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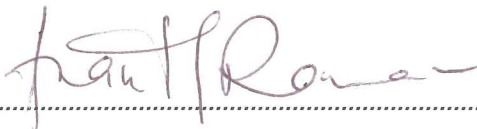
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Setting Employees up for Success

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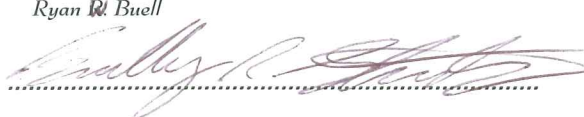
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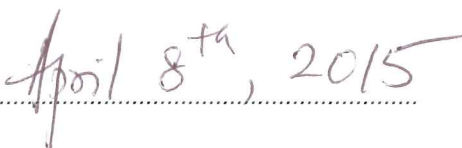
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Essays on Operations Management:  
Setting Employees up for Success

A dissertation presented

by

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to

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In partial fulfillment of the requirements

for the degree of

Doctor of Business Administration

in the subject of

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**Essays on Operations Management:**

**Setting Employees up for Success**

**Abstract**

As a result of globalization, organizations expect more from their employees. While organizations have become leaner, the productivity requirements have not decreased. Further, there is greater importance being placed on the connection between human capital and operational outcomes. This research explores the impact of management decisions on teams of employees. It also examines how organizations use and develop their workforce. In three studies, my dissertation considers how an organization manages their human capital to gain optimal operational results: 1) by leveraging multiple-team membership practices while staying cognizant of the fragility that it induces, 2) by being more thoughtful in the assignment of employees to varying work contexts, and 3) by understanding how employee development has near-term and long-term effects on the human capital pipeline and the organization's performance.

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*For Nicole, Madeline, and Morgan - the loves of my life. Without your patience, encouragement, and support this dissertation would not exist. Thank you for ensuring I maintained perspective and for reminding me what really matters. I am excited about our future and the next chapter of this journey.*

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***“If it was easy, everyone would do it!”***

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## **Chapter 1: Introduction**

### **1.1 Introduction**

Over time, human capital has become increasingly more essential to operational outcomes, and the results—which are a distinctive aspect of operations management—is that within the realm of project management, the human capital transition from a modular resource, which can easily be managed as a dynamic productivity multiplier, can enhance outcomes. But how does an organization set its employees (human capital) up for success to facilitate maximum outcomes?

In such a context, how organizations leverage employee experiences while trimming their labor pool could be counterproductive if not monitored properly. In my work, which contributes to the growing body of empirical operations literature, I explore operational choices made in the project management process that affect organizational productivity and, in turn, performance.

### **1.2 Theoretical Background**

Organizations are continuously seeking opportunities to increase overall productivity from its labor force. Prior work has theorized the implications of placing employees on multiple teams simultaneously, a practice known as multiple-team membership (MTM) (O’Leary, Mortensen, and Woolley 2011). O’Leary et al. suggests that there is a curvilinear relationship between MTM and firm performance. There are compelling reasons to expect positive and negative performance outcomes from MTM. The deployment of MTM may aid operational performance in three ways. First, MTMs may build volume flexibility (Goyal and Netessine 2011; Kesavan, Staats, and Gilland 2014), permitting any given team to scale its effort in response to the actual work demands. Second, MTMs may augment individual learning since there are greater opportunities

to see entire start-to-finish project cycles (Pisano, Bohmer, and Edmondson 2001; Reagans, Argote, and Brooks 2005) as well as more chances to work with others and thus learn vicariously (Bresman 2010). Finally, with MTM utilization, employees see a greater variety of ideas and may be able to bring these ideas from one project to the next, thus aiding performance (Hargadon and Sutton 1997; Huckman and Staats 2011).

Despite these potential benefits, there are also compelling reasons to predict a negative relationship between MTMs and project performance. First, when team members are engaged in multiple teams simultaneously, they may grow overworked and their performance may suffer (KC and Terwiesch 2009; Staats and Gino 2012; Tan and Netessine 2014). Second, as individuals' work across many teams their coordination may suffer, resulting in coordination neglect that may lead to declines in operational performance (Heath and Staudenmayer 2000; Staats, Milkman, and Fox 2012). Finally, although MTMs are meant to take advantage of potential downtime for workers, instead, if the desired work is non-overlapping then it is possible that there may be increased levels of resource blocking and starving of resources during the project.

