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Multiple Team Membership: A Theoretical Model of Its Effects on Productivity and Learning for Individuals, Teams, and Organizations

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Abstract

While organizations strive to manage the time and attention of workers effectively, the practice of asking workers to contribute to multiple teams simultaneously can result in the opposite. We present a model of the effects of multiple team membership (MTM) on learning and productivity via the mediating processes of individual context switching, team temporal misalignment, and intra-organizational connectivity. These effects are curvilinear, with learning and productivity peaking at moderate levels of these mediating processes.

> *I am slapped about the head and shoulders regularly by different project leaders to spend more time on their task . . . well, so then you feel bad, so then you try to put in a few more hours. – Employee*

> *I think it is much easier to manage in a multi-team environment. If someone works for you 100% of the time, and there is a lull, then you have to find something good for them to do. But if they are on several different projects, then there is always something for them to do – Manager* (Authors, 2007)

Over the last century, the primary approach to organizing has shifted from individual work in hierarchical structures, to more team-based work in hierarchical structures, to team-based work in matrix structures, and ultimately to team-based work in multi-team systems (Hatch & Cunliffe, 2006; Hobday, 2000; Malone, 2004; Marks, Dechurch, Mathieu, Panzer, & Alonso, 2005; Scott & Davis, 2006). As these changes have taken place, an increasing amount of responsibility has shifted to individual employees – responsibility for managing their own learning, allocating their own time, and focusing their own attention. This is especially true when employees are members of multiple teams concurrently, with no one manager aware of each employee's full portfolio of work or team commitments. In such situations, individuals may make decisions (about their time, attention, information, etc.) that are completely rational for them, but that do not result in optimal productivity and learning at the team and organizational levels (Schelling, 1978). Conversely, without complete knowledge of individuals' multiple team commitments, teams, managers, and organizations may make reasonable team- and organizational-level decisions that have very problematic effects for individuals. In this paper, we address this theoretical and practical tension regarding the allocation of time and attention, as well as the flow of information, when people are simultaneously members of multiple teams.

Based on our own survey data and surveys by other scholars (Lu, Wynn, Chudoba., & Watson-Manheim, 2003; Martin & Bal, 2006), simultaneous membership on more than one team (what we call multiple team membership or MTM) appears to be the norm for at least 65 percent of knowledge workers across a wide range of industries and occupations in the United States and Europe (Zika-Viktorsson, Sundstrom, & Engwall, 2006). Some surveys place the percent of knowledge workers who are members of more than one team as high as 94.9 percent (Martin & Bal, 2006) and in at least one company (Intel), 28% are on five or more (Lu et al., 2003). In addition, a wide variety of scholars and practitioners have mentioned the commonality of MTM. For example, Gonzalez and Mark's (2005: 143-4) comment is typical: "In fields as diverse as finance, software development, consulting, and academia, we are finding that it is commonplace that information workers are involved in multiple collaborations that occur in parallel. This demands that individuals enact specific efforts to coordinate, manage and track those collaborations." MTM seems especially common (and particularly challenging) in information technology (e.g., Baschab & Piot, 2007), software development (e.g., Shore & Warden, 2007), new product development (e.g., Wheelwright & Clark, 1992) and some consulting firms (Milgrom & Roberts, 1992), but appears to be widespread in a variety other contexts too [e.g., from education (Jones, 1990) to auto repair (Madono, 1998) and healthcare (Richter, Scully, & West, 2005)].

Despite the prevalence of MTM and scholars' acknowledgement of its existence for at least the last 30 years (Kolodny, 1979), prior research on it is sparse. As Chudoba and Watson-Manheim (2007: 67) note, "Most academic research has focused on intact teams without accounting for the possibility of multi-teaming." Only a handful of studies address it on more than a passing level. For example, in the 170 empirical articles in two recent reviews of team research (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Ilgen, 2006), only three articles mention MTM. Two allude to its existence, but move on to consider other issues and people's "focal" teams (Anderson & West, 1998; Witt, Hilton, & Hochwarter, 2001). The third measures a correlate of the lack of MTM (i.e., "single team identity"), but does not explore its causes or consequences (Campion, Medsker, & Higgs, 1996). A few other studies, outside those encompassed by the reviews above, also acknowledge the existence of MTM (e.g., Espinosa, Cummings, Wilson, & Pearce, 2003; Guzzo, 1996; Majchrzak, Rice, Malhotra, King, & Ba, 2000; Meyer, 1994), but do not address it in detail. Despite some scholars' acknowledgment that MTM "is quite prominent these days," research on MTM has been "scant" enough that a recent review (Mathieu, Maynard, Rapp, & Gilson, 2008: 442) described MTM as one of six areas in teams research that warrants attention and noted that "very little is known about [MTM's] implications for teams and individuals alike." Thus, our model is motivated by both a gap in the literature and the real-world dilemma (Kilduff, 2006) of how to strike a balance between the positive and negative effects of MTM. We believe that understanding the theoretical mechanisms by which MTM exerts its influence on productivity and learning are critical to understanding both the pervasiveness and practical costs and benefits of MTM.

Although there are only a handful of studies directly addressing MTM, other research addresses constructs and processes related to MTM at the individual, team, and organizational levels. However, as shown in Table 1, that research typically addresses only one level of analysis and does so in contexts that do not explicitly involve MTM.

Insert Table 1 about here

The studies in Table 1 make valuable contributions in their own domains, but there are several ways in which their focal constructs are distinct from MTM. First, none addresses how MTM affects the allocation of time and attention across multiple levels. Second, these literatures (especially those on multi-team systems and project portfolio management) address coordination across and interfaces among multiple teams, but not the sharing of members' time across teams. Third, previous research on the effects of fragmented time and attention has typically addressed either the positive *or* negative effects of that fragmentation, but not both. For example, research on interruptions has treated them as either harmful (e.g., Perlow, 1999) *or* beneficial (e.g., Zellmer-Bruhn, 2003) and research on “project overload” (as the name itself suggests) is focused solely on the negative implications of individuals’ over-commitment (Zika-Viktorsson et al., 2006). Research rarely acknowledges (and, as far as we know, never models) the potential curvilinear relationships, where effects associated with a low or high amount of an attribute (such as interruptions) are different from the effects of a moderate amount, or where there are simultaneously positive and negative effects operating through different mechanisms.

Thus, the model of MTM that we propose focuses on its curvilinear effects on productivity and learning as a function of its effects on time, attention, and information at the individual, team, and organizational levels. We suggest that membership in a moderate number of teams can yield productivity and learning benefits at all levels of analysis, but concurrent membership in either very few or very many project teams presents obstacles to both productivity and learning at all three levels. While these inverted-U-shaped relationships between MTM and both productivity and learning appear similar across all three levels, they are driven by underlying mechanisms, actors, and processes that are distinct and level-specific (i.e., team- and organization-level effects are not simply aggregations of individual- and team-level effects). In the subsequent sections, we expand on the competing forces at each level that, in combination, yield the curvilinear inverted-U-shaped relationships. We also address the feedback loops between productivity and MTM, which help fuel MTM’s use in organizations.

We make four key contributions with this model. First, we highlight the significant effect that this widespread work practice can have for the allocation of time and attention in organizations. At moderate levels, MTM can benefit individuals, teams, and organizations by more effectively distributing time, attention, and information, but it can hurt them when MTM is very low (through inefficiency and suboptimal information flow) or very high (through fragmentation).

Second, we identify three key mediators (context switching, temporal misalignment, and intre-organizational connectivity) through which MTM's effects on productivity and learning are manifested. Third, we describe a series of feedback loops that affect MTM itself, creating a self-fueling cycle. Fourth, we articulate several common dynamics that underlie the MTM-productivity and MTM-learning relationships at all three levels of analysis. In the sections that follow, we address key terms, boundary conditions, and assumptions. Then, we present our model. Finally, we discuss the scholarly and managerial implications of our model.

KEY TERMS, BOUNDARY CONDITIONS, AND ASSUMPTIONS

We define MTM as a situation in which individuals are concurrently members of two or more teams within a given period of time. The level of MTM within a social system is a function of the average number of team memberships held by individual members within that same time period. This definition of MTM includes three key components: team, membership, and time period. *Teams* are bounded sets of individuals that work interdependently toward a shared outcome (Hackman, 2002). Individuals are *members* of a team when they share the responsibility and reward (or penalty) for the outcomes of the team's work and recognize each other as members of the team. People may contribute to teams as consultants or occasional sources of expert advice, and teams may include some people who are so peripherally involved that they aren't recognized as members (even if they may appear on a team roster). However, recognizing that teams can and do sometimes have fuzzy boundaries (Mortensen & Hinds, 2002), our model focuses on people who are identified as members of the team by themselves and their teammates.

In order to address MTM in a meaningful way, we must make some assumptions about the *period* over which team membership is considered and the time available for work. First, for any given application of our model, it is important to consider people's team membership over some context-specific period. In contexts where teams are fairly short-lived (e.g., computer emergency response teams or hospital emergency room teams), 24-48 hours is a period over which MTM and its effects could be assessed meaningfully. In contexts where teams are longer-lived (e.g., software development), the relevant period might be weeks or months. Thus, any empirical study of MTM must take the general context (Johns, 2006) and temporal structures (Ancona, Goodman, Lawrence, & Tushman, 2001) of the research setting into close consideration. For emergency room teams, for example, MTM would be measured in terms of the average number of patient care teams on which doctors worked during their most recent 24-48 hour shift. For software developers, MTM might best be measured on a weekly or bi-weekly basis.

