CHAPTER 1
GENERAL INTRODUCTION

In 2008, a group of engineers experienced an extremely embarrassing moment during the inspection of the train tunnel they had just completed near Warsaw, Poland. Their inspection revealed that the tunnel was too low for trains to pass through without crashing into the tunnel’s ceiling. According to the Polish Railways, this costly mistake resulted from a lack of coordination between the two contracting firms that were involved in the build. A team from one organization built the tunnel, while a team from a second firm simultaneously laid down the railroad tracks. Employees from neither team had consulted each other during this collective process and, consequently, failed to notice that the tracks were placed much closer to the tunnel’s ceiling than had initially been planned. The result was a costly rebuild and months of delays in the Polish railway system (Dubroff, 2008).

Such problems are not unique to the rail sector. In 1999, for example, NASA had commissioned Lockheed Martin with designing and constructing a new unmanned spacecraft that would circle Mars and collect information on the planet’s climate (the Mars Climate Orbiter; Sauser, Reilly, & Shenhar, 2009). Launch of the new spacecraft proceeded without problems, but NASA encountered serious problems in positioning the spacecraft after it had reached outer space. Eventually, NASA lost the multimillion-dollar Mars Climate Orbiter. A subsequent evaluation revealed that there was nothing technically wrong with the spacecraft. Instead, it became clear that Lockheed Martin’s construction team had designed the navigation system to work with English miles, while NASA’s navigation team used metric kilometers to calculate the Orbiter’s flight plan. Engineers and navigators had no idea about this discrepancy during the Orbiter’s maiden voyage. Hence, the spacecraft’s direction was offset, causing it to disappear in space permanently (Postrel, 2002).
These real-life cases represent instances where tasks were beyond any single team’s scope and capacity. Several teams were needed, with each team contributing specialized efforts and expertise to the realization of complex, collective tasks (DeChurch & Mathieu, 2009; Mathieu, Marks, & Zaccaro, 2001). Completing the Polish rail tunnel, for example, required contributions from specialized teams of structural engineers and railroad technicians, whereas NASA depended on Lockheed Martin for providing them with the Mars mission’s spacecraft. Such complex collective tasks are widespread in both public and private sectors. Implementing public policy and disaster relief, for example, is often so intricate and large-scale that teams from government agencies need assistance from commercial service providers (Börzel, 1998; Kapucu, Arslan, & Collins, 2010). Similarly, designing innovative products typically requires the expertise of multiple specialized teams of engineers, originating from both universities and commercial firms (Marks & Luvison, 2012).

When working towards joint outcomes, such distinct teams have both separate (team-level) goals and collective goals. Team-level goals specify the unique outcomes that different teams need to realize within the broader project or task. For example, NASA’s teams had the unique team-level goal of successfully navigating the Mars Climate Orbiter into space, while teams from Lockheed Martin had the team-level goal of delivering a fully functional spacecraft. Realizing team-level goals is the main focus of stand-alone teams working on isolated tasks. For interdependent teams working on a complex and collective task, however, realizing team-level goals is subordinate to reaching a higher-order and long-term collective goal (Mathieu et al., 2001; Zaccaro, Marks, & DeChurch, 2012). In such settings, the collective goal specifies the greater, shared purpose to which each team’s separate effort needs to contribute. Within our Mars Climate Orbiter example, teams from Lockheed Martin and NASA shared the overall goal of realizing a successful space mission, and their unique team-level efforts needed to contribute to that ultimate result (Postrel, 2002).
In other words, teams need to align and synchronize their activities with those of other teams (i.e., *interteam coordination*) when working towards collective goals (Ancona & Caldwell, 1992a; Hoegl, Weinkauf, & Gemuenden, 2004). Interteam coordination is reflected in, for example, teams’ attempts to align schedules, negotiate common deadlines (Ancona & Caldwell, 1988), sequence interdependent subtasks (Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005; Marrone, 2010), and provide feedback on each other’s team-level contributions to the collective effort (Hoegl & Weinkauf, 2005). Interteam coordination can serve to align efforts of interdependent teams residing in the same organization (e.g., when a sales team aligns its sales offerings with the firm’s logistical department’s delivery schedule). Similarly, interteam coordination can serve to combine efforts of teams from multiple organizations (e.g., when Lockheed Martin’s and NASA’s teams would engage in interteam coordination to redesign the Mars Climate Orbiter; Joshi, Pandey, & Han, 2009; Marrone, 2010).