Prior literature that explores organizational learning examines the benefits of prior experience to organizational success (Cohen and Levinthal 1990; Reagans, Argote, and Brooks 2005; Narayanan, Balasubramanian, and Swaminathan 2009). Prior experience provides a reference point for employees to draw from when faced with new experiences. Prior experience also allows an employee to leverage their expertise quickly and makes them more adaptable (Cohen and Levinthal 1990; Reagans, Argote, and Brooks 2005). Scholars note the limitations of prior experience are highlighted when employees anchor on their past experiences and are ineffective in a new environment due to their inability to adapt (Winter and Szulanski 2001). Past

research on specialization also suggests a positive correlation between human capital specialization and organizational performance. When employees develop a special skill set they become more efficient by completing that task repeatedly. The specialization leads to increased overall productivity (Narayanan, Balasubramanian, and Swaminathan 2009; Huckman and Staats 2011; Staats and Gino 2012). However, there is a gap in the literature in understanding how learning and specialization contribute to firm performance in a multi-context setting.

Additionally, when employees are exposed to diverse tasks, the gain in knowledge across domains is accelerated (Paas and Van Merriënboer 1994; Narayanan, Balasubramanian, and Swaminathan 2009; Staats and Gino 2012). Through the completion of diverse tasks individuals acquire new knowledge. When the employee is faced with similar tasks in the future the ability to execute the requirement is easier. Task diversity may lead to sustained productivity (Edmondson 2009; Cummings and Haas 2012; Staats and Gino 2012). However, the prior literature in organizational learning has not considered a multi-location firm that deploys individuals across a single context or multiple contexts and how that human capital deployment decision affects organizational performance. That is the gap in the literature we seek to fill.

Corporate leaders have also been reawakened to the fact that they need strategic thinkers to lead their companies in the future (Oliver, Heracleous, and Jacobs 2014). They realize that operating in a globally competitive environment presents serious constraints as well as tremendous opportunities for growth (Makino, Isobe, and Chan 2004; Perkins 2014). Nevertheless, many are struggling to develop internal systems that prepare their talent to lead the organization. During economic peaks, companies hired and developed their leadership through elaborate rotation programs (Cappelli 2008). They also offered education opportunities at significant expense to the company. For some, this was a strategic way to gain and retain top

talent. During the recession, some of those programs were the first to be cut. Now, seven years later, companies are feeling the effects of those cuts to manager development.

### **1.3 Overview of Dissertation Research**

In three chapters, my dissertation empirically explores how three organizational decisions—1) the productivity of placing employees on many teams simultaneously, 2) the tradeoffs between specializing employees versus diversifying them, and 3) the appropriate experiences for employees—affect firm’s performance.

#### Chapter 2: Multiple-Team Membership, Turnover, and On-Time Delivery: Evidence from Construction Services

This chapter explores the implications of employee utilization. In firms that want to compete in dynamic markets are finding that they must build more agile operations to ensure success. One way for a firm to increase organizational agility is to allocate employees to multiple project teams, simultaneously—a practice known as multiple-team membership (MTM). MTM allows for the potential of improved project performance through additional flexibility and learning, however, there is also the possibility of negative performance effects from MTM due to overwork, coordination neglect, and problems with resource blocking and starving. In this paper, we theorize about these conflicting predictions prior to building and testing an empirical model that draws on a unique dataset consisting of 1,503 construction projects in the Europe District of the United States Army Corps of Engineers (USACE). Although USACE is a government entity, it operates similar to for-profit construction services companies.

We find that MTM shows an inverted U-shaped relationship with on-time project

delivery whereby it is first related to improved performance and then later related to worse performance. To extend our exploration, we examine whether MTM makes teams more fragile operationally. We do this by investigating whether teams that experience unanticipated turnover are more susceptible to the negative effects of MTM. Our empirical results show a negative interaction effect between the two variables. Our findings provide insight into the benefits and the difficulty in building a more agile workforce.

### Chapter 3: Coming up to Speed: Tradeoffs between Contextual Specialization and Contextual Non-Specialization in Firm Performance

This chapter considers the impact of employee movement between different context or locations and how utilization matters. We study how “*contextual specialization*,” the act of focusing an individual’s organizational tasks within a particular context, and “*contextual non-specialization*,” the practice of spreading an individual’s organizational tasks among different contexts, affects individual performance outcomes. Operations and strategy scholars have studied the effect of context on the performance of the firm, but the focus has been in a singular context. In this paper, we study the decision of a multi-location firm to deploy human capital across multiple contexts and identify a tradeoff between achieving immediate productivity gains through contextual specialization and long-term productivity gains through contextual non-specialization. We exploit a natural experiment where individuals employed with the United States Army Corps of Engineers (USACE) in Europe are treated with an exogenous shock in human resources policy related to how long they can be employed in Europe. We exploit this exogenous shock to study how contextual non-specialization and contextual specialization at the employee level affects project performance.