Second, we assume that the total time available for people's work is finite. Work time can encroach on non-work time, or individuals can shift time from one project to another, but (setting aside minor daily, weekly, or monthly variations) individuals have a limited number of hours available to work. That time may be 35-40 hours per week in some contexts or much more in others (Tischler, 2005), but we assume that it is relatively stable within any given work context. In short, the time horizon over which MTM needs to be considered varies by context, as does the total amount of time people work, but the time individuals dedicate to any one team must necessarily be reduced as they become members of multiple teams.

Having defined MTM itself, we now define the outcomes of interest in our model. MTM certainly affects a variety of individual, team, and organizational outcomes (e.g., individual stress, work/life balance, workload, and social identity). In our model, however, we focus on MTM's relationship with productivity and learning, which are: 1) central to many of the other outcomes sought by individuals, teams, and organizations; 2) critical components of a holistic view of performance (Hackman, 2002); and 3) most vulnerable to the fragmentation of time and attention (Ocasio, 1997). *Productivity* is an indicator of how effectively a system converts a set of resources into outputs and incorporates both quantity and quality of outputs (Adler & Clark, 1991). Consequently, many activities in organizations are intended to enhance productivity. It is important to note that while team and organizational productivity are clearly bounded, it is possible to assess individual productivity in the context of a single team or more broadly at the level of the individual (who potentially spans multiple teams). Given the focus of this research, we adopt the latter, broader framing, in which individual productivity is assessed across all of the teams that make up an individual's job.

Learning is an indicator of the change in knowledge, routines, or behavior of an individual, team, or organization (Argote, 1999; Huber, 1991). At the individual level, this requires actors to "attend to, encode, store, and retrieve information that exists in the surrounding environment" (Ellis, Hollenbeck, Ilgen, Porter, West, & Moon, 2003: 821). Similarly, at the team level, it consists of "the activities through which individuals acquire, share and combine knowledge" through their own experience and their interactions with each other (Argote, Gruenfeld, & Naquin, 1999: 370; Ellis et al., 2003). At the organizational level, learning is the process whereby knowledge is acquired or created, shared, and mobilized to enable the organization to adapt to a changing environment. It combines the steps that Huber (1991) described as enhancing the range of an organization's potential actions with the actual changes in those actions (Fiol & Lyles, 1985). Defined as such, organizational learning involves both exploration and exploitation (March, 1991), just as team learning involves search, transfer, and integration (Edmondson, 1999; Hansen, 1999).

Learning and productivity are often related (and periodically conflated), but conceptually distinct and often in tension (Sessa & London, 2005; Singer & Edmondson, 2008; Wilson, Goodman, & Cronin, 2007). For example, Bunderson and Sutcliffe (2003) provide evidence about how learning can both hurt and help team effectiveness, and Edmondson, Dillon, and Roloff (2007) note how learning and execution are often at odds. The same is true at the individual and organizational levels of analysis. Thus, although there is the potential for a reciprocal relationship between productivity and learning, we model their relationship with MTM separately.

Given these definitions and assumptions, our model addresses the challenges that MTM – a prevalent but rarely studied way of organizing work – poses for theory, research, and practice. We turn now to the effects of MTM on productivity and learning at the individual, team, and organizational levels of analysis.

MODEL DEVELOPMENT

Our proposed model (see Figure 1) characterizes the effects of MTM on productivity and learning in terms of three mediating constructs – context switching, temporal misalignment, and connectivity – that affect the allocation of attention and flow of information at the individual, team, and organizational levels, respectively.

Insert Figure 1 about here

To understand the dynamics of MTM, we examine not only teams themselves, but also examine the individual level "below" and the organizational level "above" our focal phenomenon in what Hackman (2003) calls "bracketing." At the individual level, members feel the effects of MTM most acutely when they frequently switch their focus from one team context to another. For teams, MTM's effects on productivity and learning are felt through the mediating state of temporal misalignment, in which the lack of overlap and contiguous blocks of time in team members' schedules prevents them from focusing on that team's task and engaging in real-time idea generation, problem solving, decision making, etc. At the organizational level, MTM's effects are mediated by the degree to which teams are interconnected through shared team members.

All three of these mediators – individual context switching, team temporal misalignment, and intra-organizational connectivity – tap into essential processes underlying how time, attention, and information are distributed at each level (Mohrman, Cohen, & Mohrman, 1995; Quinn, 2005). As shown in Figure 1, we posit that MTM increases context switching, temporal misalignment, and intra-organizational connectivity, which in turn, affect productivity and learning at all three levels of analysis. Their effects on productivity and learning follow generally inverted U-shaped patterns, with the highest productivity and learning occurring with moderate levels of MTM-driven context switching, temporal misalignment, and intra-organizational connectivity.

Individual Context Switching, Productivity, and Learning

The individual-level effects of MTM stem from the costs and benefits of shifting from working in one team context to another. For the sake of clarity, we frame our discussion around one focal team relative to the other teams of which people are members. Context has a powerful impact on behavior at all levels (Johns, 2006; Rousseau & Fried, 2001), but is especially important in teams (Hackman, 1999; Wageman, 1999). As the number of concurrent team memberships increases, by definition, the extent to which individuals have to shift their attention between different contexts increases. We define context switching as shifting between two or more team contexts, where a team's context encompasses its tasks, technologies, roles, locations, and routines. In addition, each team constitutes a meaningful "symbolic domain" (Schultz, 1991), with its own distinct social definitions and meanings. Though any two teams can be more or less similar in their tasks, technologies, roles, locations, routines, and symbolic meanings, other things being equal, the more teams one is on, the more context switching one will do.

Before turning to the effects of MTM-driven context switching on productivity and learning, it is important to recognize that team contexts may differ from one another as may the dynamics of the switches among them. Such differences may arise from the *frequency* of the switches and the *degree of difference* between the relevant contexts. In terms of frequency, two people can have the same basic levels of MTM (e.g., are both members of two teams concurrently), but have very different switching patterns over the course of a hypothetical week. For example, as shown with Members A and B in Figure 2, one might switch four times while the other switches only once (i.e., half-way through the week).

Insert Figure 2 about here

In addition to switching frequency, context switching is also characterized by the degree of difference among the contexts in question. One source of difference is the nature of the teams themselves. For example, the difference between two automobile design teams is likely to be far less dramatic than the difference between an automobile design team and a motorcycle marketing team. The latter two teams would be considerably different in terms of their tasks, functions, products, etc. (see Figure 2, members B and C respectively). Thus, the effect of MTM-driven context switching is a function of both switching frequency and degree of difference.

The effects of context switching on individual productivity. We believe there is a curvilinear (inverted-U-shaped) relationship between context switching and individual productivity resulting from the competing benefits of load-balancing and finding efficiencies and the costs of shifting attention. With regard to the opportunity to load-balance, if individuals are members of multiple teams that experience slack in their workloads at different times, the ability to switch between those team contexts enables team members to use their time more efficiently and effectively. When individuals are on only one team at a time, the natural ebbs and flows in the team's work may leave them with more free time in their schedule than is desirable (even when they have some other non-team-based work), or lead them to spend more time on tasks than is truly required.

At low levels, "beach time" (when individuals are not assigned to projects are projects are in a lull) provides welcome respites amidst high intensity work (Barley & Kunda, 2004).

However, if beach time persists or grows, it provokes anxiety and concern about one's value or about the organization's business viability (Yakura, 2001). MTM provides meaningful intervening work and a mechanism through which bench time can be reduced, as employees offset ebbs in one team's work with flows of another team's work. Wheelwright and Clark (1992: 90) witnessed this in the computer and electronics industry, where they report that "When an engineer focused on a single project is given a second one, utilization often rises slightly because the engineer no longer has to wait for the activities of others involved in that single project. Instead, the engineer can move back and forth between the two projects." In fact, they present data from one firm showing that the "percent of [engineers'] time on value-adding activities" rose from 70% to 80% as engineers added a second project. In addition to these load-balancing benefits, being on multiple teams forces individuals to be more conscious about how they spend their time and to develop more efficient work practices rather than just letting the work expand to fill the time (Svenson & Maule, 1993; Waller, Conte, Gibson, & Carpenter, 2001).

Despite these benefits, we argue that the costs of MTM accrue as the demand for context switching grows. Research on the related but more narrowly focused construct of task switching has shown that people switch tasks as often as every three minutes (Mark, Gudith, & Klocke, 2008), and managers spend as many as 10 minutes per hour responding to interruptions, which keeps them from re-focusing on their original task 41 percent of the time (O'Conaill & Frohlich, 1995). These frequent switches drive down productivity (DeMarco, 2002; DeMarco & Lister, 1985; Huey & Wickens, 1993). Just as Wheelright and Clark (1992: 90) observed increased productivity by being on more than one project, they also observed that the percent of engineers' value-adding time dropped to 60% when they were on three projects, 45% when they were on four projects, and 35% when they were members of five projects. Aral, Brynjolfsson, and Van Alstyne (2006) also found there is an inverted-U-shaped relationship between individuals' multitasking and productivity such that, beyond an optimum, more multitasking is associated with declining project completion rates and revenue generation. Research on multiple roles posits a similar curvilinear effect, with some multiple role identities being helpful and outweighing tensions due to role overload and conflict – but with some optimal number beyond which multiple roles become too psychologically stressful (Thoits, 1986).

Thus, we expect that low levels of MTM-driven context switching will increase individual productivity by facilitating load-balancing and stimulating more efficient work practices, but those benefits will be offset rapidly by role conflict/overload and the time required for individuals to: 1) regain focus; 2) re-immerse themselves in the people, roles, issues, and operations of another team context; 3) catch up on the work done in their absence; 4) physically relocate between team settings; and, 5) shift technologically between team-specific tools. As individuals become members of more teams, with a wider variety of tasks, roles, routines, locations, and tools, this context switching can exact considerable costs in terms of time, mental energy, and ultimately productivity.

