the district as a whole. As such, the Retrenchment recognized the need for more careful coordination of resources (Sprakman 1999:38).

In line with the previous organizational structure, each factory was placed under a chief factor, with chief traders at smaller posts under the factors’ command. To each factory, the Committee assigned an accountant and storekeeper, who were next in line to the chief factor. Clerks had served as de facto accountants before, but the retrenchment increased the importance of careful accounting and formalized the position. The superintendents were instructed to hold an annual Council meeting of all factors in their department in early July – at Lachine, Montreal, or Moose for the Southern Department and Norway or Fort Gary for the Northern Department.

The Southern Department included the Moose, Albany, and Eastmain Districts. Initially, the Moose district encompassed Quebec, Montreal, Lachine and all posts along the St. Lawrence River as far as Lake Superior and the U.S. border. Later, Montreal was broken out as a separate department. The Northern Department included four districts (York, Churchill, Saskatchewan, and Winnipeg) and five factories (Churchill, York, Severn, Winnipeg, and Saskatchewan) [HBCA/SF “Commissions,” 1932 Gower Memo, p.2]. Each department was overseen by a resident superintendent or governor. Each district was overseen by a manager, many of whom were chief factors at the district’s largest post. The district managers were granted wide powers in matters of trading as a result of the new plan.

While the new departmental structure created a “more precise chain of command,” it also gave managers the flexibility to set their own standards of trade<sup>10</sup> and ended the “struggle to observe ‘with a kind of religious veneration’ a standard set in London” (Williams 1983:44). In addition to the new organizational structure, the Committee began sharing half the profits of the trade — a much more substantive “move toward individual initiative and responsibility” than the previous system of fixed salaries and occasional bonuses (ibid.).

Additional changes in organizational structure came in 1815 and 1821. In 1815, at a meeting of the General Court in London, the Company’s shareholders approved the appointment of a Governor-in-Chief and Council to oversee all of the Company’s territories. Robert Semple was the first to hold this position, which was granted with unlimited tenure (Wilson, 1900, 2:222). He did so while also serving as governor of the Southern Department. In 1821 after its merger, it added two more departments (Columbia or Western, and Montreal) to incorporate the NWC posts, and began to add “districts,” which were groups of posts below the departmental level. Initially, these districts were overseen by the most senior post manager in them, but a more formal and separate district manager position also evolved. In the late 1800s and again several times in the early 1900s, the district and departmental structure was modified.

The servants at each post included a wide range of tradesmen (e.g., smiths, carpenters, armorers, coopers, shipwrights, etc.) and laborers. These men typically had little to no formal education, came to the Bay on Company ships, and served out contracts obligating them for three to five years. For many years, the men were recruited from the remote Orkney Islands, north of the Scottish mainland. The port of Stromness in the Orkneys was the last European stop for Bay-bound ships and the Company felt that the Orcadians’ tolerance for isolation and harsh weather made them better workers than recruits from more urban environments.

The Company relied heavily on Indians as its primary suppliers of furs. While the Company’s servants hunted for much of their own food, they generally did not trap for furs. The posts existed primarily as trading centers where Indians could exchange furs for beads, blankets,<sup>11</sup> brandy, and other goods. In addition, Indians played a critical role as guides, canoeists, and messengers for the Company’s men.<sup>12</sup> While the Company was almost completely reliant upon the Indians for furs, the Indians became quite dependent upon the Company for food. Without the Indians, there was no fur; and without the Company there often was little food, guns, or ammunition. This co-dependency took many shapes over the Company’s long history, but maintaining good relations with the Indians was a constant (albeit not altruistic) concern for the post managers and Committee in London.<sup>13</sup>

### ***2.2.2 The Annual Cycle of Trade***

Given that Hudson Bay (and the rivers that drain into it) is frozen for much of the year, life at the HBC posts<sup>14</sup> was organized around the narrow window in late August or early September when the Company’s two ships arrived at the mouth of Moose River and at York Factory. These arrivals followed a 12-week sail across the North Atlantic from London. Upon their arrival, the post would send various sloops, canoes, and other vessels to meet the ships at their deep water moorings.

For several weeks, every available employee associated with Moose, York, and neighboring factories was engaged nearly ‘round the clock in unloading supplies, ferrying them back to the posts, and loading furs so that the ships could depart before the narrow exit from the Bay froze again. While the ships’ cargoes were unloaded and replaced with the year’s furs, impatient captains counted every hour to their “forced dash” out of the ice-ridden Bay “as the

nippy dawns of September signaled the urgency of their departure” (HBCA B135/b/35, Russell to Bewley 12-23-1815; Newman 1985, 1:151). As I shall describe in detail later, this rush was well founded. On several occasions, delays kept a ship from departing in time and beating the ice, forcing it and its crew to “winter over” at one of the Bay posts. Already operating at the margin in terms of supplies, the unanticipated addition of a ship’s crew seriously strained the posts’ food supplies. After the ships left, Company employees devoted October and November to last minute hunting in an attempt to put away enough food to last until the spring thaw.

From December to April, there was little activity on or movement among posts. During the harsh sub-arctic winters, post managers hoped that their food supplies would last, that spring would arrive soon, and that the Indians would have good luck with their trapping. Between early April and early June, the rivers’ ice began to break up, and activities at the posts shifted to replenishing supplies, outfitting boats, and re-opening communication among posts. From May to August, those who were not occupied with trading (and, later on, with inland exploration) were repairing the posts and hunting. During the summer, the books would also be closed (literally and figuratively) on each post’s operations; the Company’s officers (with help from their clerks) would prepare their annual reports; and everyone would prepare for the rush of activity when the ships arrived again in late August or early September.

The annual shipments were just as influential in London as they were on the Bay. After the ships returned to London in late October, the Committee began the painstaking process of reviewing the journals, correspondence, reports, and annual “indents” (i.e., requests for supplies) prepared by the post managers and other officers on the Bay. In the winter, Committee members sold the year’s furs and began the cycle of preparations for the following year’s ships (e.g., acquiring trade goods and recruiting new staff). In the spring, based on the previous year’s correspondence, the Committee’s experience, and its expectations for the coming year, the Committee would draft its “Outward Letters” of instruction to the officers on the Bay.

While the number of posts and employees changed from year to year, this annual cycle in London and on the Bay was dominated by the weather, hunting season, and annual passage of the Company’s ships. The cycle continued essentially unchanged for more than two centuries. With this brief introduction to the HBC’s history, roles, and annual cycle, I now turn to my research methods and data.

### 2.3 Methods and Data

[Collections of letters] heap up in mounds of insignificance and often dismal dust the innumerable trivialities of daily life, as it grinds itself out, year after year, and then suddenly they blaze up; the day shines out, complete, alive, before our eyes. (Woolf, V., 1925, “The Pastons and Chaucer” in *The Common Reader*)

In many ways, this chapter is different from the others in that the “data” I use are also the physical manifestations – artifacts – of the managers’ dispersion and their responses to it. Thus, the description of my data is, in part, also an introduction to my findings. My main primary sources are drawn primarily from internal HBC documents and include:

1. Daily post journals kept by the managers at each post (first written in the 1670s; copies survive from 1705 onward);

2. Letters from managers to London headquarters [first written in the 1670s; one letter to London survives from 1682; more or less continuous runs from all extant posts<sup>15</sup> begin in 1723 (Davies, 1965, p. xxxviii)];
3. Letters from London to its post managers (first surviving copy is from 1670, with a mostly complete run thereafter);
4. Correspondence among post managers (there is a generally good run after 1740, and in many cases, triplicate copies survive – one for the sender, one for the recipient, and one for London) and other Company officers (e.g., Glazebrook, 1938);
5. Minutes and agendas of the London-based Executive Committee and North American councils (with Committee minutes dating back to 1671 (Rich, 1942) and Council minutes published or on microfilm surviving from 1821);
6. Reports of periodic inspections (e.g., 1821, 1891, 1931);
7. Annual Reports and Proceedings of the annual “General Court,” which was the HBC’s name for its shareholder meeting (these survive from 1868 to the present);<sup>16</sup> and
8. Internal company publications (most importantly *The Beaver*,<sup>17</sup> begun in 1920, and the *Moccasin Telegraph*, begun in 1944).

In addition, I made some use of published staff memoirs/autobiographies (e.g., Cowie, 1993 (1913); Keighley, 1989; McLaren, 1992; Ross, 1989), journals (Belyea, 2000; Merk, 1968; Rich, 1938, 1939), and collections of correspondence (e.g., Bowsfield, 1981).

Beyond these primary sources, I relied on a variety of secondary sources to help navigate the Company’s history and records. Key secondary sources included staff biographies (e.g., Chalmers, 1960; Cole, 1979; Galbraith, 1976; Morton, 1944; Stardom, 1995), book-length company histories by Rich (1958-59) and Ray (1990), and a more recent and more journalistic history of the Company (Newman, 1985, 1987, 1991). I also used conference-paper and book-length treatments of specific aspects of the HBC’s history (e.g., Brown, 1980; Brown *et al.*, 1994; Burley, 1997; Ray, 1974, 1990; Ray & Freeman, 1978).

The unique aspect of these data is that they exist precisely because of dispersion; because the Company’s vast operations and distant headquarters necessitated regular correspondence and record keeping. They survive because the Company recognized the value of saving (and using) its own records and using them to guide future decision making. A paragon of modern knowledge management virtues, the Company retained nearly complete runs of its journals, correspondence, and other papers back into the early 1700s, with some documents (including the minutes of Company meetings in London) surviving from the 1670s (Rich, 1942, 1946, 1948). These documents were maintained by the Company itself until 1974, when they were moved to the Provincial Archives of Manitoba in Winnipeg. In 1994, they were donated to the province at an appraised value of \$60 million. The HBC Archives are some of the world’s largest and most comprehensive collections of records for a single company (Craig, 1970; Simmons, 1994a; Simmons, 1994b). Initially, the Company’s recordkeeping in London was haphazard, but the volume of records which survived the Committee’s various temporary meeting places and moves around London is stunning. For example, minutes were kept for the London Committee from the beginning and minutes for most years survive from as early as 1671. Records of more than 500 trading posts survive as well.<sup>18</sup>

These records and a variety of secondary sources allow for an unusually extended look inside the firm and provide dramatic examples of the work and life in an early virtual organization. While the voluminous written records of the Company's managers do "heap up in mounds," they also contain comments that "blaze up" and shine a light on the men's experience. As Bryce (1900, p.282) notes, the "letters were written according to the good old style." Importantly, they were "Not mere telegraphic summaries and business orders as at the present day, but real news-letters – necessary and all the more valuable because there were no newspapers in the land."

Given the vastness of the HBCA records,<sup>19</sup> I had to sample on both a geographic and temporal basis. For my geographic focus, I chose Moose Factory and the surrounding posts as the historian's version of a "key informant" (Van Maanen, 1988). Although I read records from and about other Company posts and people, Moose's story, its managers, and their interactions with London and other post managers became my initial (and ongoing) window into the larger workings of the firm. In addition to being one of the Company's longest operating posts, Moose and its satellite and subordinate posts played "a vital part" in Company's history as a base for inland expansion, a depot for shipping, and a home of resident Governor William Williams (Rich, 1954, p.ix). I chose Moose because of this geographic and strategic centrality. Along with York, it served as one of the Company's two major trading and shipping centers. Moose and the surrounding posts came to be known as the Southern Department in 1809 and as the James Bay District in 1892; Moose was headquarters of both entities.

As with any other sampling strategy, this one has its advantages and its limitations. By choosing Moose, I was able to follow one post over more than 200 years, through the various phases of the Company's history. This allowed me to have a fairly fine-grained understanding of the post, its region, neighboring posts, and their business, but it also meant that I ignored many other posts. These posts clearly have interesting and varied stories to tell – with their location, strategic focus, lifespan, staff, and numerous other variables coming into play (Davies, 1965).

Even with a one-post window into the firm's operations, the volume of records was still massive. Moose Factory alone has journal records covering the period from 1730 to 1941. These records alone occupy 16 reels of microfilm (Anonymous, 2002b), so I had to narrow my focus temporally as well. To do so, I read the available journals and correspondence at regular intervals, from the time Moose was re-established in 1730 until the time, 200 years later, when its role as a hub for trade in the region formally ended. Initially, my readings were focused on times when the organizational structure and geographic reach of the Company changed (e.g., the 1774 expansion inland and the 1821 merger). Subsequently, I expanded my readings to fill in gaps and cover the years immediately before and after such changes, and to establish regular 40 year intervals between what I read. Thus, my reading of primary sources for Moose covered the:

- 1730s-40s, a period of construction and consolidation;
- 1770s-80s, a period of vigorous competition and expansion;
- 1810s-20s, a period of continued competition and two major reorganizations;
- 1850s-60s, a period of prosperity and prelude to a third major reorganization;
- 1890s-1900s, a period of transition from fur to land and retail; and,
- 1930s-40s, a period of technological change and strategic decline for the fur trade.<sup>20</sup>

On occasion, when data from the focal periods pointed toward important prior or subsequent events, I went beyond these periods. For example, because of the massive changes in the size and

configuration of the Company which began in 1774 and continued until the merger, I reviewed the annual letters between London and Moose Factory for 1765, as well throughout the 1790s.

## **2.4 Challenges of Dispersion over the Centuries**

Having set the stage in regard to the Company, my methods, and Moose Factory, I now turn to the HBC managers' experience of their dispersion. As noted in the introduction, I do so through an examination of coordination, communication, isolation, and control challenges that they faced, and the work practices they developed to deal with those challenges. Beginning with coordination, the following sections describe these challenges and the practices (or "remedies") developed to address them.

### **2.4.1 Coordination Challenges**

Given the large distances between London headquarters and the North American posts, as well as considerable distances among the posts themselves, the Company's managers and London-based executives faced critical coordination challenges. Coordination is the management of dependencies among activities (Malone & Crowston, 1994), and the HBC managers depended on both each other and London, especially at the annual shipping and hunting times, and at times of crisis.<sup>21</sup> London was equally (if not more) dependent on its distant managers. While the need for interdependent work among managers was high even during the average year, threats to the communications and transportation lines between London and the Bay precipitated even greater interdependence among managers.

Although each manager ran his own post without having to consult the others (Bryce, 1900, p.111), the nature of transportation, staffing, and communication necessitated coordination of managers' efforts. Because there were only two to three annual ships into which all furs had to go, and out of which all staff, provisions, and trade goods had to come, the managers had to ensure that they coordinated their efforts. Through this interaction, they developed a "comradeship of a very strong and influential kind" (Bryce, 1900, p.281).<sup>22</sup>

While managers had to contend with a number of critical interdependencies over the years, making the annual shipment was the most challenging and persistent from a coordination standpoint. As this section describes, if managers did not coordinate their efforts well, they risked having a Company ship "winter over" on the Bay, causing major ripple effects throughout the operation. This challenge persisted for more than two centuries and well into the steamship era, with ships wrecking or wintering over as late as the 1940s. After describing how such wintering over occurred and detailing the special coordination challenges that it posed, I describe some of the remedies used by the HBC to address those challenges. These remedies included dealt with staffing, timing, process, communications, provisions, and transportation issues.

Given the vagaries of wind and weather, and the occasional delay due to customs or repairs, the Company ships did not always leave London on time in May. In addition to being dependent on the ships' safe and timely crossing of the Atlantic and entrance into the Bay, coordination of the whole annual process hinged on several other dependencies. It depended on: 1) sufficient staff at Moose Factory to load, unload, and man<sup>23</sup> the sloops required to go between the Factory's shallow entrance and the ship's deep water anchorage; 2) sufficient sloops or other vessels that were all in good working condition to unload the ships from their deep water moorings; 3) the arrival of furs from other posts in the district with enough time to inventory and mark them; and 4) cooperative weather for the loading/unloading and ships' passage. Glitches in

any one of these could hold a ship too long at Moose and, thus, get it back out to sea too late in the season. When the ships left Moose too late, they either wrecked (as in 1903 and 1909) or the captains saw the writing on the icebergs and opted to “winter over” at Charlton Island in the Bay and at other relatively safe anchors (as they did in 1815, 1873, and 1905, among other years).

When a ship wintered over, almost every aspect of the complex trading interdependencies was affected. If a ship failed to arrive in London, the executives and relatives of the ship’s crew members had to wait for months before learning whether the ship had been lost at sea or just delayed for a year. Without its full shipments of furs, the Company’s annual auction and profits also suffered, making it harder to charter an additional vessel the following year to cover for the one that had wintered over in the Bay.<sup>24</sup> Occasionally the cost of this charter and scarcity of available ships and crews (especially during war times) would force the Board in London to forego the additional ship. The resulting gap in shipments forced the men on the Bay to stretch one year’s worth of trade goods and provisions across a two year period. Whenever a ship did not return, London also lost an opportunity to communicate with its managers – in an already infrequent communication cycle. This lag in communication meant that London would have to guess at its posts’ needs for provisions and trade goods for the coming year. Poor guesses could leave the posts with insufficient provisions (and, thus, hungry or disgruntled men) and/or insufficient trade goods (and, thus, angry or absent Indian trading partners).

In addition to affecting London, a ship’s wintering over could also severely affect life for the men at the posts and the stranded ship’s crew. Typically, it meant hunger and hardship for the post, whose numbers and demand for food, supplies, and shelter could easily double with the addition of a ship’s crew to their already tight balance of rations and gear. Unfortunately, Moose and the managers of the neighboring posts were often short on gear and supplies themselves, and the added burden of the stranded ship with men ill-trained for Bay life pushed tempers close to flaring.<sup>25</sup> In 1815, winter set in early, forcing *both* Company ships – the *Stadlow* and the *Edystone* – to winter over. Details of this double wintering over provide a rich example of the HBC managers’ coordination challenges and responses.

The demands of the two stranded ships necessitated considerable coordination of efforts throughout the Southern Department. It fell to Joseph Bewley, Chief Factor at Moose, to manage the flow of provisions and gear as best he could. James Russell, the post manager at Eastmain, was among the first people to whom Bewley wrote for help. Russell replied that “Eastmain is supporting 12 people [from the ship] besides the compliment [sic] of the district. In addition to all this, the greatest gall is only coming. I mean the ships – where their supply is coming from, God knows there is nothing here but the cattle (of which I have sent you a list), and they are in horrid bad condition for killing” (HBCA B.135/b/35, 23 December, 1815). Despite the added burden and tight provisions already affecting his post, Russell assured Bewley that he would provide every possible assistance to the ship’s captain and crew and that he is “truly sorry about scarcity of victuals” at Moose. At the same time, however, he complained that Bewley’s expectations about Eastmain’s ability to provide fish at “most seasons of the year” were based on bad intelligence:



Whoever may have informed you that fish may be caught on the E[ast] M[ain] coast at all seasons of the year, would have done well to have acquainted themselves better with the circumstances than to have talked from supposition (HBCA B.135/b/35, James Russell, Master at Eastmain to Joseph Bewley, Master at Moose, December 23, 1815).

Bewley received Russell's letter two weeks after it was written, which was a typical lag for that time and those posts. Bewley wrote back two days later, expressing his belief that the ship's woes were exacerbated because Russell did not respond quickly enough and taking umbrage at Russell's remarks regarding the availability of fish:

My information as to the possibility of catching fish at EM during most seasons of the year is derived from two sources — oral and written — and had I not been perfectly convinced that the information was correct I would not have hazarded in a public letter the words I used — viz. It appears from the observations of persons pretty well acquainted with that part of the country that fish can be procured at EM at most (not all) seasons of the year (HBCA B.135/b/35, Joseph Bewley, Master at Moose to James Russell, Master at Eastmain, January 8, 1815).

Bewley told Russell that Moose was suffering too — with added men being hosted there, one of whom had already died. Despite the tension in their correspondence, Bewley closed by noting that his “sincere wish” was “That our difficulties may be happily got over and that success may attend you.” He went on to communicate with all of the other managers in the area, and send several parties inland to transfer letters and staff.

Under good circumstances, the post managers would trade staff with specialized expertise depending on their needs. Under these circumstances, Bewley shifted staff and supplies around in a vain attempt to balance demands for them (see e.g., HBCA B135/b/35, Bewley to Jacob Corrigal, CF, Albany, February 23, 1816). Despite his attempts, post managers in the department were “entirely destitute of provisions” and “in a very low state.” In his own letter to bayside Governor Thomas Vincent, Bewley wrote that “Our state [of affairs] here is not so different” (HBCA B135/b/35, Bewley to Gov. Vincent, April 6, 1816). At the same time that Bewley was hoping for aid from Eastmain and elsewhere, he had also sent a party of men to the post at Abbitibi, which lay 21 days south of Moose. On his arrival at Abbitibi, the party's leader noted that “Although I met a personally friendly reception from [the manager here], he will not afford the smallest assistance to forward the object of our journey in any way or account” (HBCA B135/b/35, January 23, 1816, Gladman to Bewley).

The crisis of the *Edystone* and *Stadlow* continued to worsen on the Bay as well. As John Turner, captain of one of the stranded Company ships wrote to Bewley at Moose on January 10, 1816, “Our lives in a great measure depend on you for we are all on short allowance. Meat of any description is wanted for three months to serve July out” (HBCA B135/b/35). Despite pleading for additional supplies, Turner didn't hesitate to blame Bewley for his problems: “I am sorry to add that the great cause of all of our troubles was owing to the great detention at Moose” (HBCA B135/b/35, January 10, 1816, Turner to Bewley, emphasis original). Those troubles included “18 men very ill ... [and] ... many of them really in a deplorable state.”

Russell's own men at Eastmain were not much better off and he complained to Bewley that:

If a supply of provisions is not hauled hence as soone as possible from [Moose], we [at Eastmain] shall all stand the chance of starving and I am truly sorry to observe that little exertion has been made to render the necessary assistance. (HBCA B135/b/35, Russell to Bewley, February 7, 1816)

At first, Russell appeared to defer assigning blame for his predicament, and writing that “Whoever has been the cause of this calamity time will discover, but in my opinion every exertion should be rendered for the relief of such a number of distressed fellow creatures who are most of them laboring under the greatest human calamities.” But he quickly changed course and directly accused Bewley of willful negligence, and compared his response to the situation quite unfavorably with that of a previous wintering over:

When the [ship] *Prince of Wales* wintered at Struttons, every exertion was made round the Bay to render Capt. Stanwell and crew the necessary relief, but what a falling off [there has been] this year when double the exertion is necessary. It seems to pass without the least notice. (HBCA B135/b/35, Russell to Bewley, February 7, 1816)

He went on criticize Bewley for focusing on words not deeds, at a time when the latter were in order.

Exertion is much wanted and writing alone will not suffice tho that seems to be the present study — but I hope our Honorable Employees will discover the difference between writing and acting, and give preference to the latter. (HBCA B135/b/35, Russell to Bewley, February 7, 1816)

And Russell closed his February 7<sup>th</sup> letter to Bewley by threatening to share his criticisms with London, “Be assured [that] a fair and accurate account [of your response] shall be kept” (HBCA B135/b/35, Russell to Bewley, February 7, 1816).

Whether Bewley really was to blame for too much talk and not enough action, managers like him at Moose would have to rely on a careful combination of added hunting, support from “home guard” Indians, and support from the other posts on the Bay and inland. However, just as the Bay was icing over, so were the rivers which linked Moose to its inland satellite posts. Moving surplus supplies from these posts to support a stranded ship’s crew was no simple task. In almost military fashion, the manager at Moose generally had to put his staff and the crew on reduced rations and husband his supplies carefully. He also had to exert his influence to quell disputes among the men, which were always exacerbated by crowding and limited supplies.

Assuming that they all got through to spring despite the limited rations and internal disputes, they still had to contend with the viability of the ships themselves. Frozen in the crushing ice all winter, Russell wrote to Bewley on February 7, 1816 that the “Ships will be in imminent danger at the breaking up of the sound, and I should not be at all surprised to hear of their being broken to pieces.” With the two ships both having to winter over in 1815-16, “their situations [in regard to the ice and preferential position] were determined by lots [drawn] in the fall to prevent dispute” (HBCA B135/b/35, Russell to Bewley, February 7, 1816).

In addition to creating problems among the Company’s men, a “wintering over” and lag in shipments often meant lost business with Indian traders. Those traders banked heavily on the consistent supply of trade goods. Interruptions in that supply would send them over to the competition and risk losing their future business, as Russell speculated they would in his February 7, 1816 letter to Bewley:

I have scarcely seen an Indian since the fall and can say nothing respecting the trade. They know the distress to which EM is reduced and have kept off in consequence. (HBCA B135/b/35, Russell to Bewley, February 7, 1816)

For decades, the managers tried to address problems like those of 1815-16 with a multi-pronged strategy. First, they tried to ensure that sufficient staff were available to load and unload the ships. Generally, this was done by calling in resources from inland posts, from delaying all other activities until after the ships had left, and from building up a larger permanent staff at the depots. Second, they tried to ensure that inland managers closed their books and sent the shipments to Moose with plenty of time to be packed, labeled, inventoried, and loaded. Third, they experimented with changes in the packing, loading, and unloading procedures, including the place at which goods were assembled for loading. Fourth, they introduced redundancies into their communications to reduce the information vacuum created when there were interruptions or delays in the annual shipments. Fifth, they introduced a reserve of provisions to buffer against the need to feed the crews of stranded ships. Sixth, in response to a variety of challenges including wintering over, the Company adjusted its organizational structure to provide more authority on site. I describe each of these responses below.

*Staffing Remedies.* One of the Company's most immediate remedies was to share resources across posts. For the loading and unloading of ships, this generally meant arranging in advance to have the smaller sloops sent from satellite posts to the depots at York and Moose. These sloops and the men who came with them would be able to run back and forth to the deep water anchors of the Company ships, ferrying supplies to the depot and furs to the ships. Once they had finished assisting with the loading and unloading, they could then travel along the shore to the next post (e.g., Albany) and deliver its portion of the unloaded supplies.

*Timing Remedies.* In August, at the same time that the manager at Moose was biting his nails hoping that the Company's ships were not far off, his fellow managers at inland posts were biting theirs and trying to decide when the last "brigade" of canoes with furs would arrive. They tried to hold their books open and keep trading until the last possible moment. Not knowing exactly when the ships would arrive, and not knowing exactly how long it would take them to reach the Bay, they had to strike a fine balance between maximizing their returns and being able to deliver them before the ships weighed anchor.

Timing was critical to closing the books. In an era when bookkeeping and annual report writing was done without the aid of word processors and spreadsheets, actually closing the books was a painstaking process. The late 19<sup>th</sup> century arrival of carbon paper and typewriters helped somewhat, but the annual closing would still keep managers and their clerks up late. In that regard, until the relatively recent arrival of truly integrated real-time financial systems, year-end closing remained the bane of clerks', bookkeepers', accountants', and controllers' existence. However, in the 20<sup>th</sup> century, some of the Company's books could be closed earlier. As noted in the 1912 *Annual Report*:

Owing to the rapidly increasing means of communication in the districts served by the Company it has been found possible to bring the Salesshops Accounts, which have hitherto been made up to May 31<sup>st</sup> in the previous year, as far forward as January 31<sup>st</sup> of the current year. This arrangement has further advantage that Stock can now be taken at a much more convenient period. The accounts now submitted in consequence include the result for the 20 months ending January 31<sup>st</sup> last.

Unfortunately, the increased communication speed was limited to the retail stores, which were generally on major telegraph and railroad routes. In contrast to the stores' accounts, "The Fur

Trade accounts must continue to be made up as formerly, namely, May 31<sup>st</sup> of the previous year” (ibid.). By 1952, the fur trading posts were still on a separate fiscal year. With the “majority of the 191 posts operated by the Company being in isolated areas,” June 30<sup>th</sup> was the end of their year and years were still described as “Outfits” with the year ending June 30, 1951 being Outfit 281. A common fiscal year across all the Company’s stores would not be possible for another half century. Finally, in 1967, the Company announced that:

With the development of better communications it has been possible to change the year end of 142 smaller and isolated stores from 30<sup>th</sup> September to 31<sup>st</sup> January. This completes a three phase programme to bring the whole of the Northern Stores operations into line with the rest of the Company. (*Annual Report*, 1967)

Thus, changes in timing proved a useful remedy to the challenges of dispersion, but they were slow in coming and highly dependent on changes in communication and transportation technology.

*Process Remedies – Packing, Loading, and Unloading.* By 1805, their experimentation with the efficient use of staff led them to test an even more consolidated approach to their depot system. “A plan has been suggested to us for more expeditiously dispatching the bay ship” by using Charlton Island as a single point of collection and dissemination of furs from/for Albany, Moose, and Eastmain (May 31, 1805 London Committee to John Thomas and Council). That year, London also sent new instructions for packing furs. The instructions, which contained specific steps necessary to pack furs and load the companies’ ships most efficiently and effectively (e.g., HBCA B.135/c/1, 25 May 1792), presaged the time-and-motion approaches of the early 20<sup>th</sup> century. In addition to expediting loading at the Bay, they were designed to expedite the unpacking and grading of the furs in London. On the Bay, one senior manager also presaged Steiner’s (1972) well-known concept in his description of groups of men unpacking supplies from London and suffering “considerable *process losses*” due to time lags and not knowing what exactly London would be sending (HBCA A11/48, fo. 9, August 1, 1890; emphasis added).

*Redundant Communications Remedies.* One way in which the managers reduced the impact of a ship wintering over was to add another round of communication between themselves and London. They did this by sending a “special express packet” via canoe and foot, snowshoe, or dog team to Montreal. From Montreal, they would be sent onward to London aboard one of the many commercial ships that served the Canadian port city. Initially, this was only done in special situations, but it became a regular “winter express” by the late 1700s. The “express” would leave the Bay in February and reach London before it had to close its subsequent annual letter in May. Other expresses would leave York and Albany, heading westward toward the Pacific

Although this second round of communication did not address the problem of furs stuck at the Bay, it did help ensure that the managers and London could exchange their annual letters. London found this backup correspondence especially valuable, and invoked peer pressure with its manager at Moose to ensure that the winter packet was sent on a timely basis.

It would be a very humiliating distinction to our officers at Moose if it was admitted that they were the only ones incapable of expediting the dispatches as quick as the other places. We direct therefore that it be continued and that greater dispatch be made in the writings (HBCA B.135/c/1, p.176, Gov. Wegg to John Thomas and Council at Moose, May 11, 1785).

If the annual letters got through, London would at least know how many furs to expect and how large a shipment of supplies and trade goods to ship the following year. London would also benefit from getting its managers' reports on the trade in general, and competition in particular.

While the managers generally corresponded with each other, getting the backup copy of London's letters also helped the managers coordinate their efforts. Unable to correspond with every other post, managers sometimes learned about their fellow posts' activities via London. In this sense, London filled a structural hole in the managers communication network, even though London was 3,800 miles away (Burt, 1992).

The benefits of the added annual communications were clear on numerous occasions. In 1873, for example, the Company's ship returning to London was forced to "to put back on account of the straits being blocked up with ice" (HBCA A.11/46, 26<sup>th</sup> October, 1873, CF McTavish to Secy. Armit). In addition to attending to the ship's crew and ensuring that the furs would be carefully stored for winter, the other priority for managers was getting the packet box and enclosed correspondence from London off the ship. Because Moose was the entry point for the Company's ships and served as a depot and distribution center, that correspondence was not only for Moose, but for all of the factories in the department. Thus, George S. McTavish, the manager at Moose in 1873, arranged for a special express canoe to carry London's letters inland via the Abitibi River "with instructions to the gentlemen in charge of districts and posts between here and Montreal to forward the packets on from post to post with all dispatch." McTavish's cover letter to the post managers in his department was brief, explaining the ship's predicament and asking them to note the date of arrival and departure of the packet as it entered and left their posts (HBCA A.11/46, fol. 61, October 24, 1873, Chief Factor McTavish to Southern Department district managers).

While the letters would have to travel the whole way by canoe, stopping at each post along the way, McTavish would also attempt to alert London via a third, relatively new channel. On October 26<sup>th</sup>, he sent a canoe to "the operator in charge of the highest up telegraph office on the Upper Ottawa River" asking him to "oblige me by sending the annexed telegram to [the Company's agent] as quickly as possible" and obtain payment for "the cost of the message" from "the Hudson's Bay Company's agent nearest your office on demand or by presenting this note" (ibid., fol.62).

Unfortunately, at the Company's annual meeting, neither the special express nor the telegram had reached London, where the Committee was still in the dark about the annual shipment's whereabouts. In his remarks to shareholders, the Governor reported that:

Generally by this time we have received in this country the whole of the great bulk of our furs from the various districts from which they come. There may be a few parcels left outstanding, but yet the two great consignments – one from the northern district [sic] and the other from what is called the southern district [sic]– have generally arrived by this time, and we are able to tell you what the amount of these consignments is ... on the present occasion, I am sorry to say, we are not able to tell you. (*Annual Report, Proceedings*, November 25, 1873, p.2)

Later, the Governor acknowledged that "we are beginning to fear she has been lost." He hoped that it was just a delay for repairs and not a complete loss of ship, men, and furs, but:

Communications from that very great distance are so protracted that we cannot tell what the case is, and, from some reason or other, we are at present without information as to the Moose ship ... We have not only not got the furs she is bringing, but we have not received an account of what those furs consist of. (*ibid.*, p.3)

In the meantime, the Committee's response was to take out an insurance policy against the loss of the ship and its furs, even though they did not have "an account of what those furs consist of" (*ibid.*, p.4).

The Committee and Governor finally learned of the ship's status in late December and wrote McTavish, to indicate their approval for his handling of the unfortunate affair. While this may seem like an unconscionable lag time in our terms, it represented a dramatic improvement over the delay that they experienced without the added expresses and emergency telegrams. Nonetheless, the Company did not engage in special expresses frivolously. Given the HBC's perennial focus on cutting costs, "expresses" (which could require several months and as many as forty men for a long cross-country route) were a costly endeavor and were generally made only at the Governor's discretion (Cole, 1979, p.107-8).

*Redundant Provisions Remedies.* The duplicate and special packets added an element of redundancy to the annual communications, but there was still considerable risk that ships would have to winter over. Unable to eliminate that risk, the managers introduced an element of redundancy to their annual operations which would at least mitigate the adverse effects of a wintering over. As noted in the minutes of the managers' annual council meeting in 1834,

In order to guard against a recurrence of the heavy expense of chartering a vessel from England for the transport of goods" after "a detention in the country of the homeward bound ships," the Council resolved that "a reserve be made of a sufficient quantity of goods and provisions equal to one and a half' year's worth of supplies. (HBCA B.135/k/2, Minutes of Council, Southern Department, May 17, 1834, Resolve 51, folios 55-6).

They created that buffer against the cost and hardship of a wintered-over ship from "the stock on hand, the cargo this season expected, and the goods now indented for" next year. By setting aside the extra provisions, they hoped to obviate chartering additional vessels when one wintered over. They also hoped to avoid the hunger, sickness, and death like they experienced in 1816. The new emergency reserve came to bear several times, including 1873.

That year, the detention of the *Lady Head* caused George McTavish, the manager of the Southern Department and Chief Factor at Moose, to spring into action. He "did not lose a moment in making the necessary arrangements for provisioning and supplying the ship and her crew for the winter" (*ibid.*). Within several days of the ship's return to Moose's outer anchorage, he had supplied it with food and clothing for three months and sent it to Charlton Island to ride out the winter (*ibid.*, fol. 63). This was quite a contrast with the 1816 experience of his predecessor Joseph Bewley, who was constantly writing letters and sending travelling parties inland to obtain spare provisions at the department's various posts.

*Transportation Remedies.* While new modes of shipping and transport were slow to reach HBC posts, the railroad did eventually penetrate far enough to reduce the risk of stranded ships for the Western Department's annual returns. In 1886, the new railroads allowed Western Department furs to be shipped east by rail for the first time, rather than over land and water to York. Furs were still being shipped out of York and Moose from the other departments, but the loss or stranding of a ship was no longer as disastrous as it had once been (Stardom, 1995, p.50, citing Annual Proceedings, 7 December, 1886).

For London, a wintering over was always distressing, but the financial implications varied. In years when prices were low, the reduction in furs at auction was less of a setback. Sometimes, when the prices rose over the lag year, a wintering over actually benefited the Company. This was the case in 1906, after the *Stork* had spent the winter of 1905-06 stuck in the bay. When it did finally return, there had “been a marked advance in the values” of furs and ship’s furs sold for more than they would have in their intended year of sale. Unfortunately, one of the Company ships “struck a rock on the coast of Labrador on her voyage out, sustaining serious damage,” leaving the furs there to be brought home the following year (*Annual Reports*, 1905, 1906).

While such back-to-back accidents or wintering-overs were rare, their continued occurrence even in the 20<sup>th</sup> century indicates how the coordination challenge of the annual shipments was not limited to the Company’s early days or to its original fleet of sailing ships. The 20<sup>th</sup> century’s first decade was especially bad for the Company, with the *Stork* getting delayed on its outbound voyage in 1908 and running aground before reaching its emergency winter mooring at Charlton Island. Rounding out the notoriously bad decade, the *Pelican* lost her rudder and propeller blades en route to York in 1910.<sup>26</sup>

With an annual cycle that was already highly entrained to the annual shipments, any change in that cycle had a significant impact on the lives of the Company’s dispersed managers – as well as staff, Indians, and London executives. Several simple practices helped the company reduce the risk of wintering over, and several other practices helped mitigate the impact when a ship did winter over. Nonetheless, maintaining a regular supply route for the Company’s posts was a persistent challenge, even with relatively sophisticated metal-hulled steamships. As late as 1938, 1947<sup>27</sup>, and 1962, Company ships wrecked, triggering many of the same responses that Company managers had employed for centuries. After the 1930s, the managers could finally rely on airplanes to provide emergency drops of provisions and staff, but the challenge remained a defining factor in HBC managers’ experience of work in a highly dispersed organization.

As noted at the beginning of this section, the cycle of annual shipping was just one of the HBC managers’ greatest coordination challenges. Other coordination challenges included sharing the expertise of specialized staff (e.g., those with Indian language skills or special tradesmen) and coordinating prices across posts so as not to cannibalize each other’s business. In both cases, written communication among posts was the primary means of coordination.

## **2.4.2 Communication**

In addition to major coordination challenges, significant communication challenges also shaped the HBC managers’ experience. Drawing in part on Cramton’s (2001) typology of information problems in virtual teams, I present three categories of communication challenges that faced the managers and contributed to their experience of dispersion.<sup>28</sup> These three include issues of local context (including silence and salience), even and timely access, and overload. For each category of challenge, I also outline the HBC’s responses.

In almost all cases, the communication practices that I describe in this section were enacted with what most would consider minor technological changes. Advances in communications and transportation technologies were slow to reach most of the Bay posts (Roach, 1984). For individual posts, the telegraph came late and was only used in a very limited way, the railroad was slow in coming, roads were almost non-existent, and steam travel was used only locally (and, even then, not until the late 1800s).<sup>29</sup> For posts and stores closer to the U.S. border and population centers (e.g., Winnipeg, Montreal, Ottawa), the railroad and telegraph

both had a larger effect. By 1900, the telegraph was important enough to warrant a line item in the annual financial statements under the “Office Expenses” for London (*Annual Report*, 1900). With pressure on its fur business increasing in the early 1870s, the Company looked to the railroad as an alternative to York for shipping furs, and also began experimenting with steamships on the major inland waterways. The Company’s first inland steamer was used on Lake Winnipeg in 1872, but even this mode of transport had a checkered early history (den Otter, 1983).

By 1901, wireless signals across the Atlantic were giving some independent traders nearer to Montreal the latest European market information, but the first telegrams were not sent from the HBC posts on Hudson’s Bay until the 1890s. In the 1930s-40s, the airplane began to play a major role in facilitating post inspections and supply drops, and the radio telegram (which sent wireless Morse code messages) affected all aspects of managers’ personal and business affairs. In the 1940s-50s, the precursor to the snowmobile also began to affect lives at northern posts. Prior to that, however, messages were carried by canoe and York boat, or simply carried by the so-called “moccasin telegraph” (Anonymous, 1957).

#### 2.4.2.1 Communicating Local Context

Your rivers never freeze; ours are only open for a short while ... I intreat you to dismiss from your minds the sprucely-dressed wherryman<sup>30</sup> with his plush breaches and silver badge, nor conceive the descent of the solitary bargeman at London Bridge with that through the ... rocky chasms [here in North America] as at all synonymous (bayside Gov. Nixon to London, 1679, quoted in Williams, 1970, p.35).

For the managers, communicating the key features of their local context to London was among their largest dispersion-related challenges. Providing details on their local situation had the double-edged effect of ensuring that London understood where they were coming from (as we might say today), but also giving London details with which it could track and monitor the managers more closely, cross-checking different types of records for inconsistencies and judging one manager against another. Nonetheless, as this section’s epigram shows, the managers felt strongly about the Committee’s lack of local knowledge, and the Committee itself was well aware of its need for this information, once admitting that it had “no sort of clue” about many aspects of the fur trade (Rich, 1945a). This section describes several approaches that the Company took to communicate local context. Although not detailed here, managers’ understanding of London’s context was nearly as important as London’s understanding of the managers’ context.<sup>31</sup> London did its best to communicate its context in its annual letters.

*Relying on the Written Record.* Although some managers made occasional trips to headquarters, they relied primarily on the annual letters and daily journals to share details of their local context with London. The journals were generally limited to summary notes on the weather, provisions, Indians, visitors, and staff members’ activities. As such, they gave London a general picture of how men were spending their time throughout the year. As early as 1683, the Committee directed managers to keep “Journals of what hath been done in the respective factories and of all occurrences that have happened to them in the year past” and also ordered them “to send us copies of those journals, that have been kept by yourself and others” (quoted in Simmons, 1994b). As the Company began to expand inland and there was more movement of staff, London also became keenly interested in tracking its employees’ detailed movements. In 1780, the Governor and Committee directed that the managers’ journals include all arrivals and departures of Company men and all men’s salaries. To emphasize the importance of this



information, they also required that “the chief must sign journal, not the [clerk].” Records of these staff movements seem to have aided London in several ways: 1) to understand better the relative needs of its different posts; 2) to gauge the approximate distances and associated travel times among posts and other landmarks; and, 3) to apportion “bounties” or bonuses correctly for those men who explored inland.