Teams are likely to fail at collective goals without interteam coordination, even when they function perfectly as separate units and achieve all of their team-level goals (Marks et al., 2005; Smith, Carroll, & Ashford, 1995). Indeed, the teams in our introductory examples executed their primary tasks quite well independently of each other. Both Polish construction teams had completed their contribution to the overall project, since both the railroad tracks and tunnel structure were well constructed when assessed separately. Similarly, the Mars Climate Orbiter was space worthy, delivered on time, and within budget. These teams, nevertheless, failed at their collective goals because they lacked interteam coordination. They overlooked the fact that they worked within a larger system in which their contributions needed to align with those of other teams (DeChurch & Zaccaro, 2010; Mathieu et al., 2001).

Regrettably, such interteam coordination problems are common in several important sectors. For example, supply chain (SC) scholars noted that “there seems to be a general lack of managerial ability to integrate and coordinate the intricate network of business
relationships among SC members” (Kanda & Deshmukh, 2008: 317). Similar issues trouble healthcare services, with scholars observing that “despite their efforts to collaborate, professionals are lost in translation across healthcare boundaries” (Kerosuo, 2010: 372).

Finally, Donahue and Tuohy’s (2006) evaluation of the disaster relief operations following hurricane Katrina in 2005, the 9/11 terrorist attacks in 2001, the Oklahoma City bombing in 1995, and hurricane Andrew in 1992 indicated that ineffective coordination between government agencies, police, fire fighting departments, and medical responders had severely complicated all of these efforts (see also Kapucu, 2005; Takeda & Helms, 2006a; Waugh & Streib, 2006). The different teams and organizations involved in these disaster relief operations seemed unable to avoid “duplicate and conflicting efforts” and implemented “multiple, conflicting, uncooperative, and isolated command structures” (Donahue & Tuohy, 2006: 6).

The purpose of this dissertation is to address important issues in academic understanding that may have contributed to these interteam coordination problems. To do so, I start with a selective literature review of research on coordination between teams from the same organization, as well as between teams from different organizations. I examine both interteam coordination within and between organizations, because this scope enables “one to focus on aspects that are often overlooked when focusing solely on behavior ‘within’ the organizations” (White, 1974: 144–145). I conclude the general introduction with an overview of key ambiguities in existing research streams on interteam coordination and a description of how this dissertation’s empirical chapters will address these ambiguities.

LITERATURE REVIEW

Macro-level Perspectives on Interteam Coordination

Three distinct research perspectives provide insights on interteam coordination, each focusing on a different level of analysis and each with a unique perspective on how to manage
coordination. First, several studies focused on the role of the macro-level organizational structure (i.e., “the formal system of task and authority relationships that controls how people coordinate their actions and use resources to achieve organizational goals;” Jones, 2007: 7) within multi-organizational collaborations, such as strategic alliances and public-private partnerships (Borys & Jemison, 1989; Provan & Kenis, 2007). Macro-level scholars have noted that organizational structures exert considerable influence on interteam coordination within such settings, because structures specify who is responsible for coordinating across teams (e.g., formal leaders, team members, or designated coordinators), as well as whether coordination is controlled through rules and protocols or is at members’ own discretion (Galbraith, 1994; Sherman & Keller, 2011; Van de Ven, Delbecq, & Koenig, 1976).

Empirical macro-level research has mostly focused on understanding administrators’ choice of the organizational structure for interteam coordination. For example, Osborn and Baughn (1990) analyzed 153 multi-organizational collaborations and concluded that administrators prefer joint venture structures over contractual arrangements (e.g., outsourcing) for research and development alliances. Joint venture structures were favored because – unlike contractual arrangements – they included central leaders to ensure that teams exchange proprietary information and engage in day-to-day coordination. In addition, Gulati and Singh (1998) inspected announcements of multi-organizational collaborations over a 20-year period and found that partner organizations implemented bureaucratic structures when they had anticipated coordination difficulties. Administrators, arguably, appreciated bureaucratic structures more when they had expected coordination problems, because the central leaders included in such organizational forms could act as intermediaries and resolve conflicts between teams that might otherwise trouble coordination. Finally, Dekker (2004) showed that partner organizations formalized interteam coordination in rules and protocols to show their commitment to the partnership and to prevent opportunistic behavior.
Conceptual research, on the other hand, has explored which organizational structures may be most effective at promoting interteam coordination and teams’ collective outcomes. Some of these studies have indicated that interteam coordination is best realized in so-called *decentralized* structures where teams self-manage joint activities in a bottom-up manner (Börzel, 1998; Dynes, 1990; Takeda & Helms, 2006a; Waugh & Streib, 2006; Zaccaro et al., 2012). In such structures, teams provide each other with frequent feedback and laterally align efforts though informal interactions with little control from central leaders (Marks et al., 2005; Zaccaro et al., 2012). Such decentralization may be effective because the information and resources needed for interteam coordination are typically dispersed across teams, and therefore are not at the direct disposal of central leaders (Hanf & O’Toole, 1992). Indeed, central leaders may need to spend much time gaining resources and information, which can delay and complicate interteam coordination (Nidumolu, 1996).