> *Proposition 1a. Context switching mediates the effects of MTM on individual productivity such that moderate levels of MTM-driven context switching enhance individual productivity, but very low or very high levels of context switching impede individual productivity.*

The effects of context switching on individual learning. As with productivity, we also believe that context switching has an inverted-U-shaped relationship with individual learning driven by the competing mechanisms of increased information variety and decreased integration time. In terms of the positive effects of MTM-driven context switching, variety may be "life's very spice" (Cowper, 1968/1785), but variety is also a critical component of individual learning (Schilling, Vidal, Ployhart, & Marangoni, 2003; Wiersma, 2007). For learning to occur, an individual must access new information and then integrate it into his or her existing base of knowledge. Deliberate variation in employees' contexts is a traditional element of job rotation and can enhance individuals' personal development as well as their careers (Higgins, 2000; Ruderman, Ohlott, Panzer, & King, 2002). Such rotation usually involves *sequential* variation of work, which scholars across several disciplines have shown enhances individual learning (e.g., Allwood & Lee, 2004; Bourgeon, 2002; Eriksson & Ortega, 2006; Latham & Morin, 2005; Meyer, 1994; Ortega, 2001). Unlike traditional job rotation, MTM allows for *concurrent* variation in the information to which one has ready access, as well as the opportunity for more immediate application and integration of that new knowledge. MTM-driven context switching also can stimulate learning processes themselves, especially when people's switching exposes them to more "cool" projects (Grabher, 2002). Furthermore, the interruption-like dynamics associated with team members' comings and goings can enhance the learning and the effort devoted to knowledge transfer and external knowledge acquisition (Kolodny, 1979; Zellmer-Bruhn, 2003). Although concurrent exposure to new knowledge from different team contexts is likely to stimulate learning, the effect is not likely to be linear. Two means by which high levels of MTM can undermine learning are through (1) the introduction of bodies of information that are too disparate to be integrated, and (2) the deprivation of the time needed for individuals to integrate new information. First, increased diversity of exposure is effective only up to a point, beyond which any new information gained is so diverse that it does not meaningfully relate to one's existing knowledge, individuals fail to see relevant patterns or connections (Faniel & Majchrzak, 2007; Gratton & Ghoshal, 2003; Hirschfeld & Gelman, 1994), and their learning suffers (Larkin, 1989). Second, context switching can also deprive individuals of the time needed for the consolidation of new knowledge. When switching occurs too frequently, it limits people's ability to encode and retrieve knowledge (Bailey, 1989) and can be detrimental for learning (Gillie & Broadbent, 1989; Jett & George, 2003; Perlow, 1999).

Combining these competing mechanisms, we expect the relationship between MTM-driven context switching and individual learning to be curvilinear, taking the form of an inverted-U. When context switching leads to variety in teammates, tasks, roles, and/or routines, it enhances individuals' learning, but too much variety and too frequent switching makes it difficult for individuals to reflect on and integrate the diverse information to which MTM exposes them. This is consistent with prior research on other kinds of variety or diversity, which finds a similar curvilinear relationship with learning (Ancona & Caldwell, 1992a; Earley & Mosakowski, 2000; Harrison & Klein, 2007).

> *Proposition 1b. Context switching mediates the effects of MTM on individual learning such that moderate levels of MTM-driven context switching enhance individual learning, but very low or very high levels of context switching impede individual learning.*

Figure 3 depicts the relationships in Propositions 1a and 1b, including the positive and negative mechanisms driving the proposed curvilinear effects.

Insert Figure 3 about here

Temporal Misalignment, Productivity, and Learning

The team-level effects of MTM are driven primarily by the costs and benefits of misalignment in a team's temporal structure (Ballard & Seibold, 2003; Ballard & Seibold, 2004; Blount & Janicik, 2002; Orlikowski & Yates, 2002). A team's temporal structure includes how frequently it must meet, when meetings typically start (Labianca, Moon, & Watt, 2005), the mix of time that various members must devote to the team (Cummings, 2007), the amount of work that must be completed during given periods (Leroy & Sproull, forthcoming), the team's approaches to deadlines and time pressure (Waller, Zellmer-Bruhn, & Giambatista, 2002), and the rhythm of team meetings (Maznevski & Chudoba, 2000). Such structures help teams coordinate and complete their work (Harrison, Mohammed, McGrath, Florey, & Vanderstoep, 2003; Im, Yates, & Orlikowski, 2005; Janicik & Bartel, 2003; McGrath, 1988; Orlikowski & Yates, 2002). For our purposes, a team's temporal misalignment is the extent to which team members do *not* have: 1) overlapping work schedules, such that their ability to work synchronously is limited; and/or, 2) temporally contiguous blocks of time to devote to the focal team's work, such that a team member is ready to "receive" a hand-off of work from a teammate and proceed with his/her portion of the task without a lag.

As MTM increases, so does temporal misalignment among team members. When people divide their time between two teams, by definition, they have less than 100 percent of their time to work on each team. When other members of those teams are also dividing their time, there will be fewer overlapping blocks in teammates' schedules. With fewer windows of opportunity for synchronous interactions among team members, work must be carried out asynchronously or delayed – just as with geographically dispersed teams (Maznevski & Chudoba, 2000). Not all work needs to be done synchronously, but work must be coordinated to minimize time-lags between when team members are ready to hand-off their part of a task and when other team members are ready to receive and begin work on that task (Gupta, 2009; Postrel, 2009). In situations where all team members are 100% devoted to a single team, there is complete (or nearly complete) overlap in schedules and no time lags. As levels of MTM increase, the likelihood that teammates will not have contiguous blocks of time also increases. As Leroy and Sproull (forthcoming) note, "Being fully in synch with a team and available when required is, however, likely to be much more difficult when people work on multiple teams at the same time."

The effects of temporal misalignment on team productivity. We expect temporal misalignment to have a curvilinear effect on team productivity. Temporal misalignment can enhance a team's productivity by forcing them to find more efficient methods of conducting their work. However, these benefits are likely short-lived and rapidly offset by increased coordination costs and lost opportunities to work synchronously. We describe both the positive and negative effects of temporal misalignment below.

As MTM increases, teams are likely to become more efficient in their work. Knowing that they have small fractions of each other's time, and knowing that the coordination of that time will be challenging, team members develop ways to enhance their efficiency. These practices may include more focused, structured meetings, in which teams consciously spend more time on-task and less time on social, relational, or other interactions. As Fuller and Dennis (2004: 2) note, "The realization of misalignments or discrepant events can trigger certain activities by teams to reassess existing structures and enact new structures." Although there is eventually a quality/quantity tradeoff, teams working under tighter time constraints do tend to produce at a faster rate (Bluedorn, Turban, & Love, 1999; Gevers, Rutte, & van Eerde, 2006; Harrison *et al.*, 2003; Kelly & McGrath, 1985; Seers & Woodruff, 1997; Waller *et al.*, 2002). In contrast, when teams are not under some form of time pressure, they tend to use their time less efficiently and allow the work to expand to fill the time (Parkinson, 1955, 1958). Without at least some mild stress on the system, people tend to budget more generously than the task actually demands (Brooks, 1995; MacManus & Grothe, 1989).

Though we believe that mild stress from MTM-driven temporal misalignment has some productivity benefits for teams, they can quickly reach the limits of their own efficiency-enhancing practices, and shift from being more selective in what they do to simply being less able to do it (Savolainen, 2007). Beyond the small potential productivity gains from temporal misalignment, team coordination processes are fairly fragile (Arrow, McGrath, & Berdahl, 2000) and high temporal misalignment can quickly drive down productivity. Two primary mechanisms drive this negative effect on team productivity: 1) increased coordination costs (including more hand-off problems between team members), and, 2) decreased opportunity to work synchronously. As temporal alignment increases, teams must devote more time to “process management” (Massey, Montoya-Weiss, & Hung, 2003) or the “overhead” (Fitzgerald & Wynn, 2004) required to find overlapping time in each other’s schedules and sequence each other’s work effectively given commitments beyond the focal team (Curris, Krasner, & Iscoe, 1988; Malone & Crowston, 1994; Masten, Meehan, & Syder, 1991; Mayer, 2000; Montoya-Weiss, Massey, & Song, 2001; Olson, Teasley, Covi, & Olson, 2002). This is especially true when a team’s work is highly interdependent (Wittenbaum, Vaughan, & Stasser, 1998). Limited overlap in members’ schedules also requires teams to spend more time coordinating the hand-offs of work from one member to another in between meetings. Consequently, “project overload” (i.e., “perceived fragmentation, disruption and inefficiency, caused by switching between assignments for separate but simultaneous projects”) frequently results in schedule slippage (Zika-Viktorsson et al., 2006).

By contrast, when team members’ schedules include high levels of overlap (i.e., low misalignment), they are less likely to experience slippage and can coordinate their efforts more quickly and easily (McGrath, 1991; Ocker, Hiltz, Turoff, & Fjermestad, 1995; Warkentin, Sayeed, & Hightower, 1997). The ability to work synchronously (especially in an impromptu fashion) enhances teams’ productivity on complex, convergent tasks (Dennis, Fuller, & Valacich, 2008). Those synchronous interactions (especially, but not necessarily, face-to-face ones) are more evolutionarily natural (Kock, 2004) and enable fluid, interactive, intense dialogue that limits (or can correct) miscommunication, enhances idea generation, facilitates resolution of ambiguities, fosters relationship building (Maznevski & Chudoba, 2000), and enhances productivity (Mabrito, 2006; Ruuska, Artto, Aaltonen, & Lehtonen, 2008). When members can meet synchronously with little advance planning, they can more readily resolve problems, give and receive feedback, and make decisions, especially if synchronous interaction is the norm in their organization (Majchrzak et al., 2000), and they engage with higher levels of interaction and greater shared focus (Ballard & Seibold, 2004). Synchronous interaction also speeds the flow of communication because it requires less effort to encode, decode, and modify messages on the fly (Kock, 2004; Zmud, Lind, & Young, 1990). Thus, when temporal misalignment in team members' schedules significantly inhibits their ability to have such real-time interaction, it reduces their productivity.