From London’s annual letters, it is clear that they did use the journal information in these ways, despite concerns by both managers and later historians that the journals only collected dust in headquarters. For example, in 1794, the Committee made clear that it saw “with concern the disastrous circumstances occasioned by the famine among the natives as represented by Mr. Bolland’s Miccabanish Journal, and [we] hope for better times” (HBCA B.135/c/1, p.223, Governor to Chief and Council at Moose, May 29, 1794). It was also clear that London was reading the journals with a fairly close, analytical eye toward understanding its employees’ actions. In 1794, they also wrote to their manager at Moose, John Thomas, that:

By Mr. Thomas’s Journal we perceive Mr. Gladman and Jacob Spence with Indians, set off to explore Hurricane River on the 8<sup>th</sup> June. On the 30<sup>th</sup> they returned — but having gone the same tract they went before, they obtained no information or more knowledge. How come they go the same tract? [sic] It was certainly wrong, they ought to have attempted some other which if they have not done, we desire they may do immediately. (ibid.)

Furthermore, the managers could use the accumulated record from their journals and trade records to support their case in arguments with London. For example, early on, managers noticed that the population of some fur-bearing animals went through natural cycles of growth and decline. Initially, London assumed that managers’ claims of cyclical downturns were excuses to hide poor performance, but the trend data from managers’ records ultimately convinced London that returns could decrease simply because of “anticipated periodic diminution[s] in fur-bearing animals” (*Annual Report*, 1925).

In addition to providing London with valuable contextual information, the journals also provided new managers with a useful narrative about their new post. For example, in 1742, the Committee provided James Isham with journals and financial records from Fort Prince of Wales (i.e., Churchill) “for your perusal in your voyage outward that you may make your self master thereof by such time as you shall arrive at Hudson’s Bay” (quoted in Simmons, 1994b, p.15). This use of journals to orient new managers was especially important after the merger and all the changes that it brought. For example, in 1821, Archibald McDonald took charge of a post as a newcomer to the fur trade. Upon his arrival at the regional headquarters and before getting to the post, he “undertook to introduce himself to the ways of the fur trade by going over all the [post’s] past season’s records” (Cole, 1979, p.93).

In both content and form, the annual letters also provided important contextual information. The form of Company letters provided a mechanism for ensuring that the two parties to every correspondence always knew what information their communication partner had, thus helping establish mutual knowledge. Every letter began by acknowledging the date and subject of the last letter received. Such an acknowledgement may seem trivial today, but it was critically important for the posts and London to know whether their last letter had been received. To ensure that London and the managers were working on the same assumptions, London directed the managers “to signify in your annual general letter whether or not the duplicate of the preceding year, addressed to yourselves, has been conveyed to you” (London to Chief Thomas and Council at Moose, 1793). If London had not received a post’s annual letter for the previous year, its instructions were read quite differently. Today, this function is analogous to aspects of

headers in email and threaded discussions, as well as the “reply” feature in most e-mail programs, which automatically includes the text and date/time stamp of the previous message.

*Relying on Returning Captains and Managers.* In addition to the journals and letters, returning ships’ captains served as conduits for contextual information. Managers would also occasionally return to London. Sometimes, these return trips were due to circumstances unrelated to the trade (e.g., a manager’s ill health). At other times, managers returned home when there was major change, turmoil, or crisis afoot. For example, the Committee’s 1888 *Annual Report* (December 4, p.6) notes that:

The greatly altered and constantly changing circumstances of the country in which much of the trade of the Company is carried on, render necessary many alterations in the conduct of their affairs. Mr Wrigley, who has had four years experience as Commissioner, is now in London, and the Committee taking advantage of his presence, are engaged in a close examination of the Trade of the Company as conducted at the different districts and posts.

Three years later, Wrigley had been replaced by C.C. Chipman as Trade Commissioner. In preparation for his new role, “Mr. Chipman spent some weeks conferring with the Board, and has recently left to take up his duties in Canada” (*Annual Report*, July 22, 1891, p.6).

In addition to bringing the Board up to speed on the situation at its posts, travels to London also helped managers advocate their various personal or collective causes. When the Company sold much of its lands in 1870, the managers were angry that they’d been shortchanged on the cash settlement and future profits. They were also concerned that their dependence on world fur markets would leave them destitute in retirement. Thus, in 1886, manager Roderick MacFarlane used a furlough home to lobby the Governor and Committee for a more solid pension plan (Stardom, 1995, p.50).

Although return trips provided more direct interaction between managers and London, they could also lead to London getting misinformation, or at least skewed information. This was true with ships’ captains as well as returning managers. For example, in 1679, bayside Governor John Nixon complained about “this advantage all my adversaries have above me” when they “come first home [and] by fraud and flattery can have their tale first told and they can be heard [directly] by you” even if “it proves to your loss” (Rich, 1945a, p.278). Thus, returning managers enjoyed an advantage over those who remained on the Bay

*Relying on Their Own Eyes.* Despite the valuable information contained in the correspondence, journals, and records, Company leaders also increasingly began to rely on seeing situations for themselves before making final decisions. No longer willing to rely on journals and letters, they began touring their operations much more extensively. They did this for their own benefit, as well as for those outside the Company, who had even less sense of the local situation.

Although HBC leaders at the Bay eventually made use of the railroads, steamers, paddle boats, airplanes and other new transportation technologies to facilitate inspections, the practice of inspecting posts as a way to enhance local senior managers knowledge pre-dated all of those technologies. In 1737, London sent Richard Stanton to survey the damage to the burned out Moose Factory, assess the causes of the blaze, and oversee reconstruction. In this instance, Stanton was both an inspector and a replacement manager. In 1799, the Governor inaugurated the first formal and dedicated role for inspectors, when he created the position of supervisor and inspector of inland posts (based out of Albany). Then, in 1810, with dozens of new posts having been created in the last few decades, the Committee decided to introduce more structure, standards, and accountability to its posts’ financial affairs.

It did so by appointing an accountant to each post and sending its own London supervising accountant to inspect the books and jumpstart implementation of the new system. The accountants would double as storekeepers and would serve as second in command. Until this time, apprentices had played this role and only then at large posts. Each district was also given a clerk for bookkeeping, who worked under the accountant at the district's lead post. The supervising accountant was Edward Roberts, a 23 year-old clerk in the London accounts office. The Committee sent him out on the annual ship "for the express purpose of directing [the factors and their clerks on] how to keep the factory accounts according to the New System for conducting trade in the future" (HBCA A6/15, Committee to William Auld, Superintendent of Northern Factories at York, May 31, 1810).

Roberts arrived at Albany on August 16, 1810 and began to inventory the Company's property there on the following day. While everyone was loading and unloading the ship, he completed his work and sailed for Moose on the 28<sup>th</sup>. He then raced to complete an inventory of Moose's warehouse in time to sail for Eastmain on September 3<sup>rd</sup>. By September 14<sup>th</sup>, he had finished at Eastmain and sailed back to Moose, where he boarded the *Prince of Wales* for its regularly scheduled return voyage to England. After this hurried series of stops to inventory, inspect, and instruct, he brought back the annual letters armed with first-hand knowledge of the business practices being employed at three key bayside posts. When he returned, he was introduced to the Board and given a bonus of 100 guineas (A1.49, 21 Nov 1810, as quote in Simmons, 1994a).

Although there is evidence of these early inspections, George Simpson was the first leader on the Bay to make extensive use of face-to-face contact with his managers. He did so long before the availability of new transportation technologies through his own indefatigable travel,<sup>32</sup> annual meetings of the post managers, and trusted deputies whom he sent out on reconnaissance and ambassadorial missions to assess novel or rapidly changing situations and communicate Simpson's messages. For example, in 1821, he sent Archibald McDonald to the Columbia region west of the Rockies to get a "full and accurate report" of the conditions in that region where the Company had a poor handle on its operations (Cole, 1979, p.99). Visits to the posts gave Simpson "a great deal of valuable information which I trust will be turned to good account." Some of this information included things that only an outsider would recognize – "it frequently happens that a stranger perceives many things which from custom escape the observation of long residents" (HBCA, Simpson Papers, Reel 195).

In 1870, with the Company having just sold much of its land to the new Canadian government, the fur trade under increasing pressure, the anticipation of increasing pressures from settlement, and the unfamiliar tasks of building the merchandising arm of its business, the Company engaged its first "management consultant," Cyril Graham, a telegraph company executive. Graham acted like Simpson, McDonald and previous internal inspectors had, but he brought an outside eye and some expertise in merchandising, as well as familiarity with the changing nature of Canada.

After Graham's visit, London made it clear that senior managers were to "visit the more important points" in their departments and the Committee "instituted a system of closer inspection and more rigid scrutiny into the circumstances affecting the trade of the several districts and posts." The system built on the bank inspector model, with two-man teams travelling to the posts or district offices. Initially, Company inspectors had a rank superior to that of the post managers. The ranking HBC official in Canada, Joseph Wrigley, felt that this caused jealousy and suspicion among the managers, and threatened the viability of the district manager

position. Thus, he changed the position's title from Inspecting Chief Factor to simply Inspecting Officer and made them salaried employees with no share in the profits of trade (Stardom, 1995, p.44). Although the system was "steadily pursued," it was also "necessarily slow in its operation, as the trade extends over a vast territory not accessible by the ordinary modes of travel" (*Annual Report*, 1891, p.6). When C.C. Chipman took over from Wrigley as Commissioner in 1891, the Committee instructed him to:

Visit the more important points in several departments, and to report fully to the Board, the better to enable them to take such further measures as may be necessary for bringing the administration of the business more into harmony with the ever-changing circumstances and the greatly increased competition with which it now has to contend. (*Annual Report*, 1891, p.6)

In the early 1880s, the inspections were expanded to include London Committee members for the first time when Deputy Governor Sir John Rose and Secretary William Armit visited Winnipeg. Accompanying them was the first member of the London Committee resident in Canada, Sir Sandford Fleming (a man who would later devise the modern system of time zones). They went to "see for themselves the wonderful changes which had taken place, and, no doubt, their visit would be to the advantage of the Company" (*Proceedings*, July 1882). These changes included the first retail store, which was less than a year old.

The active use of the "aeroplane" debuted in 1933 with the inspection tour of the Company's relatively new Governor, Sir Patrick Ashley Cooper (*Annual Report*, 1933). While these early plane trips were not completely unlike the earlier canoe-based ones<sup>33</sup>, they enabled Cooper and his travelling assistants to inspect a tremendous number of posts. Whereas Simpson might spend all year inspecting a region's posts, Cooper and his deputies could visit as many as 25 in 11 days (McLaren, 1992, p.147). In his account as pilot for Cooper, Duncan McLaren records visiting at least 132 posts in 115 days. As early as the 1940s, the manager of the Fur Trade Department, P.A. Chester, envisioned purchasing a fleet of company aircraft to enable a "new breed of younger men" to criss-cross the department identifying necessary changes in strategy and operations (McLaren, 1992, p.148).

Although other London Governors had been in Canada, their trips were limited to the easily accessible posts and urban stores. Such was the case when Governor Kindersley visited Winnipeg in 1920 to help celebrate the Company's 250<sup>th</sup> anniversary (*Annual Report*, 1920). Newly appointed Governor Cooper made this first visit in the Autumn of 1931. This and subsequent visits were part of his general plan to get the Depression-weakened Company back on track and stemmed in part from a 1931 "Report of a Special Committee appointed to inquire into the affairs of the Company." That committee made a series of operational, organizational, and governance recommendations, but also concluded that:

Before any important changes are made, however, it is essential that the Governor and some members of the Board should visit Canada, which they have arranged to do in the immediate future.<sup>34</sup> (*Annual Report*, 1931)

Cooper's "extended visit" included stops in Montreal, Toronto, Winnipeg, Calgary, and other major centers, but not the posts themselves [although he did address posts in the Far North by wireless (*Annual Report*, 1932, p.3 and 13)].<sup>35</sup> He met with Canadian Committee members, the General Manager in Canada as well as his departmental general managers and store managers in the cities. Among the "many important changes in the organization" that were announced in the 1932 *Annual Report*, Governor Cooper reiterated that "decentralisation with greater

responsibility placed on those in charge at the place of operation” was to be adopted (p.12). Prior to this shift, there had been an Advisory Committee without executive powers based in Winnipeg, no general manager, and department heads who reported directly to the Governor and Committee in London. Beginning in September, 1930, the Canadian Committee was empowered with “control of the Company’s affairs in Canada” and,

During the Governor’s [1931] visit to Canada, arrangements were made which, in the opinion of [the] directors and the Canadian Committee, will enable the latter to administer freely on the spot the operations of the Company in Canada, while the Governor and Committee in London retain adequate control over policy and finance. (*Annual Report*, 1932, p.12).

Importantly, Philip A. Chester was also appointed “General Manager,” which carried with it responsibility and authority as “the Company’s principal executive officer in Canada” (ibid.). The Canadian Committee was now seen as “extremely valuable” for “their intimate knowledge of local conditions” (p.13).

In the latest round of what Simpson called “oeconomy” 120 years before, the Canadian Committee and GM Cooper were charged with “an intensive economy campaign” to effect “large savings in expenditure and added efficiency” (pp.12-13). Within the Fur Trade Department, Commissioner Parsons was moving ahead with attempts to significantly reduce inventories and implement “systems of control,” as well as to reorganize the districts and posts to eliminate “unnecessary” ones and focus on others that had been “receiving insufficient supervision” (pp.9-10). Continuing with a now familiar tradition, “Inspections by both the Fur Trade Commissioner and by the District Managers have been carried out on a much increased scale” (p.10). As had been the case before, however, “owing to the difficulty of communicating with some of the districts, delay must necessarily ensue before all these re-adjustments can be made effective at the posts” (p.10).

In 1932, after the Governor and one Committee member returned from their first visit to Canada (not to mention Governor Cooper’s first full year on the job), the annual report itself took on a dramatically different, “much fuller” appearance – in both scope and level of detail. It increased in size from 5x7” to 8x11” and more than doubled in length. For the first time, it included numbered sections and graphic displays of operational and economic indicators. This undoubtedly reflected broader changes in corporate reporting, and Cooper’s own agenda, but it also suggested a much more detailed and holistic understanding of the Canadian environment on the part of the Company’s London leaders. With that understanding came the conclusion that “One of the most serious problems with which the Board is faced is the provision and the training of an efficient staff of Managers and employees” (*Annual Report*, 1932, p.13). The Board’s approach was to begin “systematic training” but also to rely on the familiar “policy [which] is to promote from within whenever possible” (ibid.).

In 1933, Governor Cooper made a second trip to Canada, including his historic inspection of the Company’s northern posts (the first such visit for any London Governor in the Company’s history). The trip was doubly historic because Cooper used an airplane for the first time in the Company’s 266 years. As the 1933 *Annual Report* (p.3) described it:

It is interesting to record that this is the first time that any Governor of the Company has either paid such an extended visit to the Northern Fur Trade Posts of the Company or set foot in the present Northwest Territories. This was made possible by the use of aeroplanes.

Cooper did not make his trip alone either; he was accompanied by the manager of the London office, who had himself made an extended tour of the Company's operations in the Maritimes. Thus, during the year, "practically every branch of the Company's activities ha[d] been visited, by either a Director or the London Manager" (p.3). Furthermore, arrangements were made to have the General Manager Chester visit London as well. In all, both the breadth and pace of inspections and personal contacts between London executives, North American executives, and local managers had risen rapidly between 1931 and 1933. The "aeroplane" played a major role in this change, but as with many technological "advances" the plane was also double-edged. While it made HBC posts more accessible and less isolated, it also made the HBC's "districts more accessible to competition" (*Annual Report*, 1933, p.12). At the same time that the aeroplane was enabling wider and more regular inspections, the railroads had finally reached the Bay at Churchill and Moose. These developments "profoundly modified th[e] situation," but the Committee did not eliminate the trans-Atlantic shipment of furs out of the Bay immediately. It did, however, note that no additions would be made to its ocean-going fleet (*ibid.*).

In addition to making use of the relatively new affordances of air travel, Cooper also noted the major transportation changes with new railroads opening up and addressed staff at far northern posts by wireless (*Annual Report*, 1933). If he had not already been convinced of the merits of seeing the Company's operations and meeting its managers where they worked, Cooper's remarks in his 1934 *Annual Report* to shareholders make it clear that the 1932 and 1933 trips solidified his opinions about personal contact. In 1934, both the Governor and Deputy Governor visited Canada, with the General Manager, Fur Trade Commissioner, and other senior officials in Canada all travelling to London. Emphasizing the value of these trips despite the continued focus on economy and efficiency, "The Board regard[ed] these personal contacts between the directors and executive officers as of the highest importance in the promotion of the Company's interests" (*Annual Report*, 1934, p.3).

Coincidentally, 1934 also brought an end to the annual passage of the Company's trans-Atlantic supply ships. After 265 years of those voyages (and their highly entraining effect on HBC life and business), the ship *Nascopie* was approved to stay in Canada to deliver supplies without having to return to London each winter (*Annual Report*, 1934). Somewhat nostalgically, the 1934 *Annual Report* (p.10) noted that:

It is interesting to note this important departure from previous practice ... The departure of the s.s. "Nascopie" from the Clyde in June last probably marks the last of the annual trans-Atlantic voyages of the Company's Supply Ship after a period of 265 years.

Making his third consecutive visit to Canada, Cooper added to his string of firsts in 1934, becoming the first Governor to visit the Company's Arctic trading posts and see the "local trading conditions first hand" (*Annual Report*, 1935, p.3). He did so via airplane and the S.S. *Nascopie*, which steamed out of Montreal in July to take the Governor and annual supplies into the Bay. The *Nascopie* participated in another "first" in 1938, when it rendezvoused with another Company ship to exchange cargoes in the famed North West Passage, for which the Company's founders were looking in 1670. A mere 268 years later, it was finally being used as a commercial route by the Company (*Annual Report*, 1938).

While the Depression was softening somewhat by 1936, war was soon to overtake Europe and, by 1937, the Company's annual report began to shrink considerably and so did its staff. Nonetheless, Cooper was again visiting posts in 1939. Fur sales in London were shifted to New York and business began to suffer in all departments. By 1943, the previously 15 page annual report had shrunk to a two-page mailer, but by 1944 the war was turning, the 1,017 staff who had served in the military were beginning to return to work, and, in the Autumn of 1944, Cooper "made an extensive tour in Canada and the United States" after a five-year hiatus. (*Annual Reports*, 1939-45). After travelling to London on an annual basis for 16 years as General Manager of the HBC operations in Canada, Philip A. Chester made another Company "first" in 1945 when he was appointed to the Committee in London (*Annual Report and Governor's Statement*, 1946, unnumbered 2<sup>nd</sup> page). This appointment signified not only his rising power in the organization, but also the increasing "Canadianization" of the Company in general. While the shift had been coming for years, 1946 also marked the ascendancy of stores over furs as the Company's "largest and most important Department" (*ibid.*). While the stores were accounting for an ever larger portion of the Company's attention and profits, the expansion of the Interior Stores Division "throughout the length and breadth of the Dominion" was giving the Retail Stores Department a configuration more like that of the trading posts. To serve those posts and new interior stores, 1947 brought a reorganization of the Company's transportation and a substantial extension to its radio network. The transportation provided by ships and the Company's three airplanes covered 260,274 miles (i.e., the equivalent of 35 round trips between London and the Bay).

Although Gov. Cooper's travel required less personal exertion than Simpson's had a century prior, he was similarly committed to obtaining first hand knowledge of his managers' and staff's work, writing that, "I have always held the view that these personal contacts are essential in the successful conduct of our widespread business" (*Annual Report*, 1945). Cooper would make similar comments every year and, in 1947, visited Canada twice. Like Simpson, Cooper also focused heavily on personnel issues, albeit with the new slant of his generation.

After the war, new approaches to personnel and human relations were beginning to gain currency and the HBC was not immune to them. In fact, Cooper had pushed for decentralization since he began as governor in 1930. Over the years, he would oversee considerable Committee attention to staff training, development, and related research. By 1948, that research was focused on "the best methods of providing training and education appropriate to our type of trading organisations, whose staff may be expected to carry on their work in many parts of the world" (*Annual Report*, 1948, p.9). As in the earliest days, he focused the Company on hiring a new cadre of young recruits and socializing them into the Company family. Apropos of his particular times, however, we wrote in the 1948 *Annual Report* (p.9):

During the past few years, many of the old ideas on personnel policies have changed, and I venture to claim that at no time in the Company's history has so much attention been given to the development of good employer/employee relations, and to the breaking down of those impersonal conditions which in the past have been only too common in many large organizations.

By 1950, this changing approach to personnel and staffing included Cooper's reference to the staff as members of teams with as few as two and as many as one thousand members, "Scattered as they are between latitudes 74 degrees North and 30 degrees South."<sup>36</sup> Reflective of the emerging human relations tradition, Gov. Cooper noted that "the study of how effectively to apply the enthusiasm and goodwill which springs from" these employees was the "constant

preoccupation” managers everywhere from headquarters to the individual posts (*Annual Report*, 1950, p.9).<sup>37</sup> Cooper pointed to dispersion as a key reason for this “preoccupation,” writing that “In our Company, more than in most, responsibility devolves on individual managers often remote from central control” in whom the senior managers must have “confidence ... to meet whatever situation may arise” (*Annual Report*, 1950, p.9, §4).

The fur trade was the Company’s oldest business and, as noted in the 1951 *Annual Report* (p.18), was the:

one most closely associated in the mind of the public with the Hudson’s Bay Company, for its very name conjures up romantic visions of pioneers who first traversed the length and breadth of that vast domain which was one day to become the Dominion of Canada.

Nonetheless, the nature and role of the fur trade posts changed over time. By the middle of the 20<sup>th</sup> century, there were still posts that operated much like the original ones did and were entirely dependent on the fur trade, but they were mostly those established in the 20<sup>th</sup> century in the Arctic. Conversely, there were many fur trade posts that had become small stores as settlement expanded. At the same time, there were small stores that were established in the 1900s as small stores, with no history as fur trade posts. Taken together, this chain of more than 200 stores, “some of them nearly 2,000 miles from their headquarters in Winnipeg, [and] varying in yearly turnover from under ten thousand to over a millions dollars,” presented one of the Company’s “most complicated administrative problems” and “possibly the most difficult task of its kind in the world” (*Annual Report*, 1950, p.11, 1951, p.23). Governor Cooper apparently realized this complexity on his first visit in 1931 and decided that “if [he] were ever to understand it properly [he] must make personal contact with the men and women at our isolated posts scattered throughout Canada.” Over his 20 years as governor, Cooper made these visits an annual ritual, encouraging Committee members and London office staff to join him or make trips independently. He also encouraged Canadian managers to pay regular visits to London. Describing the value of this travel in 1951, he said:

These visits have been most valuable because I have been able to see for myself the workings of each post and have had the opportunity of meeting the men and their wives and discussing their problems with them on the spot. (*Annual Report*, 1951, p.23)

Cooper is on record describing the value of these visits to him and other senior managers, but it seems reasonable to conclude that they were valuable to “the visited” managers as well. Although added oversight could have been burdensome, post managers during Cooper’s tenure would have been less able to complain about London being as clueless as John Nixon accused them of being in 1679 when their reference point was sprucely dressed barge men on the Thames, rather than shaggily dressed traders in the rapids, rocky chasms, and icy wilds of the far north.

By 1951, technology had also reached the posts in a more significant way. Although railroads were slow to reach them, and the telegraph really never did, the radio telegram and airplane had a major impact on isolation of the posts (both from headquarters and from each other). Having two-way radio contact with Winnipeg was a mark of considerable progress in 1951 (*Annual Report*, p.23). The “aeroplane” and two-way radio (not to mention the snow mobile<sup>38</sup>), were “a far cry from the York Boat and Red River Cart used by the early settlers,” but distance was definitely not dead and the widely scattered organization remained a major



challenge – in part because “transport by canoe and dog sled is still the only method in some of our territories” (*Annual Report*, 1951, p.23).

When not being visited by special inspectors, governors, commissioners, or London Committee members, post managers still had to deal with the incessantly travelling district manager – their most immediate superior in the corporate hierarchy. In the 1940s, the *Moccasin Telegraph’s* photographer caught the managers for the James Bay, Ungava, Saskatchewan, and Nelson River districts at their desks in Hudson’s Bay House headquarters. The caption only half-sarcastically read, “Between Inspections: It’s mighty bad flying weather when you find four district managers in Winnipeg Office at one time” (May 1942, p.12). A 1968 issue of the same publication pokes fun at district managers, but tellingly describes them as the “guiding financial father[s]” who “go everywhere” and work longer hours than any one else (Seaton, 1968). It goes on to say that a district manager “may live 500 miles away, but he’s with you every mail day. You can get him in your files, but you can’t get him out of your mind” (Seaton, 1968). So, as the Company grew from its initial seven posts hugging the Bay to hundreds dispersed across Canada, managers often relied on their own eyes and “being there” to enhance their local knowledge of the posts’ operations. Similarly, the Company also adopted structural remedies as a way to enhance their knowledge of posts’ local contexts.

*Relying on Structural Remedies.* With the appointment of department governors in 1810, and especially George Simpson as de facto Governor-in-Chief in 1826, the Company attempted to enhance the communication of local context with changes to its organizational structure. By installing more middle managers, they hoped to reduce the communication gap – in both time and local knowledge – between London and the Bay. Then, with the appointment of C.J. Brydges in 1879, the Committee made its second major move to shift operational control from London to Canada. Writing privately to the Canadian Prime Minister, HBC Deputy Governor Sir John Rose, explained the move:

Our plan is to place Brydges in a position where he can – as he certainly very soon will – make himself master of the whole business, and ingratiate himself into the good opinion of the officers. ... Brydges – although nominally Land Commissioner – will really be instructed to feel his way as expeditiously as he can, so as to master the whole business of the Company – not only as regards the Lands, but as regards the Fur Trade as well ... Brydges is, in reality, the man who is to occupy the confidential relations, and exercise all authority from this day forward (Bowsfield, 1981, p.xxii)

By creating this role for Brydges, London appeared to make a “radical departure” to end the reporting of senior officers directly to London. They did so because the “The inevitable friction and overlapping which had resulted could not adequately be resolved by the London Committee with *their limited knowledge of operational detail*” (Bowsfield, 1981, p.xxii, emphasis mine). With a local officer in charge of all its business in Canada, the Committee gave up some large measure of control, but also ensured that its “directives would be more clearly conveyed to the field” (Bowsfield, 1981, p.xxii). However, 200 years of tradition dies hard and the Committee continued to exercise “minute control over all aspects of field operations.” It never appears to have acted on its mandate to Brydges, and Brydges did not live up to the smaller mandate that remained (Bowsfield, 1981). It would be another 20 years before London began implementing a more significant shift in control to its Canadian Subcommittee. This shift culminated with the actual movement of Company headquarters from London to Canada in 1970 on the Company’s 300<sup>th</sup> anniversary, but the Canadianization of the firm was well on its way by the 1920s.

#### 2.4.2.2 Ensuring Timely and Even Access to Information

In addition to understanding each other's local contexts, managers' experience of dispersion was shaped by their ability to get and give timely and even access to information. As King and Frost (2002) noted, "A major challenge facing the coordination of activity across long spatial distance was the fact that news of conditions on the ground in one location could be wildly out of date when reported at another." This was especially true when it came to information about fur prices in Europe and London's need to know the circumstances under which its staff returned to London. I describe these two situations below.

At the same time that London was hampered by not knowing about the status of delayed ships, its managers were hampered by not knowing what the going rate was for the various types of furs sold in Europe. Given the challenges of communicating with the Bay and inland posts, the managers risked buying furs at prices above those in London, which had dropped 10-45 percent since 1874. As the Governor noted in 1877:

It should be further borne in mind that the operations of the Company are carried on a distant country, where as a rule, the means of communication are slow and difficult, and where a fall in the London Fur Market remains unknown to the Officers of the Company in the remoter districts, even when they are making arrangements for the purchase and barter of Furs (*Annual Report, 1877, p.6*)

Given lag times in communications, managers had severe constraints on their ability to play the market. In response, the Governor and Committee could do little beyond holding furs back from the market.

In 1878, they considered just such an approach. In order to facilitate their decision making process, they assembled returns for the 28 types of fur sold in each of the last 25 years (*Annual Report, 1878, pp.6-7* and unnumbered appendix table). After receiving "anxious attention" and "close examination" from the Committee, the table convinced them that "in the face of the regularity of the supplies, and the uncertainty of the market, your Committee have not deemed it expedient" to withhold furs. Their longitudinal fur returns data made it clear to them that if they had adopted such a strategy in previous years, "the result would have increased the losses, which, as it is, they have to deplore" (*ibid., p.7*).

Such longitudinal analyses were undoubtedly helpful (and were not limited to this one instance<sup>39</sup>), but they still struggled with timely and even access to information. Especially in the Company's southern districts, independent traders seemed to have better fur pricing information than the HBC post managers and Commissioner. For example, Commissioner Wrigley in Winnipeg found himself three to four days behind his competitors in hearing about the results of the March 1885 fur sales in London – even though he received a telegram from London. Having lost out by this delayed knowledge of London prices, he urged more frequent cables and updates on the European market. By 1887, the Committee was finally convinced and Wrigley got news of the January sales in time to sell furs above London prices for several hours (Stardom, 1995, p.48).

Wrigley also pushed the Company toward better, faster use of information in 1886 when he began advocating twice-yearly indents for districts that could do so. Furthermore, he convinced London to use open ended contracts whenever possible, so that managers did not have to guess at their supply and provisions needs so far in advance. As a result, he was able to reduce indents significantly (Stardom, 1995, p.49).

In addition to the challenges posed by untimely access to market information, the Company also faced the challenge of ensuring even or common access to information. For

example, London continually bristled at the variability in information that it received on staff returning to London. Without a full understanding of the reasons for staff members' return, London feared re-hiring men who were 1) unfit for service, or 2) trying to game the system by returning home only to re-engage at a higher salary.

Except under very specific and unexpected circumstances, London was not willing to have its servants or officers discontinue service of their own volition. For London, the employment contract was binding and, if communications problems worked to its advantage to extend those contracts, so much the better. In order for any staff member to leave the Bay before his contract had expired, the post manager and company doctor were supposed to certify that the man could not be employed in other ways (e.g., craft work in the factory's workshops or warehouses).

For example, in 1785 with John Thomas still "learning the ropes" of his relatively new post manager position, the Committee wrote that Robert Chappel must stay because his request for recall was not "signed or authenticated by our chief (through whom every request should be made known to us). We cannot agree to his desire, especially as no certificate of ill health was sent us from the surgeon." Conversely, the Committee also became concerned because it had ordered home John Leach from Moose, but was surprised when neither he nor notice of his status arrived in London with the Company's returning ship.

By the end of the 18<sup>th</sup> century, this problem was still vexing the Governor and Committee. In their 1799 letter, they ordered that staff "should also know that we are determined to give no countenance to applications from such servants who frivolously return home on the expiration of their contracts and afterwards apply to go out again in our service." These orders were to be posted clearly for all to see (HBCA, B.135, 31 May 1799, Gov. Wegg to Chief Thomas & Council).<sup>40</sup>

In addition to needing more timely access to market information from London, post managers also needed more timely and complete information from each other. Indians were allowed to purchase supplies on credit under the assumption that they would clear their debt with the following year's trapping. As a result, Indians could run up large debts at multiple posts, which forced managers to keep their account books ahead of the Indians' movement and spending, or risk allowing Indians to run up debts that they could never re-pay. Also, Indians would go to non-HBC traders when they could, leaving the HBC with their debts and without their furs. (Stardom, 1995, p.48).

#### 2.4.2.3 Managing Information Overload

Especially after the Company began its massive inland expansion, information overload became a problem for the London Committee. London's requests for more detailed information also became a reporting burden for the managers. In the negotiation between managers feeling overloaded and London executives wanting more information on their distant operations, the Company's various communication genres developed and changed.

Starting in the late 1770s, for example, the London Committee pushed for more consistently organized annual reports from the managers – with consistency being an issue both across years and across managers. In terms of consistency across years, the Committee sought comparability in style of presentation so that it could monitor trends over time. In terms of consistency across managers, London actively compared performance from one post to the next. For example, in its 1786 annual letter to Moose, the Committee complained that "much trouble is occasioned in collecting the ... accounts of stores from want of having them placed in the same

order at all of our factories.” However, with a rapidly growing number of posts to keep track of, London needed a variety of simplifying devices to help it digest the volume of incoming information. These devices included numbered paragraphs and standardized headings at first, as well as subject tabs, abstracts, and indices over time. Beginning in the 1780s, London also promoted use of the “Book of Standing Orders,” which collected the most frequently reiterated directives from London’s annual letters and sent a bound copy to each post. The books contained room for more orders to be added over time, and were also numbered so that London could “more readily observe how far [its] commands are obeyed; and to obviate any excuse that may be made for a breach thereof through ignorance” of the most current version. In addition, London pushed for an increasing amount of information to be presented in tabular or graphic (rather than narrative and journal) form. To assist with and enforce these requests, London also began supplying ruled, pre-printed forms on which the managers would complete their reports.

In addition to these changes, the Committee in London made increasing use of special committees and subcommittees to review information coming in from the Bay. This specialization of duties or “committification” had a reciprocal relationship with the communicative forms used by the managers and the technology available. As more of London’s work was done by subcommittees, more of the managers’ reporting was divided accordingly. This appears to have reached its height in the 1890s when letters to London and its chief representative in Canada, correspondence all began to look short and telegraphic, even when it was not sent by wire. What had begun as long narrative letters was now often communicated in short one-paragraph (or less) letters that were more like discrete messages. While these short “letters” could be filed or forwarded to specific executives or subcommittees more easily than a long annual letter could, it seems that adoption of the telegraphic style may eventually have gone too far, creating large piles of exceedingly brief letters. In the 21<sup>st</sup> century, rules of e-mail etiquette have also emerged that deal with this tension. On one hand, they recommend limiting e-mails to only one or two key subjects. On the other hand, they recommend against filling people’s in-boxes with flurry of single-issue emails.

### **2.4.3 Isolation**

In the Hudson’s Bay area, temperatures fluctuate by more than 150 degrees Fahrenheit. Because moderating ocean currents never reach it, the Bay is colder than the Arctic or the North Pole (Fremlin, 1974; Matthews, 1987, especially Volume 1). One early commentator wrote that the area is “so prodigiously cold that nature is never impregnated by the sun; or, rather, her barren womb produces nothing for the subsistence of man” (Newman 1985, 1:146). During the winter of 1741-2, it was cold enough at the Company’s bayside post at Churchill to freeze port wine “in the glass as soon as [it was] poured out of the bottle” (Newman 1985, 1:146, quoting Christopher Middleton’s 11 October 1741 journal).<sup>41</sup> In fact, in addition to location, long-range climatic cycles mitigated against expansion during the Company’s first century. And, if nine months of cold were not enough, they were followed by three months of mosquitoes, flies, and occasionally deadly ice berg flows.<sup>42</sup>

In addition to these natural barriers, the Company also enforced strict discipline and a “24-7” commitment. Given the only annual departure of a Company ship and strict rules about leaving the Bay, men had to apply one year in advance if they wished to return to Europe. Even then, returning was not allowed unless one’s contract was up and usually came at one’s own expense. In rare cases, men (mostly officers) would be transported home for health reasons.

While neither a prison nor a “barren womb,” the isolated posts have been compared to “lunar colonies” forced to be mostly self-reliant by their distance from England and the settled parts of North America (Newman 1985). For some, this apparently dreary existence led to a “defiant euphoria of sheer survival,” and contributed to the Company’s strong social (or “clan”) control.<sup>43</sup> The effects inherent in the geographic isolation of the Bay are exemplified in periodic suggestions that the English and Irish governments use parts of Rupert’s Land as a penal colony akin to Siberia.

Whereas Foucault’s (1977) panoptic prison left its inmates staring into the white glow of a watchtower light, the location of Moose Factory and other HBC posts left the HBC’s employees staring into the white glow of permafrost for nine months each year. Not all posts were isolated and, as Williams (Williams, 1983, p.61) reminds us, it is easy to overemphasize the “reminiscences of the disaffected.” Nonetheless, in the early years, the more remote posts were barely more attractive for the managers than they were for employees. As an officer at Oxford House wrote, “The only advantage I have here over what a prisoner has in the civilized world is that besides being the prisoner I am also the Gaoler” (ibid.). Interestingly, however, the isolation-reducing effects of managers’ ability to read news from home and correspondence from fellow managers were balanced by managers’ relatively lonely position at the top of their posts’ hierarchy. At the larger posts, there were several “officers” who could dine together and share living quarters. At the smaller posts, there was sometimes only a manager and a young clerk, or just a manager without any peers.

In addition to the effects of one’s position in the firm, isolation also took different shapes, depending on where a manager was. For example, James Hargrave was the manager at York when the HBC and NWC merged. York was geographically isolated on the northwest shore of the Bay and it took as long as a year for letters to reach Hargrave from his fellow managers. In spite of this, York was a “nerve center” of the Northern Department and benefited from being one of the Company’s two depots. While Hargrave was geographically isolated, half of the Company’s supplies, men, furs, and communications all made their way through York.

In contrast, managers at less organizationally central posts faced greater isolation and real hardship. Far from communications hubs like York and Moose, these outposts were at much greater risk of famine, attack, and other strains. In these posts, managers could go for months with no outside contact and only old post records, a few dog-eared books, and year-old newspapers to read (Glazebrook, 1938, p.xxv-xxvi).

In addition to the organizational and geographic elements of isolation, work practices could easily moderate or exacerbate it. For example, Simpson’s push to have remote posts raise their own provisions only enhanced their remoteness, cutting them off not only from home but also the tastes of it (Cole, 1979, p.106). Simpson’s tireless travel and the inspectors who succeeded him also had an effect on remote managers’ isolation. While they may not always have welcomed a visit from the economy-minded “Birchbark Emperor,” such visits provided news from home and a diversion in what could otherwise be a very monotonous existence. Similarly, competitors who often set up operations nearby provided some “company” – even if they weren’t always welcome or friendly.<sup>44</sup>

The remoteness of the Company’s posts decreased some as it expanded after 1774, and again 100 years later after settlers began pushing west into beaver country. Interestingly, however, it then rose again in the early 1900s, as the Company expanded north into the Arctic. In 1952, Governor Cooper’s *Annual Report* noted that the majority of the Company’s 191 posts were in “isolated areas. Eventually, the Company would devote considerable energy and

financial support for research on nutrition, materials science, and other topics that were critical for maintaining healthy employees in what bordered on “capsule habitats” (Suedfeld & Steel, 2000).

Understanding the effects of isolation is especially challenging because it presents serious selection and self-selection problems. First, the Company deliberately recruited people who had grown up in harsh, isolated places (e.g., the Orkneys), figuring that they would do better in Rupert’s Land than London city boys. Second, the HBC employees who could not acclimate to their isolation served out their terms, went home, and were generally never heard from again. Those who remained to tell their tales (either directly through memoirs or indirectly through their correspondence and records) either liked the isolation, came to like it over time, or – pushing back the effects of cognitive dissonance – convinced themselves that the isolation was not so bad.

While the Company’s executives tried to mitigate some effects of their employees’ isolation (e.g., by sending books, newspapers, and other trappings of home, and by loosening restrictions on employees marrying and having children), they also fostered a sense of pioneering adventure. It is unlikely that they did this as part of any deliberate campaign against isolation, but they were concerned with morale and the employees’ well being. This simultaneous emphasis on priming the pioneer/explorer aspects of employees’ identities and providing for their material support is apparent as late as the 1950s when Governor Cooper’s remarks in the *Annual Report* included:

This is Merchant *Adventure*. ... The remoteness of so many posts makes your Company intimately concerned with the welfare not only of the staff, but also of their wives and children. Diet and health programmes are constantly being revised and housing conditions improved. (emphasis added)

Demonstrating some of his “human relations” (and paternalistic) tendencies, Cooper concluded by saying, “The very special relationship which exists between management and personnel is a unique bond.” That those who stayed on for careers with the Company became convinced of the merits of their own isolation and the hardships that dispersion provided is clear from comments in many memoirs (Cowie, 1993 (1913)) from the 19<sup>th</sup> century, but also from interviews with more modern HBC managers like Warren Tolboom, who commented on his work as a manager of remote northern posts by saying, “I believe we would have been disappointed if life had not been challenging” (Gorner, 196x, p.8). He continued, “The Arctic levels men” and “erratic temperaments fuse into steadiness or crack.” I have already noted the problems of selection and self-selection; Tolboom also reminds us of the problems of historical bias, noting that “My stories get romantic with age.” That the HBC managers who stayed came to see their isolation as romantic is clear; that it was a constant challenge for them is equally clear.

#### **2.4.4 Control**

The issue of control in a dispersed context is a critical one, and has been covered by a wide variety of authors studying different organizations and eras, with very different methodological lenses. From the classic semi-ethnographic work of Kaufman (1960) to the historical work of Yates (1989) and O’Leary *et al.* (2002), and the more economic work regarding principal/agent and transaction cost theories (Carlos, 1992; Carlos & Nicholas, 1990, 1993; Spraakman & Davidson, 1998), control in the face of strong centrifugal forces is widely

cited as one of the primary challenges of not being able to monitor people and control face-to-face.

As Yates (1989) showed, the control challenge is overcome in part through communication. This was certainly true in the HBC, and where communication protocols were also among the best indicators of one's status. For example, when the relatively new Gov. Simpson ordered managers to route all their communications through him it was clearly an attempt to exert control and convey his new role as "governor in residence." The managers bristled at Simpson's directive and made tactical use of "courtesy copies" to make their points directly to London.

In the 1880s, a similar exercise of control through communication was repeated, but this time it was Commissioner Brydges himself who was bristling. Having just created a two-person Canadian Subcommittee to supervise Canadian affairs, the Committee instructed Brydges to send copies of all his letters to the Subcommittee in Montreal. Brydges did his best to grin and bear it, burying his disaffection in his grumbling about the "additional copying required" and the "additional office assistance" that would be needed (Bowsfield, 1981, p.xlviii).

These are especially noteworthy examples, but similar issues of control at a distance manifested themselves in many of the regular interchanges between London and its distant managers. These interchanges were characterized by negotiation – both explicit and implicit – about the bounds within which the Company would operate, and the managers often pushed back on London's attempts to exercise too much control. While the managers knew that London trusted them (as noted in this chapter's epigrams), that trust had its boundaries. As London wrote to the Chief Factor at Moose on September 17, 1790, "Some instances may arise wherein it is necessary for you to vary in some minor degree from our general orders, such as agreeing with individuals of more than common merit for one year only at advance wages, but at all times we desire you to understand that you are to deviate from [London's order] as little as possible."