## Chapter 4: T-Shaped Managers—One Size Does Not Fit All: Exploratory Study from the Military

This chapter proposes a framework for how T-shaped management can be discussed through the recognition of the variance between capabilities as a result of experiences provided to employees from organizational decision. People are an organization's most important resource. Managers who are collaborative and innovative ensure that organizations remain competitive. This type of manager has been referred to as a T-shaped manager—"T" is the vertical portion that represents the depth of expertise, and the horizontal portion represents the breadth of expertise. How this type of manager is created is not fully understood. I contend that the experiences that managers have along their professional development pathway is influenced by the organization. An organization can make decisions that develop a manager's ability to sustain positive productivity.

This research proposes that there is variance in the T-shaped manager and makes a distinction between what we classify as Little T-shaped managers (LtMs) and big T-shaped (BTMs). LtMs are managers whose experiences are more tactical and whose depth of knowledge is in a specific skill area. BTMs have tactical depth but also have developed a knowledge base that crosses several functional areas and are capable of more strategic thinking. I illustrate this reasoning using the United States Army as a research setting. I conducted interviews with senior leaders and leveraged additional data to form propositions for future exploration. The research highlights that often what the organization wants in its future leaders is not necessarily what it actually develops or promotes to positions of senior leadership. This work provides a framework for discussing how an organization can create the T-shaped manager it needs.



## **Chapter 2: Multiple-Team Membership, Turnover, and On-Time Delivery: Evidence from Construction Services**

### **2.1 Introduction**

Firms face dynamic and uncertain markets, and so building agile project management is a key determinant of organizational success (Fisher and Raman 2010; Girotra and Netessine 2014). In many contexts, this need for agility has led to an increasing use of fluid project teams (Edmondson and Nembhard 2009; Huckman, Staats, and Upton 2009; Reagans, Argote, and Brooks 2005). In a fluid team, employees with potentially diverse experiences are brought together to execute a project and then the team is broken up and individuals move on to the next project. The constant assembling of the right talent at the right place permits organizations to respond more nimbly than might be possible with an organizational-level response. However, a standard model of fluid teams with individuals fully dedicated to one team (Huckman and Staats 2011) may prove inefficient. In many situations projects must be completed in a structured sequence and so there may be lag time between steps or there may not be enough work at each phase of the project to ensure full utilization of the team. As a result, organizations have responded by staffing individuals to multiple teams simultaneously, a practice known as multiple-team membership (MTM). Firm usage of MTM is growing and, although MTMs have received theoretical attention (O’Leary, Mortensen, and Woolley 2011), their operational implications have received little study and so it is important to understand these outcomes from both a practical and theoretical perspective.

There are compelling reasons to expect positive and negative performance outcomes

from MTM. The deployment of MTM may aid operational performance in three ways. First, MTMs may build volume flexibility (Goyal and Netessine 2011; Kesavan, Staats, and Gilland 2014), permitting any given team to scale its effort in response to the actual work demands. Second, MTMs may augment individual learning since there are greater opportunities to see entire start-to-finish project cycles (Pisano, Bohmer, and Edmondson 2001; Reagans, Argote, and Brooks 2005), as well as more chances to work with others and thus learn vicariously (Bresman 2010). Finally, with MTM utilization, employees see a greater variety of ideas and may be able to bring these ideas from one project to the next, thus aiding performance (Hargadon and Sutton 1997; Huckman and Staats 2011).

Despite these potential benefits, there are also compelling reasons to predict a negative relationship between MTMs and project performance. First, when team members are engaged in multiple teams simultaneously, they may grow overworked and their performance may suffer (KC and Terwiesch 2009; Staats and Gino 2012; Tan and Netessine 2014). Second, as individuals work across many teams, coordination may suffer, resulting in coordination neglect that may lead to declines in operational performance (Heath and Staudenmayer 2000; Staats, Milkman, and Fox 2012). Finally, although MTMs are meant to take advantage of potential downtime for workers, instead, if the desired work is non-overlapping, then it is possible that there may be increased levels of resource blocking and starving of resources during the project. Given that these effects may be a function of the amount of MTM, namely at lower values of MTM, the positive effects may dominate while at higher values of MTM the negative effects may dominate, this suggests that there may be an inverse U-shape relationship between MTM and performance. As a result of these conflicting effects, our first research question asks: *How does multi-team membership contribute to project performance?*

If multi-team membership provides its beneficial flexibility, at the cost of fragility to team performance, as the prior paragraphs suggest, then it is important to explore the implications of MTM in situations where such disruptions might occur. One such disruptive circumstance is when teams experience turnover—the departure of team members from the project. Prior work indicates that turnover may have a direct and disruptive impact on operational performance (March 1991; Rao and Argote 2006; Ton and Huckman 2008; Narayanan, Balasubramanian, and Swaminathan 2009). We examine the potential operational consequences of turnover in project teams with an important consideration—was the turnover anticipated or not (Huckman, Song, and Barro 2013)? With anticipated turnover, organizations can plan and respond, thus minimizing or even eliminating the effect. As a result, in order to study a disruption, we investigate unanticipated turnover. The use of MTM in projects that experience unanticipated turnover may prove particularly problematic since managers may have less flexibility to replace employees due to minimal slack in the labor pool, problems of blocking and starving may increase, and coordination as a whole may suffer. Therefore, the second and final research question is: *How do multiple-team membership and unanticipated turnover jointly affect project performance?*

The Europe District of the United States Army Corps of Engineers (USACE) is the setting for our empirical analysis and research. Although it is a government entity, USACE operates like other for-profit construction services companies. USACE employees manage projects in ninety-four different countries located in Western Europe and the continent of Africa. Employees are required to work on multiple teams in the countries of operation.