Combining the effects of a mild stimulus for efficiency-oriented team practices with increased coordination costs and decreased opportunity to work synchronously, we expect an inverted U-shaped relationship between MTM-driven temporal misalignment and productivity.

> *Proposition 2a. Temporal misalignment mediates the effects of MTM on team productivity such that moderate levels of MTM-driven temporal misalignment enhance team productivity, but very low or very high levels of temporal misalignment impede team productivity.*

The effects of temporal misalignment on team learning. Although the ability of teams to learn is clearly related to the ability of individual members to learn, team and individual learning remain distinct processes, which differ in three key ways. First, they differ with respect to content. Team learning is, by nature, not solely about an increase in domain knowledge (which would reflect aggregated individual learning) but about learning and improving team processes. Second, they differ with respect to scope. In contrast to learning at the individual level, in which one person samples from many teams and then integrates that knowledge, at the team level, multiple members each sample from at least one other team, thus the team as a whole samples from many. Third, they differ in their underlying mechanisms, with team learning affected less by context switches themselves, and more by the time spent inside and outside the focal team. On this basis, we predict a curvilinear relationship driven by the benefits of unshared experience and periodic time apart, as well as the costs of more difficult knowledge integration and shared repertoire development (Wilson *et al.*, 2007).

Turning first to the benefits of unshared experience, temporal misalignment, by definition, means that team members spend time apart from one another. This time apart, in turn, increases the uniqueness of the team members' information by increasing their unshared experience. Analogous to the effect of individual-level context switching, teams gain diversity of perspectives not only through increased diversity of experience within members, but also across members. As such, a team with members who are each on one or more other teams draws not only on its own context, but also on all of the contexts to which its members are exposed through their other team memberships. As noted by Lojeski and colleagues (2007), MTM enhances learning "because acquiring and storing knowledge among team members is not usually developed with just one group or through single projects," nor is it as likely via people's individual, non-team-based, independent work.

This unshared experience translates into unique information, which benefits team cognition (Davis, 1969; Hinsz, Tindale, & Vollrath, 1997; Stasser, 1992) and ultimately learning (Brown & Eisenhardt, 1995; Kane, Argote, & Levine, 2005; Ratcheva, 2009; Subramaniam & Youndt, 2005; Wong, 2008). In other words, teams with high and sustained levels of team member interactions (with low levels of external interaction) have a lower probability of retrieving new learning (Wilson *et al.*, 2007).This is supported by a growing body of research regarding the importance of learning from external sources (Ancona & Bresman, 2007; Argote et al., 1999; Bresman, Forthcoming; Edmondson, Bohmer, & Pisano, 2001a; Tucker, Nembhard, & Edmondson, 2007; Wong, 2004; Zellmer-Bruhn, 2003). As Ruff (2006) notes, MTM promotes innovation capabilities in the context of research teams because "each team member maintains a broad set of knowledge and methods … [and] this simultaneous work in very different projects encourages the discovery of 'latent' opportunities and promotes the *exchange of knowledge* [italics in the original] across different innovation projects."

Moderate temporal misalignment also forces breaks in team members' work, which can lead them to reconsider the value and appropriateness of existing routines (Gersick & Hackman, 1990; Louis & Sutton, 1991; Okhuysen & Eisenhardt, 2002). Such breaks are akin to the discrepant events that help groups adapt effectively and improve their processes and use of technologies (Fuller & Dennis, 2004; Johnson & Rice, 1987; Majchrzak *et al.*, 2000; Tyre & Orlikowski, 1994). In addition, spacing between learning events improves both information storage and retrieval (Donovan & Radosevich, 1999; Friedrich, 2000). Matching the timing of those events with synchronous interaction is proposed to further enhance the retrieval of team learning (Wilson *et al.*, 2007). This is consistent with prior research, which finds that despite the challenges associated with temporal misalignment, some asynchronous teams learn quite effectively (e.g., Alavi, Yoo, & Vogel, 1997; Carmel, 1999).

At the same time, as Crossan and colleagues (1999) assert, a critical component of effective team-level learning is integration. MTM-driven temporal misalignment, however, stands to impede a team's ability to integrate the diverse knowledge it has gathered for four distinct but related reasons. First, to effectively interpret and encode the information gained by individual team members, team members must have a shared frame of reference so that they treat the information similarly (Levine, Resnick, & Higgins, 1993; Paese, Bieser, & Tubbs, 1993; Tindale, Sheffey, & Scott, 1993). Second, time outside the team is likely to generate larger pools of unique information that are likely to remain unshared (Stasser, Taylor, & Hanna, 1989; Stasser & Titus, 1985) and ultimately lost to the group (Hinsz et al., 1997). Third, teams lack synchronous time to carry out the actual sharing itself. As temporal misalignment in a team increases, team members have less time to interact face-to-face or voice-to-voice and have less opportunity to pool their collected information and meaningfully integrate it. Fourth, and finally, as Wilson et al. (2007) argue, relatively rare synchronous interactions hamper information retrieval and team learning. We expect this also will be true in high-MTM contexts, with their associated high levels of temporal misalignment.

Further exacerbating these negative effects are the adjustments that temporally misaligned teams are likely to make to their processes to increase the proportion of tasks that can be carried out independently. Teams that have difficulty coordinating meeting times are likely to suffer from more communication and coordination problems (McGrath, 1991; Montoya-Weiss *et al.*, 2001). If team members experience difficulty scheduling time to meet synchronously (whether in face-to-face or digitally-mediated meetings), they will tend to structure their work so that it can be done more independently. Working in this highly independent manner, teams revert to being teams in name only, or what Hackman (1990) calls “co-acting groups.” Thus, given that effective information processing requires a balance between uniqueness and commonality of information (Hinsz et al., 1997), we expect that MTM-driven temporal misalignment will have an inverted-U-shaped relationship with team learning.

> *Proposition 2b. Temporal misalignment mediates the effects of MTM on team learning such that moderate levels of MTM-driven temporal misalignment enhance team learning, but very low or very high levels of temporal misalignment impede team learning.*

Figure 4 depicts the relationships in Propositions 2a and 2b, including the positive and negative mechanisms driving the proposed curvilinear effects.

Insert Figure 4 about here

Intra-Organizational Connectivity, Productivity, and Learning

The organization-level effects of MTM are driven primarily by the resulting network of interconnected teams. This network forms a set of pathways connecting various parts of the organization and its members to one another. As individuals are concurrently members of multiple teams in an organization, those teams are relationally linked to one another through their members. As more teams share members, their connectivity will increase (Lazer & Friedman, 2007). The result is increased resource interdependence among different units, or "multi-coupled project organizations" (Söderlund, 2002: 428), where teams share members and the work of one team can have a powerful ripple effect through its network of connections. The level of intra-organizational connectivity can be described by the number of projects that share members, as well as by the density or numbers of connections among projects. As the average number of team assignments held by members of an organization increases, by definition, so does the level of intra-organizational connectivity.

The effects of intra-organizational connectivity on organizational productivity. We argue that intra-organizational connectivity will have an inverted-U-shaped relationship with organizational productivity and that the curvilinear relationship will be driven by two positive mechanisms (i.e., improved resource utilization and reduced redundancy) and one negative mechanism (i.e., coupling tightness). As the teams within an organization become increasingly interconnected via shared members, the organization becomes more able to shift staff fluidly and quickly from team to team without incurring the costs typically brought about by restructuring or reassigning resources. Such sharing of portions of employees' time uses up slack (Nohria & Gulati, 1996), allowing organizations to accomplish more with a given set of resources. Intra-organizational connectivity may also boost productivity by preventing redundant work across projects, if team members recognize when doing a particular task would replicate something al-ready done by another team. Thus, we expect a positive relationship between intra-organizational connectivity and organizational performance as a result of organizations having the means to utilize otherwise slack resources and reduce redundant work. This is in line with Lojeski et al. (2007) who find that higher multi-tasking in organizations is a key contributor to productivity increases in the last decade.

The incremental benefit of each additional interconnection, however, is likely to diminish. The need for, and value of, additional uses for resources lessens in the face of larger existing pools of alternatives. Similarly, the likelihood of finding unnoticed redundancies decreases with the addition of each subsequent overlapping team membership. In addition, as MTM and intra-organizational connectivity increase, organizations become more tightly coupled. Scholars have long noted the benefits of "loose coupling" (Glassman, 1973; Weick, 1976), including increased resilience to exogenous shocks, greater sensitivity, improved localized adaptation, and more novel solutions (Weick, 2001). However, in situations of tight coupling, delays or crises in one project can reverberate across projects as attention and time are diverted to deal with the event. In highly connected organizations, schedule slippage or change requests from one team have been shown to affect other teams in an immediate and powerful way (Hoegl & Weinkauf, 2005; Kazanjian, Drazin, & Glynn, 2000; Sabbagh, 1996), and more interconnections among projects increase the number of these disruptions (Söderlund, 2002).