Despite the early and ongoing control challenges posed by dispersion, the combination of tactics used by the Company (Carlos & Nicholas, 1993; O'Leary *et al.*, 2002) helped it survive in a way that its fellow trading companies did not (Griffiths, 1974). For three centuries, the Committee defended its choice to run the Company from London. When it finally shifted control to Canada (both informally in the late 1800s and formally in 1970), it was for tax and other reasons besides a "crisis of control."

## **2.5 Recurring Themes and Concluding Comments on the Experience of Dispersion**

The HBC firm survived and generally thrived for more than 300 years. However many problems it faced, it seemed to have overcome them adequately to persist where other trading companies failed. In part, this was due to elements of geography and its royal charter, but it was equally (if not more) dependent on the firm's changing mix of strategies for managing at a distance. For the managers in Rupert's Land (and later Canada), dispersion was important, inherent, and often taken for granted. Although dispersion was occasionally the subject of the managers' direct comments, our understanding of their experiences comes mostly indirectly through their work practices and daily struggles with dispersed work.

As the size and geographic spread of the firm grew, so too did the coordination challenges through which the HBC managers experienced dispersion. As the number and distance between posts grew, wintering over, record keeping, information management, and information overload all became bigger problems. Coordination challenges like making the annual shipments were probably the most salient for managers, despite the relative infrequency

of them. Shipments were only annual, but they were so salient that they colored managers' experience in many ways, and the reverberations of successful or unsuccessful shipments lasted well beyond the arrival/departure times.

Communication challenges included many of those found in modern dispersed environments (e.g., by Cramton, 2001), with issues of local context and timely access to information being critical. Time, timing, and time lags were all critical elements in managers' experience of dispersion, as was isolation. Isolation especially provoked control challenges (e.g., see Burley, 1997), new approaches to management (e.g., Carlos & Nicholas, 1993), and attempts to transfer some aspects of European culture to the Bay (Brown, 1980).

As with modern dispersed teams, the salience of these and other challenges varied depending on a manager's location within the configuration of Company posts. Those closest to Simpson and his headquarters, or those who traveled with him, had disproportionate influence in the way that those based on modern corporate headquarters may have more influence than their colleagues in remote offices. Similarly, Simpson enjoyed more influence with London not because of new technology, but because he traveled back to England so frequently. In fact, transmission and transportation technologies were very slow to change for the HBC. The shift from canoes to York boat was among the first major technological changes, allowing much more freight (and letters) to be carried between posts with far fewer men. It was only later that the telegraph began to reach some posts. However, as with modern Canadian population and development, the spread of the telegraph was limited to the country's southern corridor and posts therein. Because of the very shallow waterways in its territory, the Company was also slow to make widespread use of steamships (except on the Pacific Coast). Given this incomplete availability of both steam and telegraph, most posts relied on relatively old fashioned technologies. After the York boat, the next *widespread* change in technology did not come until the 1930s-40s, when radios were distributed to all posts. Sharing features with modern e-mail, radio communication was cheap, simple, and almost universally accessible. Interestingly, it had as much impact on managers' families as it did on management of the Company's business. With access to the telegraph limited to southern posts and costly even there, the radio was the first really isolation-reducing, empowering technology to reach all HBC posts.

While some aspects of the challenges faced by HBC managers are extreme (especially their isolation), their remedies for those challenges still offer some interesting ideas for modern organizations using dispersed teams and working across long distances. Among other things, this "back to the future" exercise highlights the value of judiciously used redundancy and explicitness (especially in terms of communication); a strong corporate culture, reinforced in part through rituals, symbols, and ceremony; thoughtful recruitment, socialization, and training; strategically timed face-to-face contact; organizational tenure and memory; and careful records (if not knowledge) management. Some important elements of these strategies are discussed at greater length in O'Leary *et al.* (2002), especially as they relate to the interaction between trust and control.<sup>45</sup>

In the following chapter, I turn to a more quantitative analysis and a more traditional data set of project teams to explore how some of the dimensions of dispersion illustrated by the HBC story can be measured and assessed more systematically than researchers have to date. The challenges of coordination, communication, control, and isolation all shaped the HBC managers' experience of dispersion and added an important dimensionality to it. That dimensionality is unlikely to be captured with a single measure. While historical studies like this one are important for understanding individual managers' multi-dimensional experiences of



dispersion, it is equally important to ask, How might one measure those dimensions in more modern contexts and larger sample studies? How might we test for relationships between various dimensions of dispersion and dependent variables of interest to teams researchers (e.g., conflict, trust, leadership, communications, performance, etc.)? These are the questions to which I now turn in Chapter 3.

## 2.6 References

- Alderfer, C. P. (1972). *Existence, Relatedness, and Growth: Human Needs in Organizational Settings*. NY: Free Press.
- Aldrich, H. E., & Miller, S. (1982). "The Evolution of Organizational Forms: Technology, Coordination, and Control," In B. M. Staw, & L. L. Cummings (Eds.), *Research in Organizational Behavior*, Vol. 4, pp. 33-67. Greenwich, CT: JAI Press.
- Anonymous. (1957). "Know Your Company: The Fur Trade Department," *The Bay News*, July 1957, p.3.
- Anonymous. (2000). "Hudson's Bay Company Corporate Web Site." *Hudson's Bay Company, Toronto, CAN*, <http://www.hbc.com/hbc/overview>, last accessed May 20, 2002.
- Anonymous. (2002a). "About Hudson's Bay Company Archives." *Hudson's Bay Company Archives*, <http://www.gov.mb.ca/chc/archives/hbca/about/hbca.html>, last accessed May 1, 2002.
- Anonymous. (2002b). "Hudson's Bay Company Archives Finding Aids." *Hudson's Bay Company Archives*, <http://www.gov.mb.ca/chc/archives/hbca/resource/index.html>, last accessed May 1, 2002.
- Aupperle, K. E. (1996). "Spontaneous organizational reconfiguration: A historical example based on Xenophon's Anabasis," *Organization Science*, 7(4): 445-460.
- Bailyn, B. (1964). *The New England Merchants in the Seventeenth Century* (2nd ed.). NY: Harper & Row.
- Barley, S. R. (1998). "What can we learn from the history of technology?," *Journal of Engineering & Technology Management*, 15(4): 237-255.
- Belyea, B. (2000). *A Year Inland: The Journal of a Hudson's Bay Company Winterer*. Waterloo, Ontario: Wilfrid Laurier University Press.
- Bowsfield, H. (1981). *The Letters of Charles John Brydges, 1883-89, Hudson's Bay Company Land Commissioner*. Winnipeg: Hudson's Bay Record Society.
- Brown, J. S. H. (1980). *Strangers in Blood*. Vancouver: University of British Columbia Press.
- Brown, J. S. H., Eccles, W. J., & Heldman, D. P. (1994). *The Fur Trade Revisited: Selected Papers of the Sixth North American Fur Trade Conference, Mackinac Island, Michigan, 1991*. East Lansing: Michigan State Univ. Press.
- Bryce, G. (1900). *The Remarkable History of the Hudson's Bay Company*. London: Sampon, Low, Marston & Co.
- Burley, S. (1997). *Servants of the Honorable Company: Work, Discipline, and Conflict in the Hudson's Bay Company, 1770-1870*. Ontario, Canada: Oxford UP.
- Burt, R. S. (1992). *Structural Holes*. Cambridge, MA: Harvard University Press.
- Carlos, A. M. (1992). "Principal-Agent Problems in Early Trading Companies: A Tale of Two Firms," *American Economic Review*, 82(2): 140-145.
- Carlos, A. M., & Nicholas, S. (1990). "Agency Problems in Early Chartered Companies: The Case of the Hudson's Bay Company," *Journal of Economic History*, 50(4): 853-875.
- Carlos, A. M., & Nicholas, S. (1993). "Managing the Manager: An Application of the Principal Agent Model to the Hudson's Bay Company," *Oxford Economic Papers*, 45(2): 243-256.
- Chalmers, J. W. (1960). *Fur Trade Governor: George Simpson, 1820-1860*. Edmonton, Alberta: Institute of Applied Art.
- Chandler, A. D. (1977). *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, MA: Belknap Press.

- Cole, J. M. (1979). *Exile in the Wilderness: The Biography of Chief Factor Archibald McDonald, 1790-1853*. Seattle: University of Washington Press.
- Cowie, I. (1993 (1913)). *Company of Adventurers: A Narrative of Seven Years in the Service of the Hudson's Bay Company during 1867-1874*. Lincoln, NE: University of Nebraska Press.
- Craig, J. (1970). "Three Hundred Years of Records," *The Beaver*, Outfit 301(50): 65-70.
- Cramton, C. D. (2001). "The Mutual Knowledge Problem and Its Consequences for Dispersed Collaboration," *Organization Science*, 12(3): 346-371.
- Davies, K. G. (Ed.). (1965). *Letter's from Hudson's Bay, 1703-1740*. London: Hudson's Bay Record Society.
- Demos, J. (1970). *A Little Commonwealth: Family Life in Plymouth Colony*. London: Oxford University Press.
- den Otter, A. A. (1983). "The Hudson's Bay Company's Prairie Transportation Problem, 1870-85," In J. E. Foster (Ed.), *The Developing West: Essays on Canadian History in Honor of Lewis H. Thomas*, pp. 25-48. Edmonton: University of Alberta Press.
- Foucault, M. (1977). *Discipline and Punish: The Birth of the Prison*. London: Allen & Lane.
- Fremlin, G. (Ed.). (1974). *National Atlas of Canada*. Toronto: Macmillan Co.
- Galbraith, J. S. (1976). "The Little Emperor: Governor George Simpson of the Hudson's Bay Company."
- Glazebrook, G. P. d. T. (1938). *The Hargrave Correspondence, 1821-1843*. Toronto: Champlain Society.
- Goldman, P. (1994). "Searching for history in organizational theory: Comment on Kieser," *Organization Science*, 5(4): 621-623.
- Goldring. (1985). "Governor Simpson's Elite Recruitment in a British Overseas Enterprise, 1834-1870," *Prairie Forum*, 10(2): 251-282.
- Goodman, R. S., & Kruger, E. J. (1988). "Data Dredging or Legitimate Research Method? Historiography and Its Potential for Management Research," *Academy of Management Review*, 13(2): 315-325.
- Gorner, P. (196x). "Trappers Are Gone," *Mocassin Telegraph*, xx: 4-9.
- Griffiths, S. P. (1974). *A License to Trade: A History of the English Chartered Trading Companies*. London: Ernest Benn Ltd.
- Hackman, J. R. (1990). *Groups That Work (and Those That Don't): Creating Conditions for Effective Teamwork*. San Francisco: Jossey-Bass.
- Hargadon, A. B., & Douglas, Y. (2001). "When innovations meet institutions: Edison and the design of the electric light," *Administrative Science Quarterly*, 46(3): 476-501.
- Harris, G. A. (1994). *An Archival Administrative History of the Northern Stores of the Hudson's Bay Company, 1959-1987*. Unpublished M.A. thesis, History, University of Manitoba, Winnipeg.
- Kaufman, H. (1960). *Forest Ranger : A Study in Administrative Behavior*. Baltimore: Johns Hopkins University Press.
- Keighley, S. A. (1989). *Trader, Trapper, Tripper: The Life of a Bay Man*. Winnepeg, Manitoba, Canada: Watson & Dwyer.
- Kieser, A. (1994). "Why organization theory needs historical analyses - And how this should be performed," *Organization Science*, 5(4): 608-620.

- King, J. L., & Frost, R. L. (2002). "Managing Distance Over Time: The Evolution of Technologies of Dis/Ambiguation," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 3-26. Cambridge, MA: MIT Press.
- Lawrence, B. S. (1984). "Historical Perspective: Using the Past to Study the Present," *Academy of Management Review*, 9(2): 307-312.
- Malone, T. W., & Crowston, K. (1994). "The Interdisciplinary Study of Coordination," *ACM Computing Surveys*, 26(1): 87-119.
- Matthews, G. (Ed.). (1987). *Historical Atlas of Canada*. Toronto: University of Toronto Press.
- McLaren, D. D. (1992). *From Bush to Boardroom: A Personal View of Five Decades of Aviation History*. Winnipeg: Watson & Dwyer.
- Merk, F. (Ed.). (1968). *Fur Trade and Empire: George Simpson's Journal of Voyage from York Factory to Fort George and Back to York Factory, 1824-25* (Revised ed.). Cambridge, MA: Belknap Press.
- Morton, A. S. (1944). *Sir George Simpson: Overseas Governor of the Hudson's Bay Company*. Toronto: J.M. Dent & Sons.
- Newman, P. C. (1985). *Company of Adventurers*. NY: Viking.
- Newman, P. C. (1987). *Caesars of the Wilderness*. Markham, Ontario: Viking Penguin Books Canada.
- Newman, P. C. (1991). *Merchant Princes*. Toronto, Canada: Viking.
- Nicks, J. (1978). "Orkneymen in the HBC, 1780-1821," In C. M. Judd, & A. J. Ray (Eds.), *Old Trails and New Directions: Papers of the Third North American Fur Trade Conference*, pp. 102-126. Toronto: University of Toronto Press.
- O'Leary, M. B., Orlikowski, W. J., & Yates, J. (2002). "Distributed Work over the Centuries: Trust and Control in the Hudson's Bay Company, 1670-1826," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 27-54. Cambridge, MA: MIT Press.
- Ray, A. J. (1974). *Indians in the Fur Trade: Their Role as Trappers, Hunters, and Middlemen in the Lands Southwest of Hudson Bay, 1660-1870*. Toronto: University of Toronto Press.
- Ray, A. J. (1990). *The Canadian Fur Trade in the Industrial Age*. Toronto: Univ. Toronto Press.
- Ray, A. J., & Freeman, D. B. (1978). "Give us good measure": An Economic Analysis of Relations between the Indians and the Hudson's Bay Company before 1763. Toronto: University of Toronto Press.
- Rich, E. E. (Ed.). (1938). *Journal of Occurrences in the Athabasca Department by George Simpson, 1820 and 1821, and Report*. (Vol. 1). Toronto: Champlain Society.
- Rich, E. E. (Ed.). (1939). *Colin Robertson's Correspondence Book, September 1817 to September 1922*. (Vol. 2). Toronto: Champlain Society.
- Rich, E. E. (Ed.). (1942). *Minutes of the Hudson's Bay Company, 1671-74*. Toronto: Champlain Society.
- Rich, E. E. (Ed.). (1945a). *Minutes of the Hudson's Bay Company, 1679-1684: First Part, 1679-82*. (Vol. VIII). London: Hudson's Bay Record Society.
- Rich, E. E. (Ed.). (1945b). *Minutes of the Hudson's Bay Company, 1679-1684: Second Part, 1682-84*. (Vol. IX). London: Hudson's Bay Record Society.
- Rich, E. E. (Ed.). (1945a). *Minutes of the Hudson's Bay Company, 1679-1684: First Part, 1679-82*. (Vol. VIII). London: Hudson's Bay Record Society.
- Rich, E. E. (Ed.). (1946). *Minutes of the Hudson's Bay Company, 1679-1684*. Toronto: Champlain Society.
- Rich, E. E. (Ed.). (1948). *Letters Outward, 1679-94*. Toronto: Champlain Society.

- Rich, E. E. (Ed.). (1951). *Cumberland House Journals and Inland Journals, 1775-1782, First Series, 1775-79*. (Vol. XIV). London: Hudson's Bay Record Society.
- Rich, E. E. (Ed.). (1952). *Cumberland House Journals and Inland Journals, 1775-1782, Second Series, 1779-1782*. London: Hudson's Bay Record Society.
- Rich, E. E. (Ed.). (1954). *Moose Fort Journals, 1783-85*. (Vol. XVII). London: Hudson's Bay Record Society.
- Rich, E. E. (Ed.). (1957). *Hudson's Bay Copy Booke of Letters and Commissions Outward, 1688-96*. London: Hudson's Bay Record Society.
- Rich, E. E. (1958-59). *Hudson's Bay Company, 1670-1870* (1st ed.). London: Hudson's Bay Record Society.
- Roach, T. R. (1984). "The Saga of Northern Radio," *Beaver*, 315(Summer): 19-25.
- Ross, H. (1989). *The Manager's Tale*. Winnipeg: Watson & Dwyer.
- Seaton, M. G. U. C. (1968). "An Ode to District Managers," *Moccassin Telegraph*, Winter: 47.
- Simmons, D. (1994a). "Annals of the Fur Trade, '... if it can bee Soe Soone done': The Making of the Hudson's Bay Company Archives," *The Beaver*, Outfit 325(Vol. 74, June-July): 4-12.
- Simmons, D. A. (1994b). "*Custodians of the Great Inheritance*": *An Account of the Making of the Hudson's Bay Company Archives, 1920-74*. Unpublished M.A. thesis, History, University of Manitoba/University of Winnipeg, Winnipeg.
- Spraakman, G. P., & Davidson, R. (1998). "Transaction cost economics as a predictor of management accounting practices at the Hudson's Bay Company, 1860 to 1914," *Accounting History*, 3(2): 69-101.
- Stardom, E. (1995). *A Stranger to the Fur Trade: Joseph Wrigley and the Transformation of the Hudson's Bay Company, 1884-1891*, Winnipeg, Manitoba: Rupert's Land Research Center.
- Steiner, I. D. (1972). *Group Process and Productivity*. NY: Academic Press.
- Suedfeld, P., & Steel, G. D. (2000). "The Environmental Psychology of Capsule Habitats," *Annual Review of Psychology*, 51: 227-253.
- Van Maanen, J. (1988). *Tales of the Field: On Writing Ethnography*. Chicago: University of Chicago Press.
- Williams, G. (1970). "Highlights in the First Two Hundred Years of the Hudson's Bay Company," *The Beaver*, 50(Outfit 301): 4-63.
- Williams, G. (Ed.). (1975). *Hudson's Bay Miscellany, 1670-1870*. Winnipeg, Canada: Hudson's Bay Record Society.
- Williams, G. (1983). "The Hudson's Bay Company and the Fur Trade: 1670-1870," *Beaver*, 314(2): 4-86.
- Wilson, B. (1900). *The Great Company, 1667-1871 : Being a History of the Honourable Company of Merchants-Adventurers Trading into Hudson's Bay*. London: Smith Elder & Co.
- Yates, J. (1989). *Control through Communication: The Rise of System in American Management*. Baltimore: Johns Hopkins University Press.

## 2.7 Endnotes

<sup>1</sup> The volumes by Rich (1938; 1939; 1942; 1945a; 1945b; 1948; 1951; 1952; 1954; 1957), Davies (1965), and Williams (1975) include invaluable transcriptions of full series of letters, minutes, journals, and other HBC records. They are not selections of (or from) these primary source records, but full runs for the years covered.

<sup>2</sup> The Company's original lands encompassed approximately 1.4 million square miles (HBCA Posts SF, "Yesterday and Today" flier), but its posts would eventually be spread over an even greater area. By 1957, its Arctic posts alone encompassed more than 1 million square miles (Anonymous, 1957).

<sup>3</sup> The beaver was the first and foremost of these furs, and prime winter beaver quickly became the "Standard of Trade" by which the Company valued other furs and its trade goods. The Committee in London periodically revalued goods, but this standard, measured in "Made Beaver" (MB), existed as the Company's primary "currency" for more than a century. It also served as a way to control the discretionary behavior of its managers (Carlos & Nicholas 1990), although post managers did develop their own modified pricing scheme, from which we have the phrase "Double Standard." While the idea of a company and pricing scheme based on *beaver* may seem especially remote and somewhat exotic to readers in Boston or other urban areas (as it did for me initially), it is worth noting that Concord, MA was originally a beaver meadow exploited by nearby Boston residents (Bailyn, 1964).

<sup>4</sup> This area was bounded by the United States to the south, Rocky Mountains to the west, northern branch of the Saskatchewan river, and Lake Winnipeg and the Lake of the Woods to the east.

<sup>5</sup> Smaller scale diversification had been occurring since the early 1800s, when feathers, isinglass, and whale or porpoise oil were sent back to London for sale.

<sup>6</sup> Although they slowed considerably by the mid 1900s, Company land sales continued until the financial crises of the 1980s, when it disengaged from the real estate business to focus solely on retail.

<sup>7</sup> The Company not only established stores in Winnipeg, Edmonton, and Victoria, it essentially founded those three cities (HBCA Posts SF, "Yesterday and Today" flier).

<sup>8</sup> Its status as a Canadian retail giant comes despite the 1987 sell-off of its northern posts/stores.

<sup>9</sup> Within North America, the HBC is the oldest continually-operating company by nearly 100 years (not including some non-profit organizations — e.g., Harvard University, est. 1636 — which have been in continuous existence for several decades longer). The four companies commonly considered America's oldest are J.E. Rhoads & Sons (conveyor belts, est. 1702), Covenant Life Insurance (est. 1717), Philadelphia Contributionship (insurance, est. 1752), and Dexter (adhesives and coatings, est. 1767). In Europe, the Swedish company that is now known as Stora, (forest products and mining) was established in 1288. Its modern form began in 1862 when the original mine and the individual works were combined to form a single company — Stora Kopparbergs Bergslag. The Shore Porters' Society of Aberdeen (a moving and longshoreman's company) was founded in Aberdeen, Scotland in 1498. In what is now Finland, the Fiskars metalworking company has been in operation since 1649. In Asia, Japan's Sumitomo Group was founded as a family concern in 1585; its modern corporate form was established in 1919. Also based on Japan, Kikkoman Corp. of soy sauce fame dates to 1638 (Yates 1998). For more on this topic of "Who's the oldest?" see Newman (1985, 1:84).

<sup>10</sup> This new flexible standard of trade became known as the "Factor's or *Double Standard*" (Carlos & Nicholas 1990:868).

<sup>11</sup> Now one of the most enduring symbols of the Company, these sturdy wool "point" blankets were first manufactured for the Company in 1780. Each "point" woven into the edge of the blanket represented the blanket's value in terms of prime beaver pelt.

<sup>12</sup> Ray & Freeman (1978) and Brown (1980) provide excellent treatments of HBC relations with the Indians, and Newman (1985, 1:184) summarizes the relationship well: "The basic pattern of the Hudson Bay trade was one of mutual exploitation, yet there were few places on earth where commerce came to

terms with an indigenous population under less violent circumstances. The exchange of peltry for trade goods resulted in a balanced reciprocity of [...] two radically different cultures and totally dissimilar economies finding common ground” in order to attain their respective objectives. To a large extent, trade with the Indians succeeded because it “tapped into an existing Indian economic network dating back as much as five thousand years.”

<sup>13</sup> As with its Orcadian, British, and Canadian employees, the Company’s “generally fair” dealings with Indians “had little to do with decency or altruism and everything to do with” maintaining its supply chain and labor force (Newman 1985, 1:193). While there was a “humanistic veneer” to many of the Company’s practices, “the Company did all of these things because they were essential to its own long term economic and political interest[s]” (ibid). It frequently fed large groups of starving Indians and developed an elaborate system of credits in advance of furs. Again, however, these practices were motivated by a long-run view of the Company’s interests. As one district manager explained quite baldly, “The natives are our asset ... we must keep them alive for future profits” (quoted in Newman 1985, 1:200). In a rare example of 18<sup>th</sup> Century sentiments sounding remarkably consistent with those of modern labor and Indian historians, Company explorer Samuel Hearne wrote in his diary that, “I must confess that such conduct [encouragement of the fur trade] is by no means for the real benefit of the poor Indians” (quoted in Newman 1985, 1:200). Such sentiments may have been held more widely, but they were almost never expressed.

<sup>14</sup> Note that my focus here is on Moose and the other original posts *around* the Bay. As the Company grew, it expanded deep inland toward the Great Lakes and west to Vancouver. Life at these inland and Pacific posts was different from those near the shores of Hudson’s Bay. It is also different from the land and retail offices that began opening in the late 19<sup>th</sup> century.

<sup>15</sup> Note that subposts sent no general letters; they were handled by “mother” posts (Davies, 1965, p. xxxviii).

<sup>16</sup> A printed index for 1868-1921 exists at the HBCA, as do the actual reports and proceedings. Proceedings (nearly verbatim records of the annual shareholder meeting). I accessed printed originals of the Reports (not including proceedings) for 1900-1990 at the Baker Library, Harvard University. I accessed bound originals of the pre-1900 reports and the proceedings at the HBCA.

<sup>17</sup> While the *Beaver* began as a Company publication it is now a separate entity devoted to broader coverage of Canadian history. However, even before its mission and Company-affiliation changed, it was a publication of interest beyond the Company. During WWII, copies were distributed to Canadian troops in Europe to keep them connected to stories of home.

<sup>18</sup> Despite this impressive collection of records, the Company was not always consistent in its retention policies, and threats to its charter often pushed it towards secrecy. Occasionally, there are even indications of Enron-esque orders to destroy documents. Thankfully, there were at least some managers who, when instructed to incinerate records, demurred. For example, reflecting back on his decision not to follow the instructions to incinerate, one manager said, “The execution of this [record destruction] was put in my hands and I have to confess that my instructions were not carried out because I felt that there was nothing contained in these old books that the Company would be ashamed of and in after years they would prove very valuable from a historical point of view” (Simmons, 1994b, p.24 citing HBCA RG20/5/3, January 23, 1922).

<sup>19</sup> In total, the HBCA contain more than 6,000 shelf feet of original documents and 4,000 reels of microfilmed records (Anonymous, 2002a). Microfilming of Company records began in 1951, but access to these and original records was still limited at that time (Annual Report, 1951, p.27). General access to the Archives of the Company was not possible until 1994.

<sup>20</sup> Note that Burley (1997, p.249-52) used a related but more expansive sampling approach, reading all available records for every tenth year from 1770-1870, cutting across all posts. She also filled in gaps and read long runs of some records (e.g., London’s letters outward).

<sup>21</sup> See for example, how a council of post managers was convened when the French destroyed York and Prince of Wales forts in 1782 (Rich, 1954, p.xv). During such crises, the managers competently took much more initiative, “in spite of the detail in which the Company in London was accustomed to regulate the affairs of the posts” (ibid.).

<sup>22</sup> Despite relatively cooperative spirit among the post managers, life was not all cozy comradeship. Managers would occasionally refuse to provision each other, or delay so long that it constituted a de facto refusal (Cole, 1979, see p.96 for a rare, early refusal faced by George Simpson as he travelled to the Athabasca region in 1821).

<sup>23</sup> Here and elsewhere, I use “man” and masculine pronouns because the HBC had an all-male staff until the 20<sup>th</sup> century. The first woman factor was not appointed until 1983 (Newman, 1985, p.110n), although women worked in HBC retail stores before then and Indian women had played an important role in the Company’s trade for years.

<sup>24</sup> There is at least one instance of the Company actually buying a new ship in response to a wintering over. This happened in 1905, when the ship *Stork* had to winter over on the bay, and the Company purchased “the auxiliary steam, “*Discovery*,” which has been engaged in exploration in the Antarctic, and is therefore specially adapted for service in Hudson’s Bay. The requisite alterations have been made to the vessel to suit the requirements of the trade and she has been despatched [sic] with a full cargo” (Annual Report, 1905).

<sup>25</sup> The ships’ crews were not trained to hunt or provide for themselves. As an 1816 letter between post managers explained in regard to the crew of a stranded ship, “These Irishmen ... have behaved themselves well and conducted themselves in a satisfactory manner as far as regards their disposition, but as far as for their ability in hunting or doing anything towards their own support, they are totally incapable and would starve in the midst of plenty. (HBCA B135/b/35, Russell to Bewley, February 7, 1816). In contrast to the sailors, the ship’s officers were fairly self-sufficient, but they suffered from not having snow shoes or other winter gear that would let them hunt effectively (ibid.)

<sup>26</sup> In another example of how such unexpected events posed additional coordination burdens for the post managers, the *Pelican* could only reach Churchill, leaving the cargo for York and its satellite posts to be delivered from Churchill during the season.

<sup>27</sup> In 1947, the Company lost not only its Arctic schooner *Neophyte*, but also its famed *Nascopie*. Both wrecked “before the posts had be revictualled” presenting “a serious problem” just as wrecks had hundreds of years before (*Annual Report*, 1948, p.8).

<sup>28</sup> Note that Cramton (2001) articulated five types of information problems in modern virtual teams: 1) failure to communicate contextual information, 2) difficulty communicating the salience of information, 3) unevenly distributed information, 4) differences in speed of access to information, and 5) difficulty interpreting the meaning of silence. Because salience and silence are, in essence, functions of context, I combine such challenges and responses into one category. Similarly, even distribution and speed both deal with access to information, so I combine them under one category as well. Cramton’s information problem typology did not include *information overload*. I include it here as a third distinct type of communications challenge because overload was a major issue for the HBC managers.

<sup>29</sup> It is important to emphasize the “for individual posts” element here. For Winnipeg, Montreal, and some other southern centers, the telegraph, railroad, and steamer all had a major impact on communication with London. For example, the records of the various commissioners of the Land, Fur, and Retail Departments, all document extensive telegraphic correspondence with London (see e.g., the Introduction to the HBCA’s Section D Finding Aid).

<sup>30</sup> According to the *OED* (1989 2<sup>nd</sup> Edition), a wherryman is the operator of a “A light rowing-boat used chiefly on rivers to carry passengers and goods.”

<sup>31</sup> For example, when London did not send new staff as requested, it was important for the managers to know that frequent wars in Europe over the course of three centuries made recruitment difficult.



<sup>32</sup> One of many examples of his hard-driving approach to management by canoing around is the fact that Simpson travelled from the Bay to Fort George in “only” 84 days – 20 less than anyone else had done the trip (Cole, 1979, p.104).

<sup>33</sup> Food (and now fuel) stores still had to be arranged along the route and the planes needed repairs just like the canoes.

<sup>34</sup> In addition to gaining a better local understanding of its operations, the recommended visit would also undoubtedly help squelch the “constant rumours in Canada that the Board are contemplating the sale of the Company’s stores,” which it had “no intention of doing” (*Annual Report*, 1931).

<sup>35</sup> In 1933, however, Cooper became the first Governor to visit the full range of posts all across the Company’s domain.

<sup>36</sup> The southern latitude refers to business that the Company developed in the 20<sup>th</sup> century as the chief outlet for Karakul (a sheep whose lambs’ glossy coats were valued as fur) from south and southwest Africa (*Annual Report*, 1951, p.25). Over the years, the Company also had interests in Scandinavia, Russia, Hawaii, and other places beyond in Canadian base. The northernmost post – Arctic Bay – was established in 1926 and was 450 miles inside the Arctic Circle at the tip of Baffin Island (*Annual Report*, 1959).

<sup>37</sup> The human relations influence is also apparent in Cooper’s *Annual Report* remarks from 1953. He wrote that the staff of 8,000 were “working in jobs as diverse as Arctic shipping and Paris fashions, in great retail stores, in land, radio research, and furs. . . Attracting and holding able staff depends on good staff policies which must provide stability of employment, training, and promotion from within, recognition of long service and security in retirement for all those who are members of the Company. These policies must also nourish and strengthen the sense of partnership among the staff, management, and proprietors in the firm believe that success for all three depends upon the acknowledgment of this basic concept.” In 1954, the Governor also made clear that the Company’s commitment to its employees was not “merely the attainment of a fair standard of salaries and wages,” but also “to inspire in the management and staff a sense of partnership in the business” (*Annual Report*, 1954). While these comments reflect changing sentiments of the time, this sense of partnership and related personnel policies were important elements of the Company’s business long before the human relations movement brought them into the more general business parlance.

<sup>38</sup> The snow mobile was developed in Canada and grew into the primary product of the company Bombardier. Today, Bombardier provides cars for Boston’s MBTA subway system.

<sup>39</sup> See, for example, re-analysis of historical land sales data to settle a taxation issue (*Annual Report*, 1920). Or, for example, see the Committee’s May 25, 1803 letter displaying their use of longitudinal data to make comparisons across posts and their admonition that the managers at Moose should keep past account books for their own analysis too: “Your indents have increased for the last four years and notwithstanding the very heavy expenses in supporting Moose Factory the returns from thence are not greater than those from Severn” and “Why do you not keep your general account of goods expended as usual a year or two back? The presents and expenses at Miccanabish House are very high in proportion to the trade from [Moose]” (HBCA 1M376, Governor James Winterlake to John Thomas and Council at Moose Factory, p.269).

<sup>40</sup> Note the similarity between this and Yates’s (1989:66-71) discussion of posted lists of rules and general orders.

<sup>41</sup> For additional graphic descriptions of the harsh conditions, see several more “chilling” first-hand accounts quoted in Newman (1985, 1:146-8, 151-3).

<sup>42</sup> These flows and transportation through the Bay were exacerbated by magnetic storms, large underwater iron deposits, excessive cloudiness, childlike maps and charts, dense fog, and few shoreline beacons. Lights, beacons, and buoys were not placed in the Bay until 1914 and, until 1965, only two harbors on the Bay had been effectively charted. In a bit of wonderful irony, the 75 foot mast from a Company schooner that sunk in 1930 was erected as the last prominent beacon in 1953. Despite these unfavorable

conditions, the Company only lost 13 ships in 300 years, with the majority of them sinking this century — victims of what Newman called “the modern arrogance of confronting nature” (1985, 1:150). See Newman (1985, 1:150n) for a list of these ships and the dates of their demise.

<sup>43</sup> Some (e.g., Newman 1985, 1:161-3) argue that it also led to the Bay men’s heavy use of alcohol, and to the Company’s consequently extensive efforts to limit its import, manufacture, and consumption. In fact, alcohol abuse was the subject of However, more recent scholarly work refutes these claims, putting Bayside alcohol consumption in the context of the drinking practices of the time. For an excellent discussion of alcohol use, abuse, and control in the Bay and on the Company’s handling of it, see Burley (1997:130-9).

<sup>44</sup> During the heyday of their competition, the NWC and HBC had dozens of posts that were only yards apart and, while that proximity eventually led to violent clashes, it also provided for some more comic moments, as traders tried to lure Indian suppliers to their trading room. These side-by-side competitors bring images of modern McDonalds and Burger Kings sitting side by side at a remote interstate rest stop. Just as those competing burger flippers can often be seen talking during their breaks, the HBC and NWC traders also benefitted from the isolation-reducing effects of their tense proximity.

<sup>45</sup> Carlos (1990; 1993) has also written convincingly about ways in which the Company survived in the face of what she describes in principal/agent terms. Kaufman’s (1960) work with the forest service is also a readable, still-very-applicable investigation of the centrifugal forces facing modern managers of far flung teams and organizations.

## CHAPTER 3

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### DEGREES OF DISPERSION AND CONFIGURATIONAL COMPLEXITY IN GEOGRAPHICALLY DISPERSED TEAMS

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The research to date has certainly not covered, systematically, the range of possible combinations of time and space dispersion (Hollingshead & McGrath, 1995, p.79)

If we are indeed going to see increasing needs for collaboration between individuals in different times and places, there is also a need for more sophisticated research to explore this phenomenon. Clearly, not enough emphasis has been placed on what it means to be dispersed in this sense. (Scott, 1999, p.463)

This chapter was written jointly with Jonathon N. Cummings, of Carnegie Mellon University and the MIT Sloan School of Management, using data that he collected and analyzed in other ways in Cummings (2001). We presented a paper based on our joint work at the 2002 Academy of Management Annual Meeting, Denver, CO. I presented an early, purely conceptual and methodological version of this work at Florida International University's Rider Center "Keys Conference" on Distributed Work at Hawks Cay, Florida, March 2000.

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### 3.1 Introduction

As the HBC data show, the experience of geographic dispersion involves much more than simple physical distance. Isolation, time, and other factors affect how dispersion is experienced too. However, as described in Chapter 1, most research has treated dispersion as fixed and has established a false dichotomy – i.e., a team is either dispersed or it is not. False dichotomies are endemic in social science (Homans, 1987) and “dispersed vs. FTF” is yet another.

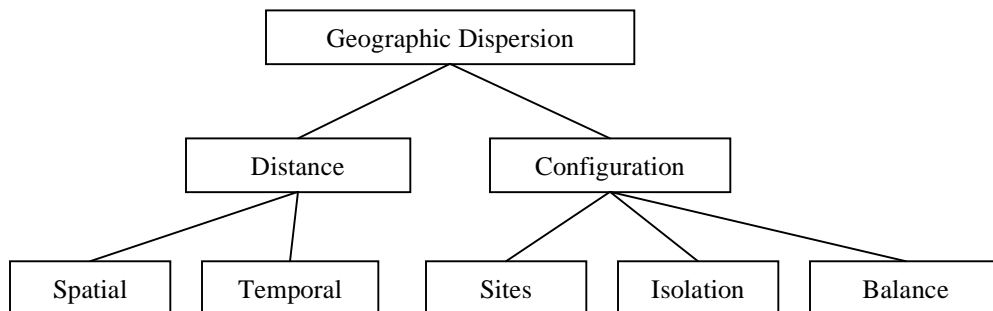
This chapter aims to move us beyond that dichotomy by proposing a framework and measures with which to characterize teams across the full range from “radically co-located” (Teasley *et al.*, 2000) to “globally dispersed.” In short, it poses two questions: 1) How can we measure teams’ geographic dispersion? and, 2) How do different measures of dispersion relate to each other and to communications frequency?

Before proposing a series of measures of geographic dispersion, the chapter begins with a definition of dispersion and discusses why it matters in teams and organizations. Building on that previous research, the proposed measures are presented and investigated with data from hypothetical teams representing an array of alternative configurations, and a sample of 182 teams from a Fortune 500 telecommunications company (Cummings, 2001). After exploring the measures in these settings, the chapter concludes with a discussion of the measures’ value and use for addressing various phenomena, as well as their limitations and avenues for future research.

#### 3.1.1 Definition of Geographic Dispersion in Work Teams

As shown in Figure 3.1, geographic dispersion includes both distance and configuration. Distance, in turn, includes both spatial and temporal components. Configuration is the arrangement of team members independent of the spatial-temporal distances among them. It includes three components – the number of sites, isolation, and balance.

Figure 3.1: Elements of Geographic Dispersion



Many elements of this definition are implicitly captured in Majchrzak et al’s (2000b, p.574) description of the team in their case study:

Two members were located in different ends of the same building, three other members were each one mile away in different buildings; one member of a second organization was located 100 miles away; and two members of the third organization were located 1,000 miles away in different buildings. [Team] members limited their travel since they were involved with many different teams within their company. As a result, all members were together only once – at the end – although there were three other formal meetings held in which some members attended.

In addition to the basic mileage between members, the description mentions travel, configuration, and changes between dispersed and FTF work over time. Importantly, it also notes (at least in general terms) that some members are within the same building, yet relatively far apart. However complete the quoted description is, it would be difficult to use such a narrative for studies with larger samples of teams. This chapter attempts to provide a more systematic, quantitative approach to characterizing the rich multi-dimensional nature of dispersion described in the previous chapter and in recent small-sample studies like Majchrzak's.

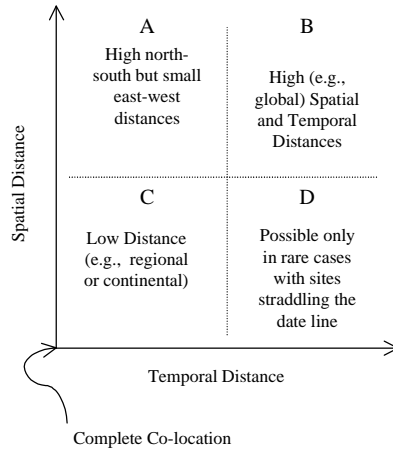
As noted by King & Frost (2002), "distance is not of one type, but can be seen in several forms." This chapter maintains that those forms or dimensions include space and time. In fact, space and time are so closely intertwined that they may be more appropriately described as one dimension – i.e., spatial-temporal distance. Distance can also be viewed in terms of demographic diversity, and this so-called "social distance" certainly interacts with spatial-temporal distance, but the details of social distance have been laid out well by others (e.g., Kilduff *et al.*, 2000; Williams & O'Reilly, 1998).<sup>1</sup> The focus here is on the spatial and temporal aspects of distance.

The spatial component of distance is the one that comes most immediately to people's minds. It is measured in feet, yards, and miles (or meters and kilometers). Large spatial distances are traversed directly with transportation technologies (e.g., boat, railroad, or airplane) or indirectly with communications technologies (e.g., semaphore, telegraph, telephone, radio, e-mail, or Internet). Small distances have typically been traversed by foot (e.g. walking down the hall), but technologies like e-mail, chat, and instant messaging are now being used even by co-workers who are quite close to each other (Levina, 2001).

The temporal component of distance does not come to mind as quickly for some as the spatial one, but a given spatial distance is often experienced in terms of the time required to traverse it or the coordination challenges it introduces. In fact, people are better at characterizing large distances in temporal terms than they are in spatial ones (Harrison-Hill, 1997).<sup>2</sup> Time and timing have attracted considerable interest in the last two decades at all levels.<sup>3</sup> However, this interest has been primarily in terms of groups' and organizations' development and change over time (e.g., Gersick, 1991, 1994; Huy, 2001; Lawrence *et al.*, 2001), or in the timing of groups' activities (e.g., Gersick, 1989; McGrath, 1990; Waller, 1999; Waller *et al.*, 2001), not in time as a way to characterize groups themselves. Thus, work remains to be done to capture and understand the temporal dimension of distance in geographically dispersed teams.

Time zones serve as fairly stable, internationally comparable descriptors of teams' temporal dispersion.<sup>4</sup> For example, "global" teams are often highly temporally and spatially dispersed, spanning many time zones. Such teams fall in Quadrant B in Figure 3.2.

Figure 3.2: Combinations of Spatial and Temporal Distance in Teams



Note: The quadrant boundaries are shown approximately at the midpoint, although this is only for ease of presentation, not to indicate any specific significance of the midpoint.

However, teams can also be highly spatially dispersed without being highly temporally dispersed (Quadrant A). Teams in which members are dispersed north to south might have many miles between members, but still have all those members in the same time zone. Teams split between North and South America, or between Europe and Africa are examples of such combinations of high spatial and low temporal distance. Alternatively, teams’ dispersion could be primarily local or regional, spanning relatively small temporal and spatial distances (Quadrant C). High temporal distance and low spatial distance (Quadrant D) is possible in theory, but rare in practice.