Decentralized team members, on the other hand, may lack the central position and dedicated resources needed for developing a real-time, system-wide oversight of activities in the broader collaboration (Provan & Kenis, 2007). As a result, decentralized team members may fail to recognize key coordination requirements (Davison, Hollenbeck, Barnes, Sleesman, & Ilgen, 2012). Instead of empowering teams to self-organize interteam coordination, other scholars therefore have suggested that it might be more effective to use formal protocols and central leaders to coordinate teams’ efforts (Provan & Kenis, 2007). Thus, these scholars point to the value of *centralized* organizational structures in which leaders work as linking-pins that control coordination between teams in a top-down manner.

All in all, the macro-level perspective points to two alternative organizational set-ups for managing interteam coordination, each with a unique set of potential strengths and weaknesses. Empirical research on this subject is limited, partly due to the complexity of collecting detailed data on the processes and performance of large numbers of comparable
multi-organizational collaborations that utilize alternative structures (Provan & Kenis, 2007; Provan & Milward, 2001). As a result, empirical research has primarily focused on uncovering administrators’ choice for particular coordination structures (e.g., Dekker, 2004; Gulati & Singh, 1998; Osborn & Baughn, 1990). Unlike performance evaluations, administrators’ choices are, however, likely to be informed by industry trends, firm-specific collaboration experiences, and personal preferences (DiMaggio & Powell, 1983; Provan & Kenis, 2007). Hence, organizational structure’s implications for interteam coordination and teams’ collective performance “remains as one of the most exciting and underexplored [research] areas” (Gulati, 1998: 306; see also Provan & Kenis, 2007).

**Meso-level Perspectives on Interteam Coordination**

A second perspective on interteam coordination examined how meso-level team factors can enable coordination across teams. Researchers that adopted this perspective have submitted that teams remain at least partially responsible for aligning their activities with other teams in the organization, regardless of whether or not interteam coordination is formally arranged through central leaders or standardized protocols (Ancona & Caldwell, 1992a; Faraj & Yan, 2009; Marrone, 2010). Indeed, teams need to build and maintain informal coordination networks to obtain direct access to external resources (personal assistance, tacit knowledge) that would be impossible or inefficient to access through formal coordination mechanisms (e.g., by putting in a formal request to a central manager; Kratzer, Gemünden, & Lettl, 2008). Hence, rather than studying organizational structure, the meso perspective has focused on examining team-level factors that allows these teams to engage in informal interteam coordination (Choi, 2002; Joshi et al., 2009).

Results from this research suggest that team composition is particularly important (Joshi et al., 2009). Building fluid teams that comprise a changing pool of mostly part-time employees with temporary contracts, for example, has been shown to promote interteam
coordination (Drach-Zahavy, 2011). Fluid teams presumably develop permeable boundaries that ease interteam coordination, whereas stable teams with mostly full-time and permanent members oftentimes develop a strong internal cohesion that isolates them from other teams (Drach-Zahavy, 2011). Other researchers have suggested that interteam coordination can be promoted by composing teams with members who differ from each other in their core domain of expertise (i.e., functional diversity; Ancona & Caldwell, 1992b). Specifically, teams in which each member’s expertise is specialized in a different subject matter area may benefit from a broader collective network and knowledge base for interteam coordination, as compared to homogenous teams where members’ expertise and contacts are concentrated in the same domain (Joshi et al., 2009). Attaching members to multiple teams is another way to promote interteam coordination (Ancona & Caldwell, 1988). Here, team members migrate to other teams, while remaining affiliated to their focal team. “Immigrant” and “emigrant” team members then link and orchestrate their focal team’s actions with their new teams’ efforts (Ancona & Caldwell, 1988: 480), thereby potentially promoting interteam coordination.