Thus, we do not expect the costs of intra-organizational connectivity to increase linearly. As some interconnection is required for productive work, we expect these negative effects to come into play primarily at high levels of intra-organizational connectivity. Therefore, we posit a curvilinear relationship between intra-organizational connectivity and organizational productivity, such that the benefits of improved resource utilization and reduced redundancy will lead to increasing productivity as organizations move from low to medium intra-organizational connectivity, while the costs of tight coupling will lead to decreasing productivity as organizations move from medium to high levels of intra-organizational connectivity.

> *Proposition 3a. Intra-organizational connectivity mediates the effects of MTM on organizational productivity such that moderate levels of MTM-driven intra-organizational connectivity enhance organizational productivity, but very low or very high levels of intra-organizational connectivity impede organizational productivity.*

The effects of intra-organizational connectivity on organizational learning. As noted by Kang, Morris, and Snell (2007), to understand organizational learning, it is important to consider the pattern of relationships among parties within a firm (Burt, 1992; Coleman, 1988; Uzzi, 1997). We believe that intra-organizational connectivity will have an inverted-U-shaped relationship with organizational learning and that the relationship will be driven by two competing mechanisms – i.e., increased paths for information flow and decreased informational diversity.

As intra-organizational connectivity increases, organizations have more paths along which information can flow, which increases the likelihood that any two potentially complementary pieces of information will be brought together and simultaneously decreases the likelihood that any potentially valuable piece of information is stuck in one part of the organization and "lost." This builds on research showing that the more often employees interact, the more opportunities they have to identify and utilize idiosyncratic knowledge (Hansen, 1999; Krackhardt, 1992; Nelson, 1989; Uzzi, 1997). These effects are not bound within the teams themselves as high interactivity across teams, such as that arising from shared membership, results in more integrated knowledge across those teams (Newell, Goussevskaia, Swan, Bresnen, & Obembe, 2007). Intra-organizational connectivity creates built-in boundary spanning capabilities for the team and improves information sharing in the organization (Ancona & Caldwell, 1992b; Hansen, 1999; Lazer & Friedman, 2007). People will carry lessons learned across units, managers at higher levels will have more sources of information about various projects and their staff

(Meyer, 1994), and more opportunities will exist for the propagation of ideas across the organization (Subramaniam & Youndt, 2005). Nobeoka, Cusumano, and others (Cusumano & Selby, 1995; Nobeoka, 1995) have shown how intra-organizational connectivity enhances organizational learning via enhanced cross-project learning. This organizational learning by working across projects may break up "collaborative dead-ends" more than simple interaction across team boundaries would (Dornisch, 2002). As a result, moderate levels of MTM-driven connectivity improve organizational learning (Carlile, 2004; Hansen, 1999; Lazer & Friedman, 2007; Marrone, Tesluk, & Carson, 2007).

While intra-organizational connectivity results in information diffusing more rapidly, it also tends to reduce the diversity of that information. As argued by numerous scholars, the stronger and more multiplex the ties between any two entities, the more homogenous and redundant their information is likely to be (Granovetter, 1973; Hansen, 1999). Beyond affecting the information itself, such interconnection is also likely to affect the ways employees search for that knowledge. Gargiulo and Benassi (2000) found that interconnected networks force individuals into limited and narrow social circles, thereby reducing their ability to access differentiated knowledge. Thus, highly connected units may diffuse information rapidly, but lack the diversity of information that moderately connected units have (Lazer & Friedman, 2007), which will decrease the development and diffusion of new ideas. We expect these homogenization effects to become increasingly severe as intra-organizational connectivity increases.

> *Proposition 3b: Intra-organizational connectivity mediates the effects of MTM on organizational learning such that moderate levels of MTM-driven intra-organizational connectivity enhance organizational learning, but very low or very high levels of intra-organizational connectivity impede organizational learning.*

We depict this relationship and its underlying mechanisms, as well as those in Proposition 3a regarding intra-organizational connectivity and learning, in Figure 5.

Insert Figure 5 about here

Feedback Loops

In addition to the effects of MTM on individual, team, and organizational productivity and learning, there are feedback loops in which those effects increase the overall level of MTM (Figure 1). These feedback loops drive the rate at which productivity and learning benefits and costs accrue at each level. First, at the individual level, both productivity and learning will lead to an increase in MTM. Individuals' productivity provides an indication of their ability to accomplish tasks and their learning affects the extent to which they are viewed as an expert. The ability to identify, access, and combine expertise that is dispersed across members is critical to the success of organizations and the teams within them (Grant, 1996). As Boh and colleagues (2007) note, managers seek to staff projects with the optimal set of individuals with the particular skills required by the task, even at a significant cost. Given the nature of MTM, productivity and learning across multiple teams is inherently more visible throughout the organization than it would be within a single team. Thus, as MTM provides a network of pathways for signaling competence, "star" individuals who are more productive across multiple teams are more likely to be noticed, sought after, and placed on more teams, thereby increasing MTM.

> *Proposition 4a: High productivity or learning at the individual-level will lead to increased MTM as highly productive and expert members are sought out by multiple teams.*

By contrast, at the team level, productivity *losses* will spawn increased MTM as management responds to team difficulties by adding more staff resources to address the problem. Despite the consistent findings concerning the negative effects of team size on performance (e.g., Hackman & Vidmar, 1970; Hoegl, Weinkauf, & Gemuenden, 2004), it is a well-documented tendency of organizations to address problems by adding more human resources (Brooks, 1995;

Hackman, 2002; Sengupta, Abdel-Hamid, & Van Wassenhove, 2008). As few organizations can or are willing to hire more employees to bolster a given team, individuals working on other teams within the organization are the most likely source of added personnel for a struggling team. This relates to the "star performer" dynamic noted earlier, as current employees known to be high performers or domain experts are most likely to be added to help low-producing teams. Consequently, applying more personnel to struggling teams increases MTM.

> *Proposition 4b: Low productivity at the team-level will lead to increased MTM as organizations apply more resources in an attempt to support struggling teams.*

At the organizational level, productivity deficits will encourage more MTM – but as a means to stretch current resources further. Organizational structures have long been identified as a means to adapt to the organizational environment (Lawrence & Lorsch, 1967; Miles & Snow, 1978). Many scholars have argued an inverse relationship between organizational slack and structural efficiency such that when times get tough, slack decreases, and competition increases, organizations need tighter coordination and more efficient use of resources (e.g., Pfeffer & Leblebici, 1973; Yasai-Ardekani, 1986). Amidst low organizational productivity, organizations are likely to try to squeeze the most out of existing resources. One approach to this is through staffing, by increasing the mean number of projects per employee. As noted by Lojeski and colleagues (2007), employee multitasking (which they operationalized as including multiple team membership) allows more work to be accomplished with the same or fewer organizational resources. As a result, low organizational productivity is likely to lead organizations to engage in more MTM in an effort to make the most efficient use of its resources.

> *Proposition 4c: Low productivity at the organizational level will lead to increased MTM as organizations seek to leverage existing resources.*

Furthermore, these feedback loops drive the rate at which both benefits and costs are experienced at the individual, team, and organizational levels. The precise number of teams at which these tipping points between benefits and costs will occur will vary as a function of the task and work environment. For example, one would expect that completion of shorter and more concrete kinds of tasks would result in a higher tipping point than the completion of longer and more complex tasks, which would be more vulnerable to MTM-driven fragmentation of time and attention. Adopting an abstracted and simplified view for the sake of illustration and holding the task environment constant across levels of analysis, we postulate that the benefits of MTM will be smaller and more sensitive to increases in MTM at the team level, while the effects for individuals are of greater magnitude and slightly more robust to MTM increases, followed by the effects for organizations which are of still greater magnitude and decline even more slowly. As explained earlier, MTM is a function of the average number of team memberships for individuals within the team or organization, and productivity is a function of the amount of output produced given a particular amount of resource (e.g., work hours). Furthermore, as MTM grows in an organization, in the moderate range it will raise the mean as well as the variance in the number of teams of which individuals are members. This variance accounts for the difference in the rate at which benefits and costs accrue at different levels. Because of this variance in MTM across workers, individuals with more team commitments are likely to shift lower value or less-specialized tasks to individuals with fewer team commitments, gravitating toward higher producing or more successful projects and allowing for improved resource deployment overall for them personally and for the organization. In short, individuals with high levels of MTM will find ways to make higher value contributions to a larger number of projects, leading to greater productivity. At the organizational level, decrements that may occur as a result of the failing of specific team projects are offset initially by the greater utilization of resources across the organization, plus the benefits of harnessing local knowledge to shift resources away from more marginal projects to those that are perceived to have greater likelihood of success. To the extent that the decisions of local actors are aligned with organizational interests, this "natural selection" process can benefit the organization overall, as projects that are perceived to be of higher value will be chosen over projects that are perceived to be less valuable. However, within such a system, more teams will fail, as team productivity is less robust in the face of the coordination difficulties caused by even low levels of MTM, and members will eventually respond to resulting performance decrements by further reducing their allocation of time. Furthermore, over time, such a system will select for individuals who function well in high-MTM environments, pushing out those who do not and further buffering organizational productivity from the costs that individuals might experience because of MTM.