Spatial-temporal distance captures much of a team’s geographic dispersion, but not its configuration – i.e., the arrangement of team members independent of the spatial-temporal distances among them. Common configurations include 1) a “fully dispersed” team with only one member at each site, 2) a team with multiple members at multiple sites, or 3) a team split across only two sites. For example, there are 21 potential configurations for a dispersed team with eight-members, not accounting for the arrangement of specific roles or resources, or the relative location of sites (Figure 3.3). For a 12-member team, the number of possible configurations jumps to 76 and these 76 do not even account for the location of specific individuals (e.g., which particular team member is isolated in a 7-1 configuration).

Figure 3.3: All Possible Configurations for An Eight-Member Team

Number of Sites	Configurations
2	7-1, 6-2, 5-3, 4-4
3	6-1-1, 5-2-1, 4-3-1, 4-2-2, 3-3-2
4	5-1-1-1, 4-2-1-1, 3-3-1-1, 3-2-2-1, 2-2-2-2
5	4-1-1-1-1, 3-2-1-1-1, 2-2-2-1-1
6	3-1-1-1-1-1, 2-2-1-1-1-1
7	2-1-1-1-1-1-1
8	1-1-1-1-1-1-1-1

Configuration can also apply to more than the simple number and arrangement of members per site; it can refer to the arrangement of members with particular roles or demographic characteristics.<sup>5</sup> A team’s configuration (like all aspects of its dispersion) can be the



result of explicit decisions about team design, or it can be the indirect result of other factors like the location of a company's plants, offices, facilities, or customers.

Configuration has long received considerable attention at the organizational level (Miller, 1987), where researchers have used the "configurational approach" to study the relationships between organizational performance and various organizational characteristics (e.g., resource inputs, context, rules and regulations, goals, climate, and informal systems) (Ketchen *et al.*, 1997; Meyer *et al.*, 1993). The arrangement of these characteristics is the "configuration" in this research. Configuration has also been studied at the micro level, in regard to the arrangement of work spaces and physical aspects of work environments (for a review, see Oldham *et al.*, 1995). However, this interest in configuration has not carried over to the team level.<sup>6</sup>

While few if any researchers studying geographically dispersed teams address configuration, several speak to its importance. For example, in their study of nine geographically dispersed teams, Armstrong & Cole (2002) discuss two important aspects of configuration – i.e., 1) the differences between being at a small or remote site vs. being at a large or headquarters site, and 2) the location of a team's leader in relation to other team members. These configurational issues can lead to conflict or to members being left out of team communications. Grinter *et al.* (1999) also address configuration when they discuss the location of the project manager (p.309), the distribution of project "mass," and the location of expertise (pp.313-14). They note that some team members or sites may be like "satellites" to the core of a team, with those satellites having fewer opportunities for "corridor conversations" and more "out of sight, out of mind" problems. From these studies, as well as case studies and more anecdotal accounts of geographically dispersed teams (e.g., Carmel, 1999; Duarte & Snyder, 1999; Karolak, 1998; Lipnack & Stamps, 1997; Maruca, 1998), configuration emerges as an important enabling condition for various positive and negative group processes and outcomes.

The preceding sections on spatial-temporal distance and configuration have focused on their objective aspects (in much the same way that demography research has focused on ascriptive personal characteristics), but individuals' perceptions of their dispersion are important too. Under the rubric of "cognitive distance," perceptions of distance and other geographic characteristics have received considerable attention in psychology, geography, planning, and other fields (Golledge & Stimson, 1997). While this chapter does not specifically address perceived dispersion, the measures proposed here provide a baseline for comparison between geographic dispersion and perceptions of it. Before introducing and exploring the proposed new measures, the next section presents a discussion of why distance matters in organizations

### **3.1.2 The Importance of Distance in Organizations**

To say that distance matters implies that its obverse – proximity – also matters, and most research has focused on the proximity side of the coin. In a dispersed team context, this chapter draws on a long line of proximity (or "propinquity") studies. Proximity research began in non-work settings, with mostly personal or social relationships. For example, early studies showed that physical distance between individual students is quite powerful in terms of developing "liking" relationships. In fact, physical distance was more powerful than social groupings in the development of those relationships (Maisonneuve *et al.*, 1952). Other studies established a positive relationship between physical proximity, interpersonal liking, and the amount of communication (Athanasidou & Yoshioka, 1973; Kahn & McGaughey, 1977).

While this early work proved quite clearly that distance matters, it did so in mostly experimental, dyadic, and non-organizational contexts. Furthermore, it did so with distances mostly measured in feet not miles (hence the description of these studies as "proximity" not

“distance” research). It was not until the 1970s that researchers began to demonstrate the importance of distance in work settings and to extend the distances in question. This research dates in part to two hallmark studies, which both addressed the importance of proximity, but set off down separate research paths. First, the work by Short *et al.* (1976) proposed the theory of social presence in an attempt to understand the use of video-conferencing among distant colleagues. Since 1976, video conferencing has become more widespread, but it is still limited by cost, infrastructure, transmission speeds, and limitations on the number of sites that can be effectively conferenced at one time. As a result, early interest in video-conferencing waned somewhat, but the concept of social presence has endured and remained especially important in studies of computer-mediated communication, computer-supported cooperative work, groupware, and newer developments like the “Buddy Lists” in instant messaging.

In the second hallmark study, Allen (1977) showed that work-related communication frequency drops rapidly as distance between co-workers increases and, as the distance nears 50 meters, communication frequency reaches an asymptote. Allen’s work has remained extremely influential in office design, management of R&D, and a variety of sub-fields addressing the relationship between physical space and office layout (Cohen & Prusak, 2000; Oldham *et al.*, 1995). For example, Heim and Compton (1992, pp.182-3) present the asymptotic curve from Allen’s research, noting that the “basic phenomenon is strong and its understanding is vital for designing buildings and organizing work teams effectively.” More than any other work, Allen’s (1977) research brought the social psychological research on proximity into an organizational context and, to a large extent, his studies remain the standard in that regard. Although it has been replicated and refined (Cummings, 2001; Van den Bulte & Moenaert, 1998), as Rice & Gattiker (2001:558) note, “Few researchers other than Allen (1977) have seriously considered the ways in which physical structures constrain or facilitate organizational communication.”

Since the studies by Short *et al.* and Allen in the 1970s, researchers in a wide variety of fields (e.g., information systems, organization studies, computer-supported cooperative work, etc.) have been exploring the role of distance in work settings (Kraut *et al.*, 1990). However, simple physical conceptions of distance dominated until the work of Monge and colleagues (Monge & Kirste, 1980; Monge *et al.*, 1985). Building on previous research regarding the relationship between residential proximity and friendship, Monge & Kirste (1980) proposed a measure of proximity based on one’s “opportunity to communicate face-to-face.” They defined proximity as the “relative frequency with which various people co-occupy specific ‘communication locations’ (i.e., places where people can engage in face-to-face communication) during a defined time period.” Their measure began with all of the rooms in a given organization and evaluated the percentage of time that each individual would be in each room. The Monge studies are noteworthy for their recognition of the importance of proximity to multiple others, not just a single partner in a dyadic relationship. This work is also unusual in that it moved away from the previous view of proximity as the fixed, physical distance between individuals.

While Monge and colleagues expanded upon the previously dyadic work and provided a measure for more organizational analyses of distances, there is still surprisingly little work in organization and management studies that has incorporated the effects of dispersion at the team level. However, the collective picture from recent field studies (e.g., Majchrzak *et al.*, 2000a), business books (e.g., Carmel, 1999), management magazines (e.g., Maruca, 1998), and the popular press (e.g., Rosenwald, 2001) is one of widely varying degrees of dispersion.

So, from the early proximity work to the hallmark studies of the 1970s and more recent research at other levels (e.g., Sorenson & Audia, 2000), we know that distance is an influential

construct. We also know that it has a number of strong general effects with implications for collaborative work and the technologies to support it (Kiesler & Cummings, 2002; Kraut *et al.*, 2002; Olson & Olson, 2000, 2002). However, we have yet to unpack the black box of dispersion. Beyond Allen's (1977) findings, we have little understanding of how much (if any) dispersion is too much. More generally, we have little understanding of the relationships between *degrees* of dispersion and other important processes and outcomes.

For example, some researchers have shown that dispersed teams get off to a slower start than co-located ones, but that relationships in dispersed teams may eventually reach the same level of development (Walther, 2002). If this is true outside of laboratory teams, is it true for all degrees of dispersion? Might the speed of team and relationship development behave in a non-linear way with regard to degree of dispersion? Research to date offers few answers to questions like these. As Sessa *et al.* (1999, p.8) note, with geographically dispersed teams (GDTs):

Practice precedes science ... In collecting and annotating the literature about GDTs, we have found that much of the current research looks only at the ends of the continuum, at teams that meet face-to-face or at teams that are completely dispersed.

This focus on opposite ends of the continuum is all the more problematic given that:

[Naturally occurring work] teams are rarely completely co-located or completely dispersed. Usually, they exist somewhere between these two situations. Likewise, GDT members rarely meet in a purely dispersed fashion; they often meet face-to-face at the beginning of the project or over the course of the project. Sometimes a few members may work in the same location, but the team itself is still considered a GDT. (*ibid.*)

In sum, research has focused on ends of a spectrum at which relatively few teams actually work. As Hollingshead and McGrath (1995) noted, "the research to date has certainly not covered, systematically, the range of possible combinations of time and space dispersion ..." In fact, there are only a handful of studies (Burke *et al.*, 1999; Cramton & Webber, 2001; Cummings, 2001; Knoll, 2000; McDonough *et al.*, 2001) that specifically address varying degrees of dispersion in work teams.<sup>7</sup> Each of these studies takes a different approach to characterizing dispersion.

Knoll (2000) addressed "temporal dispersion" (which she defined as "how evenly members were spread among the Greenwich Mean Time zones," p.57) as part of her study of communication and cohesiveness in global virtual teams. She measured temporal dispersion in terms of (1) the mean of the "absolute" hourly differences between pairs of team members, and (2) the standard deviation of these differences, but her attempt to incorporate degrees of dispersion was confounded by the experimental nature of her study. As with many other studies using concocted<sup>8</sup> groups (e.g., Jarvenpaa & Leidner, 1999), the degree of dispersion was constrained by common team size and the assignment of subjects to teams with comparable international representation (i.e., six-member teams with one from each of six participating countries). Thus, Knoll was unable to assess the impact of varying degrees of dispersion.

McDonough *et al.* (2001) also tried to account for different degrees of dispersion with their three categories of teams – i.e., "co-located, virtual, and global." Unfortunately, these categories' definitions conflated cultural diversity and location, and mixed teams that are dispersed across different floors of the same building with teams dispersed across different countries. Burke *et al.*'s (1999) study of four-person student groups doing collaborative writing is noteworthy for articulating the need to study teams that fall between the extremes of co-location and complete dispersion:

This study explores an emerging work arrangement, the partially distributed workgroup, in which one member is separated from the ‘core’ group but linked via communication and computer support. Partially distributed groups may well interact differently ... [and are] likely to produce different group dynamics and outcomes than either fully co-located or fully distributed groups (pp.454-4).

However, Burke et al. operationalized “remote” by stationing three subjects in one room and the fourth in another room. As noted earlier, such operationalizations make team members’ dispersion quite ambiguous and imply that all dispersion is equal.

In contrast to Burke et al. (1999), Cramton & Webber (2001) studied 38 *naturally-occurring* dispersed IT teams, working in a real corporate setting. They measured the teams’ “total geographic spread” with a multiple choice question whose choices account for time zones and travel time. The choices were: (1) all members within one hour’s drive of each other, (2) members more than one hour’s drive apart but within the same time zone, (3) members spanning one to two time zones, (4) members spanning three to six time zones, and (5) members spanning more than six time zones. While this measure is valuable in its incorporation of both time zones and travel time, it does not allow their effects to be modeled separately and is highly sensitive to outliers. Given these five categories of dispersion, a team with nine members in Boston and two in Hong Kong would be a Category 5, despite the tight clustering in one site. In addition to using categorical measures, Cramton & Webber (2001) also measured the *frequency* of work from dispersed locations with a self-reported “always, often, occasionally, never” question. While within-team agreement on these two measures was low, they found that relationships with important outcome measures (e.g., trust, team performance, work processes) did vary depending on the measure used. This finding and their attempt to incorporate both temporal and spatial aspects of dispersion sets them apart among the research on geographically dispersed teams.

A fifth study – Cummings (2001) – uses clearer categories to describe spatial distance in a large sample of teams. Members were asked whether each of the others (1) “worked immediately next to you,” (2) “worked on the same floor and on the same hallway as you,” (3) “worked on the same floor, but on a different hallway than you,” (4) “worked on a different floor than you,” (5) “worked in a different building than you in the same city,” (6) “worked in a different building than you in a different city,” or (7) “worked in a different building than you in a different state or country.” As its wording suggests, this measure is especially attuned to low levels of dispersion. Of the seven possible responses, only the last two capture dispersion beyond the city level and, even then, a team dispersed across three countries (e.g., England, Japan, and Australia) would have the same score (i.e., 7) as one dispersed across three states (e.g., MA, CT, and NY). As regression analyses later in this chapter will show, the new measures proposed here complement this seven-item measure by focusing on higher levels of dispersion.

Despite the early proximity research and these more recent studies of geographically dispersed teams, we still lack a clear guide for understanding dispersion in teams. Simple physical distance is obviously relevant to dispersion in teams, but is only one aspect of dispersion. As the HBC study and research reviewed in Chapter 1 suggests, teams’ configuration and the temporal aspects of their dispersion are important as well.

### **3.2 New Measures of Geographic Dispersion**

The previous section has shown that dispersion is important in relation to a wide variety of constructs, but has generally been overlooked in research on teams. As Scott (1999, p.463) notes, “If we are indeed going to see increasing needs for collaboration between individuals in different times and places, there is also a need for more sophisticated research to explore this

phenomenon. Clearly, not enough emphasis has been placed on what it means to be dispersed in this sense.” Informed by research at a variety of historic and modern companies, and by the growing literature on geographically dispersed teams, the measures developed here begin to operationalize the ways in which teams are dispersed.

With the advent of global positioning and geographic information systems, the technological ability to measure dispersion has grown exponentially (Fischer & Getis, 1997). However, this chapter offers a relatively short list of potential measures, which are theoretically and/or empirically justified, or which provide the means for usefully (but not unnecessarily) detailed characterizations of dispersion in teams. While a single measure of dispersion would be analytically convenient, no single index is likely to capture teams’ dispersion adequately. Researchers should choose among the measures carefully based on their data sets and phenomena of interest.

As summarized in Figure 3.4, the first measures are of configuration (Site, Isolation, and Imbalance Indices), the next two (Separation and Overlap Indices) are of spatial and temporal distance. The last two (Role and External Indices) combine distance and configuration. They are presented in approximate order of complexity within each group.

Figure 3.4: Summary of the Measures and Elements of Dispersion Captured by Each

Measures	Summary	Spatial	Temporal	Configurational
Site Index	Number of sites per team			*
Isolation Index	Percent of members alone with no other team members at their site			*
Imbalance Index	Standard deviation of members per site divided by team size			*
Separation Index	Average distance from one member to the “average other” member	*		
Overlap Index	Actual shared work hours among members divided by the potential shared hours if team were co-located		*	
Role Index	Average distance to team leader	*	*	*
External Index	Average distance to headquarters	*	*	*

### 3.2.1 Site Index

Other things being equal, the higher the number of sites, the more dispersed a team is. Inherent in this measure is a sense that as the number of sites increases, so does the technical and social complexity of coordination, interaction, and communication. As Grinter et al. (1999) and Kraut & Streeter (1995) note, coordination is especially challenging in dispersed teams. This was equally true in the 18<sup>th</sup> and 19<sup>th</sup> centuries, as Chapter 2 and the HBC data show.

The definition of “site” and “co-location” is far from clear-cut (Olson & Olson, 2002), but its operationalization is relatively easy. In this chapter, it is operationalized by building (as opposed to city or zip code), leaving room for site effects even at relatively close geographic proximity.

### 3.2.2 Isolation Index

Measuring only the number of sites does not address the number of team members per site. For example, is the dispersion of hypothetical Team A with 24 members distributed across 6 sites (1-3-3-5-6-6) the same as the dispersion of hypothetical Team B, with 6 members

distributed across 6 sites (1-1-1-1-1-1)? While the two teams have the same number of sites, members of Team B are more isolated and, absent FTF meetings, collaborative work in Team B requires technology-enabled interaction. In contrast, the work of Team A could be divided so that some highly interactive work is assigned to co-located sub-teams. This suggests a second measure called the Isolation Index and defined as the percentage of team members who are at sites with no other teams members. Low values of the index indicate low levels of isolation. The range for this index is 0 (all team members have at least one teammate at their site) to 1.0 (none of the team members have teammates at their sites).

Inherent in the Isolation Index is a sense that the more members per site, the greater the potential for in-person interaction without travel. While members who share a site with a cluster of teammates may not avail themselves of the potential for such interaction, they at least have the option, whereas isolated members do not. The Isolation Index assumes that being isolated is problematic (see Cooper & Kurland, 2002, and studies reviewed by them, esp. p.512), but it is worth noting that sub-teams with clusters of members may result in intergroup-like problems within the team. Co-located sub-teams may actually engender less trust and more conflict. Whether a team has isolated members or not, and whether that isolation proves to be positive or negative, the *relative* number of members per site is another important aspect of a team's configuration. A third measure helps address that aspect.

### **3.2.3 Imbalance Index**

Independent of the number of sites and degree of isolation, some teams have more or less balanced membership across sites. For example, a 12 person team could be split evenly between two sites (6-6) or divided unevenly with nine members at one site and three at another. Such an imbalance may trigger heightened intergroup-like relations among sites. Members at sites with a small percentage of the team (call them "minority sites") may also feel more "out of the loop" and face greater communication challenges. Except in cases where a minority site has only a single member, such effects would not be captured by the Isolation Index. However, a measure called the Imbalance Index, equal to the standard deviation of members per site divided by the size of the team does address such configurations. Teams with an equal number of members at all sites (e.g., 4-4 or 2-2-2-2) are maximally balanced and have an Imbalance Index of 0.0. Teams with highly unequal numbers of members across sites (e.g., 9-3 or 6-1-1-1) have high a Imbalance Index. A team with n-1 members at one site is the most imbalanced configuration possible.

The Site, Isolation, and Imbalance Indices proposed above begin to capture important elements of teams' configuration and create a more complete picture of teams' dispersion, but they do not account for distances among sites – i.e., they are purely measures of configuration. For a clearer picture of spatial-temporal distances, several additional measures are helpful.

### **3.2.4 Separation Index**

The proposed Separation Index is based on the average "crow flies" or "Great Circle" distances between all team members at each site, weighted by the number of members at the sites, for a matrix of all possible, non-redundant member-to-member connections.<sup>9</sup> Inherent in such a measure is the expectation that members of GDTs will occasionally want to meet FTF and that the ease and frequency with which those meetings happen depends on the distances separating members (as well as travel budgets and other factors).

The Separation Index represents the average spatial distance for one team member to the "average" other team member (including those at his/her own site). The higher the Separation

Index, the more dispersed the team. For a hypothetical team of 10 members dispersed across three sites (call them K, L, and M), the separations (S) among sites are as follows:  $S_{KL} = 300$  miles;  $S_{KM} = 1,000$  miles,  $S_{LM} = 5,000$  miles. With  $n_K = 4$ ,  $n_L = 2$ , and  $n_M = 4$  members per site, the Separation Index for this hypothetical team would be calculated as follows:

$$\text{Separation Index}_{KLM} = [(S_{KL} * n_K * n_L) + (S_{KM} * n_K * n_M) + (S_{LM} * n_L * n_M)] / [(n^2 - n) / 2]$$

where  $n_i$  is the number of members per site and  $n$  is the total number of members on the team

Thus, for this team, the Separation Index =  $[(300 * 4 * 2) + (1,000 * 4 * 4) + (5,000 * 2 * 4)] / [(10^2 - 10) / 2] = 58,400 / 45 = 1,298$ . An expanded calculation would be used for teams with more sites, with distances and weights being added for each new member-to-member connection.<sup>10</sup>

### 3.2.5 *Overlap Index*

As Kayworth & Leidner (2000) describe, the temporal aspect of distance can be a “major hurdle” for geographically dispersed teams. In their field-based quasi-experiment, a typical student project team member reported that:

The team leader is seven hours ahead of the other groups. He would usually e-mail at 2:00 pm his time. The message would get to us at 7:00 am in the morning, and we would e-mail our leader in the afternoon. If we e-mailed the message at 2:00 pm our time, the message would get to the leader at 9:00 pm. Information took a day to send and receive.

This quote hints at the challenges of working asynchronously across time zones. For some teams, the only alternative to working asynchronously is to travel or extend the workday.

Whether one uses miles or travel time to measure distance, the assumption is that team members will eventually or periodically want to meet FTF (as a team or in sub-teams) and there should be measures to assess how difficult it is to hold such a meetings. The proposed Overlap Index addresses this issue by gauging how difficult it is for a team to have synchronous communications at some time during a normal (or slightly extended) work day.

Inherent in a measure that accounts for time zones is the sense that spanning time zones adds complexity to the coordination and communication in a team, not to mention travel between sites.<sup>11</sup> These temporal differences are likely to amplify spatial separations and make events like conference calls difficult to schedule. Conference calls that include members of a global team invariably require someone to dial in at times outside of their normal work day. For example, a team with members in Boston, London, and Tokyo spans 13 time zones and a team call starting at 09:00 Eastern time would require members in Tokyo to dial in at 22:00 their time (Figure 3.5).

Calculation of the Overlap Index parallels that of the Separation Index, in that it builds on a matrix of all possible member-to-member connections and then divides by the potential number of shared hours for a given workday and team size. With the Overlap Index, however, the matrix is populated by the number of overlapping work hours (OWH) between each member during a workday of fixed length (e.g., 8, 10, or 12 hours).<sup>12</sup> Unlike the Separation Index, a higher Overlap Index indicates a *less* dispersed team.

Figure 3.5: Work Days for a Sample of Major World Cities by Time Zone

This figure shows the extent to which work days in the world's major cities overlap. The world's 25 time zones (numbered 0 to 24) and a sample of major cities in each appear in the two left-most columns. Some time zones (i.e., 4, 23, and 24) include no major cities. The first time zone is Greenwich Mean Time (GMT). The right hand part of the figure includes columns for each hour GMT and shows the 10 hour workday (i.e., 08:00 to 18:00) for each time zone as a shaded bar. For example, Rome (TZ=1) is one hour ahead of London (TZ=0), so Romans are already one hour into their workday when Londoners start theirs, and Romans' workday ends one hour before Londoners' does. On the other side of the globe, workers in Tokyo are finishing their work day just as Londoners begin theirs. They have only one shared work hour.

TZ	Major Cities by Time Zone	Time of Day (24 hour clock) and 10 Hour Workdays (shaded)																								
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0
0	London, Lisbon, Lagos, Reykjavik																									
1	Rome, Paris, Oslo, Lagos																									
2	Johannesburg, Cairo, Athens, Jerusalem																									
3	Baghdad, Dubai, Moscow																									
4	None																									
5	Islamabad																									
6	Dhaka																									
7	Bangkok, Hanoi, Jakarta																									
8	Hong Kong, Singapore, Perth																									
9	Seoul, Tokyo																									
10	Vladivostok, Brisbane																									
11	Sidney*, Canberra*, Melbourne*																									
12	Kamchatka																									
13	Wellington*																									
14	Honolulu																									
15	Anchorage																									
16	Seattle, San Francisco, Los Angeles																									
17	Denver, Salt Lake City, San Salvador																									
18	Chicago, Mexico City, Houston																									
19	NYC, Lima, Havana, Bogota, Boston																									
20	La Paz, San Juan, Caracas, Halifax																									
21	Buenos Aires, Santiago*, Montevideo																									
22	Rio de Janeiro*, Sao Paulo*																									
23	None																									
24	None																									

\* The times shown are for snapshot taken at noon on January 1 in London, at which time the \*'d cities are observing Daylight Savings Time.



The formula for the OWH between any two sites, allowing for any length workday is:

$$\text{If } |TZ_A - TZ_B| < 13, OWH_{AB} = WD - |TZ_A - TZ_B|$$
$$\text{If } |TZ_A - TZ_B| \geq 13, OWH_{AB} = |TZ_A - TZ_B| - (24 - WD)$$

where A and B refer to two sites, TZ is the time zone,<sup>13</sup> and WD is the length of the workday

The potential number of overlapping work hours is simply  $[(n^2 - n) * WD] / 2$ , where “n” is the number of team members and “WD” is the length of the workday. A longer workday would allow for a higher Overlap Index (e.g., .2 and .33 for 10 and 12 hour days, respectively) and any fully co-located team will have an index of 1, regardless of team size or work day length. For an eight-hour workday, teams that have three sites and three members exactly eight hours apart will have the minimum OWH (e.g., teams spread across London, San Francisco, and Hong Kong; or Sydney, Chicago, and Tel Aviv). With a standard workday of less than 12 hours, the workdays for some pairs of time zones will neither touch nor overlap. Members in such time zones have negative Overlapping Work Hours, indicating how far apart they are from sharing any work hours (and thus how difficult scheduling any synchronous interaction is).

Because time zones are based on east-to-west distance, the temporal Overlap Index is inherently tied to the spatial Separation Index. Nonetheless, the Overlap Index adds an important dimension to our understanding of certain teams’ dispersion patterns. Specifically, it captures an important difference between teams that are dispersed primarily in an east-west direction and teams that are dispersed in a north-south direction. For example, the Separation Index for a team split between New York and Lisbon would be almost the same as for one split between New York and Lima – because the NY-Lisbon distance (3,379 miles) is similar to NY-Lima distance (3,635), but New York and Lima are in the same time zone and could have an extended conference call without adjusting their workdays at all. In contrast, New York and Lisbon are five time zones apart and a NY-Lisbon team would have much less flexibility for synchronous interaction (see Figure 3.5 for a depiction of overlapping work hours around the globe).<sup>14</sup>

So far, all of the proposed measures have treated team members as interchangeable. Two additional measures account for the fact that team members are rarely interchangeable, and that role and power differences add an important layer of complexity to teams’ dispersion.

### 3.2.6 Role Index

Power and roles are important in teams in general (Ancona *et al.*, 1999; Cohen & Bailey, 1997; Gibson & Zellmer-Bruhn, 2001), but they may be especially important in geographically dispersed teams, where configuration can enhance or detract from one’s power (or ability to wield it). Take, for example, Team A with a leader who is the sole member working out of the company’s Paris office. The other eight team members are divided equally among two sites in the U.S. Compare this with Team B, in which the leader switches places with a team member in one of the U.S. sites. In Team B, three members arguably have much greater, easier access to the team leader (and vice versa). One can easily imagine how the difference between these two teams’ “role maps” could have an important impact on interactions and processes of the team. In Team A, the isolated leader might be much more likely to (1) support (and demonstrate) norms of effective electronic communications, or (2) call FTF meetings of the team. In Team B, the

leader might be less likely to call FTF meetings and lead by example when it comes to electronic communication (because she would be able to communicate FTF with one third of the team).

The configuration of roles is not limited to hypothetical teams. For example, Armstrong & Cole (2002) described how the position of a manager in relation to the team had a dramatic effect on conflict management. Team members based in the manager's office would regularly engage him in impromptu conversations and tell him "why [his plans] would be stupid." The manager would listen to their objections, clarify details, and explain his position. In contrast, employees from the site 15 km away would prepare formal objections to his plans and present them during the manager's weekly visits. Although the "remote" site was relatively close, with no time zones or major social distances to cross, these objections still took longer to resolve and were rarely resolved as completely as those raised by team members' in the manager's office.

The distribution of roles and power on a team can be described in narrative form, mentioning where key roles are located in the configuration of team members, being careful to note where particularly powerful team members are in relation to their teammates. The configuration can also be captured quantitatively for comparison across teams. For example, a Role Index could measure the distance between a team's members and key players or centers of power within the team. With such an index, it is important to remember that roles and power change over time – in both emergent and planned ways – and that both have formal and informal manifestations. Any characterization of teams' dispersion in these terms needs to be especially specific about the time when that characterization is made and whether formal or informal roles and power are being considered. For this chapter, the Role Index is operationalized as the average distance from each member to the formal team leader at the end of the project.

### **3.2.7 External Index**

So far, all of the proposed measures have been internally focused. However, as we know from the work of Ancona and colleagues (e.g., Ancona & Caldwell, 1992b), *external* relations are also critical to team functioning. Thus, it is important to characterize teams' configuration in relation to key external constituencies and resources. For example, where do the team members work in relation to headquarters, the team's corporate sponsor, key sources of external expertise, or the recipient of the team's work product (whether it be an internal or external customer)?

Armstrong & Cole (2002) note the effect of such external relations in their discussion of sites close to the home office and those on the "metaphorical (and often geographically literal) periphery of the organization." Managers who were at or near the home office had more connections and easier access to upper management in their department, as well as other departments. They also had a more direct understanding of their mission and less likelihood of feeling vulnerable. Remote sites' desire for responsibility and achievement often conflicted with the home office's rationale for involving the remote site. The HBC data also provide a clear example of the importance of an External Index. For example, HBC managers' proximity to district managers or Indian suppliers had an important influence on their business.

In addition to members' proximity to various key constituents and relational/social resources, their proximity to key material resources is also important. As Hackman (1990) notes, availability and accessibility of resources is a critical enabler of a teams' success. In dispersed teams, this includes the traditional task-relevant resources, but can also include communications and technology infrastructure such as adequate networks, telephone links, video-conferencing equipment, groupware tools, etc. Potential quantitative measures of such relationships include travel time, geographic distance, and/or shared work hours between a team's members or leader and key external constituencies. It could also be the average distance between each team member

and headquarters, which is how it is operationalized in the following section. Regardless of what role player or external entity is used, both the Role and External Indices are modified versions of the Separation Index and, thus, can use either spatial or temporal measures of distance. Having answered the question “How can we measure geographic dispersion more robustly?” the subsequent sections investigate the measures with a series of hypothetical teams and a data set of 182 real teams from a telecommunications company (Cummings, 2001).

### 3.3 Illustrating and Investigating the Measures with Hypothetical Teams

A series of hypothetical teams help illustrate some of the dispersion measures proposed above, and show how different spatial-temporal configurations of team members affect those measures. This approach parallels Lau & Murnighan’s (1998) use of hypothetical teams with varying demographic diversity to illustrate the role of “faultlines.” For ease of illustration, the teams all have ten members, but those members’ configuration vary (Figure 3.6).

Figure 3.6: Coordinates, Time Codes, and Configurations of Hypothetical Teams

Site	Coordinates*		Time Code	Members by Team by Site								
	Lat	Long		A	B	C	D	E	F	G	H	I
London	51.50	0.00	0	10	5	3	1	2		4		1
Boston	42.36	-71.06	19				2		2		1	1
Lima	-12.00	-77.00	19					2			8	1
Pittsburgh	40.44	-80.00	19								1	1
San Francisco	37.44	-122.16	16				2	2				1
Sydney	-33.90	151.20	10		5	3						1
Tokyo	35.75	139.58	9					2				1
Singapore	2.00	104.00	8									1
New Delhi	28.63	77.20	5			4	5	2				1
Johannesburg	-26.17	28.03	2							4		1
Cairo	30.00	31.28	3							2		
Buenos Aires	-34.33	-58.5	20						3			
Karachi	24.9	67.15	6						1			
Bangalore	13.8	77.3	5.5						4			

\* Negative longitudes are west of the Greenwich Meridian; negative latitudes are south of the Equator

The teams are intended for illustrative purposes, not as a representative sample. In fact, they are skewed toward high levels of distance, but somewhat lower levels of isolation and imbalance.

Team A is in essence a control – a completely co-located team with all of its members in London. At the other end of the continuum, Team I has one member in each of the ten globe-spanning cities. The remaining teams represent various configurations in between the fully co-located and full-dispersed extremes. Team B is split between two cities, with half the members in London and half in Sydney. Team C is similar to Team B, but shifts four of its members to New Delhi (e.g., to work with a new software development division based there) so that it straddles three sites. Team D is noteworthy because it has one completely isolated member (e.g., a project manager based in the company’s London headquarters) and a large cluster of five members in New Delhi. Team E spreads dyads across five sites. Team F explicitly mirrors the dispersion of a

real “follow-the-sun” team led by two Sloan School alumni, with development centers in Bangalore and Buenos Aires, financial and executive leaders in Boston, and a senior technical expert in Karachi. Team G has members spread north-south across considerable spatial distances, but all members are within three time zones of each other. With a large cluster in Lima and isolated members in Boston and Pittsburgh, Team H illustrates a highly imbalanced configuration and relatively high spatial distance, but zero temporal dispersion.

An examination of the measures in Figure 3.7 shows how problematic simple labels of “more dispersed” or “less dispersed” can be. Some teams jump out as more dispersed than others, but an initial sense of a team’s relative dispersion does not always hold across measures.

Figure 3.7: Dispersion Indices (and Ranks in Parentheses) for Hypothetical Teams

Measures	A	B	C	D	E	F	G	H	I
Site Index	1 (9)	2 (8)	3 (5)	4 (3)	5 (2)	4 (3)	3 (5)	3 (5)	10 (1)
Isolation Index	0 (5)	0 (5)	0 (5)	0.1 (4)	0 (5)	0.1 (1)	0 (5)	.2 (3)	1 (1)
Imbalance Index	0 (6)	0 (6)	0.06 (5)	0.17 (2)	0 (6)	0.13 (3)	0.12 (4)	.40 (1)	0 (6)
Separation Index*	0 (9)	5.9 (2)	4.9 (6)	5.1 (5)	5.8 (3)	5.7 (4)	3.1 (7)	1.3 (8)	6.4 (1)
Overlap Index**	1 (8)	0.3 (5)	0.4 (6)	0.1 (1)	0.2 (2)	0.3 (4)	0.8 (7)	1 (8)	0.3 (3)

\* In thousands of miles \*\* Based on an 8 hour workday

For example, Team I with its members isolated at each of ten sites has the highest Separation Index but has more temporal overlap than Teams D and E. Team D is the most temporally dispersed archetype because half of its members are in New Delhi, which shares *negative* hours with four of the other five members (in Boston and San Francisco). In addition, despite the fact that Team I is spread across ten sites and 20 time zones, it does not have the lowest Overlap; the configuration of members forms a “chain,” with successive members linking or temporally overlapping with their nearest neighbors.

This idea of members serving as “links” was prominent in two teams followed during exploratory research for this chapter. In those teams, members were dispersed London-Miami-Hong Kong and Boston-London-Tokyo. While none of the sites was “close” to each other, team members in Miami, Boston, Hong Kong, and Tokyo all described their colleagues in London as important temporal “lynch pins.” In workdays that would regularly stretch to 10 hours or more, team members in London could talk briefly with their colleagues in Tokyo and Hong Kong before those Asian offices closed without having to extend their workdays. Then, the London members could relay any important news or information to colleagues in the eastern U.S., with which London shared nearly half its workday. In contrast, members in Boston and Miami only rarely spoke with their Asian colleagues, and only then by dialing in for midnight team calls. Yoshioka et al. (2000) found similar temporal challenges in synchronous interactions among the U.S., Singapore, Australia, and Japan.

As rankings of the hypothetical teams for each measure in Figure 3.7 suggest, there is overlap in what some of the measures capture. The closest relationship between measures is for the Separation and Overlap Indices, which are definitionally and operationally similar. However, there are cases where the link is not so tight. For example, Team D has the least temporal overlap of the hypothetical teams, but only the fifth highest Separation Index. In contrast, the Imbalance

Index is not closely related to any of the other measures. Teams can be highly imbalanced and still have members in relatively close spatial-temporal proximity to one another, as is the case with Team H.

While these hypothetical teams comprise a small sample that is deliberately constructed to illustrate the measures, they provide an initial indication of how those measures may behave in larger samples. In particular, the Separation and Overlap Indices are so closely related that their individual effects may be difficult, if not impossible, to detect in a real sample. While retention of both the Overlap and Separation Indices may not be warranted in general, the former is useful in samples with high north-south dispersion, or when temporal issues are a specific concern.

### **3.4 Investigating the Measures with Telecommunications Company Data**

In this section, data from a study of 182 real telecommunications company teams (Cummings, 2001) help investigate the measures further, and explore the relationships between geographic dispersion and communication frequency. The data analyzed here were collected by Cummings in June 2000 in a Fortune 500 telecommunications firm. At the time of the research, the global firm employed over 100,000 individuals, 40% of whom were engineers.

Each team in the sample had a “team name,” 4 to 12 members (mean = 8, SD = 1.94), and a specific project assigned to them. Ninety-four percent of the projects started and ended between January 1998 and January 2000 (average project length was 15 months). The teams had a designated leader, a general manager responsible for providing resources, and an identifiable customer (64% of whom were internal to the corporation). Members of the teams generally came from within the same division (5% of teams reported having a member from another division) and almost all were company employees (8% of teams reported having one customer participate, including those with internal customers). The teams worked on projects ranging from product development (e.g., design handheld scanning device for shipping company) to service improvement (e.g., convert client platform for car phones from analog to digital) to process management (e.g., execute separation and sale of business unit to another stakeholder) to manufacturing operations (e.g., modify existing factory to support new production of pagers). For more on the sample, see Cummings (2001).

Team leaders provided project descriptions as well as member names, locations, and contact information. After gathering background information on the teams, a survey was sent in June 2000 as an email attachment to each team member who had a valid email address (1315/1474 or 89%). It took approximately 20-30 minutes to complete, and included a cover letter describing the purpose of the study and ensuring confidentiality. The response rate was 73% (957/1315). At least one person responded from each team; 86 teams had greater than a 75% response rate; 63 had between a 50% and 75% response rate; 28 had between a 25% and 50% response rate; and 5 had less than a 25% response rate. The survey was sent an average of six months after teams had completed their projects.

Data were also collected on the zip code, city, state, and country of each member, which were used to obtain coordinates and time zones for each team member.<sup>15</sup> These coordinates and the trigonometric formula for calculating Great Circle distances were then used to compute distances between every pair of team members.<sup>16</sup>

In addition to data on team members' locations, Cummings' data set also includes communications frequency, performance, and various aspects of demographic diversity. Performance for the 182 teams was assessed by a panel of independent company managers who rated the teams as part of a naturally occurring internal bonus competition. Teams that advanced only to the regional level of the competition were given a ranking of 1 (N=84), while those that

advanced to the divisional and corporate levels were given rankings of 2 (N=77) and 3 (N=21), respectively. Interestingly, and consistent with Cummings' (2001) findings using the seven-item distance measure, there were no significant relationships between any of the dispersion measures and team performance (all  $r$ 's < |.07|; all  $p$ 's > .10). This suggests that whatever effect geographic dispersion has on communication and other processes, it does not have any direct effect on performance.

This somewhat surprising non-relationship runs counter to both the "touters" and the doubters of virtual teams, calling into question both the positive and pessimistic descriptions of virtual teams' potential [cf. Lipnack & Stamps (1999) and Townsend et al. (1998) vs. Handy (1995) and Harvey & Buckley (2002, p.373)]. Firms may believe that dispersed teams require more human and financial resources, and thus, compose and support them more carefully. Such close attention might help explain away the finding of no relationship, but the sample of 182 teams shows no link between dispersion and either industry or firm experience. Managers may still be giving dispersed teams more attention, but that doesn't translate into more experienced team membership. The non-relationship could still reflect a selection bias not captured by firm or industry tenure, or it could reflect the simple proposition that teams can learn and adjust relatively quickly to their dispersion and whatever challenges it poses (Walther, 2002).

To measure communication frequency, each member was asked "How frequently did you communicate with X during the project?" on a 5-point scale (1:never, 2:monthly, 3:weekly, 4:daily, 5:hourly) where X represented the name of every other member ( $\alpha = .77$ ; mean = 2.97; SD = 0.44). Members reported these frequencies during the planning phase (i.e., early or first half of group work; mean = 2.90; SD = .41) and the completion phase (i.e., late or second half of group work; mean = 3.11; SD = .50) of their projects.<sup>17</sup>

As shown in Figure 3.8, teams ranged from one to eight sites, with the mean having 2.25 and the majority of teams having four or fewer sites. They also ranged from fully co-located to globally dispersed, with Separation Indices as low as .01<sup>18</sup> and as high as 4,795 for a team with members in Brazil, China, the U.K., and the United States.

Figure 3.8: Descriptive Statistics of Dispersion Measures (n=182 Teams)

Measures	Mean	StDev	Range
Site Index	2.25	1.5	1-8
Isolation Index	.10	.17	0-1.00
Imbalance Index	.18	.20	0-0.59
Separation Index (miles)	279	741	0.01-4,795
Overlap Index (8 hour day)	.97	.09	.46-1.00
Role Index (mean distance to team leader, 1-7 scale)	3.27	1.16	1-6.44
External Index (mean distance to headquarters in miles)	2,503	2,690	0-9,354

Given the relatively low average Separation Index of 279 miles, the average Overlap is a high 0.97. By definition, teams with low spatial distances among members will have comparably high levels of temporal overlap. Most teams did not span many time zones, although some did have Overlap Indices below .50 (e.g., one team with four members in Israel and six spread across three U.S. time zones, and another with members in the U.K., China, Brazil, and U.S.).

As noted earlier, operationalization of the Role and External Indices can vary depending on the nature of the sample and availability of data. For this sample, there was an identified

leader for each team and the average distance from that leader to each team member was available on the 1-7 scale used by Cummings (2001). This average was used for the Role Index, given that the leader's site was a common meeting place for teams in the sample and was where resource approval for the teams generally originated. Average distance in miles from each team member to company headquarters was used to operationalize the External Index.<sup>19</sup>

Of the 182 teams, 156 had all members within one country, 18 had members spanning two countries, and 8 had members in three or four countries. There were 117 teams whose members were located within the same city, albeit not in the same building or area of a building. Thus, the sample includes a fairly wide range of dispersion and some "global" teams, but it includes a large majority of co-located and regionally or continentally dispersed teams. In addition, only one of the 182 teams was dispersed across the Northern and Southern Hemispheres. As a result, the spatial and temporal measures will be nearly perfectly correlated.

Given this chapter's interest in dispersed teams, the focus is on the sub-sample of teams that are spread across multiple sites (n=115), with occasional references to the sub-sample of teams that span multiple cities (n=65) and nations (n=26). Of the 26 multinational teams:

- 5 are mostly Asian or Middle Eastern and 9 are primarily European in their composition;
- 11 are "continentally" dispersed (i.e., only North American, European, or Asian);
- 12 have no U.S. members; and,
- 14 are technically multi-national, but all but one or two of their members in one country.