One of the most recommended compositional strategies for promoting interteam coordination, however, involves developing or assembling teams of generalist members acquainted with the multiple functions present in the overall organization (i.e., high intrapersonal functional diversity; IFD). Teams may develop IFD by allowing their members to obtain experience in different functional domains, for example, through participating in cross-functional job rotations and personnel movements (Griffin & Hauser, 1996; Leenders & Wierenga, 2002; Marks, Sabella, Burke, & Zaccaro, 2002; Srikanth & Puranam, 2011). Scholars have suggested that teams with high IFD enjoy a superior understanding of their diverse organizational context (Ancona & Caldwell, 1990; Ford & Schmidt, 2000; Marrone, Tesluk, & Carson, 2007) and, therefore, may be particularly capable of managing interteam coordination in an informal, emergent manner (Cannella, Park, & Lee, 2008; Joshi et al., 2009).
Other scholars have, however, warned that there may also be unexpected downsides to IFD that might mitigate its advantages for interteam coordination (Buyl, Boone, Hendriks, & Matthyssens, 2011; Postrel, 2002). Specifically, efforts to increase teams’ IFD may have the detrimental side-effect of reducing these teams’ depth of functional expertise (Hatvany & Pucik, 1981; Raskas & Hambrick, 1992). Lack of depth may, in turn, limit these teams’ capacities to fulfill their unique, specialist task responsibilities within the organization (Postrel, 2002).

All in all, the meso-level perspective points to IFD as an important compositional strategy that may enable teams to self-manage interteam coordination. Specifically, increasing teams’ IFD may enable informal, interteam coordination in the organization. At the same time, however, there is theoretical ambiguity regarding the detrimental side effects of this compositional strategy, and empirical research to resolve that ambiguity appears to be absent.

Micro-level Perspectives on Interteam Coordination

A third group of scholars has explored individual team members’ role in coordinating activities between teams. These scholars have stipulated that interteam coordination essentially emerges through individual members’ efforts to coordinate on behalf of their team – which I refer to as an individual’s “interteam coordination behavior” (Williams, 2002). Importantly, individual members often differ widely in their interteam coordination behavior, even when they work in the exact same team (Marrone, 2004). Moreover, members often work as informal coordinators and engage in direct, lateral coordination with members outside their team even when their core job role in the organizational structure does not mandate or require such activities (Kratzer et al., 2008; Tushman & Scanlan, 1981). Hence, there is variation between team members’ interteam coordination behavior that is not accounted for by meso-level team characteristics or macro-level organizational structure. The
final perspective addressed this issue by exploring micro-level factors that may lead some members to exhibit more interteam coordination behavior than others.

Tushman and Scanlan (1981), for example, found that team members differed in their interteam coordination behavior because they had dissimilar levels of technical competency. It appeared that technically competent members gained a sort of ‘expert’ status in their organization and were, therefore, frequently approached by external team members for discussing task-related issues (Tushman & Scanlan, 1981). Additional differences may exist between team members’ interteam coordination behavior because some individuals may feel more confident than others at representing the team externally (Marrone et al., 2007). Specifically, members with high ‘boundary spanning self-efficacy’ may engage in more interteam coordination behavior because they perceive these activities as less problematic and more exciting compared with colleagues in the team who lack such confidence (Marrone et al., 2007). Other researchers have indicated that individuals are particularly effective at interteam coordination behavior when they can adjust their activities to diverse social contexts (i.e., high self-monitoring; Caldwell & O’Reilly, 1982), frequently contact external team members, and strongly identify with the team and organization (Richter, West, van Dick, & Dawson, 2006). These factors may lead some members to execute the bulk of the interteam coordination behavior within the team (Levina & Vaast, 2005).

Besides these factors, researchers have examined the distinct individual-level implications of members’ “breadth of functional experience” (i.e., the degree to which a person’s work experience is dispersed across different functional domains), that may, on the meso level, form IFD. These researchers have suggested that breadth of functional experience is a particularly important determinant of individual team members’ engagement in and effectiveness at interteam coordination behavior (see Burke & Steensma, 1998; Noble & Jones, 2006; Raskas & Hambrick, 1992). Members with broad functional experiences may
learn to “speak different languages of different functions, understand diverse cultures, and be similar to diverse external groups” (Choi, 2002: 196; see also Ancona & Caldwell, 1990), which can enable them to successfully engage in high levels of interteam coordination behavior (Ancona & Caldwell, 1988, 1990; Beechler, Søndergaard, Miller, & Bird, 2004; Marrone, 2004). Empirical research on this topic is, however, scarce and some researchers remain skeptical about the value of broad functional experiences for interteam coordination behavior. These skeptics have cautioned that functional broad individuals may suffer from the “jack of trades but master of none syndrome” and fail at coordinating intricate matters across specialized domains or teams (Buyl et al., 2011: 170; see also Jans & Frazer-Jans, 2004).