> *Proposition 5a: The productivity benefits of MTM are smaller in magnitude and decline more quickly in response to MTM increases at the team level, while individual productivity gains are higher in magnitude and more robust, exceeded only by the productivity benefits at the organizational level.*

With respect to learning, teams again stand to gain the least and lose the most from MTM. Team repertoires, the key byproduct of team learning processes (Wilson *et al.*, 2007), are difficult and time consuming to develop, because they are fairly specific to the particular task that the team faces as well as the skills and propensities of the members. As discussed earlier, slight gains accrue because of the diversity of experience and well-timed breaks, but temporal misalignment can quickly disrupt the ability of a team to capitalize on those benefits. Organizational learning is initially enhanced by the increased information flows across teams, but is also sensitive to the loss of institutional knowledge held by longstanding employees and codified in organizational routines (Argote, Ingram, Levine, & Moreland, 2000; Kane et al., 2005). As high levels of MTM lead to potentially more diverse projects as well as a potentially higher rate of employee burn out, the likelihood of institutional knowledge becoming codified is reduced. Furthermore, similar to team learning, codification of knowledge at the organizational level requires the time and opportunity for individuals to reflect collectively and to establish routines and processes that reflect lessons learned (Edmondson, Bohmer, & Pisano, 2001b). As MTM increases, the time for such reflection declines. However, the learning benefits for individuals, particularly those who thrive in an MTM environment, continue to grow even at relatively higher levels of MTM, as the exposure and connections individuals make contribute to the base of experience they can draw upon. Eventually, however, at high levels of MTM these benefits decline as the amount and depth to which individuals can participate in any given team decreases below a point at which any meaningful new knowledge can be gained.

> *Proposition 5b: The learning benefits of MTM are smaller in magnitude and most easily disrupted by increases in MTM at the team level, followed by the organizational level, and finally the individual level.*

Summarizing our model, MTM leads to context switching by individuals, temporal misalignment in teams, and intra-organizational connectivity in organizations. In turn, as shown in Figure 1 and Table 2, context switching, temporal misalignment, and connectivity mediate the effects of MTM on productivity and learning in an inverted U-shaped fashion, with *moderate* levels of context switching, temporal misalignment, and connectivity positively affecting productivity and learning at each level.

Insert Table 2 about here

In addition, high productivity and learning at the individual level leads to an increase in MTM, while conversely, *low* productivity at the team and organizational levels is associated with increased MTM. Consequently, the productivity and learning benefits for teams will likely be of smaller magnitude and less robust as MTM grows within the organization, particularly compared to the effects at the individual and organizational levels.

DISCUSSION AND IMPLICATIONS

Although many (if not most) academics have personal experience with MTM (working concurrently on multiple teaching, research, and service teams), to the best of our knowledge, this paper is the first attempt to model the mechanisms driving MTM at the individual, team, and organizational level. As such, it represents the beginning of a multi-level theory (Klein & Kozlowski, 2000a) and identifies important levers for managerial efforts to deal with the effects of MTM. We believe this has numerous implications for scholars and practitioners managing in MTM environments. For scholars, these include implications for existing and new theory, as well as methods for studying MTM and non-MTM teams alike. For practitioners, our model suggests key enabling conditions for successful use of MTM.

Scholarly Implications – Theoretical

Although we do not believe that the prevalence of MTM invalidates the large body of research that has explicitly or implicitly focused on single-team membership, and we have focused largely on effects related to the allocation of time and attention, we believe MTM does suggest a re-examination of some key findings and also suggests a number of directions for future research. For example, these include individual-level research on identity issues and employee skills that are conducive to MTM; team-level research on the relationship between MTM and geographic distribution; organizational-level research on rules, norms, culture, work-life issues, and cross-team coordination as they relate to MTM; cross-level research on context switching and productivity; and multi-level research on information transparency. While we briefly address each of these in turn, they are not meant as an exhaustive list, but rather as examples of areas for future work in this domain and an attempt to stimulate future MTM research.

At the individual level, a shift to the MTM perspective has strong implications for research on identity and multiple identities. Stemming from early work by Tajfel (1981), we now have a large body of theory and research on social identity and categorization within organizations (see, Ashforth & Mael, 1989; Hogg & Terry, 2000). There is also a burgeoning literature on multiple and dual identities (Ashforth & Johnson, 2001; Foreman & Whetten, 2002; Hillman, Nicholson, & Shropshire, 2008; Thoits, 1983). Potentially competing spheres of one's life (e.g., work and family, Rothbard, Phillips, & Dumas, 2005), interpersonal relationships at work (Sluss & Ashforth, 2007), and the geographic dispersion of work (Scott, 1997; Thatcher & Zhu, 2006) may all trigger competing identities. MTM creates potentially competing team-level bases for identification, increases the number of relationships people have, and appears to be correlated with geographic dispersion. Thus, given how easy it is to trigger inter-group competition (Tajfel, 1970), membership in multiple teams within the same organization may be enough to cause identity-related tensions and conflict (Fiol, Pratt, & O'Connor, 2009) without requiring broader socio-religious bases for those conflicts. Because most research on identification has addressed organizational targets (Johnson, Morgeson, Ilgen, Meyer, & Lloyd, 2006), MTM represents an important context (and cause) in which to understand how individuals identify with multiple, alternative, work-related targets.

Beyond identity, recognition of the frequency of MTM as a work context suggests future research on the skills and characteristics that enable individuals to work effectively in MTM settings. Organizational and social skills, as well as other individual characteristics related to multitasking, time allocation, and the pursuit of multiple goals (e.g., Hecht & Allen, 2005; Kaufman-Scarborough & Lindquist, 1999; Schmidt, Dolis, & Tolli, 2009; Schmidt & Dolls, 2009) are likely to rise in importance in settings where individuals must navigate tensions among competing teams and priorities (Mayer & Salovey, 1993). In addition, research on social cognition (Fiske & Taylor, 1991), team mental models (Klimoski & Mohammed, 1994), and representational gaps (Cronin & Weingart, 2007) suggests that individuals' contexts directly shape their understanding and the way they represent their knowledge to others. Understanding how MTM affects such processes and examining how individuals, teams, and organizations learn and evolve over time in response to MTM will become increasingly important. Individuals and teams are likely to adopt a variety of practices in response to the pressures and opportunities they experience in an MTM environment. The effectiveness of these practices will be an important topic for future research, as will individuals' understanding of their own productive capacity, ability to say "No" to requests that exceed that capacity, and skills managing their interdependent commitments in a forthright manner.

At the team level, the relationship between distributed work and MTM is another area for future research. Individual expertise is a key motivator for MTM, as MTM allows teams to leverage the time of experts more efficiently by allowing them to utilize their time on an as-needed, less-than-100% basis. Similarly, distributed work in organizations is often motivated by the desire to take advantage of specific expertise that is not physically collocated (e.g., Boh et al., 2007). Work by Cummings (2007) begins to explore these issues, finding that being on multiple teams (and having members committed at high levels of time to the focal team) improves focal team performance – except when geographic dispersion is high. In that case, committing significant time still helped, but being on multiple teams hurt performance, a finding consistent with Lojeski et al. (2007).

At the organizational level, work is needed to explore the effects of organizational rules, norms, and culture on the way in which individuals' MTM activities are perceived and reported. Many organizations mandate a maximum number of teams of which any employee can be a member or hours they can bill (Milgrom & Roberts, 1992). In some cases, these rules are designed into information and HR systems such that employees cannot enter information for more than the organizationally-mandated maximum number of projects or hours. However, these rules do not always align with actual norms or practice. In many organizations, norms of what is required to be considered a "team player" demand membership on more teams than employees can actually report. Thus, employees are often forced to adjust their reported hours to fit organizational requirements (Yakura, 2001). In our own research (Authors, 2007), we found repeated evidence of employees reducing their reported hours, or choosing not to report their membership on certain teams. Similarly, we found significant work-life issues arising from MTM. Managers and employees report that the time required to accommodate the additional overhead demanded by work on multiple teams is most frequently taken from personal or family time, leading to significant work-life tension. The ways in which these tensions are viewed and handled are highly dependent on the underlying organizational culture. Thus, we believe more work on the relationship between MTM and organizational rules, norms, and culture is warranted.

In addition, at the organizational level, more work is needed to understand the complexities of coordination and resource sharing across teams interconnected by membership. Work on multi-team systems has provided numerous insights into related issues of cross-team coordination. For example, Marks and colleagues (DeChurch & Marks, 2006; Marks et al., 2005) have examined issues of leadership, teamwork, and coordination in environments in which multiple teams are working together towards a single ultimate goal. To date, however, research has largely conceptualized such teams as independent with respect to membership. Thus, further work is needed to understand how these processes unfold when teams are not only interdependent with respect to their goals but also with regard to their membership. For example, how can organizations best coordinate the work of teams when they share members? How can human and technical systems support that coordination most effectively?

Working across levels, incorporating MTM into our understanding of team dynamics in organizational contexts also suggests many cross-level effects. For example, team productivity is likely to have effects on individual context switching. As coordination losses mount and team productivity falters on a given project, emergencies or crises will arise more frequently requiring team members to attend to the project at less predictable intervals (Chisholm, Collison, Nelson, & Cordell, 2000; Jett & George, 2003). This will draw members away from their other teams, to which they will try to return as soon as possible to prevent similar decrements. Thus, over time, the team-level productivity decrements on one project spread downward to individual team members, not only directly but indirectly, by increasing their level of context switching. Membership in multiple teams is also likely to diminish the extent to which any one team exerts normative control over its members' choices about priorities and tradeoffs. Consequently, members are making more independent decisions about which of their teams gets shortchanged or prioritized, and they are not all making the same choice. Some cross-level effects are also likely to "skip" a level. For example, Aral and colleagues find links between network structure and the establishment of individual social capital (Aral & Van Alstyne, 2008) and individual productivity (Aral et al., 2006). Thus, system-level structures of MTM may have strong implications for individual-level outcomes.

Scholarly Implications - Methodological

Beyond the implications MTM holds for theory, developing a complete understanding of the effects of multiple team memberships will require more innovative methodological approaches. In particular, MTM data necessitates the use of multiple levels of analysis. Increasingly common in research on groups and teams (see Klein & Kozlowski, 2000b), multi-level analysis is particularly critical for research in MTM contexts due to the non-independence of teams. Given the required coordination of teams' deadlines and task work, their structures, pacing, and ultimate success are intertwined. Even beyond the formal linkages between teams, sharing individuals across teams increases the likelihood of contagion or diffusion. This suggests that studies not explicitly focused on MTM must at least control for the non-independence of many teams.