Descriptive statistics for the three sub-samples are shown in Figure 3.9. Interestingly, the multinational teams tend to have slightly more sites and slightly less overlap, but are not significantly more likely to have isolated or imbalanced membership. Where they do differ considerably is in the Separation and External Indices. For example, the average Separation Index nearly doubles for each sub-sample of teams (441 to 780 to 1,454 miles).

Figure 3.9: Descriptive Statistics of Dispersion Measures for Sub-Samples of Teams

Index	Multi-Site Teams (n=115)			Multi-City Teams (n=65)			Multinational Teams (n=26)		
	Mean	StDev	Range	Mean	StDev	Range	Mean	StDev	Range
Site	2.98	1.47	2-8	3.55	1.72	2-8	3.77	1.75	2-8
Isolation	.16	.19	0-1	.22	.22	0-1	.23	.21	0-.67
Imbalance	.29	.17	0-.59	.25	.16	0-.58	.25	.16	.05-.55
Separation	441	893	0.01-4,795	780	1074	1.25-4,795	1,454	1,366	62-4,795
Overlap	.95	.11	.46-1.00	.91	.13	.46-1.00	.83	.17	.46-1.00
Role	3.77	1.13	1.5-6.4	4.20	1.14	2-6.4	4.28	1.16	2.2-6.4
External	2,479	2,711	0-9,354	2,381	2,790	0-9,354	4,028	3,102	0-9,354

While such teams are far from the globally dispersed ones that draw many researchers' attention (e.g., Maznevski & Chudoba, 2000), even these low levels of dispersion are likely to have an effect on communications within the teams (Allen, 1977). This relationship is borne out in the correlations in Figure 3.10 (columns 1 and 2).

Figure 3.10: Correlation Matrix for Multi-Site Teams, n=115

Variable	1	2	3	4	5	6	7	8	9	10
1 Communication Freq., Planning Phase										
2 Communication Freq., Completion Phase	.73									
3 Team Size	-.17	-.23								
4 Distance (1-7)	-.51	-.36	.00							
5 Site Index	-.46	-.37	.13	.72						
6 Isolation Index	-.34	-.27	-.34	.55	.86					
7 Imbalance Index	.29	.21	.23	-.58	-.53	-.27				
8 Separation Index (miles)	-.35	-.34	.05	.60	.62	.56	-.28			
9 Overlap Index (8 hour day)	.35	.34	-.05	-.60	-.66	-.59	.31	-.96		
10 Role Index (distance to leader)	-.43	-.26	-.04	.82	.63	.46	-.54	.45	-.45	
11 External Index (distance to HQ)	.12	.19	-.10	-.04	-.18	-.18	.02	.05	.04	-.11

$r > .30, p < .001$ ;  $r > .24, p < .01$ ;  $r > .18, p < .05$ ;  $r > .15, p < .10$

As shown in Figure 3.10, many of the measures are correlated with each other for the multi-site sub-sample. With primarily east-west dispersed teams, the Separation and Overlap Indices are almost perfectly correlated as expected. Given that team size varies in this sample but was held constant in the hypothetical teams, team size is included here. It is significantly correlated with Isolation and Imbalance, but not with any of the other indices. As expected, larger teams tend to have lower levels of Isolation and higher levels of Imbalance. Imbalance appears least related to the other indices, followed by the Role and Isolation Indices. The Site Index is relatively highly correlated with all of the other measures, but not with Size.

Although they vary in strength, these correlations suggest that even though each measure captures some theoretically distinct element of geographic dispersion, those elements are highly inter-related in this sample. With few if any other samples of naturally-occurring geographically dispersed teams (with *varying degrees of dispersion*), and with this sample being skewed toward single site, east-west, and low-dispersion teams, it is difficult to know how much these correlations hinge on the specifics of this sample.

### 3.4.1 Configurational Complexity

Even though we do not have other real-team samples against which to compare the spatial-temporal distances of the 115-team sub-sample, it is possible to assess its “configurational complexity” in relation to the population of all possible configurations for teams with 2-12 sites and 4-12 members. Within these boundary conditions (which match those of the 115-team sub-sample), there are 256 possible unique configurations. The sample of 115 real teams includes 64 different dispersed configurations, or 25% of the 256 possible ones. Twenty-five percent may suggest that the sample of real teams has relatively low level of “configurational complexity,” or it may only reflect the fact that some of those 256 vary by the location of only a single member. Figure 3.11 presents configuration measures for the 256 possible configurations.

Figure 3.11: Correlations among Size and Configuration Measures for All Possible Configurations of 4-12 Member Teams, n=256

Measures	Size	Site Index	Isolation Index
Site Index	.30***		
Isolation Index	-.16**	.77***	
Imbalance Index	-.06	-.53***	-.31***

\*\*  $p < .01$ , \*\*\*  $p < .001$



These correlations are not appreciably different from those in the 115 real teams (Figure 3.10). The only exceptions are in the Site Index, which is much less correlated with Size and much more highly correlated with Isolation and Imbalance in the 115 team sample. This suggests that the 115 team sample and its 64 distinct configurations is actually fairly representative of the population of 256 possible configurations; it is actually more “configurationally complex” than the 25% figure noted above might suggest. In this and other samples, the degree of “configurational complexity” is likely to be strongly influenced by companies’ structures. For example, the range of configurations will be much higher for a company with ten plants and 20 regional offices than it would for a company with two plants and four regional offices.

### 3.4.2 Relationships between Dispersion and Communication Frequency

Although most of the 115 teams had fairly low levels of dispersion, there is a relatively strong and highly statistically significant correlation between all measures of dispersion and both planning and completion phase communication frequency. Dispersion is clearly related to less frequent communications within the teams (Figure 3.12).<sup>20</sup>

Figure 3.12: Correlations between Planning and Completion Phase Communication and Dispersion for All Teams and Multi-Site, Multi-City, and Multinational Teams

Index	All Teams, n=182		Multi-Site Teams, n=115		Multi-City Teams, n=65		Multinational Teams, n=26	
	r <sub>planning</sub>	r <sub>completion</sub>	r <sub>planning</sub>	r <sub>completion</sub>	r <sub>planning</sub>	r <sub>completion</sub>	r <sub>planning</sub>	r <sub>completion</sub>
Site	-.41***	-.29***	-.46***	-.37***	-.47***	-.38**	-.61***	-.67***
Isolation	-.33***	-.23**	-.34***	-.27**	-.39***	-.30**	-.44*	-.52**
Imbalance	.00	.03	.29**	.21*	.39**	.22†	.49**	.55**
Separation	-.32***	-.28***	-.35***	-.34***	-.32**	-.32**	-.57**	-.60***
Overlap	.31***	.28***	.35***	.34***	.33**	.33**	.57**	.61***
Role	-.41***	-.24***	-.43***	-.26**	-.51***	-.22†	-.54**	-.42**
External	.10	.18*	.12	.19*	.27*	.29*	.28	.38†

† p < .10, \* p < .05, \*\* p < .01, \*\*\* p < .001

This is particularly true early in their projects. Except for the multinational teams, relationships between communications and Site, Isolation, and Imbalance also decrease somewhat over time (as indicated by lower correlations for late phase communications), suggesting that team members may learn to deal with the effects of such dispersion. Early on, however, the complexity of managing across multiple sites appears to be more challenging for communications than the miles among them (as indicated by more negative correlations with the Site Index than with the Separation Index).

Comparing all 182 teams to the three sub-samples, there are some interesting differences. For example, the relationships between dispersion and communications are stronger among multi-site teams than they are for the 182 team sample, and are considerably higher for the multinational teams. The high correlations and significance levels for the relatively small sub-sample of multinational teams are noteworthy and suggest that the international aspects of teams may be an important factor in their communications that is not captured by the dispersion measures. The correlations also suggest that proximity to the team leader (i.e., Role Index) is associated with less frequent communications early on, but that this association diminishes by the completion phase of teams’ work. In contrast, proximity to company headquarters is associated with more communications, and the association increases in the second phase of the

projects. This may be because teams closer to headquarters were less dispersed on average (thus communicating more).<sup>21</sup>

Building on the correlations reported in Figure 3.10, several exploratory regression models are presented in Figure 3.13 to explore the behavior of the dispersion measures considered together and in relation to a commonly studied dependent (or process) variable. For simplicity of presentation, the regressions are presented with Overall Communications Frequency as the dependent variable. It is the simple mean of planning and completion phase communications frequency. The models also include Cummings' seven-item Distance variable and Reporting Manager variable, based on what is now known as the Teachman Index (Taagepera & Ray, 1977; Teachman, 1980) of the number of different managers to whom team members report. The Reporting Manager variable was one of several demographic diversity measures tested including, age, sex, industry experience, firm tenure, and functional diversity. Of these, only the Reporting Managers one was significantly related to communication frequency ( $r = -.35$ ,  $p < .001$  for both the planning and completion phases).<sup>22</sup>

Models 1 and 2 include variables used by Cummings (2001); Models 3-6 add the new dispersion variables. Although the dispersion measures are highly inter-related, variance inflation factor (VIF) and Cook-Weisberg tests indicate that all six models meet assumptions regarding collinearity and heteroscedasticity.

Figure 3.13: Overall Communications Frequency and Dispersion in 115 Multi-Site Teams

Independent Variables	Coefficients, (Standard Errors), and Significance by Model					
	M1	M2	M3	M4	M5	M6
Constant	4.02*** (.20)	4.16*** (.21)	4.04*** (.23)	3.76*** (.27)	3.93*** (.27)	4.034*** (.20)
Team Size	-.05 <sup>†</sup> (.02)	-.02 (.02)	-.01 (.02)	-.01 (.03)	-.01 (.03)	<i>excluded</i>
Distance (1-7)	-.18*** (.03)	-.16*** (.04)	-.12** (.04)	-.11 (.07)	-.17* (.07)	-.13*** (.04)
Reporting Managers		-.25* (.13)	-.27* (.13)	-.27* (.13)	-.27* (.13)	-.33*** (.10)
Separation Index			-.0001 (.0000)	-.0001 (.0001)	-.0001* (.0001)	-.00015** (.0001)
Site Index				.01 (.08)	.03 (.08)	<i>excluded</i>
Imbalance Index				.27 (.33)	.14 (.33)	<i>excluded</i>
Isolation Index				.01 (.50)	-.21 (.49)	<i>excluded</i>
Role Index				.04 (.05)	.06 (.05)	<i>excluded</i>
External Index				.0000 <sup>†</sup> (.0000)	.0000 (.0000)	<i>excluded</i>
Multinational (Y/N)					.28* (.11)	.29** (.10)
R <sup>2</sup> and Prob > F	.25***	.28***	.29***	.32***	.36***	.34***
Adjusted R <sup>2</sup>	.24	.26	.27	.27	.30	.32

Excluded variables were included in previous (reported and unreported) regressions, but were not significant

<sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Model 1 shows the regression of overall communications frequency against the seven-item distance measure, controlling for team size. While the number of reporting managers was

negatively correlated with communications (Figure 3.10), the addition of the reporting managers variable in Model 2 does not appreciably affect the fit of the model, controlling for distance and team size. Nonetheless, reporting managers is retained as a variable in Models 3-6 because it is independently significant. Models 3 and 4 add the Separation Index alone and then the Separation Index in conjunction with the other dispersion measures. In neither model is any of the dispersion measures significant itself, and there is only negligible improvement in the overall quality of model when they are added.

Given that there were considerable differences in correlations between dispersion and communications frequency for the multinational sub-sample of teams, Model 5 introduces a dummy variable to account for teams that are multinational, and there are several notable changes in the overall model fit and individual coefficients. First, the multinational variable is a significant, positive, independent predictor of communications and the overall model fit exceeds .30 for the first time. Second, the Distance measure returns to significance and the Separation Index emerges as significant for the first time. The number of reporting managers remains at the same level it had been in all previous models. Given that Size and the dispersion measures were not significant when controlling for the other variables in Model 5, Model 6 presents a slightly reduced form version of Model 5. In it, both the seven-item Distance and mileage-based Separation Index are significant, controlling for reporting managers and multinationality, which are also significant. The change in  $R^2$  from Model 2 to Model 6 is highly significant ( $p < .001$ ).

Since the seven-item Distance variable more effectively accounts for relatively low degrees of distance, while the Separation Index better accounts for high degrees of distance, their joint significance is understandable. As Allen (1977) found, very small degrees of distance can have a profound effect on communications. However, as shown here, larger degrees of distance can have an important, independent effect on communications too. The coefficient of the Distance variable is difficult to interpret because of its non-linearity; a one unit change could mean moving down the hall or moving to another country. In either case, a one unit change in Distance is associated with a 0.13 unit drop in communications frequency, controlling for Separation, Reporting Managers, and Multinationality. The Separation Index is more easily interpreted, with a 1,000 mile increase in the average distance between team members associated with 0.15 unit drop in communications frequency, controlling for Distance, Reporting Managers, and Multinationality.

That the configurational variables like imbalance and isolation were not independently significant may reflect the relatively high collinearity among some dispersion measures. Alternatively, or in addition, it may reflect the relatively local or regional nature of dispersion in the sample analyzed here. Nonetheless, these large-sample findings about the independent significance of multinationality, low (even within-building) levels of distance, and high levels of distance (i.e., greater than 1,000 miles of Separation) attest to the need to operationalize dispersion in a multi-dimensional way.

### **3.5 Conclusions, Limitations, and Suggestions for Future Research**

As noted in the introduction to this chapter, research on dispersed teams is still in its relatively early stages with few useful frameworks and taxonomies to characterize this “new” domain of interest. Nonetheless, the volume of research is growing quickly and, thus, the need for tools and terms to characterize teams’ geographic dispersion is also growing. Others have called for richer descriptions of teams’ actual tasks and contexts (e.g., Hackman, 1999; Rousseau & Fried, 2001; Wageman, 1999), to which this chapter adds encouragement and methods for characterizing teams’ dispersion.

For small sample studies, narrative descriptions (like the Majchrzak et al. one quoted at the beginning of the chapter) may be sufficient, but the measures proposed here should spur researchers using small samples to consider both spatial-temporal distance and configuration more carefully and consistently. For large sample studies, the proposed measures offer a quantitative means for characterizing dispersion – be it an independent, dependent, or control variable – in a robust way.

Investigations of the new measures in both hypothetical and real contexts provide a better understanding of their behavior, inter-relationships, and potential. They also provide some indication of how various components of dispersion relate to communication frequency. This final section summarizes that emerging understanding, highlights some of the chapter's limitations, and makes suggestions for future research.

In addition to the theoretical background and development of the proposed measures, this chapter contributes several key findings to the literature on geographically dispersed teams. First, especially for the telecommunications company sample, the measures are inter-correlated to varying degrees, with some (e.g., the Separation and Overlap Indices) being empirically indistinguishable. The hypothetical teams indicate that there are cases where these correlations are likely to be lower and the measures will be more distinct (e.g., samples with more teams dispersed north to south, and samples with higher average levels of dispersion).

Second, despite the correlations among measures, they relate to communications frequency at very different levels ( $r = .21-.51$ ), suggesting some important empirical distinctions. In this regard, they lend support to the Cramton & Webber's (2001) findings that the relationship between dispersion and trust, performance, and work processes depends importantly on the measure of dispersion that is used. To the extent that these differences apply with other dependent variables, and to the extent that we want to understand dispersion, not assume or dichotomize it away, the choice of measures is likely to be an especially important one.

Third, previous measures of dispersion [e.g., Cramton & Webber (2001), Cummings (2001), and (McDonough *et al.*, 2001)] have been categorical, non-linear, and self-reported. While none of those attributes is negative, this chapter's development of several continuous, linear measures that depend less on self-reports is valuable. For example, it will allow for larger sample studies that draw on companies' financial, human resources, and project management information systems to characterize the dispersion of their teams and relate that dispersion to key performance measures – recognizing, as the next chapter will show, that data on teams and team members' location drawn from corporate information systems isn't necessarily a better or more complete representation of how and where members spend their time.

Fourth, recognizing that multi-collinearity of the measures may limit our ability to disentangle their separate effects, the exploratory regression analyses presented here indicate that the Separation Index complements the seven-item Distance measure used by Cummings (2001), with a one unit change in Distance and a 1,000 mile change in Separation explaining roughly the same decrease in communication frequency. Controlling for multinationality of the teams, the Separation Index captures the independent effect of large-scale distances, while the seven-item Distance measure better captures small-scale distances. Furthermore, because the Separation Index is linear, it provides a more readily interpretable coefficient.

Fifth, although a variety of demographic diversity measures were not related to communication frequency, multinationality was positively related to it, even after controlling for the Separation Index and Distance. Although working across nations (and thus cultures, languages, etc.) is likely to be more complex, multinational teams performed as well or better

than single-country ones, suggesting that any added complexity of multinational work may have been overcome by the higher average levels of communications. This is consistent with conventional wisdom that more (and more explicit) communication is especially necessary in geographically dispersed teams (Lipnack & Stamps, 1997).

A sixth important finding is actually a non-finding of sorts – i.e., that performance is not significantly related to any of the new measures of dispersion. Cummings (2001) found the same result with his seven-item measure of Distance, but a performance effect could have been masked by that measure's skew towards low levels of dispersion. The spatial-temporal measures proposed here capture higher levels of dispersion, yet continue to show no performance effect. This may suggest that the telecommunications company recognized dispersed teams as a greater challenge, and devoted more resources to them, but age, industry experience, and firm tenure data from company do not support this explanation. Alternatively, it may suggest that teams are succeeding in overcoming the challenges posed by geographic dispersion work, or that those challenges have been overstated in the literature (popular and academic), or both.

Sixth, especially in light of the attention being paid to learning (Edmondson, 1999), adaptation (Majchrzak *et al.*, 2000b), and timing (Walther, 2002) in research on teams and organizations, decreases in the negative relationships between most dispersion measures and communication frequency from the planning to the completion phases for the multi-site teams remind us that more attention needs to be paid to (1) understanding geographically dispersed teams over their full natural life cycles, and (2) looking beyond simple communication frequency to communication content and media. While it was not intended to explain these decreases (and there are a variety of plausible, competing explanations), they also serve as a reminder that individuals and teams are creative, adaptive agents – capable of learning to work better at a distance and overcome the challenges it may pose.

Seventh, given the dearth of prevalence data on dispersed teams in general, this study's careful description of 182 teams' dispersion is interesting in itself. In particular, the comparison of the configurational complexity in the sample to the universe of possible configurations is a new and potentially useful approach to understanding teams' dispersion. However, more comparisons with different samples are necessary before the 182 team sample can be described as “relatively complex” or “relatively simple” from a configurational standpoint.

While much more detailed than the approaches taken by previous research on dispersion in teams, the work presented here has several limitations. First, the proposed measures do not address the specific timing of certain interactions within teams (e.g., whether FTF interactions happen early in a team's work together, as many recommend). They also focus on the *potential* for or ease with which teams can engage in certain kinds of interaction (FTF and synchronous); they do not capture *actual* levels of interaction (e.g., the percentage of time team members spend together FTF or via phone, or the time they devote to travel). Both actual and potential are important, as are the relation between the two. Second, the measures presented here could not address some important aspects of social distance that add important layers of complexity teams' work (e.g., ethnic or cultural diversity). In this vein, we know little about what effects (on communication and other interesting dependent variables) can be attributed to geographic dispersion alone, to social dispersion alone, or to some combination of the two.

Third, we know little about how geographic and social dispersion combine to create *perceived* dispersion for individual team members. Since, as the old adage has it, perception is 9/10ths of reality, future research on teams would benefit greatly from an enhanced understanding of how people perceive dispersion. “Cognitive distance” research and measures in

the field of social geography should provide a useful foundation (Golledge & Stimson, 1997). Fourth, the measures stand to be assessed with more highly dispersed samples and against a wider range of dependent variables. Communication is important, but learning, satisfaction, retention, commitment, trust, leadership, and identity are also constructs that are often described as being strained by dispersion.

Fifth, this study's results include some sense of change over time in the planning and completion phase communication variables (Figure 3.12), but the conception of dispersion is primarily static. As with most constructs, dispersion can change over time as team composition changes, team members travel or relocate, and organizations combine or separate. The measures proposed here lend themselves to longitudinal or cross-sectional analyses of geographic dispersion. Their relationship to the percent of time team members spend in different places [cf. (Monge *et al.*, 1985)] would also be a useful check on the measures and provide interesting insights into the mobility or immobility of teams and team members.

Despite these limitations, the measures and analyses presented here are an important contribution to the study of GDTs. Hopefully, this work also encourages us all to include the degrees and multiple dimensions of dispersion in future studies. Several promising directions in which such work might go are offered below.

1. There is clearly work to be done to disentangle the various dimensions of geographic dispersion, and understand how they relate to perceived and social distances. While controlled studies may have exacerbated an inattention to degrees of dispersion, they still hold great promise for this type of work. Rather than concocting teams with identical degrees of dispersion, future studies could systematically vary the distance among and/or configuration of team members. They could also systematically vary spatial-temporal and social distance, comparing teams that are low in social distance but high in spatial-temporal distance. This would help us articulate what (if anything) is attributable solely to spatial-temporal distance

2. Although it was not possible with these data, future research should assess people's *perceptions* of dispersion, and the relationships between those perceptions, the elements of dispersion captured by the proposed measures, and key outcome variables. It may turn out that perceived dispersion is quite at odds with "actual" dispersion.

3. While one can characterize teams as more or less dispersed using Separation and Overlap, it is not clear that the same applies with the notion of Imbalance. Imbalance does not have a clear connection to spatial-temporal distance, but imbalanced teams tend to have large clusters of co-located members, and thus also have higher average levels of communications. Decades of research on intergroup effects suggest that imbalance is likely to be important for other dependent variables not tested here – e.g., conflict, competition, and cohesion. Understanding the separate and joint effects of imbalance and clustering (or low levels of spatial-temporal distance) is an important next step.

4. The analyses presented here have only scratched the surface with the Role Index and External Indices. There is much more potentially fruitful work to be done in this regard, building on Ancona's research (Ancona & Caldwell, 1992b) regarding team's externally oriented actions and adding a more spatial component to ideas of resource dependency (Pfeffer & Salancik, 1978) and team leadership (Hackman, 2002). In addition, the Role Index privileges a role-based approach to leadership, but there are equally (if not more) compelling models of leadership that are more functionally based (Hackman & Walton, 1986). Future work could create a more functionally-oriented Role Index.

Given the relative infancy of research on geographically dispersed teams and the role of time, space, and configuration in them, these additional streams of research are necessary before we can address some very basic questions about the theory and practice of geographically dispersed team work. The following chapter takes up several of these – including what effect *changes* in dispersion have within individual teams' life cycles.

### 3.6 References

- Allen, T. J. (1977). *Managing the Flow of Technology*. Cambridge, MA: MIT Press.
- Ancona, D. G., & Caldwell, D. E. (1992a). "Demography and Design: Predictors of New Product Performance," *Organization Science*, 3(3): 321-341.
- Ancona, D. G., & Caldwell, D. F. (1992b). "Bridging the boundary: External activity and performance in organizational teams," *Administrative Science Quarterly*, 37(4): 634-665.
- Ancona, D. G., Goodman, P. S., Lawrence, B. S., & Tushman, M. L. (2001a). "Time: A New Research Lens," *Academy of Management Review*, 26(4): 645-663.
- Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. (2001b). "Taking Time to Integrate Temporal Research," *Academy of Management Review*, 26(4): 512-529.
- Ancona, D. G., Scully, M., Kochan, T. A., Van Maanen, J., & Westney, D. E. (1999). *Managing for the Future: Organizational Behavior & Processes* (2nd ed.). Cincinnati, OH: South Western College Publishing.
- Armstrong, D. J., & Cole, P. (2002). "Managing Distances and Differences in Geographically Distributed Work Groups," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 167-212. Cambridge, MA: MIT Press.
- Arrow, H., McGrath, J. E., & Berdahl, J. L. (2001). *Small Groups As Complex Systems : Formation, Coordination, Development, and Adaptation*. Thousand Oaks: Sage Publications.
- Athanasίου, R., & Yoshioka, G. A. (1973). "The Spatial Character of Friendship Formation," *Environment and Behavior*, 5: 43-65.
- Burke, K., Aytes, K., Chidambaram, L., & Johnson, J. J. (1999). "A Study of Partially Distributed Work Groups: The Impact of Media, Location, and Time on Perceptions and Performance," *Small Group Research*, 30(4): 453-490.
- Carmel, E. (1999). *Global Software Development Teams: Collaborating across Borders and Time Zones*. Upper Saddle River, NJ: Prentice Hall.
- Cohen, D., & Prusak, L. (2000). *In Good Company*. Boston: HBS Press.
- Cohen, S. G., & Bailey, D. E. (1997). "What makes teams work: Group effectiveness research from the shop floor to the executive suite," *Journal of Management*, 23(3): 239-290.
- Cooper, C. D., & Kurland, N. B. (2002). "Telecommuting, Professional Isolation, and Employee Development in Public and Private Organizations," *Journal of Organizational Behavior*, 23: 511-532.
- Cramton, C. D., & Webber, S. S. (2001). *Modelling the Impact of Geographic Dispersion on Work Teams*, Working Paper
- Cummings, J. N. (2001). *Work Groups and Knowledge Sharing in a Global Organization*. Unpublished Ph.D. thesis, Carnegie-Mellon University, Pittsburgh, PA.
- Depickere, A. (1999). "Managing Virtual Working: Between Commitment and Control?," In P. J. Jackson (Ed.), *Virtual Working: Social and Organisational Dynamics*, pp. 99-120. London: Routledge.
- Duarte, D. L., & Snyder, N. T. (1999). *Mastering virtual teams : strategies, tools, and techniques that succeed* (1st ed.). San Francisco: Jossey-Bass.
- Edmondson, A. (1999). "Psychological safety and learning behavior in work teams," *Administrative Science Quarterly*, 44(2): 350-383.
- Fischer, M. M., & Getis, A. (Eds.). (1997). *Review of Recent Developments in Spatial Analysis: Spatial Statistics, Behavioural Modelling, and Computational Intelligence*. NY: Springer.



- Gersick, C. J. G. (1989). "Marking Time: Predictable Transitions in Task Groups," *Academy of Management Journal*, 32(2): 274-309.
- Gersick, C. J. G. (1991). "Revolutionary Change Theories: A Multilevel Exploration of the Punctuated Equilibrium Paradigm," *Academy of Management Review*, 16(1): 10-36.
- Gersick, C. J. G. (1994). "Pacing strategic change: The case of a new venture," *Academy of Management Journal*, 37(1): 9-45.
- Gibson, C. B., & Zellmer-Bruhn, M. E. (2001). "Metaphors and meaning: An intercultural analysis of the concept of teamwork," *Administrative Science Quarterly*, 46(2): 274-303.
- Golledge, R. G., & Stimson, R. J. (1997). *Spatial Behavior: A Geographic Perspective*. NY: Guilford Press.
- Grinter, R. E., Herbsleb, J. D., & Perry, D. E. (1999). *The Geography of Coordination: Dealing with Distance in R&D Work*. Proceedings of the GROUP 99 Conference of the ACM, Phoenix, AZ, 306-315.
- Hackman, J. R. (1990). *Groups That Work (and Those That Don't): Creating Conditions for Effective Teamwork*. San Francisco: Jossey-Bass.
- Hackman, J. R. (1999). "Thinking Differently about Context," In R. Wageman (Ed.), *Research on Managing Groups and Teams*, Vol. 2, pp. 233-247. Greenwich, CT: JAI Press.
- Hackman, J. R. (2002). *Leading Teams: Setting the Stage for Great Performances*. Boston, MA: Harvard Business School Press.
- Hackman, J. R., & Walton, R. E. (1986). "Leading Groups in Organizations," In P. S. A. Goodman (Ed.), *Designing Effective Work Groups*, pp. 72-119. San Francisco, CA: Jossey-Bass.
- Handy, C. (1995). "Trust and the Virtual Organization," *Harvard Business Review*, 73(3): 40-50.
- Harrison-Hill, T. (1997). *The Tyranny of Distance: A Cross-Cultural Comparison of Tourists' Perceptions*. Proceedings of the Sixth Symposium on Cross-Cultural Consumer and Business Studies, Honolulu, HI, 371-376.
- Harvey, M., & Buckley, M. R. (2002). "Assessing the 'Conventional Wisdoms' of the Management for 21st Century Organizations," *Organizational Dynamics*, 30(4): 368-378.
- Heim, J. A., & Compton, W. D. (1992). *Manufacturing Systems: Foundations of World-Class Practice*. Washington, DC: National Academy Press.
- Hollingshead, A. B., & McGrath, J. E. (1995). "Computer-assisted groups: A critical review of the empirical research," In R. A. Guzzo, & E. Salas (Eds.), *Team Effectiveness and Decision Making in Organization*, pp. 46-78. San Francisco, CA: Jossey-Bass.
- Homans, G. C. (1987). *Certainties and Doubts: Collected Papers, 1962-1985*. New Brunswick, N.J.: Transaction Books.
- Hutchins, E. (1991). "Organizing work by adaptation," *Organization Science*, 2(1): 14-39.
- Huy, Q. N. (2001). "Time, Temporal Capability, and Planned Change," *Academy of Management Review*, 26(4): 601-623.
- Jarvenpaa, S. L., & Leidner, D. E. (1999). "Communication and trust in global virtual teams," *Organization Science*, 10(6): 791-815.
- Jehn, K. A., B, G., & Neale, M. A. (1999). "Why differences make a difference: A field study of diversity, conflict, and performance in workgroups," *Administrative Science Quarterly*, 44(4): 741-763.
- Kahn, A., & McGaughey, T. A. (1977). "Distance and Liking: When Moving Close Produces Increased Liking," *Sociometry*, 40(2): 138-144.

- Karolak, D. W. (1998). *Global Software Development: Managing Virtual Teams and Environments*. Los Alamitos, CA: IEEE Computer Society.
- Kayworth, T., & Leidner, D. E. (2000). "The Global Virtual Manager: A Prescription for Success," *European Management Journal*, 18(2): 183-194.
- Ketchen, D. J., Jr., Combs, J. G., Russell, C. J., Shook, C., & et al. (1997). "Organizational configurations and performance: A meta-analysis," *Academy of Management Journal*, 40(1): 223-240.
- Kiesler, S., & Cummings, J. N. (2002). "What do we know about proximity and distance in work groups? A legacy of research," *Distributed Work*, pp. 57-82. Cambridge, MA: MIT Press.
- Kilduff, M., Angelmar, R., & Mehra, A. (2000). "Top management-team diversity and firm performance: Examining the role of cognitions," *Organization Science*, 11(1): 21-34.
- King, J. L., & Frost, R. L. (2002). "Managing Distance Over Time: The Evolution of Technologies of Dis/Ambiguation," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 3-26. Cambridge, MA: MIT Press.
- Knoll, K. E. (2000). *Communication and Cohesiveness in Global Virtual Teams*. Unpublished Ph.D. thesis, University of Texas, Austin.
- Kraut, R. E., Egido, C., & Galegher, J. (1990). "Patterns of contact and communication in scientific research collaborations," In J. Galegher, R. E. Kraut, & C. Egido (Eds.), *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Kraut, R. E., Fussell, S. R., Brennan, S. E., & Siegel, J. (2002). "Understanding the effects of proximity on collaboration: Implications for technologies to support remote collaborative work," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 137-164. Cambridge, MA: MIT Press.
- Kraut, R. E., & Streeter, L. (1995). "Coordination in Software Development," *Communications of the ACM*, 38(3): 69-81.
- Kurland, N. B., & Bailey, D. E. (1999). "Telework: The advantages and challenges of working here, there, anywhere, and anytime," *Organizational Dynamics*, 28(2): 53-68.
- Lau, D. C., & Murnighan, J. K. (1998). "Demographic diversity and faultlines: The compositional dynamics of organizational groups," *Academy of Management Review*, 23(2): 325-340.
- Lawrence, T. B., Winn, M. I., & Jennings, P. D. (2001). "The temporal dynamics of institutionalization," *Academy of Management Review*, 26(4): 624-644.
- Levina, N. (2001). *Multi-party Information Systems Development: The Challenge of Cross-Boundary Collaboration*. Unpublished Ph.D. thesis, Sloan School of Management, Information Technology Department, MIT Sloan School of Management, Cambridge, MA.
- Lipnack, J., & Stamps, J. (1997). *Virtual Teams: Reaching Across Space, Time, and Organizations with Technology*. New York: Wiley.
- Lipnack, J., & Stamps, J. (1999). "Virtual teams: The new way to work," *Strategy & Leadership*, 27(1): 14-19.
- Maisonneuve, J., Palmade, G., & Fourment, C. (1952). "Selective Choices and Propinquity," *Sociometry*, 15(1/2): 135-140.
- Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. (2000a). "Technology adaptation: The case of a computer-supported inter-organizational virtual team," *MISQ*, 24(4): 569-600.

- Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. L. (2000b). "Technology adaptation: The case of a computer-supported inter-organizational virtual team," *MISQ*, 24(4): 569-600.
- Maruca, R. F. (1998). "How do you manage an off-site team?," *Harvard Business Review*, 76(4): 22-35.
- Maznevski, M. L., & Chudoba, K. M. (2000). "Bridging space over time: Global virtual team dynamics and effectiveness," *Organization Science*, 11(5): 473-492.
- McDonough, E. F., III, Kahn, K., & Barczak, G. (2001). "An Investigation of the Use of Global, Virtual, and Colocated New Product Development Teams," *Journal of Product Innovation Management*, 18: 110-120.
- McGrath, J. E. (1990). "Time Matters in Groups," In J. R. Galegher, R. E. Kraut, & C. Egido (Eds.), *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.
- Meyer, A. D., Tsui, A. S., & Hinings, C. R. (1993). "Configurational approaches to organizational analysis," *Academy of Management Journal*, 36(6): 1175-1195.
- Miller, D. (1987). "The Genesis of Configuration," *Academy of Management Review*, 12(4): 686-701.
- Monge, P. R., & Kirste, K. K. (1980). "Measuring Proximity in Human Organization," *Social Psychological Quarterly*, 43(1): 110-115.
- Monge, P. R., Rothman, L. W., Eisenberg, E. M., Miller, K. I., & Kirste, K. K. (1985). "The Dynamics of Organizational Proximity," *Management Science*, 31(9): 1129-1141.
- Oldham, G. R., Cummings, A., & Zhou, J. (1995). "The Spatial Configuration of Organizations: A Review of the Literature and Some New Research Directions," *Research in Personnel and Human Resource Management*, Vol. 13, pp. 1-37. Greenwich, CT: JAI Press.
- Olson, G. M., & Olson, J. S. (2000). "Distance Matters," *Human-Computer Interaction*, 15(1): 139-179.
- Olson, G. M., & Olson, J. S. (2002). "The (Currently) Unique Advantages of Collocated Work," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 113-136. Cambridge, MA: MIT Press.
- Pelled, L. H., Eisenhardt, K. M., & Xin, K. R. (1999). "Exploring the black box: An analysis of work group diversity, conflict, and performance," *Administrative Science Quarterly*, 44(1): 1-28.
- Pfeffer, J., & O'Reilly, C. (1987). "Hospital Demography and Turnover among Nurses," *Industrial Relations*, 36: 158-173.
- Pfeffer, J., & Salancik, G. R. (1978). *The External Control of Organizations: A Resource Dependence Perspective*. New York: Harper and Row.
- Reisman, A., Cull, W., Emmons, H., Dean, B., Lin, C., Rasmussen, J., P., D., & George, T. (1977). "On the Design of Alternative Obstetric Team Configurations," *Management Science*, 23(6): 545-556.
- Rice, R. E., & Gattiker, U. E. (2001). "New Media and Organizational Structuring," In F. M. Jablin, & L. L. Putnam (Eds.), *The New Handbook of Organizational Communication*, pp. 544-581. Thousand Oaks, CA: Sage Publications.
- Rosenwald, M. (2001). "Long-Distance Teamwork: As 'Virtual Offices' Spread, Managers and Their Staffs Are Learning to Adapt to New Realities," *Boston Globe*, April 29, 2001, p.1.
- Rousseau, D. M., & Fried, Y. (2001). "Location, Location, Location: Contextualizing Organizational Research," *Journal of Organizational Behavior*, 22: 1-13.

- Scott, C. R. (1999). "Communication Technology and Group Communication," In L. R. Frey, D. Gouran, & M. S. Poole (Eds.), *Handbook of Group Communication Theory and Research*, pp. 432-474. Thousand Oaks, CA: Sage.
- Sessa, V. I., Hansen, M. C., Prestridge, S., & Kossler, M. E. (1999). *Geographically Dispersed Teams: An Annotated Bibliography*. Greensboro, NC: Center for Creative Leadership.
- Short, J., Williams, E., & Christie, B. (1976). *The Social Psychology of Telecommunications*. Chichester, UK: John Wiley & Sons.
- Sorenson, O., & Audia, P. G. (2000). "The Social Structure of Entrepreneurial Activity: Geographic Concentration of Footwear Production in the United States, 1940-1989," *American Journal of Sociology*, 106(2): 424-462.
- Taagepera, R., & Ray, J. L. (1977). "A Generalized Index of Concentration," *Sociological Methods and Research*, 5: 367-374.
- Teachman, J. D. (1980). "Analysis of Population Diversity," *Sociological Methods and Research*, 8: 341-362.
- Teasley, S., Covi, L., Krishnan, M. S., & Olson, J. S. (2000). *How does radical collocation help a team succeed?* Proceedings of the CSCW 2000 Conference, Philadelphia, PA, 339-346.
- Townsend, A. M., DeMarie, S. M., & Hendrickson, A. R. (1998). "Virtual Teams: Technology and the Workplace of the Future," *Academy of Management Executive*, 12(3): 17-29.
- Van den Bulte, C., & Moenaert, R. K. (1998). "The effects of R&D team co-location on communication patterns among R&D, marketing, and manufacturing," *Management Science*, 44(11): S1-S18.
- Wageman, R. (1999). *Research on Managing Groups and Teams, Vol.2: Groups in Context*. Greenwich, CT: JAI Press.
- Waller, M. J. (1999). "The timing of adaptive group responses to nonroutine events," *Academy of Management Journal*, 42(2): 127-137.
- Waller, M. J., Conte, J. M., Gibson, C. A., & Carpenter, M. A. (2001). "The effect of individual perceptions of deadlines on team performance," *Academy of Management Review*, 26(4): 586-600.
- Walther, J. B. (2002). "Time Effects in Computer-Mediated Communication: Past, Present, and Future," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 235-258. Cambridge, MA: MIT Press.
- Williams, K. Y., & O'Reilly, C. A., III. (1998). "Demography and Diversity in Organizations: A Review of 40 Years of Research," *Research in Organizational Behavior*, 20: 77-140.
- Yoshioka, T., Yates, J., & Orlikowski, W. (2000). *Community-based Interpretive Schemes: Exploring the Use of Cyber Meetings within a Global Organization*. Presented at the 35th Annual Hawaii International Conference on System Sciences (HICSS'02), Big Island, HI, January 7-10, 2002.

### 3.7 Endnotes

<sup>1</sup> In general, researchers have found that demographic diversity often increases the coordination costs for teams, but can also induce task conflict that may spark creativity (Jehn *et al.*, 1999; Pelled *et al.*, 1999). Given the extensive research on demographic diversity in teams and organizations, we address it only to the degree that social and spatial-temporal distances may interact in work teams (Kiesler & Cummings, 2002). For example, a hypothetical team could have high social dispersion but relatively low geographic dispersion. As a result, it might have trouble developing shared understanding and common ground among demographically diverse members, despite relatively frequent opportunities to interact FTF. Conversely, another team could have high geographic dispersion, but relatively low social dispersion. In such a team, there would be fewer opportunities for FTF and/or impromptu communication, but the low social dispersion might compensate by making that communication smoother when it did occur.

<sup>2</sup> Researchers interested in vacation travel decisions have found that people's estimates of the distance between Los Angeles and Sydney are much more accurate when they expressed it in terms of hours than when they did so in miles. People generally know that the cities are "14 hours apart," but only those who travel frequently and monitor their frequent flier miles can correctly answer that they are 7,500 miles apart.

<sup>3</sup> For a recent review, see the recent special issue of the *Academy of Management Review*, 26(4), October 2001, including (Ancona *et al.*, 2001a; Ancona *et al.*, 2001b).

<sup>4</sup> There are 25 time zones from -12 through 0 (i.e., Greenwich Mean Time) to +12. Each zone is theoretically 15 degrees wide in longitude as measured East and West from Greenwich, England. The time zone system was devised in the late 1870s by a Canadian railway planner (and HBC Committee member), Sir Sandford Fleming, and the current system has changed little since the 27-nation Meridian Conference established it in 1884. Standard time is determined locally and the zones' boundaries only roughly follow the 15 degree lines. Boundaries commonly diverge from those lines to accommodate political boundaries and some countries have adjusted the zones. For example, central Australia, India, and several countries in the Middle East and South Asia have half-hour time zones and/or 30 minute offsets. Russia adheres to its time zones, but the whole country is on permanent Daylight Savings Time and is, thus, an hour ahead of the actual zones. Workers at the polar stations all use one time zone, instead of 24 extremely narrow ones, as does China despite the fact that it spans five time zones. To account for the large differences in sunrises and sunsets without different time zones, western Chinese start their work days at 12:00 and continue til 20:00 (Xudong Gao, personal communication, 26 May, 2001).

<sup>5</sup> In this sense, it is closer to Reisman *et al.*'s (1977) role-oriented use of configuration.

<sup>6</sup> Reisman *et al.* (1977) addressed the configuration of team members, but did so in regard to the proportion of anesthesiologists and anesthesiologists' assistants; i.e., they dealt with the configuration of roles in an a-spatial sense. Hutchins (1991) also addressed "configuration" in the context of teams, but he was referring to the configuration of tasks in the context of a team's work. Ancona and Caldwell (1992a, p.325) discuss teams' configurations as well, but do so in terms of the composition of "skills, abilities, information, contacts, and knowledge."

<sup>7</sup> At the individual level of analysis, Scott & Timmerman (1999:245) control for "degree of virtuality," which they define as the percent of one's work week spent away from the main office, but do so in the context of "teleworkers." Kurland & Bailey (1999) also describe a variety of virtual work arrangements, but again do so primarily in the context of individual teleworkers.