In sum, congruent with the meso-level perspective’s predictions regarding IFD, the micro-level perspective points towards the unique value of generalist work experiences for interteam coordination. At the same time, micro-level research provides theoretical reasons to doubt that generalist experiences are a panacea for an individual’s interteam coordination behavior, and empirical studies investigating this subject are again largely missing.

RESEARCH GAPS AND PRESENT APPROACH

All in all, the literature review points to three important ambiguities in existing research perspectives that can trouble effective management of interteam coordination. First, on the macro-level of analysis, there is debate regarding how organizational structures can be designed so that interteam coordination and teams’ performance at collective tasks is optimized. Chapter 2 of the present dissertation addresses this issue in the context of a multi-organizational collaboration that had switched from a traditional, centralized organizational structure toward a contemporary multiteam system (MTS) approach. The MTS approach involves using a highly decentralized organizational structure, in which interdependent sub-teams (i.e., component teams) engage in direct interaction with each other to self-manage joint efforts. Chapter 2 employs quasi-experimental time-series analyses to quantitatively...
examine the performance consequences of this shift in structural approaches. In the next step, Chapter 2 draws from three weeks of on-site observations and two rounds of qualitative interviews to generate a new, inductive understanding of the advantages and disadvantages of the MTS approach for interteam coordination and teams’ collective performance. The qualitative part also explores how formal coordination mechanisms can be used to leverage the MTS approach’s strengths and mitigate its weaknesses. Specifically, Chapter 2 examines the role of a formal integration team of boundary-spanning intermediaries (i.e., liaisons) in supporting team’s coordination and task execution within the decentralized MTS structure.

On the meso-level of analysis, the literature review indicates that there is theoretical controversy regarding the value of the widely recommended strategy of building teams with generalist members (i.e., IFD). In fact, some scholars have suggested that IFD’s potential benefits may be offset by its downsides for teams’ capacity for specialized tasks. Chapter 3 addresses this issue by examining the relationship between IFD, interteam coordination, and performance in MTSs involved in realistic decision-making simulations. In doing so, Chapter 3 aims to advance a more complete perspective on the performance implications of IFD in MTSs by considering both the advantages of IFD for interteam coordination, as well as the detrimental side effects of IFD for other important processes in MTSs that require depth rather than breadth of functional experience. In addition, Chapter 3 integrates existing meso-level insights on IFD with the macro-level insights generated in Chapter 2, and explores how integration teams within MTS structures may help to realize IFD’s benefits for coordination while mitigating its detrimental side effects for other important processes.

Finally, ambiguity exists on the micro-level of analysis regarding breadth of functional experience’s role for individual members’ interteam coordination behavior. Chapter 4 explores this issue and examines the relationship between individual members’ breadth of functional experience and their interteam coordination behavior within an MTS structure used
Chapter 4 empirically examines the specific interpersonal capacities that individuals with broad functional experiences may develop during their diverse careers. In addition, Chapter 4 aims to identify the motivational mechanisms that may cause members to use these interpersonal capacities for interteam coordination behavior. Finally, Chapter 4 examines the implications of team members’ combined engagement in interteam coordination behavior for their team’s overall performance level.

OVERALL APPROACH OF THIS DISSERTATION

Taken together, the chapters in this dissertation aim at developing an integrated understanding of interteam coordination by advancing new knowledge on an interrelated set of macro-, meso-, and micro-level antecedents that can help to promote this important activity. On the macro level, Chapter 2 examines how a shift in organizational structure can influence interteam coordination and teams’ achievement of collective outcomes. In doing so, Chapter 2 sheds new light on how decentralized, MTS structures can be optimized for interteam coordination. Chapter 3 subsequently zooms in on the internal dynamics within MTS structures and examines how an important composition strategy (i.e., IFD) can enhance interteam coordination and performance. As such, Chapter 3 helps to reconcile conflicting meso-level predictions regarding IFD’s implications and advances scientific knowledge on the internal working of an important organizational structure for managing interteam coordination (i.e., MTSs). Chapter 4 continues where Chapter 3 ends and addresses remaining ambiguities associated with IFD’s individual-level foundations. Chapter 4 contributes to micro-level research by examining the individual-level capacities that may emerge through broad functional experiences, as well by exploring an important individual-level factor that may motivate individuals to direct that capacity towards interteam coordination behavior.