The attention devoted to project-based organizations has increased recently due to the nature of globalization. Beyond its current relevance, the Europe District is an appropriate setting

for our analysis for several reasons. First, there is a large volume of projects completed that provides for us with a sufficient sample size. In addition, the context has MTM, which enables us to observe employees operating on multiple projects simultaneously, which is central to our study. Similar to previous studies, we use project-level data. Fortunately, we are able to link individual employee attributes to project data, thereby allowing us to analyze the impact of engaging on multiple teams. With this well-defined linkage between employee attributes and performance, we are able to highlight the relationship between MTM and turnover on on-time delivery. Second, there is high turnover as individuals rotate through the Europe District and then return to the United States. This phenomenon allows us to explore the impact of *unanticipated* turnover caused by the enforcement of a human resource policy and understand the challenges faced by managers who must staff projects to ensure on-time delivery in the midst of turnover. Third, the district is responsible for projects throughout Europe and Africa, which allows for multiple observations of employees engaged in diverse areas.

We contribute to the understanding of the development of agile operations in three ways. First, we empirically show the complex effect of MTM on project outcome. Prior work develops theory that MTM affects operational performance (O’Leary, Mortensen, and Woolley 2011) and the limited empirical exploration has used survey data to show a positive relationship on manager rated performance (Cummings and Haas 2012). We leverage empirical, archival organizational data and find that the project team performance first improves then degrades as MTM increases. MTM has emerged as a strategy for both workforce utilization and flexible response to dynamic conditions, and so MTM is likely to remain a common labor paradigm in management. However, the efficiency gains from MTM may be substantially reduced or offset entirely if employees are assigned to too many teams.

Second, we gain insight on the optimal level of MTMs in our setting. We find that the stationary point of the inverted U-shape is at sixty-three MTMs, which is 45% less than the average MTM in our sample. Finally, for our third contribution, we explore the fragility of MTM. By leveraging the implementation of a human resource policy that permits us to identify *unanticipated* and *anticipated* turnover, we better understand how different types of turnover influence outcomes and, importantly, we explore what happens when MTM and unanticipated turnover are combined. Consistent with a view that MTM may result in a more fragile operating system, we find that *unanticipated* turnover is even more harmful to operational performance when MTM is higher compared to when it is lower. This observation identifies the increased systemic risk that comes from high levels of MTM.

## **2.2 Performance and Multiple-Team Membership**

### **2.2.1 Multiple-Team Membership**

The traditional view that individuals join *one* team and stay on that team until project completion is often not the case in modern organizations (Arrow and McGrath 1995; Hackman 2002). Over the past thirty years, many organizations have recognized that the flexibility offered by individuals working on multiple projects at the same time may improve individual, team, and organizational performance (Edmondson and Nembhard 2009). Scholars have labeled this practice multiple-team membership (MTM) (O’Leary, Mortensen, and Woolley 2011). The transition to MTM can be observed in a wide array of industries and functions including: information technology (Baschab and Piot 2007), consulting (Gardner, Gino, and Staats 2012), education (Jones and Frederickson 1990), healthcare (Richter, Scully, and West 2005; Valentine

2015), and new product development (Edmondson and Nembhard 2009).

Although the performance effects of MTM have not been extensively explored empirically, prior scholars have theorized about the potential positive or negative impact of MTM on team performance (O’Leary, Mortensen, and Woolley 2011). Cummings and Haas (2012) use survey data to show that working on multiple teams is related to positive, managerially rated team performance. Examining the operational performance of MTM more rigorously, in practice, is important because MTM could be related to either improved or worse team performance. We begin by examining the performance benefits of MTM.