<sup>8</sup> Note that the phrase "concocted" is relatively common in teams research, which actually uses it as part of taxonomy of group types (Arrow *et al.*, 2001). I use it here for that reason, recognizing that it may strike some as odd. Armstrong & Cole (2002, p.187) offer an alternative – "created entity" – that captures the same idea, but is slightly less "chemical" sounding.

<sup>9</sup> The average travel time between sites could be used instead of or in addition to distance in miles. Such an index would combine a sense of space, transportation technology, and time.

<sup>10</sup> Note that redundant connections are not included in the calculation (e.g., three hours is included only once for the potential connection of team members  $K_1$  and  $L_1$ ; not also for the  $L_1K_1$  connection in the matrix). However, same-site connections are because the denominator accounts for all non-redundant connections by including the co-located connections.

<sup>11</sup> Wiesenfeld et al. (1998) used a measure that they called “virtual status,” defined as the number of days spent in the office, at home, or in “mobile mode.” They argued that “working in any of [the other two] virtual states implies lack of face-to-face meetings and other organizational cues that may be available in the office.” Higher scores indicated more days in the office and lower “virtual status.” This misses the critical shared time element of shared work hours, but it may capture some important elements of contact with people outside the team.

<sup>12</sup> While using a workday of common length across sites is necessary for calculating the SWH, it does mask international variations in the duration and start/end time of work days. For small samples of teams, a different length work day could be set for each site.

<sup>13</sup> Time zones begin with 0 for Greenwich Mean Time and run east around the globe to 24. Note that many renditions of the Universal Time Code system use + and - values of 0 to 12, where UTCs of -1, -2, -3, etc. correspond to UTCs of 24, 23, 22, etc. in the 0-24 scheme that we employ. For example, in our use of the UTCs, New York has a UTC of 19; in the +/- 0-12 UTC scheme, New York has a UTC of -5 (indicating that it is 5 hours behind Greenwich Mean Time).

<sup>14</sup> As Depicker (1999, pp.101-3) show, another level of detail in the spatial-temporal description of work includes the percentage of time people spend at different locations, not just the percentage of time that they spend apart from their team members. While focused on tele-commuters and not specifically team members, their data include the percent of time spent in different locations (i.e., home, main office, satellite office, customer site, in transit, other) by job category (i.e., manager, engineer, sales, services).

<sup>15</sup> Team members’ coordinates were derived using ZipFind, government publications, and various other resources. Time zones were obtained manually from official time zone maps. For domestic sites, the zip codes were converted to coordinates using a software program called ZipFind, which also derived the time zones and calculated the distances between every pair of team members located in the U.S. For international locations (approximately 35% of the sample), where zip codes are not relevant, central coordinates for the building’s city were used.

<sup>16</sup> Great Circle distance between any two sites =  $\text{RadiusEarth} * \text{ACOS}(\text{COS}(\text{RADIANS}(90-\text{Lat1})) * \text{COS}(\text{RADIANS}(90-\text{Lat2})) + \text{SIN}(\text{RADIANS}(90-\text{Lat1})) * \text{SIN}(\text{RADIANS}(90-\text{Lat2})) * \text{COS}(\text{RADIANS}(\text{Long1} - \text{Long2})))$ , where RadiusEarth equals 3,963 miles or 6,377 kilometers, and Lat1, Long1, Lat2, Long2 refer to the *decimal* coordinates of the two sites.

<sup>17</sup> Note that the correlation of self-reported distances between pairs in all dyads was .37. While this is somewhat low, the differences were not large (across 5,573 pairwise combinations, the mean difference was less than .01) and do distinguish well between frequent and infrequent communicators. Furthermore, and of particular interest, the (dis)agreement between pairs was not related to the miles separating them, their reported personal closeness, or their knowledge of each other. In other words, distant pairs were no more likely to disagree about how often they communicated.

<sup>18</sup> Note that all individuals in the same site were initially coded as having zero miles between them for the Separation Index. Because there is actually some distance between them, and because transformations with a Separation Index of zero are problematic, we re-coded all individuals in the same site as having .01 miles between them. For more careful assessments of distances within sites, the seven-item measure used by Cummings (2001) is more appropriate, but the .01 distance is adequate for comparisons with individuals separated by large distances.

<sup>19</sup> The Role Index could also be calculated using distance in miles, but the seven-item measure seemed more appropriate for these exploratory tests because relatively small distances to the team leader (e.g., same floor or same hallway) may make an important difference. In contrast, it is not relevant to talk in terms of being on the “same hallway” as headquarters, so we used miles to calculate the External Index.

<sup>20</sup> Since Imbalanced teams tend to have large clusters of co-located members, there is a positive correlation between it and communication. As noted earlier, the Imbalance Index does not fall easily on the intuitive continuum from dispersed to co-located in the way the other dispersion measures do.

<sup>21</sup> Teams below the median in distance to headquarters (1,182 miles), had Separation Indices twice as large as teams above the median in distance to headquarters (421 vs. 200 miles).

<sup>22</sup> Diversity of age, sex, years with the firm, and years in the industry were all analyzed using the coefficient of variation (i.e., the standard deviation divided by the mean) for each team. Diversity in the number of reporting managers and functional areas was analyzed using what has come to be known as the Teachman Index. This approach has been used widely by team and demography researchers (e.g., Ancona & Caldwell, 1992a, pp.327-8; Pfeffer & O'Reilly, 1987) for categorical data such as functional areas.

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## CHAPTER 4

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### GOING VIRTUAL: THE “ALLEVUS” INTERNAL CONSULTING PROGRAM’S EXPERIMENT WITH INCREASINGLY DISPERSED TEAMS

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While the bulk of CMC research focuses on the dichotomy of FTF vs. distributed work, ... groups that meet FTF as well as virtually seem to predominate in organizations. (Griffith & Neale, 2001)

In collecting and annotating the literature about G[eographically] D[ispersed] T[eam]s, we have found that much of the current research looks only at the ends of the continuum, at teams that meet face-to-face or at teams that are completely dispersed ... [Naturally occurring work] teams are rarely completely co-located or completely dispersed. Usually, they exist somewhere between these two situations. Likewise, GDT members rarely meet in a purely dispersed fashion; they often meet face-to-face at the beginning of the project or over the course of the project. Sometimes a few members may work in the same location, but the team itself is still considered a GDT. (Sessa et al., 1999, p.8)

Distance among members of a distributed group is multidimensional ... [and] ... The impact of such distances on the performance of distributed work is not directly proportional to objective measures of distance. (Armstrong & Cole, 1995)

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## 4.1 Introduction

With the previous chapter addressing the static dimensions of geographic dispersion and their relationship to communication across a large sample of teams, this chapter looks at one organization's shift to doing its work in more highly dispersed teams. It also addresses changes in the dispersion *within* a single team.

As the first epigram reminds us, “groups that meet FTF *as well as virtually* seem to predominate in organizations” (Griffith & Neale, 2001, emphasis added). Teams' work is rarely all FTF or all dispersed; most teams employ some hybrid of the two (Sessa *et al.*, 1999). And, with exceptions like the HBC, most organizations do not set out with geographically dispersed teams as their chosen model for getting work done. Rather, they start out working in more traditional FTF teams and, because of mergers, environmental pressure, or any number of other reasons, they shift some of their work to geographically dispersed teams. Such is the case for Allevus\*, a large, national, non-profit humanitarian organization.

Using a comparative case study approach, I follow the life history of two teams that are part of Allevus's Internal Consulting Program (ICP), which helps improve the operations of Allevus's individual chapters. Chapters are Allevus's fundamental organizing unit, providing services to areas typically defined by a city, county, or several counties.<sup>1</sup> The ICP's primary activities are its “ICP studies,” which convene a team of subject area experts from around the country to review a given chapter's operations and make recommendations for improvement in various areas (or “modules”) of the chapter's operations (e.g., Governance, Volunteer Management, Human Resources, Technology, and Community Image).

Both teams profiled here used a mixture of FTF and dispersed work, but the balance and timing differed. The “Proxima” team followed ICP's typical model, which included 1) a series of conference calls to launch the team; followed by 2) all members spending one week on-site at the subject chapter, conducting interviews and meeting as a team each night to discuss their findings and outline their recommendations; and concluding with 3) members revising and finishing their work at a distance from their home chapters. As a “typical” ICP team, Proxima serves as a representative example of seven other teams that I followed over the course of 15 months. In contrast, the “DiStar” team members did much of their work at a distance from each other, and the chapter they studied was itself widely dispersed, serving the entire population of a large, rural western state. Like Proxima, DiStar was launched with a series of conference calls and members of the team spent one week in the DiStar service area interviewing the chapter's staff and constituents, gathering other data, and drafting their individual sections of the final report. However, the team members began their work “on site” working in isolation or in two small sub-groups. They met FTF as a full team only twice, and then only at the end of the week. The DiStar team is the first example of ICP's attempt to employ a more “virtual” model for its teams and, thus, serve more small, more rural, and/or more geographically dispersed chapters without co-locating a team of experts for an entire week. The dispersion of DiStar team members was driven by the dispersion of the chapter itself. For other ICP studies of small, less strategically important chapters (for which ICP cannot justify the cost of co-locating a team of experts), ICP has been

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\* “Allevus” is a pseudonym. While Allevus has allowed me to identify it in future work, the people described in this chapter participated in my research under the assumption that their identities would be kept confidential. In recognition of that commitment and the generous access and candor that they provided, all references to Allevus's units, teams, team members, staff, and affiliated individuals and organizations are pseudonyms.

contemplating an even more dispersed approach – in which all or most of the interviewing and data collection is done at a distance by team members who do no travel at all.

Given this setting and the state of research on geographically dispersed teams, my comparison of these two teams addresses three questions, and the relationships among them:

1. Timing and Interaction – How and to what extent did the team’s geographic dispersion affect the timing and nature of team members’ interactions?
2. Boundaries and Identity – How did the teams’ different spatial-temporal distance and configuration affect their conceptions of themselves as distinct, bounded teams?
3. Effectiveness – How and to what extent did differences in the two teams’ dispersion affect their final product, growth as a group, and individual learning?

Before turning to the methods and data for this study, the next section presents the related research and theoretical background on each of these questions as they relate to dispersed teams.

#### **4.1.1 Timing and Interaction**

Calls for attention to time and timing in work groups are not new. McGrath wrote about this issue nearly 20 years ago (McGrath & Rotchford, 1983) and it has continued to occupy a prominent place in his research (e.g., McGrath, 1990, 1991, 1993) and that of his colleagues (e.g., Arrow & McGrath, 1993; Arrow *et al.*, 2001; Hollingshead *et al.*, 1993). In addition, there are now multiple streams of research dealing with distinct elements of time and timing in groups (not to the mention individual and organizational levels).<sup>2</sup> The recent special issue of the *Academy of Management Review* (Ancona *et al.*, 2001a; Ancona *et al.*, 2001b) and associated theme of the 2000 Academy of Management Annual Meeting are only two prominent indications of the importance being placed on time in organizations. Of particular relevance to this chapter is the longitudinal work done by McGrath and colleagues on computer-mediated groups (much of which is summarized in McGrath & Hollingshead, 1994), the work by Walther, examining time and its interaction effects with a wide variety of other variables in computer-mediated contexts (summarized in Walther, 2002), the field research of Maznevski and Chudoba (2000), and the studies by Jarvenpaa and colleagues which have dealt with issues such as “swift trust” in dispersed teams (e.g., Jarvenpaa & Leidner, 1999).

Despite this new work, a recent review of the literature still concluded that “Few have specified theoretically what the effects of time might be when groups use communication technology” and “Little evidence about temporal dynamics in electronic groups exist” (Walther, 2002, p.235). To the extent that there is still much work to be done on temporal dynamics of “electronic groups,” there is even more to be done on groups that are hybrids – i.e., that use a combination of dispersed and FTF work. While one could argue that one must understand the “pure types” before addressing mixed or hybrid forms, those hybrids appear to be much more prevalent (Griffith & Neale, 2001; Sessa *et al.*, 1999).<sup>3</sup>

Although there is a dearth of related research, there are several aspects of timing and team interaction on which there is strong conventional wisdom (e.g., see popular press books such as Duarte & Snyder, 1999; Lipnack & Stamps, 1997), which is occasionally supported by academic research. Dispersed teams’ generally slower development (Armstrong & Cole, 2002), if not their ability to “catch up” to FTF teams (Walther, 2002), is widely noted. The corollary to that “they just take longer” wisdom is the “but getting together FTF first helps” wisdom. While initial FTF interaction may well grease the relational skids of teamwork, there is an increasing

amount of evidence suggesting that there are benefits (or at least no performance losses) from initial interactions at a distance (Orlikowski *et al.*, 2001; Zheng, 2001), and that teams are capable of developing (or “importing”<sup>4</sup>) trust surprisingly quickly (Jarvenpaa & Leidner, 1999; Meyerson *et al.*, 1996). Given the research that has (and has not) been done specifically addressing the timing of interactions in dispersed teams, there were four aspects of the ICP setting that presented an especially intriguing setting in which to study temporal dynamics.

First, the traditional ICP teams appear to invert the conventional wisdom on how “good” dispersed teams should structure their work (i.e., start FTF, go off and conduct work at a distance, and then re-convene to knit that work together). In contrast, they start at a distance, then spend a week with evening FTF meetings and other incidental FTF contact, leaving their final “knitting” to be done at a distance. Given the generally problematic nature of group writing, the idea that this final writing and revision be done at a distance is quite reasonable. However, that dispersed teams can consistently perform well (as the ICP’s customer satisfaction data indicate they do) without an initial FTF meeting is noteworthy. Second, the ICP teams are “novel” – at least in regard to those teams that have been studied so far – in that they are a hybrid of dispersed and FTF. Third, as a humanitarian aid organization, Allevus has developed a culture that supports high levels of performance by functionally diverse professionals who are drawn together from a wide geographic area in emergency situations. I expected this culture might yield additional insights about the role of short-term teams in general, and their initial interactions in particular. Fourth, because Allevus was planning to adopt a more dispersed model for its ICP studies, there was the potential for a natural experiment, or at least a useful comparison.

#### **4.1.2 Boundaries and Identity**

To work well together, team members need to know who they are. (Hackman, 2002, p.44)

Any given [dispersed] team member was likely to disagree with the rest of his or her team on one-quarter of potential team members ... This finding is [especially] startling when one considers that the lack of agreement occurred despite strong priming in the form of an official list of team members (Mortensen & Hinds, 2002)

Taken together, Hackman’s statement and the disagreement levels found by Mortensen & Hinds would seem to bode ill for a good fraction of the 24 dispersed product development teams that they studied. Mortensen & Hinds (2002) found that team members were much more likely to omit distant colleagues from their lists of team members. They attribute this to an apparent “out of sight, out of mind” problem, and then link boundary disagreement to lower perceived performance and transactive memory. While a small sample and the post-hoc nature of their analyses<sup>5</sup> limited Mortensen & Hinds’ (2002) ability to understand the links between boundary agreement, performance, dispersion, interdependence, etc., their results are provocative and call a number of widely held assumptions into questions.

First, traditional definitions of teams generally include a criterion that members agree on who, in fact, is on the team. Recent research on more permeable team boundaries (Ancona *et al.*, 2002) and membership change (Arrow & McGrath, 1993), combined with a sense that dispersed teams typically have more fluid membership, should raise our awareness about the potential importance of boundary (dis)agreement. Tests of within group agreement are frequently used to justify aggregation of data to the group level. As more work is done with dispersed teams, we need to be increasingly alert to low levels of within group agreement. These “disagreements”

may turn out to be relevant independent variables unto themselves, as Mortensen & Hinds (2002) found. Their findings also lend support to Arrow et al.'s (2001, p.34) definition of groups as:

Open and complex systems that interact with the smaller systems (i.e., the members) embedded within them and the larger systems (e.g., organizations) within which they are embedded. Groups have fuzzy boundaries that both distinguish them from and connect them to their members and their embedding contexts.

Just as the previous chapter advocated a continuous view of dispersion (rather than a “dispersed” vs. FTF dichotomous one), Arrow et al. go on to establish six criteria of “groupiness” and note that these are “not an exhaustive set” and “should be viewed as continua rather than dichotomies” (p.35). A given set of individuals (i.e., a “putative group”) may be more or less “groupy” and that groupiness may have both positive and negative consequences.

Even though the performance-boundary agreement relationship found by Mortensen & Hinds was low, there were stronger connections between boundary agreement and more intermediate variables (e.g., transactive memory). Given the importance placed on establishing team boundaries (Hackman, 2002) and working across them (Ancona *et al.*, 2002; Ancona & Caldwell, 1992), the fact that teams may not know “who’s in and who’s out” is potentially problematic. It represents an initial failure to effectively bound a team, a probable predictor of ineffectiveness, and a hurdle for critical boundary-crossing work.<sup>6</sup> Thus, I approached the ICP data with an eye toward issues of boundary definition and team identity.

### 4.1.3 Effectiveness

There are now extensive reviews of research on group and decision support systems (e.g., Baltes *et al.*, 2002; Carey & Kacmar, 1997; Hammond *et al.*, 2001), and on the use of computer-mediated communication more generally (Maznevski & Chudoba, 2000; Scott, 1999), but the majority of these studies have not been in the field with teams in real organizational contexts. Typically, they have also dealt with specific processes, which may or may not be strongly connected to team effectiveness – e.g., brainstorming (Barki & Pinsonneault, 2001) – and with individual use of various media. Furthermore, their findings have generally been equivocal, spawning a large literature and several interesting theories,<sup>7</sup> as well as some intriguing attempts to adjudicate among them. At the end of the day, however, findings regarding the effectiveness of geographically dispersed teams are few and far between (Govindarajan & Gupta, 2001).<sup>8</sup>

Given the dearth of work on dispersed team effectiveness, it seems an opportune time to consider the definition of effectiveness itself. Major models of team effectiveness (e.g., Gladstein, 1984; Goodman, 1986; Hackman, 1983) all include multiple criteria for judging effectiveness such as task output, growth as a group, and individual learning. However, “effectiveness” is most commonly equated with quality of task output in terms of cost, quality, and timeliness or, when it is judged on multiple criteria, the results are collapsed onto a single variable (e.g., Lemieux-Charles *et al.*, 2002). Although Hackman (1990; 2002) and others have noted that such criteria carry different relative weights, I am aware of only one study that has explicitly looked at the relationships and tradeoffs among them. In describing their own experience as business school professors, Druskat & Kayes (2000) captured what is undoubtedly the experience of many other teachers who have used the infamous “group project” – i.e., that the best performing teams are often among the worst in terms of team process and learning; that they privilege short-term task accomplishment over longer-term learning or growth as a team.

Given the attention already paid to specific task accomplishment (e.g., making a decision, generating a list of alternatives, etc.) and more relational and individual variables (e.g., identification and commitment), it seems appropriate to consider the Druskat-Kayes question in a dispersed context. Dispersion may differentially help or hinder teams on the three effectiveness criteria, but exactly what those differences are has not been studied. Thus, this chapter poses as its third basic question: How and to what extent did differences in the DiStar and Proxima teams' dispersion affect their final product, growth as a group, and individual learning?

After a summary of the methods and data that I used, this chapter turns to an overview of the typical ICP study with the Proxima team as a representative case. I then present the forces pushing ICP toward a more dispersed version of its studies, and introduce the DiStar team as the first example of this more dispersed model. The DiStar case focuses on three key ways in which its story differed from the Proxima one – i.e., timing, team boundaries, and effectiveness.

## 4.2 Methods and Data

This study employs the comparative case study approach described by Arrow, McGrath & Berdahl (2001) as one of the three most promising strategies for understanding groups as complex systems. There are few group-level comparative case studies on which to draw (Hackman, 1990, being the primary exception), but the case study method has been used and described extensively (Eisenhardt, 1989; Yin, 1984). By adopting it, I hope to complement the larger-sample findings of Chapter 3 and the longer-range historical findings of Chapter 2.

I elaborate on the nature of the two teams' work in the sections that follow, but in brief, they offer the opportunity to compare two teams from the same unit over the course of their natural "life" cycles (i.e., project launch to completion) doing ostensibly the same task with similar training and experience levels, but with considerable variation in the teams' dispersion. As such, this study has many of the advantages that Arrow, McGrath & Berdahl (2001, pp.267-8, 279-80) highlight, including a high degree of contextual realism, and the ability to understand groups' dynamics over time, beginning with their initial conditions and history.

The chapter focuses on two teams<sup>9</sup> drawn from a larger study of ICP teams, which began in late February 2001. In April 2001, Anita Woolley, a doctoral candidate at Harvard University, and I conducted 12 exploratory interviews with ICP staff and team members to understand the nature and history of Allevus and the ICP.<sup>10</sup> Subsequent data collection included three main components for studying a series of nine ICP teams as they were launched and conducted their work between April 2001 and June 2002<sup>11</sup>:

- Listening to and recording each ICP teams' tele-conference calls (usually three per team, two before the site visit and one after, ranging from 30-90 minutes long);
- Going on-site with some teams to observe their meetings, dinners, and interviews, and listening to recordings of other teams' meetings;<sup>12</sup> and,
- Interviewing team members after they had finished their final reports.<sup>13</sup>

The chapter draws on these data, ICP documents, and informal interactions with ICP staff.<sup>14</sup>

I chose to profile the DiStar team because it is ICP's first attempt to operate with a more fully dispersed study team. I chose the Proxima team as the comparison case for several reasons. First, Proxima shared several key features with the DiStar team, which provided some natural "control" and allowed me to focus more closely on differences in the team's dispersion. The ICP program officer was the same for both DiStar and Proxima, as was the senior volunteer member

of the team. DiStar and Proxima teams also covered a similar number of modules (nine and seven, respectively) and were not drastically different in size (seven vs. five members). Proxima and DiStar were conducted within the same fiscal year, minimizing differences due to overall changes in ICP budgets, policies, and procedures. Proxima was also a team that did not include any newly piloted changes to the typical ICP team approach. Second, because I could not observe the DiStar team's activities in person, I chose another team whose activities I was also unable to observe in person. Although this reduced the amount of information that I had on the teams, it meant that I was drawing on comparable sources of data for both DiStar and Proxima – i.e., recordings of team calls, meetings, and interviews. Third, by focusing on a case taken from the middle to latter end of my data collection, I hoped that any researcher-subject effects would have stabilized to some extent. Any interaction between researcher and subject – no matter when in the course of data collection – is likely to produce some effect on the subjects' behavior. Nonetheless, I hoped that the nature of those effects stabilized some by the time of the Proxima team, especially since I had worked with the PO and volunteer team leader on previous ICP studies. While I did not actually participate in any of the teams' work, I did my best to be an unobtrusive observer – to be silent during meetings, but friendly enough between them and at team dinners to gain members' trust. In his introductory comments on the Proxima team's first tele-conference, Roger, the team leader, indicated that I was fairly successful at this:

I want to say 'Hello' to Michael [O'Leary] and Anita [Woolley] again. I enjoyed working with both of you [on my last ICP team] and I can tell the rest of the team that even though they were observing the team, after a while they became part of our team and we'll look forward to that with both of you [this time too].

Although this type of welcome reflected Roger's statesmanlike qualities more than our actual participation in the teams' work (which was limited to hanging the occasional flip chart on a conference room wall), it did indicate that we were generally unobtrusive.

All conference calls, meetings, and follow-up interviews were recorded and transcribed.<sup>15</sup> For the Proxima team, these included the two pre-site conference calls and three nights of team meetings. As with all ICP teams, Proxima also had one tele-conference call after the site visit. For the DiStar team, the recordings included an initial launch call on September 5, 2001, after which the study was postponed; a "re-launch" launch call in March 2002; the standard "second" pre-site visit call; evening conference calls on Monday and Tuesday during the week when team members were in DiStar's region (but not co-located at the chapter headquarters); and evening FTF meetings on Wednesday and Thursday, once the team finally convened at the DiStar headquarters. The typical post-site call was scheduled for the DiStar team, but only two team members had the correct number, so the call was cut short. Thus, the recordings number six for Proxima and seven for DiStar, although their timing and nature were slightly different.

In addition, I had access to the draft and final versions of the teams' reports, and to a wide variety of team and ICP documentation including ICP newsletters, annual reports, and other program descriptions; the ICP team member training handbook and orientation materials; and miscellaneous other team- and program-level documentation. I was also included on the distribution list for team e-mail correspondence. Team members rarely corresponded directly with each other, but the ICP staff member who managed each team (i.e., the "program officer" or PO) sent an average of 4-6 messages to the team over the course of each study.<sup>16</sup> These messages included one to launch the team and announce the first conference call, plus additional ones to announce the other conference calls and update the team on travel plans and the final report.



There was also e-mail and telephone contact between the PO and individual team members. Before the teams' site visits, this one-on-one communication was generally to assist with travel plans and interview scheduling, and to ensure that members received all the appropriate advance materials (e.g., chapter documentation binder). After the site visits, one-on-one communication was generally focused on editing individual members' sections of the final report. In general, no team member had more than half a dozen one-on-one contacts with the PO, and many team members had only one or two such contacts.

While I had access to a large percentage of teams' interactions, there were several key aspects of their work to which I was not directly privy. First, I was not included in the one-on-one calls and e-mails between the PO (and/or ICP director) and the CEOs of chapters contemplating an ICP study. Such interactions helped scope and bound every new ICP study, and ensured that the timing was right for the subject chapter.<sup>17</sup> Although I was not able to collect data on these calls, I discussed them with the POs shortly after they happened. Second, I did not have access to the one-on-one calls and e-mails to identify and recruit new ICP team members. However, I did interview the ICP staff member responsible and, thus, was able to discuss the recruiting process and strategies for composing the teams. Third, I was not able to observe or record all of the unplanned interactions between team members. Even when I observed a team on-site, I was generally not present at the chapter offices during the day and, thus, missed brief interactions among team members as they took breaks between interviews. However, when I observed teams in person, I would drive with team members to and from dinner and join them for meals. On occasion, I also shared a car with team members going to and from the airport at the beginning and end of the week on-site. These unplanned, unstructured interactions allowed me to gain the trust of team members and the POs, to interact with them on a more informal basis, and to observe them interacting in a more casual setting than the team meetings.

Despite missing some elements of ICP teams' interactions, I was able to observe and/or record a large percentage of their FTF and dispersed work. Importantly, I was also able to follow teams from the e-mail announcing their formation to the delivery of their final product. This level and duration of access provide an especially valuable window onto the work of seven teams that were partially dispersed and two that were mostly dispersed. While not an ethnography, the study shares important characteristics of one – i.e., following a group through the duration of its full natural lifecycle, observing its interactions in situ (whether in situ meant FTF meetings or tele-conferences and e-mails, or both), and relying on key informants. For this chapter, those “informants” included the PO and team leader, who served on both of the teams profiled here, as well as on four others that I studied. While sharing these valuable elements with the ethnographic tradition, the study also includes some elements of a naturally occurring experiment. Because the ICP was pilot testing a more dispersed approach to its studies but left other aspects of its work unchanged, I was able to compare two teams that were ostensibly quite similar on all but one aspect – i.e., their geographic dispersion.

After actually dialing into and recording the conference calls, my analysis of these data and the interviews began with an initial reading of the transcripts from beginning to end. I then read them a second time to identify recurring or distinguishing themes, and abstracted key passages regarding those themes. My initial list of themes included those described in the previous section (e.g., timing and performance), as well as others that recurred in the data but were not on my initial list (e.g., PO and leader behaviors, and isolation). A third reading of the transcripts helped find additional passages that might augment (or call into question) those that I had already abstracted. A return to the program's documentation (e.g., team member handbook)

which I had initially read 12 months before the DiStar team's work and subsequent analysis helped contextualize (or re-contextualize) my understanding of the data. For example, it reminded me of the potential importance of the PO's considerable record of ICP studies and the role of the DiStar team's aborted launch just prior to the September 11<sup>th</sup> tragedies. As I did these second and third readings<sup>18</sup>, I iterated back and forth between the data and what I thought might be relevant theory or prior research. This iteration, and use of what Klein & Myers (1999) call dialogical reasoning, proved especially valuable in several cases. For example, my understanding of time and timing in the teams' work evolved considerably over the course of the analysis. Initial field notes and drafts described the DiStar team in relatively unequivocal terms as the more dispersed team. As the subsequent sections of this chapter show, that "more dispersed" designation proved to be both problematic and intriguing. Also, as I describe in the following sections, my initial impression that the ICP teams essentially "inverted" the widely prescribed FTF-dispersed-FTF sequence for virtual team work also changed considerably, as I more closely considered the theoretical work regarding enacted temporal structures (Orlikowski & Yates, 2002, forthcoming). This work helped illuminate ways in which beliefs and expectations regarding the role of initial interactions (especially FTF ones) can become constraining. This iterative, inductive approach is consistent with the suggested principles for interpretative case study research (Klein & Myers, 1999) and the suggested approach for case study research in general (Eisenhardt, 1989; Miles & Huberman, 1984; Yin, 1984). Among the principles outlined by Klein & Myers (1999), I have already noted the importance of contextualization and dialogical reasoning. As will become clear in my discussion of the DiStar data, I also benefited from their "principle of suspicion" as it related to members' characterizations of how much FTF time they had together. This principle encouraged me to maintain a healthy suspicion or skepticism as I read and re-read the call, meeting, and interview transcripts.

### **4.3 The ICP Program, Typical ICP Team Approach, and "Proxima" Team Case**

The ICP program emerged in 1996 with a series of pilot studies of metropolitan chapters. Internal audits and "operations reviews" had been done before that, but they were generally done when there were signs of financial or other improprieties at a chapter, or when a chapter was unable to meet its financial obligations to the national organization. Operations reviews were evaluative rather than enriching, and had no provisions for sharing lessons learned from one review to the next. ICP studies, on the other hand, were designed to be more supportive, enriching opportunities for chapters that were healthy enough to make use of an ICP team's recommendations. For its first few years, the ICP had to be especially careful to distinguish its studies from audits and operations reviews, which invariably put subject chapters on edge and had a much more sanctions-oriented connotation.

The first ICP studies focused on financial operations, but quickly expanded to include a wider range of operational and service delivery issues (i.e., both back and front office). Over the course of the first few ICP studies, the final reports increased in length, breadth, complexity, and consistency. They shifted from a long memo or letter to the subject chapter's chief executive, to the current multi-module format, complete with analyses of operational benchmarks, the ICP team's findings, and a series of phased recommendations spread out over three months to three years. The final product and work of the ICP teams shares some aspects with both for-profit consulting teams as well as academic accreditation teams, well known to most department chairs and university presidents (Kells, 1979). In contrast to accreditation teams, however, ICP teams are much less evaluative in nature, with no sanctioning or enforcement authority.

As the ICP studies became broader and more detailed, the ICP staff grew to include three full-time POs and two administrative staff to help with ICP team logistics. Training for ICP team members evolved from an unscripted one-on-one discussion with the ICP director to a formal, annual orientation program, complete with exercises and practice modules. The size and duration of ICP studies also grew, encompassing more modules and, thus, requiring more subject matter experts on each team. To support these larger teams, the ICP staff created and refined a series of interview protocols and templates for benchmarking, presentations to the chapter, and the final reports. By March 1999, the current modules, supporting materials, and training program were largely in place, but the ICP has a strong culture of continuous improvement and frequently updates and refines the materials. The most recent additions include MS Word templates containing the outline and subject headers for each section of the final report.

Between its founding in 1996 and the end of fiscal year 1999, ICP conducted approximately a dozen studies. In FY 2000 and each year since, it has conducted approximately a dozen studies per year. The ICP teams now include an average of four to five members plus the PO, but some are as large as eight members. Typically, the studies focus on six to ten modules, with some team members responsible for two modules. For example, the Financial Development (i.e., fundraising) and Community Image modules are typically done by the same person, as are the Financial Management and Use of Technology modules.

With the exception of the PO, ICP team members work without direct compensation as a service to the subject chapters and the organization as a whole. When Allevus employees work on ICP studies, they have to arrange with their home chapter to ensure that their normal duties are covered for the week that they devote to the study. In addition to providing a service to other chapters and to Allevus as a whole, ICP team members describe their service on the teams as a way to: 1) learn from and about other chapters in ways that enhance their home chapter's operations, and 2) enhance their resumes and broaden their exposure within the organization.<sup>19</sup>

By e-mail and phone, the PO and ICP Director generally work with the subject chapter's CEO to define the study's scope, obtain commitments from the chapter to provide logistical support for the ICP team while it is on site, and recruit individual team members. A key part of defining the scope is deciding which modules the team will cover (Figure 4.1).

Figure 4.1: Sample of Potential Modules Covered by ICP Teams<sup>20</sup>

• Volunteer Management	• International Services
• Chapter Governance	• Financial Management
• Community Services	• Use of Technology
• Human Resources	• Financial Development
• Facilities Management	• Community Image

Over the years, ICP has developed various templates for each of these modules and created associated training materials for new ICP team members. ICP studies can include as many as 14 modules, but the ICP staff and director have increasingly sought to focus studies on the 5-8 modules of greatest importance or concern to the chapter. This was the case with Proxima, which included seven modules, and DiStar, which included nine.

The "Proxima" team followed the typical model for ICP teams, and is presented here as representative of them. As shown in Figure 4.2, it was slightly below average in size and slightly above average in terms of the number of modules it covered, but the ranges of teams' size and modules were relatively narrow. Proxima included four subject matter experts from around the

country, was managed by a PO employed full-time by the ICP, and was led (nominally) by a volunteer member of the team.<sup>21</sup> Two members were full-time director-level staff from Allevus chapters and one was a regional program manager at Allevus’s national headquarters.

Figure 4.2: Summary of ICP Teams Studied – Typical and “More Dispersed” (shaded)

Team Name	Members, PO and Leader Names, and Modules	Comments
Sunshine*†^	6, Mary and Roger, 8	All teams (including shaded ones) had two conference calls prior to arrival “on site” at their subject chapter and one call after they left the chapter. Except as noted, teams all had Monday morning meetings plus evening meetings Monday to Thursday.
Nova*†	8, Judy and Valerie, 10	
Plains*	7, Mary and Cal, 6	
Heartland†	5, Mary and Gary, 10	
River*	6, Judy and Walt, 7	
Proxima^	5, Judy and Roger, 9	
Seaside	8, Judy and Terry, 8	
DiStar	7, Judy and Roger, 6	Conf. calls on Mon. and Tues; FTFs on Weds. and Thursday
Moto^	9, James and None, 1	Moto was widely dispersed (only one FTF on Thursday), but had a considerably different task: “I almost didn’t consider it an ICP quite frankly,” James the PO said in follow-up interview.
n= 9 teams	Averages** = 6.8, 8	Total of 26 interviews <sup>22</sup> , 20 days on site <sup>23</sup> , 26 calls, 31 FTFs

\* O’Leary on site with team; †Woolley on site \*\* Not including Moto team ^ No formal Monday morning meeting

Once the Proxima study’s scope was defined and the team members were identified and recruited, the team was launched with two tele-conference calls including “Judy” the PO, four team members, and the CEO of the Proxima chapter. On the first call, Judy introduced the study, team members introduced themselves, and Proxima’s CEO described the chapter and his goals for the study. The team also made initial logistical decisions regarding the site visit.

After the first call, team members received a large binder of background material about the chapter. This material included the chapter’s annual reports, board meeting minutes, operational statistics, organization chart, etc. Judy also used Allevus’s national database to generate reports comparing Proxima to other chapters of its size on key performance indicators (e.g., fundraising, service levels, etc.).

The second team call was held one week before the site visit and included three primary agenda items: 1) a “report-out” by each team member, providing initial impressions of his/her module based on the binder and benchmarking data; 2) a review of the on-site interview schedules with some requests for additions and changes to the list of interviewees; and, 3) additional logistical discussions about flights, hotels, cars, and arrangements for the team’s first on-site meeting. This was the last team interaction before they arrived on site.

During the day Sunday, team members arrived in the city where Proxima is headquartered and they checked into the same hotel. A few members who arrived early enough met for an informal dinner. On other teams, the PO and team leader are often the first to arrive and most likely to have dinner together, but other members often join them too. As is true with most ICP teams, the full Proxima team did not get together until Monday morning, when they had approximately one hour to meet and prepare for a meeting with the subject chapter’s staff.<sup>24</sup> At the staff meeting, Proxima’s CEO introduced the team and described the objectives for the ICP study. Then, Judy gave a brief overview of the ICP process, team members introduced themselves, and they all entertained questions from the staff. After the staff meeting, they had a team lunch and then spent the remainder of the day conducting one-on-one interviews with chapter staff and members of the community.<sup>25</sup>

Mondays generally conclude with a team meeting and dinner. These meetings typically last 90-120 minutes and include a general review of the day's activities, discussion of any logistical difficulties or scheduling problems, a report from each team member on their initial impressions based on the day's interviews, and confirmation of everyone's interview schedules for Tuesday. After the meeting, team members eat together at a nearby restaurant and then retire to their hotel rooms to check in on their home chapter's operations and write up notes from the day's interviews. The Proxima team diverged from this routine somewhat because the chapter invited them to attend a baseball game at which the chapter provided first aid services. As a result, the team spent Monday evening at the ballpark. Both in advance and in retrospect, Judy and the team were not pleased with the altered schedule, saying that attending the game may have been important in terms of relations with the chapter, but was unfortunate for the team – delaying its first real meeting until Tuesday evening.

Tuesday and Wednesday were full days, with each member interviewing as many as 10 staff and/or community members between 8:00 a.m. and 6:00 p.m. They did not have a team lunch on either day, but did have a team meeting and dinner both evenings. Following a long day of interviews, the Tuesday evening meeting included relatively detailed reports on members' evolving impressions of the subject chapter's major issues, as well as an initial SWOT<sup>26</sup> discussion. By Tuesday evening, team members had a larger basis on which to develop impressions and initial conclusions, so the meeting was longer and more substantive than Monday's. This is typically the pattern for ICP teams' Monday and Tuesday meetings. For Proxima and other teams, the Wednesday meeting was longer still, with food brought into the hotel conference room so the team could work through dinner to refine its conclusions and discuss its recommendations. Judy facilitated these discussions and captured their key points on a flip chart. She spent her days ensuring that the interview schedules ran smoothly, obtaining additional data requested by team members, sitting in on 1-2 interviews with each team member, and preparing for the evening meetings.

By Thursday, team members had completed most of their 60 scheduled interviews, and devoted the morning to conducting a few added interviews, making follow-up calls, reviewing newly collected data, and drafting their "module." Thursday afternoon, the team met and prepared a rough draft of the slides that they would use to brief the chapter's CEO and board on Friday morning. This briefing always focuses on "low hanging fruit" – i.e., changes that can be made in 60 days or less while the chapter awaits the team's full report. Thursday evening, the team met with the chapter CEO to give him a preview of the briefing and discuss any political hot buttons that the team's suggestions might press. After the preview, the team went to dinner together and retired to their rooms to write their modules. Finally, Friday morning, the team convened at the chapter offices and briefed the CEO and board. The team leader was the primary presenter and his seniority and volunteer status helped put the board at ease.

#### **4.4 The Challenge to Change: Going More Virtual**

ICP has done nearly 50 studies like Proxima since the program was founded in 1996, most of which have been in metropolitan areas, or for strategically important chapters (e.g., those that have had particularly heavy demand for Allevus services). As successful and well-received as the studies have been, most chapters are unlikely to need a second one for a decade or more. With studies completed for most of Allevus' major chapters in the last five years, ICP now needs to develop new services to sustain itself.<sup>27</sup>

Among those new services, it envisions a “more virtual” version of the typical ICP study, which would allow it to serve smaller, more rural, less strategically important chapters without the high travel and lodging costs of a normal ICP team. The vision ranges from an entirely virtual ICP study (for which there would be no site visit and no FTF team meetings) to a study which is more dispersed than the typical model, but still includes some on-site data collection and/or some FTF interaction among team members. DiStar and one other team completed such moderately dispersed studies this spring. They represent ICP’s first forays into a more virtual version of its traditional studies.

As such, the comparison of DiStar to Proxima represents an early indication of the challenges faced by ICP as it attempts to conduct its work in a more dispersed fashion. The shift is less than a complete test of a “virtual” ICP, but DiStar was different enough to cause considerable concern among the ICP program officers and director. These concerns came despite a climate characterized by frequent modifications and “pilot tests” of those modifications with the next available ICP study.<sup>28</sup>

#### 4.5 “DiStar” – The Experience of Moving to More Dispersed Work

In order to cover the vast territory of the DiStar chapter, the DiStar team’s approach included several major adjustments to the traditional ICP. Although some teams covered multiple counties spanning two different states (e.g., the Sunshine team), the DiStar chapter encompassed an entire state, making it much larger than the Proxima chapter’s service area. Rather than having all members spending the week in and around the same city, the DiStar team members split up and covered four cities across the width and breadth of the chapter’s service area. Three members including Judy started the week together in Southwest City, while three others (including the most experienced team member and de facto leader for that group) started in North City. The seventh member started alone in Southeast City, which is the DiStar chapter headquarters (Figure 4.3).

Figure 4.3: DiStar Team Members’ Locations Each Evening

Location	Sun.	Mon.	Tues.	Weds.	Thurs.
SW City	Judy Jerry Rob	Judy Jerry Rob	–	–	–
SE City (HQ)	–	Richard	Richard Judy Jerry Rob	All 7 (i.e., Richard, Judy, Jerry, Rob, Ron, Vicki, Roger)	
North City	Ron Vicki Roger	Ron Vicki Roger	–	–	–
Central City	–	–	Ron Vicki Roger	–	–

Richard, the lone member in Southeast City did not arrive until Monday and did not have any interviews until Tuesday, although he joined in on the team’s Monday night conference call.

On Tuesday afternoon, the Southwest City group drove five hours to join Richard at Southeast City, while Ron, Vicki, and Roger drove three hours from North Central City to arrive in Central City by dinner time. On Wednesday, this second group drove another three hours and

the full team finally converged at its hotel in Southeast City. The full team did not have its first FTF meeting until that evening after members had completed nearly all their interviews and data collection. This amount of travel time and the separation among members was a significant departure from past ICPs.

The second alteration to the typical ICP approach included having each team member assigned a primary and a secondary module. For the secondary module, members were expected to be more attuned to issues in that module than they normally would, and to share information that they picked up in the course of their interviews with the lead person on the module. The lead person was then responsible for integrating the two streams of information and writing the initial draft of the module. The secondary person would review it and make suggestions regarding the draft. This approach was described as a “tag team,” “partnership,” or “matrix” one by various team members. It was intended to help cover the chapter’s expansive territory more effectively, since no individual team member could travel to all branches of the DiStar chapter, yet important questions for each module needed to be asked at each branch office.<sup>29</sup>

The third alteration to the typical ICP included not conducting the normal Monday morning team meeting and introductory briefing for chapter staff. Instead, Judy did the briefing herself as part of the DiStar chapter’s regularly scheduled Tuesday conference call. Because DiStar itself is far-flung, many of its own staff meetings are done by telephone.