Furthermore, in conducting analyses at multiple levels, researchers need to be cognizant of the difficulty in acquiring accurate information regarding the amount of effort individuals put into different projects. Workers in MTM environments may under- or over-report their hours on different projects for a variety of reasons (Yakura, 2001). This can result from organization-based or information systems-based limits to the number of hours or number of projects that they can report, or it can result from individuals' attempts to carry over, buffer, or hoard time (Yakura, 2001). Either way, researchers will be left with inaccurate data. While this tendency has interesting theoretical implications, it is problematic methodologically because such inaccuracies are likely to reflect consistent biases rather than random variation. Ideally, individual effort on a given project should be assessed using multiple methods, such as surveys of individual and managers, as well official organizational time tracking systems. Triangulating among these data sources will provide a more robust understanding of how people divide their time – as well as a better sense of how actual and "official" time use compare. Interestingly, studying people on multiple teams may also be helpful from a methodological standpoint because people on multiple-teams have a current basis for comparison; they do not have to reach back in their memories to answer common survey questions that begin with the phrase "In comparison to other teams of which I *have been* a member…"

Managerial Implications

Beyond the stated scholarly implications, we believe our model identifies potential leverage points for practitioners seeking to maximize the upside of MTM while minimizing its downside. Through our interviews with managers and employees in MTM environments, we have learned that managers' actions can make a major difference in how effectively these environments operate. These actions, which moderate the relationships between MTM and context switching, temporal misalignment, and connectivity, help explain how some firms prosper with staff committed to 2-6 times more teams than their competitors (Milgrom & Roberts, 1992: 449).

First, managers' knowledge of employees' multiple team assignments is crucial to the functioning of an MTM system as a means of prioritizing when deadlines conflict. Second, managers can help employees and teams develop schedules and practices that keep context switching and team temporal misalignment at moderate levels. The provision of tools and systems that automate administrative tasks (such as setting meeting times or distributing announcements) also can help to moderate levels of context switching and temporal misalignment. Third, managers defining different types of roles on a team – e.g., whether a member is core or peripheral, or a "consultant" versus a major contributor – can help employees prioritize their time and set expectations about meeting attendance (Ancona & Bresman, 2007; Haas, 2006). Fourth, understanding the attributes of individuals and of project structures that best lend themselves to an MTM environment can increase the probability of success. Clearly, a variety of personal attributes could moderate an individual's ability to work well in an MTM context (Kulik, Oldham, & Hackman, 1987). For starters, self-discipline, organization skills, and a high tolerance for ambiguity (Budner, 1962) are important in many settings, but are likely to be especially valuable in MTM environments. Clients and projects with which the organization is familiar also lend themselves more readily to an MTM context due to greater ability to anticipate projects' dynamics. It is also helpful if MTM projects contain a certain degree of modularity to enable team members to work somewhat asynchronously. Fifth, although eager individuals may join too many teams for their own good, we believe that voluntary MTM is likely to have better results than mandatory assignment to multiple teams.

Finally, good information and regular, early, honest dialogue about everyone's commitments and goals is likely to improve the results of MTM. Information transparency is important for teams in order to most effectively schedule their members' time and coordinate team processes. It is also important at the organizational level as a means to coordinate work across teams more effectively. As noted previously, the amount of flexibility projects have varies depending on exogenously dictated project cycles (e.g., accounting firms must align most of their work to federal tax dates). Nevertheless, to the extent that managers have access to clear, accurate data on individuals' multiple team memberships, they are better able to take advantage of natural ebbs and flows in work cycles. Without this transparency and accurate information (as well as other systems and processes to manage MTM effectively), the feedback loops and curvilinear relationships described earlier are likely to lead to failure at multiple levels. Keeping MTM within an optimal range is a considerable managerial challenge.

Though increasingly prevalent in organizations, MTM remains largely unstudied. In this early exploration of the impact of MTM on individuals, teams, and organizations, we highlight the competing mechanisms by which MTM-driven context switching, temporal misalignment, and intra-organizational connectivity exert their positive and negative effects on learning and productivity. Because of those mechanisms, and the potentially conflicting short-term interests and information of individuals, teams, and organizations, MTM has the potential to fuel itself and generate a vicious cycle. However, further research also has the potential to help scholars and practitioners understand how to manage these competing forces and achieve optimal levels of MTM in a given context. For scholars, that understanding is clearly relevant in the non-academic work contexts they study, but it is also personally relevant for every faculty member who has juggled multiple research, teaching, and service team memberships (Singell & Lillydahl, 1996). For everyone juggling multiple team memberships and striving to avoid being spread too thinly, research on MTM holds the promise of forestalling a future in which attention becomes more fragmented (Hudson, Christensen, Kellogg, & Erickson, 2002; Jackson, 2008) and people feel more “slapped about the head and shoulders” by their multiple team commitments.

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TABLE 1: Constructs Related to Multiple Team Membership

Construct	Definition	Distinctive Features	Sample References
Individual-level			
Multitasking	Attending to or acting on multiple stimuli, activities, or interactions *simultaneously*.	Studied as a behavior with associated cognitive, emotional, and behavioral implications	(Baehner, Kaenig, Pick, & Krumm, 2006; Leroy & Sproull, forthcoming)
Polychronic time use		Studied as a trait or an attitude	(Bluedorn, 2002; Kaufman, Lane, & Lindquist, 1991)
Multicommunicating		Studied with respect to communication	(Reinsch, Turner, & Tinsley, 2008)
Context switching	Shifting attention between sets of stimuli by choice or unwanted interruption, acclimating to the new context	Referred to in general terms regarding tasks, people, tools, roles, routines, and locations	(Henfridsson & Lindgren, 2005)
Task switching		Studied in terms of the positive and negative implications of work interruptions	(Jett & George, 2003; Perlow, 1999)
Team-level			
Boundary spanning	One or more members working across team boundaries	Treated as an activity or role that enhances team effectiveness	(Ancona & Bresman, 2007; Ancona & Caldwell, 1992b) (Joshi, Pandey, & Han, 2008; Lindgren, Andersson, & Henfridsson, 2008)
Organizational and System-level			
Cross-project learning and learning in matrix organizations	The transfer of knowledge across projects or other organizational units	Focused on organizational learning, but not via shared membership in multiple teams	(Cusumano & Selby, 1995; Ford & Randolph, 1992; Nobeoka, 1995)
Multi-team systems	Systems of two or more non-overlapping teams interfacing directly and interdependently to accomplish collective goals	System-level view focused on leadership, integration, coordination, and control across teams	(Bock & Patterson, 1990; De Maio, Verganti, & Corso, 1994; Hoegl & Weinkauf, 2005; Marks *et al.*, 2005; Mathieu, Marks, & Zaccaro, 2001; Payne, 1995)
Multi-project portfolios, project portfolio management, and multi-coupled project organizations	Set of projects under the managerial responsibility of one person	Portfolio-based view of multiple projects focused on risks, rewards, and ripple effects	(Armour, 2005; Hoegl & Weinkauf, 2005; Kazanjian *et al.*, 2000; Lycett, Rassau, & Danson, 2004; Payne & Turner, 1999; Seider, 2006; Thiry & Deguire, 2007)

TABLE 2
Summary of MTM-Driven Mediators, Benefits, Costs and Feedback Loops for Productivity and Learning

Level of Analysis	Proposition	MTM-Driven Mediators	Mediator-driven Benefits	Mediator-driven Costs	Feedback Loops Driving MTM (and Associated Propositions)
Productivity					
Individual	1a	Context Switching	More opportunity to find efficiencies and load balance	More time lost to readjustment and role conflict/overload	High individual productivity creates "stars" who are recruited onto more teams (Proposition 4a)
Team	2a	Temporal misalignment	Stimulus for more efficient work practices	Increased coordination costs; less opportunity to work synchronously	Low team productivity leads to more members being added to the team (Proposition 4b)
Organization	3a	Intra-Organizational Connectivity	Improved resource utilization and reduced redundancy	Tightness of organizational coupling	Low organizational productivity drives organizations to spread people across more teams to leverage resources (Proposition 4c)
Learning					
Individual	1b	Context Switching	More varied sources of information and stimulating effects of switching	New information too disparate and time insufficient for effective integration	High individual learning creates experts who are recruited onto more teams (Proposition 4a)
Team	2b	Temporal Misalignment	Increased diversity of experience; breaks and time apart to integrate learning	Increased difficulty integrating across members and developing new team repertoires; more independent work	
Organization	3b	Intra-Organizational Connectivity	More paths for information flow	Reduced information diversity	