There are at least three ways MTM may positively affect team performance. First, MTM may offer a manager volume flexibility—the ability to increase capacity up or down to meet service demand (Goyal and Netessine 2011). In prior work in call centers, researchers found that volume flexibility allowed management to quickly redirect employees based on demand and to position employees in critical stages to improve performance (Iravani, Van Oyen, and Sims 2005). Kesavan, Staats, and Gilland (2014) found that leveraging volume flexibility with a flexible labor force mix—as captured by full-, part-time, and seasonal labor—resulted in increased sales and profits and decreased expenses for retail operations, at least up to a point. In a team context, volume flexibility could prove beneficial since work is rarely uniformly distributed. If individuals take part in multiple teams at the same time, then they have the potential to move between different projects based on project needs—when one project is particularly time-intensive then multiple people can focus their attention there with the hopes that other projects might need less time at that moment (we discuss potential challenges with this approach below). This type of flexibility has been referred to as temporal flexibility (Kesavan, Staats, and Gilland 2014).

Second, when organizations use MTM, employees can augment their individual learning. Research has consistently shown that one of the most important predictors of team performance is team or individual prior experience (Pisano, Bohmer, and Edmondson 2001; Reagans, Argote, and Brooks 2005). Multiple-team membership may aid individual learning in two ways. First, by operating on many teams, and engaging in multiple tasks, there is an opportunity for greater learning by doing. Individuals get the opportunity to be a part of more projects that are cycling through start to finish, than they would if they were only on one project at a time. Second, MTM may benefit individual learning when people have the opportunity to see how others do the task—often called vicarious learning (Bresman 2010; Gino et al. 2010). By watching others, an individual can learn how to complete a task successfully or learn from the mistakes that the other person might make (KC, Staats, and Gino 2013).

Finally, when individuals work on multiple teams they are exposed to a diversity of ideas and people and they may then have the opportunity to provide the knowledge that they gain on one team to another (Hargadon and Sutton 1997). Prior literature focused on transfer of ideas from one project to the next (Cummings 2004; Huckman and Staats 2011). For example, when an individual identifies a novel solution on one project, they may be able to bring that solution to another project (Narayanan, Balasubramanian, and Swaminathan 2009; Staats 2011). MTM offers the opportunity to share knowledge in real-time across multiple, simultaneous projects.

While MTMs have positive aspects, they can lead to a decline in performance through at least three different mechanisms. First, there is potential to overload the workforce through engagement on too many teams or tasks. It is well-established that engaging employees on too many tasks can lead to “overwork,” which is observed when individuals are given too much work relative to a normal load (KC 2013; KC and Terwiesch 2009; Staats and Gino 2012; Tan

and Netessine 2014). For instance, in a restaurant setting, when a server has too many tables and is given additional requests, it is difficult for that server to continue to provide high-quality service, so customer satisfaction and overall revenue suffer (Tan and Netessine 2014). This phenomenon is not isolated to the restaurant industry and has also been observed in financial services (Staats and Gino 2012) and healthcare (KC and Terwiesch 2009). When employees are overworked they are unable to sustain high levels of performance. Even when employees are performing similar tasks on multiple projects, they may be overextended and cannot produce quality work. MTMs extend employees in different directions, thus creating a situation where employees may be in a continuous state of overwork and as a result team performance may suffer.

Second, when employees work on too many teams, there may be coordination challenges that reduce efficiency. Prior research on virtual and distributed teams notes that teams often struggle to perform to their potential when they work in different locations or do their work at different times (O’Leary and Cummings 2007). Team members working on multiple teams may find it possible to perfectly synchronize their activities, but in all likelihood, they will be forced to accomplish tasks at different times due to their other project commitments. Combined with the risk of overwork, this may lead to increased conflict, decreased shared understanding (Mortensen and Neeley 2012), and, in general, lower team performance (Staats, Milkman, and Fox 2012).

Finally, there is an opportunity for MTM to block and starve resources in the project life cycle. In the case of two consecutive machines, if the downstream machine fails to operate, the upstream machine becomes blocked. We apply this idea to project teams as well. If a flexible labor force exists and that labor force is over extended, and a situation arises where more employees are needed on one project versus another, the manager may be unable to secure team



members' time to meet critical requirements. In this case, the benefits of flexibility and MTM are lost. Even though the manager could move the employees to meet a critical demand, the performance on the other projects would suffer, creating a starving effect within the process (Schultz et al. 1998). If starving occurs, then individuals are unable to work on the project when there is work to be done and team performance suffers. These potential conflicts are likely to increase as teams are made up of more individuals working across a greater number of teams.

As noted, it is possible that there are benefits and costs at play for any project team, albeit in varying amounts. We posit that the balance between the two changes as the amount of MTM increases within a team. At low levels of MTM the benefits may outweigh the costs because employees are less likely to be affected by the difficulties of overwork, blocking/starving, and coordination neglect. However, as MTM increases, these costs may increase dramatically. This suggests MTMs inverted U-shaped relationship with project performance and so our first hypothesis is as follows:

*Hypothesis 1: Multiple-team membership and project performance have an inverse U-shaped relationship.*

### **2.2.2 The Disruptive Consequences of MTM; The Case of Turnover**

The discussion above notes that MTM may have both positive and negative performance consequences. Although increasing MTM may provide some flexibility and learning, it may also introduce fragility to the team. If this is the case then such fragility may prove particularly costly when teams experience disruptions. One operational disruption that many teams experience, at some point during their existence, is team member turnover. Therefore, we first consider the operational consequences of turnover and then examine its joint effect with MTM.