The fourth and final alteration included a telephone briefing for the DiStar chapter’s board of directors on Friday. For Proxima and other typical ICPs, this briefing is done FTF at the chapter’s main office. However, the DiStar board is scattered across hundreds of miles and holds many of its own regularly scheduled meetings by phone. As such, the “virtual exit briefing” was novel for ICP, but the tele-conference medium was typical for the chapter.

The experience of moving to a more dispersed version of the ICP was especially apparent in the DiStar team’s effectiveness, boundaries, and timing. In this section, I discuss the DiStar team’s story, with a focus on these three aspects as they compare to those of the Proxima team described earlier.

#### **4.5.1 Effectiveness**

Team members expressed anxiety going into DiStar and they were less than completely satisfied with their effectiveness at the end of the project. With two DiStar members having served on the Proxima team nine months earlier, the Proxima follow-up interviews allowed them to share their expectations regarding the upcoming DiStar study. Roger, the most senior DiStar team member and leader of the Proxima and Sunshine teams said that the DiStar was likely to have a “very different dynamic,” but he was unsure what direction that dynamic would take. He said, it “could be very good or it could be an absolute disaster.” Judy the PO was similarly uncertain about the prospects for the DiStar study. She was described by others and herself as “extremely anxious” and “especially concerned regarding the DiStar study.” After the study was over, she reflected, “I guess I had some anxiety about the fact that it was very different from what we had done before.” She attributed “equal amounts” of her anxiety to the dispersion of the chapter and that of the team. A self-described “hands-on manager,” Judy was “feeling personal anxiety with the fact that I wasn’t you know physically there” with the whole team.<sup>30</sup>

In follow-up interviews, team members indicated that the result was neither “very good” nor “an absolute disaster.” Rather, the DiStar report was judged “acceptable” and would be helpful for the chapter, but was uninspired and flawed in some important ways. In particular, it was overly long, with less careful attention paid to phrasing, integration across modules, and the

ability of the chapter to act on the recommendations. As one member noted, “There are 86 recommendations!” in the draft report; it “will never come off the shelf” if we don’t combine some, tighten it up, and give the chapter a better sense of priorities.

The DiStar report was also less coherent than previous, traditional studies, and reflected less consensus about what the chapter’s major issues really were. As one member put it, “I do not think [our work] was just ... as completely tied up when we left [DiStar] as it usually is.” The DiStar report was “more divergent, with more different styles even in the same module” and there was “not a really clear vision of what we found in the chapter.”

At best, members’ assessments of their final report and overall effectiveness were subdued and cautious. To the extent that they spoke positively about the report, it was always followed immediately with a caveat of some sort. For example, one described the report as “not that bad,” but noted that a considerable amount of editing was required for some modules after the site visit and expressed doubts about the quality of the final product (e.g., “I just don’t know how the whole report is going to be.”). Another said that “The end product is going to be fine; they will get a good report; it is going to help them a lot,” but then admitted:

It could have been more efficient and effective had we looked at it a different way... [Other teams’ products have been] better, more clear, more concise, easier for the receiving unit to process and implement; this will take more effort [for the chapter] to sort through it.<sup>31</sup>

A third said that the “end product will be fine” but “I think we missed the real picture of what the [DiStar chapter] is trying to be” and “I don’t think we ever got a sense of what the key issues were for the chapter.”

Perhaps more important than their impressions about the final product itself, was members’ recognition of several other dimensions on which the team’s effectiveness was wanting. While members had some good (albeit tentative) things to say about the final report, they were uniformly dissatisfied with the team’s growth as a group and the limited amount that they were able to learn from each other. In Proxima and previous studies, team members always indicated that serving on ICP teams provided them with a tremendous opportunity to learn from each other and the subject chapter, and to expand their network of professional contacts. On DiStar, however, team members regretted that their opportunities to learn and network were greatly constrained. They looked forward to learning about their team members’ chapters, but reported that “There was none of that” in the DiStar team. Furthermore, they were all dissatisfied with the lack of camaraderie, which they had come to expect from their previous ICP experiences or ICP’s reputation – “I guess on the whole I don’t feel like we had the same level of camaraderie that we did on some of the other [ICP] teams.” Team members attributed this primarily to the delayed FTF interaction, saying that “Not knowing them ‘til the last two or three days definitely left that feeling.” For DiStar, the tele-conference calls apparently did little to promote “camaraderie” and mitigate the effects of geographic dispersion.

Emblematic of the sense of “disjointedness” and the reportedly low levels of camaraderie, two members were unable to remember the names of their fellow teammates during follow-up interviews held just several weeks after the team’s visit to DiStar. Even in the case of members who were paired as primary and secondary authors of a module, they could not always recall the name of their purported “partners,” referring to them simply as “the other guy.” This lack of common identity and knowledge of one’s own team members was unheard of in Proxima and other traditional teams. The most senior DiStar team member, with extensive experience evaluating organizations inside and outside of Allevus, reported that “I don’t feel we ever got to



the point where we were seeing the same things” as a team. He mused somewhat regretfully, “I don’t think we ever came together as a team.”

For Judy the PO, this lack of growth as a team was especially troubling. She said that “I wish there was some way we could have put it together so we had more of a team experience.” She and other members indicated that “building a team” was not a goal unto itself, but lamented that they did not get to know each other and grow from that interaction. She also noted that the lack of cohesion while “on site” carried over to her interactions with team members afterwards:

It has just been ... harder to [connect with people after the site visit.] This team has not been as cohesive. It is just a team that has been harder to follow up with.

Despite the challenges she faced in following up with team members, Judy was credited with being the “lynch pin that brought the final product together.” In this regard, DiStar was not different from Proxima or any of the other teams that I observed. The PO always played a major role as editor and integrator of the final report; that role was just more critical in studies where there was more integrating and editing left to be done after the site visit, as both Judy and the team members said was true with DiStar’s draft report, which was “so disjointed [and did not] have clear direction or recommendations.” Judy reported that it was “harder to get this report finished (even though it is only seven modules instead of 10 or 14 like the other ones) because it required more one-on-one follow-up.” Judy “just did not get as much information from the briefings” as she usually did and also “had to deal with a lot of editing.”

In this sense, DiStar’s effectiveness was mixed at best, from the standpoint of the individual members, volunteer team leader, and PO. On balance, they felt that the final product was acceptable (if not outstanding), but that the team had not succeeded in terms of the other two dimensions of team performance – i.e., growth as a team and meaningful individual experience. As one noted, “I was not nearly as satisfied personally [with DiStar], nor do I think we probably did as good a job.” Members seemed to share the sentiment that “The whole thing was less than the sum of the parts. I think the talent on the team was stronger than the team itself. Much stronger.” In particular, team members left DiStar regretting that they had not learned more from each other and that they had “not come together” as a team. They attributed this to the team’s dispersion, as well as the nature and timing of its interactions. I address these two themes next.

#### ***4.5.2 Boundaries and Identity***

As noted earlier, relatively little is known about the experience of geographic dispersion in natural organizational settings as it relates to team boundaries and identity. The DiStar team meetings and follow-up interviews pointed to two aspects of their dispersion as particularly salient. First, in addition to a considerable amount of time lost to travel, members noted that the sub-team configuration with one isolate (3-3-1) and the relative isolation even after they came together in SE City had a powerfully negative effect on the team’s boundaries and identity (not to mention its growth as a group and individual members’ satisfaction).

Across the board, members described DiStar as anything but one team. For example, one said that it was “something in between” one cohesive team and two separate teams. DiStar fell significantly short of recommendations for clearly bounding a team (Hackman, 2002), and the centrifugal forces of its configuration were apparent from the very first call. In the original scheduling documents and travel plans, what was intended as a single team convened to develop an integrated product ended up being described as “Team A and Team B,” or “Team 1 and Team

2,” based on the (balanced) clusters of three people that started the week on opposite ends of the DiStar service area. Furthermore, the potentially isolating tendencies of dispersed teams were apparent from the first team correspondence. For the team member who started the week alone, agendas and team rosters relegated his status on the team to an asterisk, connoting his peripheral status even before the team arrived at DiStar.

This member reported that his isolation was quite problematic and would have been even worse if he hadn’t had some previous ICP experience:

If this had been my first ICP, I would have felt totally out of synch. I would not have had the self-discipline to get things done; I would not have known exactly what to expect in myself.

The team’s separation was particularly salient for him and he noted that:

It felt a little disjointed to me because we were split up so much ... I felt really out of it with the IT [module], which I was supposed to have some input on ... I definitely felt a bit of a disconnect there having to split up like that.

This disjointedness almost completely undermined the intended benefit of the “tag team” approach, by which pairs of members in each sub-team were supposed to compare notes and review each others’ drafts.<sup>32</sup>

Although he believed that “With these huge [service areas], you’re going to have to split people up ... that’s the only practical way to do it,” he believed the isolation could be mitigated without full team co-location, saying that co-located pairs would be enough of a “critical mass” to overcome the negative effects he felt. In the future, he suggested that it would be unwise to “leave any single member sort of stranded and alone.” If a chapter’s dispersion meant that you had “to split people up,” he said he would keep them in pairs at a minimum.

Although the co-location of the groups of three people provided a greater sense of collegiality and support than the complete isolation experienced by the seventh member, even the “co-located” sub-group members reported feeling somewhat isolated. Because the team hotel lacked speakerphones, members could not conduct the evening telephone debriefings as groups sitting around conference tables. Instead, they spent their days conducting interviews alone and then joined the “team” conference call from their individual hotel rooms. Conflicting interview schedules, personal obligations and unforeseen issues (e.g., a minor illness for one member) also kept the sub-groups from sharing as many meals together as traditional ICP teams do.

Once the team members were finally all in SE City, they found themselves within one day of their final briefing, but with a considerable amount of time already lost to travel. As such, they spent most of their time on Thursday working alone to finish writing their modules. While they expressed dissatisfaction with the lack of integration across their modules, time pressure left them feeling like writing was a higher priority than discussing or integrating their work (beyond the one Wednesday evening FTF meeting).

While the data in Chapter 3 explored several ways to measure configuration and provided an initial indication of how configuration might matter for team communication, the Proxima/DiStar comparison makes clear that isolation and a sub-group configuration can quickly undermine a team’s sense of boundaries, identity, and common mission. While members of DiStar differed on whether they were best characterized as individuals or two sub-teams plus an isolate, none of them described it as one team. The team’s senior member said that, in fact, “There were two teams; *at least* two teams” (emphasis added). Furthermore, he noted that even when the team came together on Wednesday, members had to leave their sub-group and go meet

with the partner from the other sub-group. For him, this “even broke up what had transpired in the first two days” in terms of “team building.” Another member said that “It was more like six individuals who came together than [it was like] two teams.” Interestingly, team members generally left either the PO or the isolated member out of their descriptions of the number of team members (hence this and other characterizations of the team as being six, not seven, individuals). Another reported that:

It felt like I was dealing with six individuals or small groups of people as opposed to dealing with a team and that may feed into my overall impression that it was really working with six individuals as opposed to a team.

This absence of a single team identity corresponded with a reduction in “collaboration *between the two teams* as they partnered with each other” (emphasis added; “two teams” referring to the sub-groups that started the week in different cities).

The fact that members’ comments mentioned “the teams” rather than “the team” was a simple, but powerful indicator that DiStar’s configuration undermined its ability to come together as a single entity working toward a common, integrated report. As Mortensen & Hinds (2002) suggest, the centrifugal forces of work in dispersed teams can be considerable. And, while teams may overcome those forces to produce acceptable final products, they are still likely to undermine the other two aspects of team effectiveness – team growth and individual learning.

The measures developed and tested in Chapter 3 can also be applied to the ICP teams. Figure 4.4 shows the ICP teams’ degrees of dispersion at the time of their three tele-conference calls.<sup>33</sup>

Figure 4.4: ICP Teams’ Degrees of Dispersion at 1<sup>st</sup>, 2<sup>nd</sup>, and Final Calls

Team	Site	Isolation	Imbalance	Separation	Overlap	Role	External
Sunshine	6	1.0	0	337	8	228	385
Nova	6	.75	.10	1087	6.7	1598	1050
Plains	6	.71	.06	803	7.2	1748	628
Heartland	5 <sup>34</sup>	1.0	0	1290	6.4	1249	1725
River	5	.83	.08	997	7	2272	660
Proxima	5	1.0	0	113	8	162	91
Seaside	6	.75	.06	838	7.3	644	527
DiStar	7	1.0	0	617	7.9	577	581

With the exception of DiStar, all teams shifted from the dispersion captured in Figure 4.4 to an essentially common level of dispersion at the time of their site visits – i.e., one site, no Isolation, Separation, or Imbalance, and complete temporal Overlap. Since the traditional ICP teams do not differ from one another during the on-site time for any measure except the External Index, their measures for that on-site time are not shown above. As noted in Chapter 3, the Separation Index assumes some desire to meet FTF, and acts as a proxy for such the difficulty of holding such a meeting. Since the traditional ICP model includes “traditional” FTF meetings while on site but none before or after, the Separation Index does not distinguish among the traditional teams in a practical way. Overlap is somewhat more relevant for the teams and their conference calls, but levels of Overlap were all relatively high, causing minimal difficulties for scheduling the calls.

However, the DiStar team’s dispersion during its “on-site” time differed from that of Proxima and the other teams. As shown in Figure 4.4, Proxima began and ended its work with considerable isolation, but no imbalance, complete Overlap, and the lowest levels of Separation, distance to the team leader (Role Index), and distance to Allevus headquarters (the External

Index). When the team went on site (Figure 4.5), it was farther from headquarters, but otherwise showed no dispersion.

Figure 4.5: Proxima and DiStar Teams' Dispersion over Time

Team	Site	Isolation	Imbalance	Separation	Overlap	Role	External
Proxima (pre/post-site visit)	5	1.0	0	113	8	162	91
Proxima (Monday-Friday)	1	0	0	0	8	0	1051
DiStar (pre/post-site visit)	7	1.0	0	617	7.9	577	581
DiStar (Mon. and Tues.)	3	.14	.16	179	8	170	1619
DiStar (Weds. and Thurs.)	1	0	0	0	8	0	1467

The DiStar team was only moderately dispersed in comparison to the other eight teams before it went on site (Figure 4.4), but differences in pre-site visit dispersion were of limited relevance for the teams. Aside from minor effects on scheduling the conference calls, there were no differences in dispersion that affected the teams' work. Separation varied, but the practical implications of that variation were virtually nil because: 1) team members were similarly isolated with little or no imbalance; 2) isolation was high (if not complete) on all teams; and 3) members were beyond easy reach (but within an easy call) of each other, the team leader, and headquarters.

As shown in Figure 4.5, the DiStar team's dispersion decreased considerably on nearly every measure as the team went from conference calls to on-site time. DiStar's most striking difference from the other teams is that it remained somewhat dispersed in its 3-3-1 configuration until its Wednesday evening meeting. As I described in this section, DiStar's Monday-Tuesday 3-3-1 configuration had a greater effect on the team's boundaries and identity than the relatively low levels of dispersion in Figure 4.5 suggest. As described in the next section, the timing of its interactions and the delayed FTF meeting were important ways in which this configuration was manifested.

#### 4.5.3 *Timing and Nature of Interactions*

With the exception of the Wednesday and Thursday evening meetings of the whole team and informal interaction among co-located sub-groups during their long drives between branch offices, DiStar's work was done at a distance. When members interacted with each other, it was by telephone and they did many of their interviews by phone as well. Team members described the most salient implications of their dispersion in largely temporal terms:

1. The overall reduction in time available "to focus on issues" because of the time lost to travel;
2. The absence of a FTF launch meeting, chapter briefing on Monday morning, and the general delay in FTF team interaction;
3. The overall reduction in time available for informal interaction and team development; and,
4. The difficulty they had understanding the DiStar chapter, given its own far-flung configuration.

Six of DiStar's seven team members spent as much as a full day driving during their five days on site, and all felt the burden of working across a far-flung chapter. This travel "reduced their time [on site] by 30 or 40%" because they were on the road for the equivalent of a day or

more. As a result, “not as much time was spent focusing on the issues.” The time lost to travel further limited the opportunities for full team meetings.

Among the most salient “lost opportunities” was the absence of a Monday morning team meeting. Reflecting and reinforcing researchers’ findings about the importance of early interactions (Arrow *et al.*, 2001; Ginnett, 1993; Hackman, 2002), the more experienced team members were especially conscious of this loss:

We lost that initial team meeting on Monday morning ... and that introduction. We also didn’t have the introduction with the chapter that we normally do Monday morning. It’s a very important element ... [In other teams] the volunteer lead was so eloquent in how he phrased things and other team members were able to pick up on his sense of what the ICP was; what he articulated for the chapter spilled over to the team. It pointed out for me one of the elements of ICP that was truly valuable that we were not able to measure before.

Without the initial Monday meeting, Judy had to compensate and spend more time touching base with team members individually. She “felt like I was using up a lot of their time covering things that we would normally go over in our initial meeting Monday morning or in our briefing Monday night.” Because they did not have the morning meeting, she “was grabbing bits and pieces of their time before we went and it wasn’t as cohesive ... it was looser than I’d like it to have been.”

Although the conference calls might have been structured to retain more of the aspects of the traditional FTF meetings, Judy and the team were convinced that the best (if not only) way to improve their approach was to meet FTF at the beginning of the week. She thought “the fact that the team went off on its own initially and worked its way together was the wrong way to go.” While Judy’s business-like approach to the conference calls, general anxiety, and strong attachment to the traditional model<sup>35</sup> had to affect team members’ experiences, the members all put an initial FTF meeting at the top of their list of suggested changes. Although they said that such a meeting might not have affected the team’s product, they still “wished there was some way we could have put it together so we had more of a team experience.”

In addition to losing time to “focus on the issues,” the team also felt that they lacked sufficient time to learn and develop as a group. In contrast to the Proxima team, whose meetings were characterized by considerable laughter and lighthearted conversation, the DiStar team’s calls were task-focused with almost no off-task conversation. However, the actual amount of time available for getting to know each other FTF does not appear to have been as different for DiStar as members’ descriptions of that time suggests.

DiStar’s two FTF meetings were nearly as long as Proxima’s three FTF meetings (3 hours 45 minutes vs. 4 hours 25 minutes), and this does not include time spent together briefing (and preparing to brief) the DiStar CEO on Thursday afternoon. The DiStar team certainly lacked some of the casual time together that the Proxima team had (e.g., at the baseball game on Monday and the team dinner Tuesday), but Proxima team members complained that the baseball game was actually counterproductive because the bleacher seating made it impossible for them to talk as a group. Given that the DiStar team members logged as many as eight hours driving in each of their three-person subgroups, and that the Proxima team did not have a Monday evening team meeting (in person or FTF), the total amount of time spent with team members FTF may not have been much greater for Proxima than it was for DiStar. In fact, it may have been less.

While the recordings do not capture all of the incidental interactions (e.g., those in the car rides, at meals, in elevators, mingling before and after the formal start to team meetings, etc.), it is interesting to note that DiStar logged 8 hours 20 minutes of FTF team meetings and tele-

conference time together, while Proxima had only 6 hours and 53 minutes.<sup>36</sup> Since DiStar's Thursday meeting with the chapter CEO was not recorded, the conservative addition of one hour more FTF time would put DiStar's total meeting time at 2.5 hours more than Proxima's. In addition, 30 hours is a conservative estimate of the time that DiStar team members spent in cars with their sub-groups travelling between branch offices. Even if this time is "discounted" by 3/7<sup>th</sup>s because it was spent in three-person subgroups rather than the full seven member team, the Proxima team would have to have spent 3.25 more hours FTF *each day* between Monday and Thursday to log the same amount of time together that DiStar had.

Nonetheless, DiStar team members all placed considerable emphasis on the fact that they did not have enough time to "gel," develop as a team, develop a common understanding of the chapter's issues, and learn from each other. It seems that their clock time together was quite at odds with their expectations of that time (Orlikowski & Yates, 2002, forthcoming). This appears to be the result of three factors. First, some of the time was spent in sub-groups, not the full team. Second, the *delay* between the beginning of DiStar's work "on site" and their first FTF interaction as a full team seems to have had a considerable effect on perceptions of time available for "bonding." Third, DiStar team members, and especially the PO, perceived the teleconference calls as fairly impervious to their influence. They did not see changes to their calls as a viable option for improving team interactions. In follow-up interviews, I asked all of them if the calls could have been structured or organized any differently in order to enhance their value and compensate for the delayed FTF meetings; all responded negatively, saying that only an earlier FTF meeting would have helped.

Interestingly, the other ICP team that operated at a greater than normal degree of dispersion (not profiled here because its task was considerably different from that of the DiStar and Proxima teams) had longer, more free-flowing, more social, and more unstructured teleconference calls. Although members of this "Moto" team did mention that the conference calls "dragged on" some, they had far fewer complaints about the teams' ability to bond, despite having only one FTF meeting (in comparison to DiStar's two), having that meeting even later in the week than DiStar did, and having no FTF sub-group interaction (in comparison to DiStar's 12.75 "discounted" hours in sub-groups). Moto's experience suggests that a different approach to DiStar's conference calls might have reduced team member's perceptions that they did not have time to develop as a group. DiStar team members' expectation that they would have two days together starting Wednesday may have kept them from trying to get more out of the Monday and Tuesday conference calls. In contrast, members of Moto knew that they would not meet FTF until the last night of the team's work and, thus, seem to have put more effort into making the calls productive – from both a task and team development standpoint.<sup>37</sup>

It was not just the team members' interactions with each other that were done at a distance. Unlike previous ICPs, "Something too that was difficult was the fact that so many of the interviews were conducted by telephone." This hurt the quality of the team's product because "It was important ... to go out to these areas just to see the community to see where the chapter actually operates ... And also to understand truly the distance between the places ... You can look at a map and see how far it is, but you just don't understand what the chapter is dealing with it until you drive it." Even though the team lost a considerable amount of time to travel, it apparently still did not get a full sense of scope and diversity of DiStar's service area. As one member noted, DiStar was as "dispersed socio-politically" as it was geographically and, thus, the team had a particularly difficult time getting a handle on the chapter. Even after the team had its

two FTF meetings and the final report had been written, he said “I could not tell you exactly what DiStar’s issues were; I really could not tell you that today.”

Doing more than half of their interviews by phone was yet another factor that “that was isolating people.” Because team members “ended up doing the calls from their hotel room rather than at the chapter where they would be able to – between calls and interviews – chat with [their] colleagues,” they lost those “few minutes between interviews or at lunch time to come in together in the room we had and sit down and chat informally with one another.” As a result, there “just wasn’t that informal dialogue.” In fact, one member who had a large number of phone interviews from his hotel room said that “If I had know that I was doing most of them by phone, I could have done them from my home.” For him, “Although the team experience was an important component – the interacting with folks there,” the people in his sub-group “were off a lot” and their ostensibly co-located time lacked the benefits of being co-located.

As noted in the introduction, ICP teams appear to invert the traditional recommendation that teams meet FTF at the beginning of their work, then disperse to do the work, and then reconvene at the end to pull it all together. In contrast, ICP teams begin their work via e-mail and two tele-conference calls, then come together FTF, and finally disperse again to finish their work by e-mail and a final tele-conference call. They were an attractive research site specifically because of this apparent inversion. However, my analysis revealed that the inversion was characteristic of the program’s espoused, objective, clock-based temporal structures – not of the teams’ enacted, practice-based temporal structures. The teams did not feel that they “came together” until they met on site – on Sunday evening, Monday morning, or Monday evening for Proxima and other typical teams; on Wednesday for DiStar.

In this sense, the teams enact their own temporal structures, which are somewhat at odds with the program’s espoused “objective” temporal structure (Orlikowski & Yates, 2002, forthcoming). The conference call discussions describe the pro forma task strategy, and include team member introductions, the logistics of the team’s work, and even a presentation of each members’ individual findings, but in practice they do little to “launch” the team (i.e., bound it, begin developing relationships within the group, adjust and embrace the task strategy, etc.). Despite the conference calls, DiStar (and to some extent all ICP teams) are essentially not launched until they meet FTF.

#### **4.6 Conclusions and Contributions**

In regard to the three questions posed at the beginning of this chapter, the Proxima-DiStar comparison provides several interesting answers. First, DiStar team members described their own report as something between “acceptable” and “good,” but flawed in key respects and not nearly as good as previous ICP reports. More interesting in some ways than this apparent negative effect on their product is the negative effect that dispersion seems to have had on the other two aspects of team effectiveness – i.e., growth as a team and individual satisfaction. On both of these counts, team members’ verdicts were unanimously negative.<sup>38</sup>

Whether and how we weight these two elements of team effectiveness is something that has received relatively scant attention. As mentioned earlier, the importance of assigning weights to the criteria has been noted (Hackman, 2002) and one study has deliberately attempted to examine the interaction between learning and task performance (Druskat & Kayes, 2000), but that study is a noteworthy exception. Druskat & Kayes show that in contrast to research with longer-lived teams (e.g., Edmondson, 1999), learning appears less related to performance in short-term teams. This issue of the interaction and weighting of effectiveness criteria is important

in FTF teams too, but may be more salient in geographically dispersed teams because dispersion presents particular challenges for team growth and learning.

While the products of geographically dispersed teams may be equally good (as Cummings, 2001, found), the teams may not be as effective on other dimensions. Furthermore, poor performance on the other dimensions is likely to be problematic in the medium to long-term even if it is overlooked or inconsequential in many short term studies. The DiStar team members all said they would not hesitate to serve on another ICP team, but there is little doubt that they would prefer a more traditional one and I expect that a *second* DiStar-like experience would begin to reduce their “re-enlistment” rate. Given the importance ICP attaches to maintaining a willing and committed base of potential team members, and the research on volunteer motivations (e.g., Farmer & Fedor, 2001), the ICP staff and POs consider any threats to members’ willingness to serve on future teams as threats to the program’s overall viability.

Interestingly (and unfortunately), Druskat & Kayes (2000) did not ask their team members about willingness to work with the team again. In more corporate settings, where working together again is often (if not always) likely, the tradeoffs among effectiveness criteria are not as easy as they may be for students. Students may interact with each other socially (and perhaps work on another team together), but are less likely to be concerned about the implications of future work-related interaction. Shadow-of-the-future effects and the desire to retain key employees are likely to force real work teams to balance the three effectiveness criteria more carefully.

This chapter’s second question addressed the effect of dispersion on team members’ conceptions of themselves as a distinct, bounded entities. Despite being the “more virtual” team, DiStar’s Separation was still fairly low and its Overlap was complete. However, its configuration was distinct from that of the other teams and that difference was noticeable. Members were consistent in their descriptions of DiStar as two teams (at best) or six individuals (at worst). Interestingly, the *perceived* time FTF, the delayed onset of that time, and the 3-3-1 sub-group-plus-isolate configuration were the elements of dispersion that appear to have been most influential for DiStar.

The chapter’s third question addressed the issue of timing. As with the second question, *perceived* time of interactions appeared to be as important as any “objective” measures of it. In addition, the specific timing of FTF interactions and expectations about how the teams would interact also appeared to have been especially influential. Given the timing and location of their interactions, DiStar members felt that they had to trade off among the three criteria of effectiveness. Thus, one of the key questions raised by the ICP teams is whether short-term dispersed teams can “have it all”? Are there mechanisms for enhancing individual satisfaction, team growth, *and* performance? Or must these criteria be traded off against each other?

Among other directions, answers may lie in making better use of time between when team members are named and when they actively engage one another as a team. For the DiStar team, the two initial conference calls and time running up to the site visit did little to enhance either the team’s product or learning. Although it is in a very different context, Orlikowski et al. describe how on-line interactions can enhance subsequent face-to-face interactions. Zheng et al. (2001) also show initial text-only interaction can be as effective as an initial FTF meeting. Finally, Bos et al. (2001) show that trust can emerge through mediated interaction. While these studies were in contexts quite different from the ICP one, they do suggest the potential for enhancement of ICP teams’ early interactions. Given the importance of initial team interactions found by others, (Arrow *et al.*, 2001; Ginnett, 1993; Hackman, 2002), and the dissatisfaction of



DiStar team members with their learning and growth as a team, a focus on enhancing (or “jump starting”) their early time together seems advisable.

Given the successes noted above in other contexts, changes in the structure and approach to ICP’s initial interactions (including conference calls and other pre-site-visit interactions) seem both warranted and feasible. However, effective change of this sort is unlikely to be achieved solely by adjusting structure and process of conference calls or other interactions. As the work of Orlikowski, Yates, and colleagues has shown (e.g., Orlikowski & Yates, 1994; Yates *et al.*, 1999; Yoshioka *et al.*, 2002), people bring strong interpretive schemes about the appropriateness of various communication genres to a given task or project, and conference calls are just such a genre.

Enhancing the effectiveness of increasingly dispersed ICP teams is likely to require changes in team members’ assumptions and *expectations* about the tele-conference and e-mail. In an experimental setting, Tidwell *et al.* (2000) have shown that manipulation of people’s expectations regarding the duration of their relationships can lead e-mail partners to communicate more frequently and more openly. Changing such expectations in a non-experimental setting is not likely to be easy. Adjustments in the mechanics and structure of the ICP calls and initial interactions are unlikely to succeed without related changes in people’s understanding and expectations of such interactions’ roles, potential, and temporal structures.

In addition to addressing the ICP teams’ temporal structures, there may also be some benefit to adjusting their time horizons – i.e., members’ perceptions of the team’s lifespan. However, it is unclear whether they would be better served by trying to expand team members’ understanding of their team’s life cycle or to contract it. The expansion to a time horizon of medium/long-lived teams might invoke the potential benefits that come from such a longer-term perspective. As Walther notes (2002, pp.251), “Long-term groups, or groups that believe they will exist long term, seem to be more effective.” Alternatively, contracting team members’ time horizons might invoke some of the benefits of short-term teams (Meyerson *et al.*, 1996) and be consistent with Allevus’ rapid response culture.

Walther’s remark about *beliefs* is especially relevant to the ICP data.<sup>39</sup> In general, ICP teams seem to view themselves as (*and act as if they are*) short-term teams, even though their clock-based life cycle would tend to classify them more as “medium-term” teams. As described by Meyerson *et al.* (1996), this short-term perspective may have some positive effects (e.g., a member of the typical Nova team told me and her team members during a break in their work that “I can say anything in these teams and trust people more because I don’t worry about seeing them again and know it will be over in a week”). But it may have disproportionately negative effects, especially as ICP experiments with more non-typical teams like DiStar.

For the DiStar team, it is difficult to know whether it was perceptions of their brief time together or of their dispersion, or the combination, that was most influential. However, I suspect that an equally dispersed team with a longer life span (or different expectations regarding their lifespan and timing of FTF interaction) would have paid more attention to their growth as a team and individual members’ learning. Although Druskat & Kayes (2000) raise teams’ life spans as an important variable, and note that their results (high performance despite low learning) may be a feature of their student teams’ short life spans, they study it only in short-term teams.<sup>40</sup> Further research (perhaps in controlled or quasi-experimental settings) will be needed to more fully understand the interactions between time and the criteria of effectiveness.

While it is exploratory and inductive, this study has several distinguishing characteristics. First, very few studies of teams are longitudinal. For example, of 51 studies on computer-assisted

groups (reviewed by Hollingshead & McGrath, 1995), only five were from a series of meetings and only three were over an extended time period. Other, more recent reviews continue to note the paucity of longitudinal field studies of naturally occurring teams (e.g., Maznevski & Chudoba, 2000). Thus, this study is a relative rarity in that it follows naturally occurring geographically dispersed teams from their inception (if not conception) through the completion of their projects. Given the apparent importance of teams' initial interactions and history, access to the Allevus teams beginning with their first calls is particularly unusual. Second, access to and use of a variety of data sources helped provide an especially rich and complete picture of the teams' work.

Third, the nature of the ICP allowed me to compare groups that were nearly identical in terms of their initial conditions (e.g., organizational context, training, experience, and selection) and desired outcomes (e.g., structure, content, and delivery of final report; team and client satisfaction and learning), but quite different in one key respect – their dispersion. While no two naturally occurring teams have completely identical initial conditions, access to such highly comparable teams is rare. Thus, this study builds on in-depth case studies of individual geographically dispersed teams (most notably Majchrzak *et al.*, 2000a; Majchrzak *et al.*, 2000b) and larger, more controlled studies of geographically dispersed student teams (Jarvenpaa *et al.*, 1998; Jarvenpaa & Leidner, 1999), but focuses on variation in geographic dispersion in a way not previously possible.

#### **4.7 Limitations and Suggestions for Future Research**

Despite following a total of nine ICP teams, this chapter focuses on only two because most of the teams varied little in terms of their dispersion.<sup>41</sup> The resulting two-team comparative case study is useful for understanding a “new” (or at least new to researchers) way of working. Given the limited amount of research on naturally occurring geographically dispersed teams (especially hybrid ones doing some work FTF and some at a distance), the exploratory nature of this study seemed appropriate.

In addition to its small sample size, there are several other important limitations of this work. First, the non-profit nature of Allevus and ICP team members' “donation” of their time to the program make it difficult to examine issues such as compensation. Second, the ad-hoc, short-term nature of the ICP teams makes it difficult to draw comparisons with teams that are similarly dispersed, but responsible for longer-term projects conducted as part of an employees' normal job expectations (like the telecommunication company teams in Chapter 3) or ongoing business operations (like the HBC teams in Chapter 2).

Third, although I had access to a large portion of the team's interactions, I could not capture the entirety of team members' interactions. Even when I was on site with the teams, I missed some of their incidental interactions (e.g., during car rides or between interviews). In this regard, geographically dispersed teams present an interesting paradox. On one hand, electronic interactions are more easily followed, captured, and archived than FTF ones. On the other, their very dispersion makes it difficult to follow the team as a whole. One can observe their group FTF interactions as a full team, but must make difficult choices about how to gather data on their individual and sub-group interactions. Rennecker (2000) approached this problem by “riding the circuit” from site to site on her focal team, spending some time at each and getting to know each members' local context. However, an incredibly cooperative site and a collaborative data collection strategy with Anita Woolley provided access to a large fraction of nine teams' work,

from their launch to their completion. For those interested in studying dispersed teams *in situ*, employing a dispersed team of researchers may be one of the best approaches.

Fourth, DiStar was ICP's first attempt at a more fully dispersed team approach. Given the potential for learning and improvement, some of my findings may be attributable to the program's "getting the kinks out" of this new approach. Fifth, DiStar and Proxima shared the same PO and team leader. On the one hand, this was an advantage for comparative purposes. On the other hand, it will be interesting to see how much of the DiStar experience can be attributed to the behavior of PO and leader. Given their self-reported anxiety about the dispersed approach, a PO and leader who are less anxious and more creative in their approach to distant interactions (e.g., as may have been the case with the Moto team) might make a considerable difference.

In addition to those suggestions already made in my discussion of the ICP data, there are several other areas that deserve study in the future. First, careful work in controlled or semi-controlled settings could focus attention on how people *perceive* their dispersion and how those perceptions affect their behavior, independent of more "objective" measures of dispersion (like those presented in Chapter 3). Similarly, the ICP results suggest that we still have much more to learn about the role that *expectations* play in terms of future interaction and team life span.

Second, the centrality of a "relatively simple" technology for the ICP teams bears special mention. The most influential (or potentially influential) technology used by the ICP teams was the tele-conference. With the exception of work like Olson's (1999), there is little recent research on the role of tele-conferencing. This is especially ironic given the dissatisfaction with video conferencing, the relatively limited adoption of more sophisticated CMC technologies, and the subsequent prevalence of audio-only tele-conferencing. Since Short et al (1976), work on other "sexier" media [including web and video teleconferencing – e.g., Grenville et al.(2000)] has outweighed work on teams' use of teleconferences, despite their low cost and apparent prevalence (Smeltzer & Vance, 1989). As researchers, we have studied the role of e-mail quite extensively; we would do well to focus some attention on tele-conferences as well. Together, these two relatively "simple" technologies are the ones that appear most widely used by geographically dispersed teams.

## 4.8 References

- Ancona, D., & Chong, C.-L. (1996). "Entrainment: Pace, cycle and rhythm in organizational behavior," *Research in Organizational Behavior*, 18: 251-284.
- Ancona, D. G., Bresman, H., & Kaeufer, K. (2002). "The Comparative Advantage of X-Teams," *Sloan Management Review*, 43(3): 33-39.
- Ancona, D. G., & Caldwell, D. F. (1992). "Bridging the boundary: External activity and performance in organizational teams," *Administrative Science Quarterly*, 37(4): 634-665.
- Ancona, D. G., Goodman, P. S., Lawrence, B. S., & Tushman, M. L. (2001a). "Time: A New Research Lens," *Academy of Management Review*, 26(4): 645-663.
- Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. (2001b). "Taking Time to Integrate Temporal Research," *Academy of Management Review*, 26(4): 512-529.
- Armstrong, D. J., & Cole, P. (1995). "Managing Distances and Differences in Geographically Distributed Work Groups," In S. Jackson, & M. Ruderman (Eds.), *Diversity in work teams: Research paradigms for a changing workplace*, pp. 187-216. Washington, D. C.: American Psychological Association.
- Armstrong, D. J., & Cole, P. (2002). "Managing Distances and Differences in Geographically Distributed Work Groups," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 167-212. Cambridge, MA: MIT Press.
- Arrow, H., & McGrath, J. E. (1993). "How member change and continuity affects small group structure, process, and performance," *Small Group Research*, 24(3): 334-361.
- Arrow, H., McGrath, J. E., & Berdahl, J. L. (2001). *Small Groups As Complex Systems : Formation, Coordination, Development, and Adaptation*. Thousand Oaks: Sage Publications.
- Bailyn, L. (1988). "Freeing Work from the Constraints of Location and Time," *New Technology, Work and Employment*, 3: 143-152.
- Bailyn, L. (1993). *Breaking the Mold: Women, Men, and Time in the New Corporate World*. NY: Free Press.
- Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002). "Computer-Mediated Communication and Group Decision Making: A Meta-Analysis," *Organizational Behavior & Human Decision Processes*, 87: 156-179.
- Barki, H., & Pinsonneault, A. (2001). "Small Group Brainstorming and Idea Quality: Is Electronic Brainstorming the Most Effective Approach," *Small Group Research*, 32(2): 158-205.
- Benders, J., Huijgen, F., & Pekruhl, U. (2001). "Measuring Group Work; Findings and Lessons from a European Survey," *New Technology Work & Employment*, 16(3): 204-217.
- Bos, N. D., Gergle, D., Olson, J.S., & Olson, G.M. (2001). *Being there versus seeing there: Trust via video*. Proceedings of the CHI 2001 Conference, NY, xx-xx.
- Bresman, H. (2001). *External Sourcing of Core Technologies and the Architectural Dependency of Teams*, Working Paper #4215. Cambridge, MA: MIT Sloan School of Management.
- Carey, J. M., & Kacmar, C. J. (1997). "The Impact of Communication Mode and Task Complexity on Small Group Performance and Member Satisfaction," *Computers in Human Behavior*, 13(1): 23-49.
- Cummings, J. N. (2001). *Work Groups and Knowledge Sharing in a Global Organization*. Unpublished Ph.D. thesis, Carnegie-Mellon University, Pittsburgh, PA.

- Druskat, V. U., & Kayes, D. C. (2000). "Learning Versus Performance in Short-Term Project Teams," *Small Group Research*, 31(3): 328-353.
- Duarte, D. L., & Snyder, N. T. (1999). *Mastering virtual teams : strategies, tools, and techniques that succeed* (1st ed.). San Francisco: Jossey-Bass.
- Edmondson, A. (1999). "Psychological safety and learning behavior in work teams," *Administrative Science Quarterly*, 44(2): 350-383.
- Eisenhardt, K. M. (1989). "Building Theories from Case Study Research," *Academy of Management Review*, 14(4): 532-550.
- Farmer, S. M., & Fedor, D. B. (2001). "Changing the Focus on Volunteering: An Investigation of Volunteers' Multiple Contributions to a Charitable Organization," *Journal of Management*, 27: 191-211.
- Gersick, C. J. G. (1988). "Time and Transition in Work Teams: Toward a New Model of Group Development," *Academy of Management Journal*, 31(1): 9-41.
- Gersick, C. J. G. (1989). "Marking Time: Predictable Transitions in Task Groups," *Academy of Management Journal*, 32(2): 274-309.
- Gersick, C. J. G., & Hackman, J. R. (1990). "Habitual Routines in Task-Performing Groups," *Organizational Behavior & Human Decision Processes*, 47(1): 65-97.
- Ginnett, R. C. (1993). "Crews as Groups: Their Formation and Their Leadership," In E. L. Wiener, B. G. Kanki, & R. L. Helmreich (Eds.), *Cockpit Resource Management*. Orlando, FL: Academic Press.
- Gladstein, D. (1984). "Groups in Context: A Model of Task Group Effectiveness," *Administrative Science Quarterly*, 29: 499-517.
- Goodman, P. S. (1986). *Designing effective work groups* (1st ed.). San Francisco: Jossey-Bass.
- Govindarajan, V., & Gupta, A. K. (2001). "Building an Effective Global Business Team," *Sloan Management Review*, 42(4): 63-71.
- Grenville, D., Kleiner, B. M., Denson, M., & Anderson, S. (2000). *Human factors issues in video teleconference meeting performance: A case study*. Proceedings of the Proceedings of the Human Factors and Ergonomics Society Annual Meeting, Santa Monica, CA, 2:223-226.
- Griffith, T. L., & Neale, M. A. (2001). "Information processing in traditional, hybrid, and virtual teams: From nascent knowledge to transactive memory," *Research in Organizational Behavior*, Vol 23, 23: 379-421.
- Hackman, J. R. (1983). *A Normative Model of Work Team Effectiveness*, Technical Report No.2. New Haven, CT: Yale School of Organization and Management, Research Program on Group Effectiveness.
- Hackman, J. R. (1990). *Groups That Work (and Those That Don't): Creating Conditions for Effective Teamwork*. San Francisco: Jossey-Bass.
- Hackman, J. R. (2002). *Leading Teams: Setting the Stage for Great Performances*. Boston, MA: Harvard Business School Press.
- Hammond, J., Koubek, R. J., & Harvey, C. M. (2001). "Distributed Collaboration for Engineering Design: A Review and Reappraisal," *Human Factors and Ergonomics in Manufacturing*, 11(1): 35-52.
- Hollingshead, A. B., & McGrath, J. E. (1995). "Computer-assisted groups: A critical review of the empirical research," In R. A. Guzzo, & E. Salas (Eds.), *Team Effectiveness and Decision Making in Organization*, pp. 46-78. San Francisco, CA: Jossey-Bass.