FIGURE 1

Multi-level Model of Multiple Team Membership

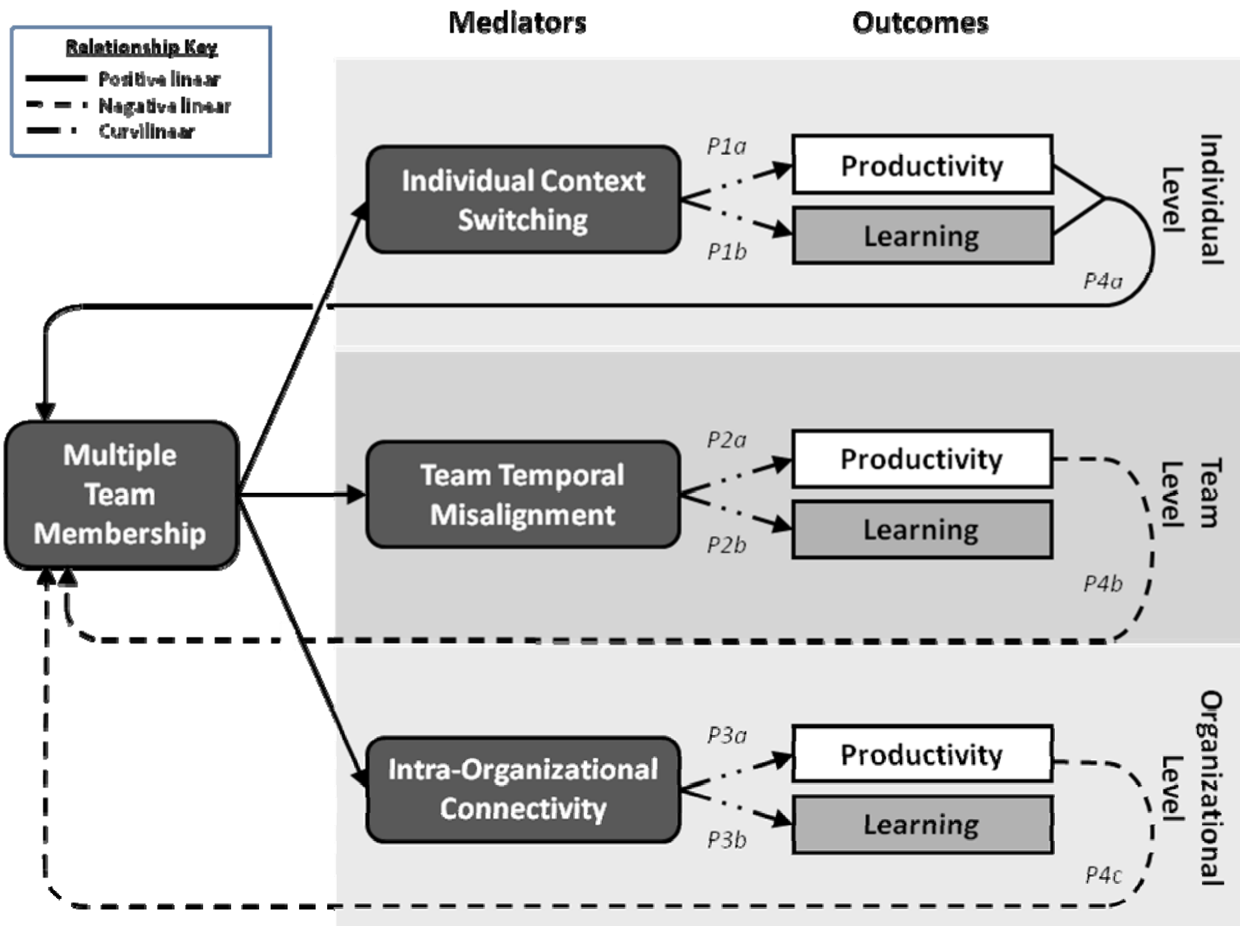
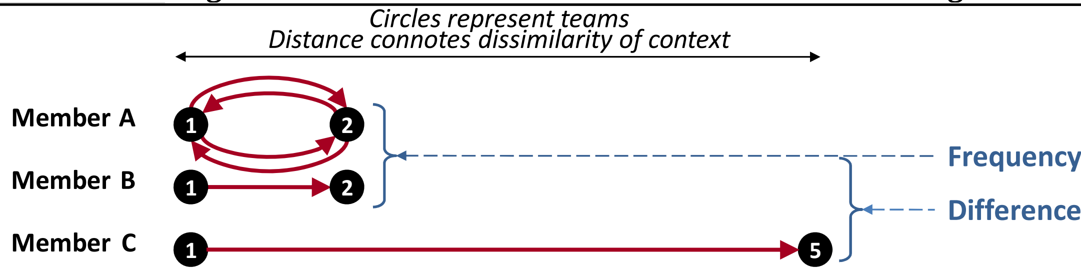


Figure 1: Characteristics of Individual Context Switching



Frequency* = *How often switches occur ***[A vs. B]***

Member A and B both switch between the same two teams over a given time period, but member A switches four times while member B switches only once. Increased frequency is inversely related to contiguous work time.

Difference* = *How different contexts are from one another ***[B vs. C]***

Members B and C both make one switch between two teams, but member C's teams are more different from one another than member B's

Figure 3: Mechanisms Linking MTM-Driven Context-Switching to Individual Productivity and Learning

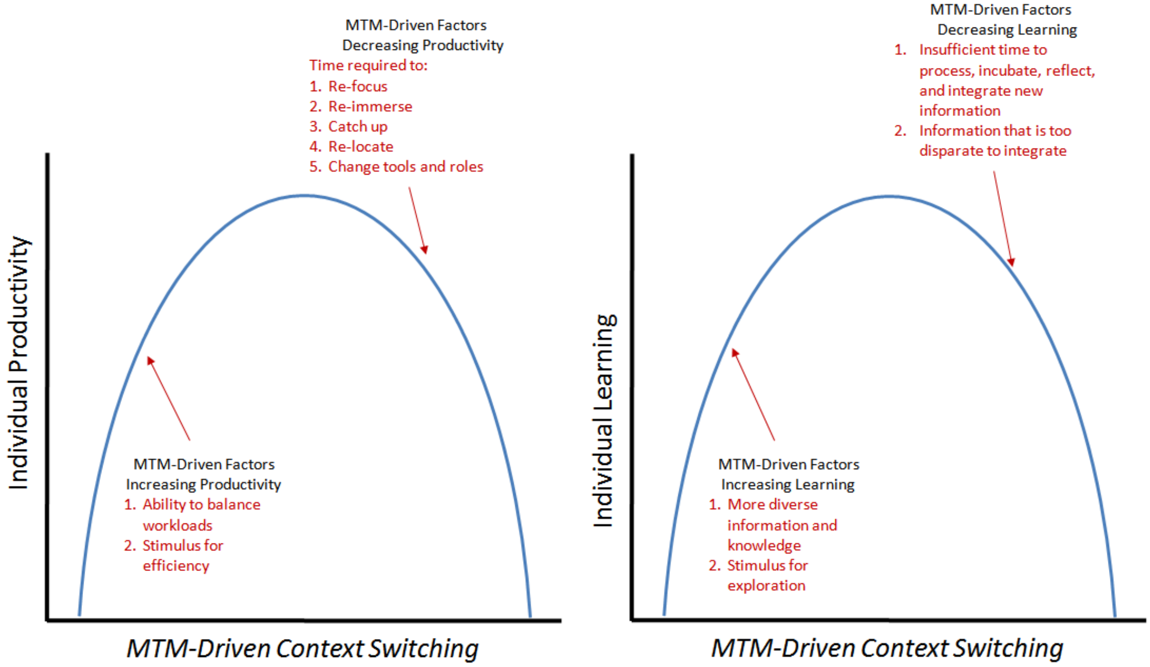


Figure 4: Mechanisms Linking MTM-Driven Temporal Misalignment to Team Productivity and Learning

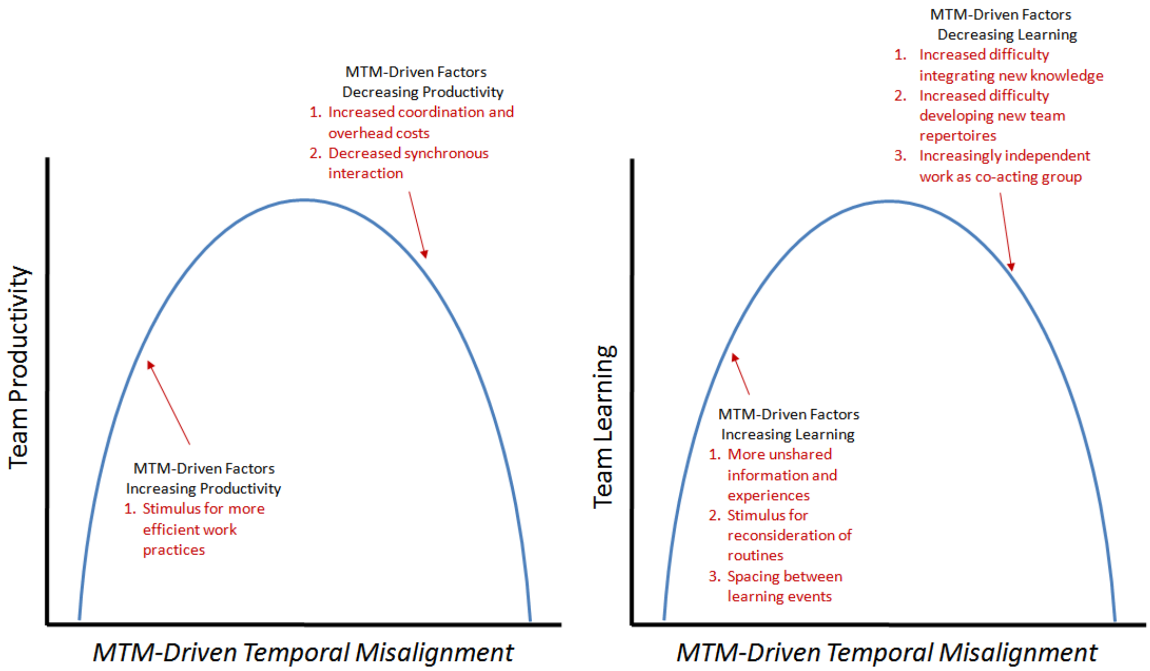


Figure 5: Mechanisms Linking MTM-Driven Intra-Organizational Connectivity to Organizational Productivity and Learning