Prior research details how turnover may negatively or positively affect operational performance (Narayanan, Balasubramanian, and Swaminathan 2009; Hausknecht and Holwerda 2013). Scholars have argued that turnover is inherently disruptive and therefore has negative effects (Argote and Epple 1990; Kacmar et al. 2006). From this perspective, high turnover hinders a firm's ability to provide services, because trained employees depart and the onus is on the firm to quickly recruit, train, and retain proficient replacements (Ton and Huckman 2008; Kacmar et al. 2006). Note, that in cases where individuals require little prior knowledge to complete the work or existing operations have grown complacent and new individuals bring a fresh, innovative perspective, then turnover may prove helpful in either lowering costs or injecting new ideas (Argote and Epple 1990; Glebbeek and Bax 2004).

However, in most contexts, turnover introduces operational challenges that may inhibit performance. Interestingly, recent work shows that organizations may be able to mitigate the effects of turnover. For example, Ton and Huckman (2008) find that process conformance lessens the negative effect of turnover in the retail setting. Huckman and Song (2013) consider *anticipated* turnover and find that by managing *anticipated* annual turnover of hospital residents, a large teaching hospital was able to continue providing excellent care to its patients. This phenomenon is also observed in military units that rotate into areas of conflict (e.g., Afghanistan, in recent years). The military maintains high levels of stability even during large organizational transitions in and out of the region (Huckman and Staats 2013). In each case, senior managers forecast personnel requirements and make appropriate adjustments to manage the inherent risk induced by turnover while capturing the benefits, discussed above.

Although prior work highlights that managers are able to better offset the negative effects of turnover when it is *anticipated* the same may not prove true for *unanticipated* turnover.

*Unanticipated* turnover occurs when the departure occurs unexpectedly so that the firm has limited time to make labor force adjustments. As discussed earlier, turnover may have negative effects on organizations (Narayanan, Balasubramanian, and Swaminathan 2009; Hausknecht and Holwerda 2013); however, there could also be additional negative impacts on the firm due to *unanticipated* turnover. First, *unanticipated* turnover creates immediate disruptions. Because managers cannot foresee the impending turnover, they are unable to plan appropriate actions to ensure proper team composition. The residual effect of this action contributes to degradation of performance, which could delay project delivery time (Shaw et al. 1998).

A second negative consequence of *unanticipated* turnover is that it changes how teams are composed, as highlighted previously. If projects are in varying stages of completion, the knowledge shared amongst team members is compromised. This creates a state of overwork for employees with project specific knowledge. The employees who remain must transfer knowledge to new members, if new members are staffed to the project. Superiors sometimes determine to accept risk and not staff new members on projects because they feel that the remaining employees can nudge the project forward. The remaining employees are stretched on both the current project where the *unanticipated* turnover arose and also on the other projects on which the employees are simultaneously engaged.

As discussed, MTM and *unanticipated* turnover both occur in organizations and both can negatively affect performance. In the case of the former, MTM can create an overworked, over-scheduled, and poorly coordinated workforce that is unable to reach its performance potential. In the case of the latter, turnover induces untenable disruptions that are the result of purging knowledgeable employees at critical moments during the project life cycle. Although each when considered separately can be detrimental to performance, here we explore whether they have an

interaction effect, whereby together they speed the degradation of performance.

Earlier we noted that MTM overworks the labor force, blocks a manager's flexibility to maneuver employees due to minimal slack in the labor pool to meet critical demands, and results in poor coordination. Turnover may exacerbate each of these effects. Because employees are working on more than one team, when they leave, their departure disrupts not just one team or project but also the portfolio of teams or projects on which an individual employee is participating. Ideally, managers would respond to disruptions from turnover through the flexibility that the MTM offers—for example, moving an individual onto another team that needs a person with similar skills as the departing team member. However, not only is the problem felt across multiple teams, but when managers are unable to select which employee departs and which employee stays in the organization, they lose the ability to mitigate the negative effects of blocking. In reality, unless the company is running with idle capacity then there are even fewer employees in the organization with the appropriate skills to place on critical projects at critical moments and the interaction of MTM and *unanticipated* turnover will negatively impact performance. Finally, with fewer resources to complete a project, there is a greater risk that coordination challenges will increase and the quality of performance by the remaining team members will diminish. As a result, we hypothesize that the negative effects of *unanticipated* turnover will noticeably worsen project performance when interacted with *MTM*. Thus, we hypothesize:

*Hypothesis 2: MTM and unanticipated turnover have a negative interaction effect with project performance.*

### **2.3 Organizational Setting**

To study our research questions we require a field site with at least four features: (1) a project-based environment with sufficient sample size of projects; (2) project staffing that includes MTM, as opposed to a setting with single team staffing; (3) turnover of team members over time, and a shock to the system that enables us to disentangle anticipated from unanticipated turnover; (4) detailed tracking of individual and project variables. The United States Army Corps of Engineers (USACE) provides just such a setting. USACE, headquartered in Washington, D.C., has approximately 37,000 civilian employees delivering engineering services to customers in more than 130 countries worldwide. A large part of the work that the USACE undertakes is handled like other for-profit construction services companies. USACE builds and manages large-scale construction projects around the world. For example, USACE manages the United States (U.S.) Army military construction program totaling over \$44.6 billion from 2007 to 2014. USACE also owns and operates 24% of the hydropower capacity for the U.S. (3% of the total electric capacity for the U.S.). The USACE is organized into nine separate divisions, each further parsed into organizations called districts. There are six districts outside the continental U.S.

We targeted the Europe District as the focus of this study because of: (1) the global nature of the district, (2) the higher volume of projects completed relative to other districts, (3) the higher turnover experienced as individuals rotate through the Europe District and then return to the United States, (4) the modus operandi of requiring employees to participate on multiple teams simultaneously, and (5) we were able to secure access for our research project. These setting attributes allow for a rich exploration of the phenomenon in which we are interested in.

The Europe District of the USACE has been operating for more than fifty years and is currently responsible for conducting projects in ninety-four countries. Headquartered in

Wiesbaden, Germany, the district provides engineering, construction, stability operations, and environmental management products and services to the Army, Air Force, and other U.S. government agencies and foreign governments throughout the U.S. European Command and U.S. Africa Command. The district's global responsibilities create unique operational challenges since there are country-specific regulations and human resource policies with which they must comply.

USACE is project-based and government-owned, yet independently operated. USACE does not receive direct financial support from the U.S. government. Instead, it charges agencies for à la carte project management, and, much like a private corporation, must keep its customers satisfied by completing projects on-time and within the specified budget in order to remain in operation. USACE's operational construct is similar to a global architecture and engineering (A&E) firm that conducts large-scale construction projects. Projects are reviewed monthly and managers are required to update project information continuously. These organizational attributes allow for generalizability of our results to other project-based companies and industries.

### **2.3.1 Organization Policies: The Five-Year Rule**

Since the USACE Europe District operates outside the continental U.S., it is subject to a unique personnel policy that comes from the U.S. Code Title 10, U.S. Code 156—"ROTATION OF CAREER-CONDITIONAL AND CAREER EMPLOYEES ASSIGNED TO DUTY OUTSIDE THE UNITED STATES." This policy, referred to as the five-year rule, mandates that no employee may remain on an assignment outside the continental U.S. longer than five years. The rule was put in place to increase the global assignment opportunities for a higher percentage

of the workforce. USACE personnel report that without the five-year rule enforcement, most USACE employees would choose to stay in Europe for longer than five years because of the additional pay and the opportunity to live abroad (Roncoli 2013). The five-year rule forces employees to move despite their personal preferences or the preferences of their direct supervisors. However, the five-year rule has only been intermittently enforced since its publication in 1960.

The various military commanders, who take on the role of a CEO of the organization, determined whether the rule was enforced or not. Due to the constant change in military leadership, the individual USACE districts cannot anticipate when the five-year rule will be enforced, thus it is effectively an exogenous event and so we can use this enforcement in order to examine the consequences of anticipated turnover and unanticipated turnover. Because of the swift enforcements of decisions within the organization, there is limited threat of leakage of information to the subordinate organizations, which would allow them to prepare for the enforcement of the five-year rule. Our sample time period for the study covers January 2004 through December 2012. In the initial period, the five-year rule was not enforced. Then in May 2005 a new leader assumed the position as deputy commander of USACE and in August 2006 announced that the five-year rule would be enforced. In discussions with the commander who made the decision to implement the policy, he enforced the rule when he was informed, a year into his tenure, that it was not being enforced. There was no notice given to the organization prior to implementation. Thus, it is possible to examine how teams responded to this shock to the system. We note that when the five-year rule was implemented, the policy significantly affected the organization at all levels.

In 2013, prior to collecting data, we visited and observed the USACE European District

over a thirty-day period. We interacted with project managers, division managers, and senior leadership. In discussions with the managers, we learned that there was no science to the assembly of an individual project delivery team. Instead, when a new project came in it was given to the individual judged to have the most idle capacity.