- Hollingshead, A. B., McGrath, J. E., & O'Connor, K. M. (1993). "Group task performance and communication technology: A longitudinal study of computer-mediated versus face-to-face work groups," *Small Group Research*, 24(3): 307-333.
- Jarvenpaa, S. L., Knoll, K., & Leidner, D. E. (1998). "Is Anybody Out There? Antecedents of Trust in Global Virtual Teams," *Journal of Management Information Systems*, 14(4): 29-64.
- Jarvenpaa, S. L., & Leidner, D. E. (1999). "Communication and Trust in Global Virtual Teams," *Organization Science*, 10(6): 791-815.
- Kells, H. R. (1979). "The People of Institutional Accreditation: A Study of the Characteristics of Evaluation Teams and Related Aspects of the Accrediting Process," *Journal of Higher Education*, 50(2): 178-198.
- Klein, H. K., & Myers, M. D. (1999). "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," *MIS Quarterly*, 23(1): 67-94.
- Lea, M., & Spears, R. (1992). "Paralanguage and Social Perception in Computer-Mediated Communication," *Journal of Organizational Computing*, 2: 321-341.
- Lemieux-Charles, L., Murray, M., Baker, G. R., Barnsley, J., Tasa, K., & Ibrahim, S. (2002). "The Effects of Quality Improvement Practices on Team Effectiveness: A Mediation Model," *Journal of Organizational Behavior*, 23: 533-553.
- Lipnack, J., & Stamps, J. (1997). *Virtual Teams: Reaching Across Space, Time, and Organizations with Technology*. New York: Wiley.
- Majchrzak, A., King, N., Ba, S., Rice, R. E., & Malhotra, A. (2000a). "Computer-Mediated Inter-Organizational Knowledge-Sharing: Insights from a Virtual Team Innovating Using a Collaborative Tool," *Information Resources Management Journal*, 13(1): 44-53.
- Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. L. (2000b). "Technology adaptation: The case of a computer-supported inter-organizational virtual team," *MISQ*, 24(4): 569-600.
- Maznevski, M. L., & Chudoba, K. M. (2000). "Bridging space over time: Global virtual team dynamics and effectiveness," *Organization Science*, 11(5): 473-492.
- McDonough, E. F., III, Kahn, K., & Barczak, G. (2001). "An Investigation of the Use of Global, Virtual, and Colocated New Product Development Teams," *Journal of Product Innovation Management*, 18: 110-120.
- McGrath, J. E. (1990). "Time Matters in Groups," In J. R. Galegher, R. E. Kraut, & C. Egido (Eds.), *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.
- McGrath, J. E. (1991). "Time, Interaction, and Performance (TIP): A Theory of Groups," *Small Group Research*, 22(2): 147-174.
- McGrath, J. E. (1993). "The JEMCO workshop: Description of a longitudinal study," *Small Group Research*, 24(3): 285-306.
- McGrath, J. E., & Hollingshead, A. B. (1994). *Groups interacting with technology: ideas, evidence, issues, and an agenda*. Thousand Oaks, CA: Sage Publications.
- McGrath, J. E., & Rotchford, N. L. (1983). "Time and behavior in organizations," *Research in Organizational Behavior*, 5: 57-101.
- Meyerson, D., Weick, K. E., & Kramer, R. M. (1996). "Swift trust and temporary groups," In R. M. Kramer, & T. R. Tyler (Eds.), *Trust in organizations: Frontiers of theory and research*, pp. 166-195. Thousand Oaks, CA: Sage.

- Miles, M. B., & Huberman, M. (1984). *Qualitative Data Analysis: A Sourcebook of New Methods*. Beverly Hills, CA: Sage Publications.
- Mortensen, M., & Hinds, P. J. (2002). "Fuzzy Teams: Boundary Disagreement in Distributed and Collocated Teams," In P. J. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 283-308. Cambridge, MA: MIT Press.
- Olson, J. D. (1999). What is the impact of telephones and synchronous computer-mediated collaboration on the work of virtual teams? Unpublished Ph.D. thesis, Colorado State University, Fort Collins, CO.
- Orlikowski, W. J., & Yates, J. (1994). "Genre repertoire: The structuring of communicative practices in organizations," *Administrative Science Quarterly*, 39(4): 541-574.
- Orlikowski, W. J., & Yates, J. (2002, forthcoming). "It's about Time: Temporal Structuring in Organizations," *Organization Science*.
- Orlikowski, W. J., Yates, J., & Fonstad, N. (2001). "Sloan 2001: A Virtual Odyssey," In I. Zigurs, & L. Chidambaram (Eds.), *Our Virtual World: The Transformation of Work, Play, and Life Via Technology*, pp. 191-218. Hershey, PA: Idea Group Publishing.
- Perlow, L. A. (1998). "Boundary control: The social ordering of work and family time in a high-tech corporation," *Administrative Science Quarterly*, 43(2): 328-357.
- Perlow, L. A. (1999). "The time famine: Toward a sociology of work time," *Administrative Science Quarterly*, 44(1): 57-81.
- Rennecker, J. (2000). *The Myth of Spontaneous Connection: An Ethnographic Study of the Situated Nature of Virtual Teamwork*. Unpublished Ph.D. thesis, Sloan School of Management, Organization Studies Group, MIT, Cambridge, MA.
- Rubin, H. J., & Rubin, I. S. (1995). *Qualitative Interviewing: The Art of Hearing Data*. Thousand Oaks, CA: Sage Press.
- Scott, C. R. (1999). "Communication Technology and Group Communication," In L. R. Frey, D. Gouran, & M. S. Poole (Eds.), *Handbook of Group Communication Theory and Research*, pp. 432-474. Thousand Oaks, CA: Sage.
- Sessa, V. I., Hansen, M. C., Prestridge, S., & Kossler, M. E. (1999). *Geographically Dispersed Teams: An Annotated Bibliography*. Greensboro, NC: Center for Creative Leadership.
- Short, J., Williams, E., & Christie, B. (1976). *The Social Psychology of Telecommunications*. Chichester, UK: John Wiley & Sons.
- Smeltzer, L. R., & Vance, C. M. (1989). "An Analysis Of Graphic Use In Audio-Graphic Teleconferences," *Journal of Business Communication*, 26(2): 123-141.
- Tidwell, L. C., & Walther, J. B. (2000). Getting to Know One Another a Bit at a Time: Computer-Mediated Communication Effects on Disclosure, Impressions, and Interpersonal Evaluations. Presented at the Seventh International Conference on Language and Social Psychology, Cardiff, Wales, July 2000.
- Tyre, M. J., & Orlikowski, W. J. (1994). "Windows of opportunity: Temporal patterns of technological adaptation in organizations," *Organization Science*, 5(1): 98-118.
- Wageman, R. (2001). "How Leaders Foster Self-Managing Team Effectiveness: Design Choices Versus Hands-on Coaching," *Organization Science*, 12(5): 559-577.
- Waller, M. J. (1999). "The timing of adaptive group responses to nonroutine events," *Academy of Management Journal*, 42(2): 127-137.
- Waller, M. J. (2000). "All in the timing: Team pacing behaviors in dynamic conditions," In C. L. Cooper, & D. M. Rousseau (Eds.), *Trends in organizational behavior, Vol. 7: Time in organizational behavior*, Vol. 7, pp. 37-43. Brisbane, Australia: JohnWiley & Sons.

- Walther, J. B. (1992). "Interpersonal Effects in Computer-Mediated Interaction: A Relational Perspective," *Communication Research*, 19: 52-90.
- Walther, J. B. (1997). "Group and Interpersonal Effects in International Computer-Mediated Collaboration," *Human Communication Research*, 23: 342-369.
- Walther, J. B. (2002). "Time Effects in Computer-Mediated Communication: Past, Present, and Future," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 235-258. Cambridge, MA: MIT Press.
- Walther, J. B., Slovacek, C. L., & Tidwell, L. C. (2001). "Is a picture worth a thousand words? Photographic images in long-term and short-term computer-mediated communication," *Communication Research*, 28(1): 105-134.
- Woolley, A. W. (1998). "Effects of intervention content and timing on group task performance," *Journal of Applied Behavioral Science*, 34(1): 30-46.
- Yates, J., Orlikowski, W. J., & Okamura, K. (1999). "Explicit and implicit structuring of genres in electronic communication: Reinforcement and change of social interaction," *Organization Science*, 10(1): 83-103.
- Yin, R. K. (1984). *Case Study Research*. Beverly Hills, CA: Sage.
- Yoshioka, T., Yates, J., & Orlikowski, W. (2002). *Community-based Interpretive Schemes: Exploring the Use of Cyber Meetings within a Global Organization*. Presented at the 35th Annual Hawaii International Conference on System Sciences (HICSS'02), Big Island, HI, January 7-10, 2002.
- Zheng, J., Bos, N.D., Olson, J.S., & Olson, G.M. (2001). *Trust without touch: Jump-start trust with social chat*. Proceedings of the CHI 2001 Conference, NYC, NY.



## 4.9 Endnotes

<sup>1</sup> Allevus has more than 1,200 chapters nationally.

<sup>2</sup> Examples – some of which more or less go “above” or “below” the group level – include: Gersick (1988; 1989) on group development; Waller (1999; 2000) on timing, pacing, and deadlines; Ancona and colleagues on entrainment, temporal rhythms, and temporal design of work (Ancona & Chong, 1996; Ancona *et al.*, 2001a; Ancona *et al.*, 2001b); Perlow (1998; 1999) on interruptions and time use; Orlikowski and Yates (2002, forthcoming) on temporal structuring; Tyre and Orlikowski (1994) on timing and opportunities for change; and Bailyn (1988; 1993) on time, place, and scheduling of work, and its relation to personal and family life. Researchers such as Wageman (2001) and Woolley (1998) have also addressed the timing of coaching and other interventions in group work.

<sup>3</sup> I use the word “appear” quite deliberately, since data on prevalence of “traditional” FTF teams in general is poor (as noted by Benders *et al.*, 2001, who also try to remedy the situation with data on prevalence in Europe), and data on prevalence and composition of dispersed teams is even poorer (e.g., see McDonough *et al.*, 2001).

<sup>4</sup> The idea of “importing” comes from Gersick & Hackman (1990) and Ginnett (1993), who write about bringing routines, norms, etc. from one group or context into another. As it relates to more specifically trust, “importing” refers to the trust that is placed in new team members based on things that they bring with them to the group – i.e., their organizational and other affiliations, their history and reputation in the organization, their network of professional relationships, etc.

<sup>5</sup> They did not start out intending to study boundary agreement; rather, they were startled by the lack of it in their data and proceeded to investigate it, rather than sweep it under the empirical rug.

<sup>6</sup> However, there is a possible exception to this hurdle – if a team sees itself as having fairly permeable boundaries and shifting membership, it may be more likely to engage with its external environment. Whether the benefits of such disagreement-driven-external-engagement outweigh the potentially negative effects on cohesion, team identity, etc., is unclear. As Bresman has shown (2001), external engagement is a complicated phenomenon, which depends heavily on factors beyond the team itself.

<sup>7</sup> Social identification/deindividuation or SIDE (Lea & Spears, 1992), Social Information Processing, (Walther, 1992), and the Cues Filtered Out perspective (dating back to at least Short *et al.*, 1976) are the three most well known.

<sup>8</sup> Cummings’ work (2001) is a rare exception.

<sup>9</sup> Originally, this study was intended as a field experiment, with a larger number of ICP teams conducting more fully dispersed versions of the traditional ICP study. Following September 11<sup>th</sup>, the challenges facing Allevus grew exponentially and ICP scaled back its plans to launch and pilot test more dispersed studies. In fact, the DiStar study profiled here was originally scheduled to occur in early October, 2001, but was delayed because of restrictions on travel and more pressing demands on team members’ time.

<sup>10</sup> Four interviewees were current or former POs, four were current or former chapter chief executives who had served on ICP teams (ten collectively), one was with a member of the Allevus national headquarters staff who had served on several ICP teams, three were with Allevus volunteers who had served on ICP teams before (eight collectively), and one was with an ICP administrative staff member responsible for the annual ICP team training program and team member recruitment. These interviews averaged 30 minutes long and were divided equally between myself and Ms. Woolley. We followed a common protocol for these semi-structured interviews and took detailed notes. We also conducted joint telephone interviews with two chapter CEOs, who are the primary “customers” and first recipients of ICP teams’ reports.

<sup>11</sup> The nine teams included the last two of FY01 (which held their site visits in April and June) and the first seven from FY02. Members were also surveyed at several key points in the course of their work, but survey data are not included here because of the small sample size.

<sup>12</sup> When we could not join a team on-site, the POs agreed to record their meetings for us. A small (3” x 1.5”) digital recorder was sent to each PO, who then simply placed the recorder on the team’s meeting

room table. While we had no control over the start and end time of these recordings, the content of them indicates that the tapes were started before the meetings began and were allowed to run through to the natural end of the meetings. Of the nine teams studied, I observed the on-site activities of four in-person. My colleague, Anita Woolley, observed two of the four as well as one that I did not.

<sup>13</sup> One team member from DiStar and one from Proxima did not respond to requests for follow-up interviews, but no team member expressed any concern with our research or indicated their unwillingness to participate in any other way. In fact, comments from individual team members indicated that I “blended in” – using the Allevus and ICP jargon, understanding their operations well, and being generally unobtrusive. The interviews – all conducted by telephone – were semi-structured with a series of basic questions and follow-up probes. I attempted to engage the ICP team members as “conversational partners,” and give them plenty of opportunities to raise and comment on subjects that were not part of the interview questions (Rubin & Rubin, 1995).

<sup>14</sup> In accordance with the guidelines of the MIT Committee on the Use of Human and Experimental Subjects (COUHES) and approval of the Committee, team members were told that their participation was completely voluntary, that they could withdraw or refuse to continue participation at any time, and that the results of the study were completely anonymous. For each study in which I and/or Ms. Woolley collected data, the PO gave team members a written summary of the research and its implications for the team (e.g., having a researcher on site with them and/or listening to their calls and meeting recordings).

<sup>15</sup> Perhaps somewhat ironically given the topic of this thesis, the transcription was done “at a distance” by a firm in New Delhi, India, with digital recordings and their MS Word transcriptions being passed back and forth via e-mail in an academic rendition of the “follow the sun” approach to global software development.

<sup>16</sup> Of the nine teams studied, three were led by Program Officer “A,” five by Program Officer “B,” and one by Program Officer “C.” DiStar and Proxima were both led by “B,” lending an additional degree of comparability across them. “B” had the most experience as a PO (12 studies prior to March 2001). A and C had done one and two respectively, prior to this research. In terms of general experience with Allevus, the POs were roughly equivalent in years (if not roles and specific areas of focus), although B was the only one who had actually been CEO of a chapter.

<sup>17</sup> ICP is careful to do studies at times in chapters’ development when they can actually make use of ICP teams’ advice. Chapters that are in an extremely bad state of affairs, are in the midst of their own internal review or audit, or have a brand new (or outgoing CEO) are generally considered poor candidates for ICP studies.

<sup>18</sup> While I did more reading than listening, I did return to the original meeting and interview recordings regularly to cross-check the accuracy of a transcription and listen for the pacing, rhythm and tone of the comments themselves.

<sup>19</sup> Allevus relies heavily on internal promotion, and service on ICP teams was described by all as a desirable way to demonstrate your skills beyond the limits of your chapter.

<sup>20</sup> The names of several modules are not presented here because their inclusion would compromise the true identities of Allevus and the ICP.

<sup>21</sup> Each ICP team includes at least one volunteer as a “team leader” – i.e., someone who is not a paid staff member of either a chapter or the Allevus national organization. These volunteers are typically board members for their local chapters who have gotten involved in national-level Allevus activities. The teams include a volunteer as the designate leader to reinforce the importance of volunteers in the organization and to allay subject chapters’ concerns that an ICP is “just a bunch of folks from national telling us what to do.” Despite the designation as team leader, this member of the team general plays more of a spokesperson role, while the PO is the real leader, facilitator, and manager of the team. In political terms, the PO is analogous to the prime minister, while the volunteer team leader is analogous to the president.

<sup>22</sup> Not including the 12 exploratory interviews and more than a dozen additional conversations with ICP staff. Note that Walt was an exploratory interviewee as well as an interviewee after his membership on the River team.

<sup>23</sup> Not including five days Woolley spent on site with the Heartland team.

<sup>24</sup> For some teams, there is just a brief “Hello” among team member’s before the chapter meeting. However, POs prefer to have 30-60 minutes for the team to meet on its own.

<sup>25</sup> For some teams, the staff meeting is followed immediately by interviews and there is no team lunch, with members eating on their own or in pairs while at the chapter offices.

<sup>26</sup> A SWOT analysis identifies an organization’s Strengths, Weaknesses, Opportunities, and Threats.

<sup>27</sup> The ICP is not funded directly by the chapters that receive its service. Its budget and support comes from the national organization, which is supported by donations and an assessment on all the chapters. ICP’s budget is proportional to the number of studies it expects to provide. As the projected number of studies declined, the ICP staff realized that they had to develop additional service offerings to maintain their previous level of support.

<sup>28</sup> Although such continuous improvement efforts are common for ICP, they usually involve creating new templates and other supporting materials that are quite consistent with ICP’s highly structured processes. Although the modifications reflect a willingness to change, they often involve changes that increase the consistency (and decrease the flexibility) of the team’s work.

<sup>29</sup> The tag-team approach was especially concerning to one team member, who worried that varying experience levels could create problems within the pairs. On the other hand, the member acknowledged that the pairs could “get together ... work well ... extend each other and respect each other’s knowledge and perspective,” resulting in a “dynamite” study.

<sup>30</sup> In fact, her comment ended “with *that second team*,” reinforcing her initial and ongoing sense that there was not, in fact, a single entity.

<sup>31</sup> Repeated filler phrases (“you know,” “I mean,” “hmm,” etc.) have been edited out for clarity except in cases where the phrase and associated pause seemed to reflect on the person’s uncertainty in what they were saying.

<sup>32</sup> No provisions were made for these pairs to interact before Wednesday evening and, by that time, they were so focused on completing their own modules that providing feedback or input to their partner took a back seat.

<sup>33</sup> As noted in Figure 4.2, the “Moto” team’s task was considerably different from the other teams’ tasks. Therefore, its measures are not shown in Figure 4.4 or Figure 4.5.

<sup>34</sup> There were two Los Angelinos on the team, but they worked from home, so they’re counted as two sites. Team members who worked at the same Allevus office are counted as being at the same site (as was the case with the telecomm teams in Chapter 3).

<sup>35</sup> Among other indications of this attachment (including her own statements and behaviors, as well as comments from other ICP staff), Judy commented that “If we are going deal with places with this much geography, I don’t really know what we can improve upon at this point, and [the normal model] really worked at some places that are smaller geography

<sup>36</sup> These times do not include my interviews with team members or the first DiStar “launch” tele-conference call which was held in September 2001 before the team’s site visit was re-scheduled.

<sup>37</sup> Although the comparison of Moto to the other ICP teams (including DiStar) is difficult because Moto’s task was so different, the ICP results provide some interesting contrasts with experimental findings that high levels of group identity and expected future interactions led groups to work harder and have more positive relational communication (Walther, 1997). Moto had neither high levels of identity nor expectations of future interactions, but they worked hard, produced a product that was well received, and had generally positive experiences (despite complaints about traffic congestion as they attempted to cover the Moto service area for their data collection). More careful analyses of the Moto transcripts may help understand what can be done to counterbalance the forces that Walther has found at work.

<sup>38</sup> Although the Proxima and other typical teams were not uniform in their appraisals of their own effectiveness, those appraisals were overwhelmingly positive (and in some cases effusively positive). On occasion, individual members serving on their first ICP were also described by more veteran teammates as somewhat inexperienced, “needy,” and “unsure” of themselves. However, even those comments were

balanced by respect for the “green” members’ subject matter expertise. Against the backdrop of these overwhelmingly positive reviews, DiStar’s mixed to negative ones are that much more striking.

<sup>39</sup> An intriguing new study by Walther et al. (2001) also showed that interventions to enhance social presence and team identity are highly dependent on perceptions about a team’s life span. They found that seeing fellow team members’ photos was beneficial for short-term teams, but harmful for long-term ones.

<sup>40</sup> Note that the definitions of short, medium, and long term are relative. For Druskat & Kayes, for example, teams lasting for a semester were “short-term.” Whether the ICP teams should be considered short-term (vs. very short term or medium term) is unclear. While the ICP teams’ life span was technically an average of 120 days, their *engaged* time together as a team was only one week. For some companies, a short-term project may be three weeks, while for others it may be three years. Conceptions of “short-” and “long-term” vary widely. The categorization of teams’ lifecycles may be best done in relation to other teams in that organization. For example, Allevus often uses SWAT-like teams that last one to two days. In comparison to these rapid response teams, ICP ones may be “medium-term,” even if we only consider their one week on-site.

<sup>41</sup> The Moto team was even more dispersed than DiStar, but its task was considerably different – so different in fact that the PO responsible questioned whether it should even be considered an ICP team.

# CHAPTER 5

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## CONCLUSIONS, CONTRIBUTIONS, AND NEXT STEPS

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## 5.1 Conclusions and Contributions

In this thesis, I began with the simple argument that geographic dispersion has gone surprisingly unexamined despite its role as the domain-defining construct for geographically dispersed teams (GDTs) and other increasingly common manifestations of dispersed or “virtual” work. I then sought to shine light on and open the “black box” of dispersion, showing that geographically dispersed work is actually far from a “new” phenomenon in organizations. Then, grounded in this historical perspective on dispersed work and some sense of how dispersion and its multiple dimensions were experienced by Hudson’s Bay Company managers, I turned to the ways in which those dimensions could be measured and analyzed. Finally, I focused my attention on Allevus’s internal consulting organization and its experiment with increasingly dispersed project teams. By comparing two teams that were quite similar in many ways, but intentionally different in their degrees of dispersion, I was able to explore the challenges faced as dispersion increases, and to understand how teams’ *experience* of dispersion relates to the dimensions and measures that I developed in Chapter 3.

Before turning to the contributions of this thesis, several primarily methodological conclusions are in order. First, I hope this work is part of a growing number of studies that are both field-based and longitudinal. As Scott (1999) notes in his review, “Only by looking at groups and their projects more *processually* and studying them at *multiple points in time* can we begin to develop a fuller picture of group communication” (emphasis added). The studies presented here (especially in Chapters 2 and 4) should begin to develop that “fuller picture” of groups dealing with the challenges and opportunities of geographic dispersion.

Second, while dispersed academic and scientific collaboration is not new by any means,<sup>1</sup> the practice of writing this thesis required several noteworthy geographically dispersed collaborations. My work on the HBC has involved travels to Canada, telephone interviews, and numerous e-mail interactions with HBC scholars all across North America. The empirical aspects of Chapter 3 began as the result of a “weak tie,” and included only one phone call and two FTF meetings between me and Jonathon Cummings over the course of an 18 month collaboration. The rest is the product of e-mail interactions. Chapter 4 involved cooperative data collection with Anita Woolley, with whom I have had fairly infrequent FTF contact despite our “co-location” at graduate programs in the same city. It also involved the considerable assistance of ICP staff based in three different cities, and the willing participation of ICP team members from 57 additional cities. Finally, some transcription was done in Cambridge, MA, but most was done by a company in India, with whom Ms. Woolley and I had only e-mail interaction as we enacted our own version of a “follow-the-sun” effort – with us posting digital recording files to a web server in India during our workday, an Indian project manager downloading them and giving them electronically to his staff during their day, and then e-mailing us MS Word transcriptions for arrival when we woke up.<sup>2</sup>

While my interactions with these dispersed colleagues had their share of hiccups, miscues, and misunderstandings, in the years to come, I believe that field studies of dispersed teams will be done best by teams of dispersed researchers. As Bob Thomas notes:

It seems to me that the field site that we now think of when we talk about field research is very much a physical field. It is a field site that each one of us can physically enter and can directly interact with other people in order to increase our ability to observe and understand phenomena. And yet I am struck by the fact that in some ways the field sites that are opening up are [ones] where we will not be physically copresent. The opportunity to do field research in some virtual

site in cyberspace is going to be an extraordinary opportunity in the 21<sup>st</sup> century, and one for which many of us have very little preparation. (quoted in Kaghan *et al.*, 1999, p.69)

Thomas is right that “virtual sites” are a great opportunity and that such “navel gazing” will raise some extremely important questions about subject-researcher interactions. For example, in traditional FTF observation of teams, “technology” (beyond use of one’s eyes, paper, and pencil) is not necessary and, thus, is never a salient factor. However, in geographically dispersed teams, “observation” typically requires researchers to use the same tools used by the teams (e.g., e-mail, web, audio, or video conferencing). This gives the researcher a more direct, visceral understanding of those technologies, but it also makes it difficult to separate the researchers’ impressions as technology user from his or her impressions as observer of technology in use.

The genre of theses and other scholarly writing requires authors to stake claims about what contributions they hope their work will make. As with any scholarly work, the contributions of this thesis will be judged by those who read it, the work that I hope to publish extending it, and the indirect and direct effects that such reading and publication have on others’ work. That said, I hope this thesis contributes to the growing literature on geographically dispersed teams first and foremost by simply calling attention to a construct that has become domain-defining but taken for granted. As noted by two authors with influential records of research on the topic (Olson & Olson, 2000), distance matters despite claims of its death (Cairncross, 1997), and I believe it matters even more than before because team members with limited technology are now more obvious. In the past, those members with the means to traverse or communicate across large distances were the exceptions. The reverse is now true, and it has profound implications for domestic and international policy (e.g., Grimes, 2000; Zachary, 2002).

Second, I hope that this heightened attention leads us (researchers and practitioners) to consider time/timing, space/place, and configuration as important *variables* during the design, work, coaching, and leadership of teams. In this light, Hackman’s (1992) point that settings are often more mutable than people believe, is especially apropos; so is Ancona’s work in progress regarding “temporal design” in organizations.<sup>3</sup>

Third, I hope that I have highlighted how dispersion’s challenges (and potential remedies) have cut across technological eras, always changing somewhat in how they manifested themselves, but rarely changing in their fundamentals. While I do not discount the role or importance of technology, I very deliberately hope to provoke people to consider carefully what is truly different about “management by canoe,” “management by coach,” and “management by computer,” etc. Clearly, communication and transportation speeds have greatly decreased<sup>4</sup>, but it is all too easy to fall under the spell of what Brown & Duguid (2000, p.16) call “endism” – i.e., the overly deterministic sense that new technologies will soon spell the end of everything from cities and government, to universities and hierarchy. However hopeful I am about my work countering some of this endism, I am well aware that it too is not a new phenomenon. Mee (1898) was neither the first nor the last to hold forth about how technology would change everything, but his 104 year-old commentary is worth an extended quote here:

It is probable that before the dawn of the twentieth century ... the telephone will be a quite indispensable element in English social life. But it will be a much more comprehensive and effective instrument than the telephone as we know it [p.339] at present, and the likelihood is that it will be fitted in our houses just as gas or electricity is now. It will be so cheap that not to have it would be absurd, and it will be so entertaining and useful that it will make life happier all round, and bring the pleasures of society to the doors of the artisan’s cottage. That, indeed, will be the unique feature of the Pleasure Telephone. It will make millions merry who have never been merry



before, and will democratize, if we may so write, many of the social luxuries of the rich ... The humblest cottage will be in immediate contact with the city, and the “private wire” will make all classes kin ... the telephone is likely to effect immense changes, and will no doubt create something like a sensation ... carrying business and pleasure into the homes of thousands [p.340], and making next-door neighbors, as it were, of strangers who have never met [p.341] ... Whether this claim is exaggerated or not, time alone will prove; but at any rate the Pleasure Telephone opens out a vista of infinite charm which few prophets of to-day have dreamed of, and who dare to say that in twenty years the electric miracle will not bring all the corners of the earth to our own fireside. [p.345]

Although it may not have needed it, Mee drives his points home with the Cairncross-like (1997) line that:

If, as it is said to be not unlikely in the near future – the principle of sight is applied to the telephone as well as that of sound, earth will be in truth a paradise, and distance will lose its enchantment by being abolished altogether. (p.345)

With the replacement of only a word or two here and there, Mee’s “dated” commentary could be the ad copy for numerous 21<sup>st</sup> century, “distance-killing” technologies (videophones, e-conferencing, etc.).

In addition to these general contributions, I hope my work makes the following study-specific contributions.

## **Chapter 2**

- Demonstrates the value of the occasionally-recommended but rarely used historical approach to modern management and organizational studies.
- Shows that today’s “virtual teams” are actually the descendants of geographically dispersed teams that existed (and succeeded despite huge challenges) many generations ago.
- Suggests that modern dispersed teams might learn something about their own struggles with coordination, communication, control, and isolation by looking back at the ways their “ancestors” dealt with those same challenges.

Among other things, this “back to the future” historical perspective highlights the value of judiciously used redundancy and explicitness (especially in terms of communication); strategically timed face-to-face contact; organizational tenure and memory; and careful records (if not knowledge) management. On the potential applicability of these strategies to modern geographically dispersed teams, see also O’Leary et al. (2002).

## **Chapter 3**

- Defines dispersion more clearly than it has been defined before, and moves our conception of it beyond simple physical distance to a multi-dimensional view that encompasses time, space/place, and configuration.
- Develops measures to capture those dimensions and begins to test their interactions with each other, as well as with communication frequency and performance.

- Points the way toward future use of those measures with different data sets, a wider range of dependent variables, and dispersion as a concept that is considered carefully at the research design stage.
- Warns against the tendency toward use of any single measure to capture a phenomenon that includes distinct dimensions.

#### Chapter 4

- Suggests that dispersion poses special and distinct challenges for the three criteria by which teams’ effectiveness is judged (i.e., final product, growth as a group, and individual learning), and argues that more attention to the weighting of those criteria is needed (both by researchers and by teams themselves).
- Reminds us that a fuller understanding of geographically dispersed teams will require special attention to team members’ expectations, experience, and perceptions of dispersion, not just the aspects of it that are captured by Chapter 3’s measures.<sup>5</sup>
- Highlights that teams’ experience of dispersion may be as strongly shaped by the timing of their FTF and dispersed interactions as by the ratio between the two.

In addition to these important study-specific contributions, the three studies present several cross-cutting messages as well. For example, the role of perceived distance emerges as especially important. The first study documents how managers experienced distance. The second study did not set out to address perceived dispersion at all, but its measures provide a baseline of “objective” geographic dispersion against which team members’ perceptions of dispersion can be compared. The third chapter reinforced the importance of perceptions and serves as a reminder that Chapter 3’s measures are best used in conjunction with a careful understanding of teams’ specific contexts, tasks, and challenges.

Although they highlight different dimensions of dispersion, the three studies together also attest to the importance of seeing dispersion as multi-dimensional. It remains an open question which dimensions are most important under which conditions, but I believe that the three studies make a strong case for moving beyond a simple, dichotomous view of dispersion (see Figure 5.1 for a summary of this new view of geographic dispersion).

Figure 5.1: Toward a New View of Geographic Dispersion

From geographic dispersion as ...	To geographic dispersion as ...
<ul style="list-style-type: none"> <li>• A new aspect of work</li> <li>• Assumed or controlled away</li> <li>• A dichotomy</li> <li>• Fixed</li> <li>• A simple function of physical distance</li> <li>• “Objective”</li> </ul>	<ul style="list-style-type: none"> <li>• An ancient aspect of work</li> <li>• Accounted for in its own right</li> <li>• A series of continua</li> <li>• Variable</li> <li>• A multi-dimensional construct with spatial, temporal, and configurational components</li> <li>• Also perceived and enacted</li> </ul>

As part of that case, the studies indicate that dispersion is experienced as more than just distance, even when that distance includes a temporal dimension. Configuration is correlated with distance (as shown in Chapter 3), but configurational complexity proves to be a critical aspect of dispersion. Whether it was the isolation experienced by HBC and ICP team members, the imbalance between large and small posts or ICP sub-groups, or the simple number of sites on

the telecommunications teams, these aspects of dispersion warrant consideration in conjunction (and potential interaction) with spatial-temporal distance. Much of the recent research on “virtual teams” (e.g., Cramton, 2001), as well as the foundational research on which it draws (e.g., Allen, 1977), focuses on communication. While communication is undoubtedly critical and warrants continued study, the configuration-related findings of this dissertation suggest that *coordination* warrants attention as well. Whether the coordinating was across dozens of posts in the HBC, a half dozen telecommunication company sites, or three ICP sub-groups, its challenges proved as difficult as communication ones.

## 5.2 Suggestions for Further Research and Next Steps

I have already alluded to several potentially productive directions for further research above. In terms of specific suggestions for future research, I make two more here. The first suggestion echoes calls by Rousseau & Friend (2001), Hackman (1999), and others to contextualize our research more carefully and attend to the potentially powerful effects of teams’ time, place, and configuration. For future or in-progress studies of geographically dispersed teams this call can be answered quite simply with explicit descriptions of those teams’ dispersion. The often vague and incomplete way in which dispersion is described in most research makes it extremely difficult to compare and cumulate findings.

The second suggestion is founded in the total absence of reliable prevalence data on geographically dispersed teams. European researchers have done better at gathering such data, but they have typically focused on individual “tele-workers” who may or may not be working in teams (e.g., see Dangelmaier *et al.*, 1999, and their summary of the European Community’s telework development and trends – TELDET – survey initiative). All who write about geographically dispersed teams grasp at anecdotal evidence and questionable surveys sponsored by consultants and technology vendors who have vested interests in high prevalence rates. We have no reliable data (snap shot or longitudinal) showing how prevalent geographically dispersed teams are, and certainly nothing that would allow us to say how their prevalence varies by industry, job type, job level, region, country, etc. Such data – collected at regular intervals with consistent definitions of terms – are sorely needed and would undoubtedly force us to re-evaluate our understanding of who works where, how much, when, and for whom.

As for my own next steps, some are also alluded to above, but the most immediate ones include further work with the Allevus teams, and additional exploration of the dispersion measures. The Allevus work will include teams that have already completed their work, as well as those that are in the queue to start new projects. The analyses will include coding the teams’ meetings and calls, looking at the potential ripple effects of initial interactions. They will also include examining additional teams experimenting with different levels of dispersion. The measures work will involve collaborating with researchers who are beginning new data collection efforts of their own, and who are interested in accounting more carefully for degrees of dispersion. I hope it will also include the collection of new data from a company where I did exploratory research, examining the effects of adding new members to dispersed teams at distinctly different times in their life cycles.

As for the Hudson’s Bay Company, its managers, and the rich records that they were wise enough to keep for their own use (and kind enough to preserve for ours), my work will also continue, but it will focus more on the 1880-1950 period. Records from that era have only recently been opened to the public and are only partially catalogued, but they provide a potentially invaluable window into the recent roots of many “modern” issues – both dispersion-

related and otherwise. Furthermore, those records are always available, and are never subject to cancelled team meetings, mergers, acquisitions, and corporate budget cutting. In short, they provide a wonderful opportunity to fill the inevitable lag times that accompany work with “live” subjects.

### 5.3 References

- Allen, T. J. (1977). *Managing the Flow of Technology*. Cambridge, MA: MIT Press.
- Bartunek, J. M., & Seo, M.-G. (2002). "Commentary: Qualitative Research Can Add New Meanings to Quantitative Research," *Journal of Organizational Behavior*, 23: 237-242.
- Brown, J. S., & Duguid, P. (2000). *Social Life of Information*. Boston: HBS Press.
- Cairncross, F. (1997). *The Death of Distance: How the Communication Revolution Will Change Our Lives*. Boston: HBS Press.
- Cramton, C. D. (2001). "The Mutual Knowledge Problem and Its Consequences for Dispersed Collaboration," *Organization Science*, 12(3): 346-371.
- Dangelmaier, W., Kress, S., & Wenksi, R. (1999). "TelCoW: Telework under the Coordination of a Workflow Management System," *Information and Software Technology*, 41: 341-353.
- Galegher, J. R., Kraut, R. E., & Egido, C. (1990). *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- George, J. M., & Jones, G. R. (2000). "The Role of Time in Theory and Theory Building," *Journal of Management*, 26(4): 657-684.
- Giddens, A. (1984). *The Constitution of Society: Outline of the Theory of Structuration*. Berkeley: University of California Press.
- Grimes, S. (2000). "Rural Areas in the Information Society; Diminishing Distance of Increasing Learning Capacity?," *Journal of Rural Studies*, 16.
- Hackman, J. R. (1999). "Thinking Differently about Context," In R. Wageman (Ed.), *Research on Managing Groups and Teams*, Vol. 2, pp. 233-247. Greenwich, CT: JAI Press.
- Hallowell, E. M. (1999). "The Human Moment at Work," *Harvard Business Review*, Jan-Feb: 2-8.
- Handy, C. (1995). "Trust and the Virtual Organization," *Harvard Business Review*, 73(3): 40-50.
- Kaghan, W. N., Strauss, A. L., Barley, S. R., Brannen, M. Y., & Thomas, R. J. (1999). "The practice and uses of field research in the 21st century organization," *Journal of Management Inquiry*, 8(1): 67-81.
- Mee, A. (1898). "The Pleasure Telephone," *The Strand Magazine, London*, 16(44): 339-345.
- Olson, G. M., & Olson, J. S. (2000). "Distance Matters," *Human-Computer Interaction*, 15(1): 139-179.
- Rousseau, D. M., & Fried, Y. (2001). "Location, Location, Location: Contextualizing Organizational Research," *Journal of Organizational Behavior*, 22: 1-13.
- Schunn, C., Crowley, K., & Okada, T. (2002). "What Makes Collaborations across a Distance Succeed? The Case of the Cognitive Science Community," In P. Hinds, & S. Kiesler (Eds.), *Distributed Work*, pp. 407-432. Cambridge, MA: MIT Press.
- Scott, C. R. (1999). "Communication Technology and Group Communication," In L. R. Frey, D. Gouran, & M. S. Poole (Eds.), *Handbook of Group Communication Theory and Research*, pp. 432-474. Thousand Oaks, CA: Sage.
- Zachary, G. P. (2002). "Ghana's Digital Dilemma," *Technology Review*, 105(6): 66-73.

## 5.4 Endnotes

<sup>1</sup> In fact, it has actually been the source of much useful knowledge about the effects of distance. See, for example, the recent chapter by Schunn et al. (2002) or the extremely valuable book by Galegher and colleagues (1990).

<sup>2</sup> That these transcriptions were all done with no FTF or voice contact, no prior knowledge of any of the parties concerned (save the reputational effects of our Institute and university affiliations), and no advance payment is just one example that trust can exist without “touch,” contrary to what some pundits say (e.g., Hallowell, 1999; Handy, 1995).

<sup>3</sup> Although the work and increasing prominence of time in management research (e.g., George & Jones, 2000) is an excellent and welcome development from which I have benefited greatly, I would argue that *place* deserves an equally prominent seat next to its conceptual cousin; the two are inextricably linked.

<sup>4</sup> See Janelle, 1969, cited by Giddens (1984 p.114), noting that the journey from East to West Coasts of the U.S. has shrunk from four months (by stage coach or wagon in 1860) to four days (by train in 1910) to four hours (by plane in 1960).

<sup>5</sup> Bartunek & Seo (2002) provide a more extended discussion of how qualitative methods are vital for shedding light on such “local perceptions” and “local dynamics.”

## BIOGRAPHICAL NOTE

Michael O’Leary was born in Port Jefferson, NY, and grew up in Stony Brook, NY, where his parents are both clinical psychology professors at the State University of New York. He attended public schools in Stony Brook and neighboring Setauket, NY, graduating from Ward Melville High School in 1987. He received a B.A. in Public Policy Studies from Duke University in 1991 and served as an elected member of the university’s Board of Trustees from 1991-95. After graduation, he worked as an educational policy analyst for Pelavin Associates (now part of the American Institutes for Research) in Washington, D.C. While there, his primary clients were the Secretary’s Office of the U.S. Department of Education and the National Center for Education Statistics. He specialized in K-12 educational finance and organizational transformations in U.S. higher education.

From 1994 to 1997, he was a management consultant in Coopers & Lybrand’s Higher Education and Non-Profit Consulting Group, serving major research universities and medical centers (e.g., Columbia, Georgetown, Stanford, Tufts, Boston University, and the Universities of Pennsylvania and Minnesota), as well as several large non-profit organizations (e.g., the Educational Testing Service and the NCAA). His consulting clients were all undergoing major changes in their information technology systems and dealing with the strategic, organizational, and behavioral implications of those new systems.

Joining the Organization Studies Group’s Ph.D. program at the MIT Sloan School of Management in 1997, he was a Zannetos Fellow and was also supported by grants from the Center for Innovation & Product Development, the NSF, and the International Center for Research on the Management of Information Technology. He joined the faculty at Boston College’s Carroll School of Management as an Assistant Professor of Organization Studies in 2002. There, he will be teaching courses in organizational behavior and communications, and the social aspects of information technology at the undergraduate, MBA, and Ph.D. levels.

His research focuses on geographically-dispersed work, especially in a team context, and employs a mixture of quantitative, qualitative, historical, and action research methods. More generally, he is interested in the intersection of team performance, working relationships, and the social and behavioral aspects of information technology use. He is the author of “Distributed Work over the Centuries: Trust and Control in the Hudson’s Bay Company, 1670-1826,” (in Hinds & Kiesler, eds., *Distributed Work*, MIT Press, 2002), and “Managing by Canoeing Around: Lessons from the Hudson’s Bay Company,” (*Knowledge Directions*, 2001), both of which were written with Wanda Orlikowski and JoAnne Yates.

In 1995, in Cambridge, MA, he married Meg Maureen Talty, who received her MBA from the MIT Sloan School in 1996. They are residents of Somerville, MA and parents of two young children – Grace Langford O’Leary and Liam Thomas O’Leary. In addition to spending time with his family, he enjoys playing tennis and soccer, watching college basketball, cooking, fishing, and doing genealogical research.

Contacts:      mike.oleary@bc.edu (as of August 2002)  
                  michael.oleary@sloan.mit.edu (lifetime e-mail address)