## **2.4 Data**

The data used to explore our research question was provided by USACE. Our sample is composed of all 1,503 projects conducted at USACE European District from January 2004 to December 2012. Our data includes 861 individual employees and indicates the projects they worked on in each month. These data can be used to calculate how many simultaneous projects each employee participated in each month, yielding approximately 1.25 million person-project-month records. We also can combine these data with project outcome data. Because the outcome is project-level, all variables are aggregated to the project level, which yields a total of 1,503 project observations.

Examining the summary statistics in our data (Table 2.1) we find that the average project length is thirty-nine months, with considerable variation across projects. Because employees are operating at a managerial level on projects that they are assigned, the employees are engaged on many project teams in a given month. The average multiple-team membership is 101 teams. If one assumes that there are four and one-third weeks in a month and that individuals work forty hours per week then that implies individuals have 172 working hours per month and therefore are spending 1.7 hours per project, on average. Interviews with USACE personnel confirmed that these numbers matched their expectations. Since USACE served as general contractor on most projects that meant that much of the project team's time was spent monitoring and working with



subcontractors outside of USACE and so these small number of hours per project per month are reasonable. Finally, the average size of a project team is 16.8 members.

**Table 2.1: Summary Statistics**

<b>Variable</b>	<b>Count</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
<b>Project Length (YRS)</b>	1503	39.29	20.56	11	95
<b>MTM</b>	1503	101.01	54.74	0	351
<b>Tenure (YRS)</b>	1503	4.86	1.50	0.46	11.62
<b>Education</b>	1503	7.72	2.99	0	17
<b>Status</b>	1503	7.54	2.78	0	14
<b>Project Member Size</b>	1503	16.76	18.06	1	114

#### **2.4.1 Dependent Variables**

The primary objective measures of performance in the project management space have been well-established: schedule, cost, and quality (Gaddis 1959; Dumond and Mabert 1988). A project should be delivered on-time, on budget, and at the expected quality (or better on any of these dimensions). Ideally, it would be possible to consider performance on all dimensions simultaneously. However, the realities of our context focus our attention on performance, on-time delivery, for two primary reasons. First, quality is measured at the end of a project during the formal project sign-off. If the quality level is not acceptable then the project is not signed off and it remains open. As such, on-time delivery effectively measures both quality and performance. Second, although ideally we could look at budget performance, the financial data was deemed too sensitive to share and so we did not receive it.

Project managers estimate and record an expected delivery date for each project prior to the start of the project. We measure performance on this dimension by creating an indicator variable, *on-time*, which equals “one” if a project was delivered on or before the deadline and equals “zero” otherwise.

#### **2.4.2 Independent Variables**

This study seeks to examine multiple-team membership, turnover, and their interaction terms. Therefore, to start, we construct a measure for multiple-team membership. Operationalizing this variable is non-trivial. We follow the guidance of O’Leary et al. (2011) by calculating the average number of MTMs that are present across team members over the life cycle of a project. As mentioned earlier, employees track which projects they work on in a given month. Therefore, each month we calculate the total number of additional projects that each individual took part in. These values are then averaged over all the employees on that project in the given month. Finally, we construct our variable, *MTM*, by averaging these monthly values from across the project’s entire life cycle.

We then create our unanticipated and anticipated turnover variables using impact of the five-year rule on the labor force. *Unanticipated* turnover represents a variable for the proportion of employee project turnover affected by the enforcement of the five-year rule. As discussed previously, the five-year rule began to be enforced in August 2006. We use this fact to identify those employees who would be immediately impacted by this policy. Those employees who have more than forty-eight months in Europe as of July 2006 are directly affected by the policy.

Using the policy implementation in August of 2006, we construct both *unanticipated turnover* and *anticipated turnover*. These two variables exhaustively cover the overall turnover

variable discussed above. *Unanticipated* turnover captures the turnover from individuals subjected to the implementation of the five-year rule, while anticipated turnover captures all other team departures. Note, given the implementation of the five-year rule, our measure of unanticipated turnover is, in fact, unanticipated. Given that our measure of anticipated turnover captures all other turnover, it is likely to include some cases that are anticipated (e.g., a person announcing a move back to the U.S.) and some that are unanticipated (a person taking another job). Although our interviews suggested that the latter turnover type was rare in this context, we note that since our focus of interest is on the unanticipated variable, our measure is not biased.

### **2.4.3 Controls**

We control for factors that may affect our operational performance.

*Policy Impact.* This variable represents the impact the five-year rule has on a project. This variable is constructed by first determining the number of employees in a given month who were identified as the affected population. The affected population is defined as any employee who has at least forty-eight months in the organization as of July 2006, the month prior to the notification of the policy enforcement. We then average the monthly observations and collapse them at the project level to determine overall potential five-year rule impact on a given project.

*Team Characteristics.* Highly skilled teams may generate better project outcomes. Therefore, we control for average team *years of experience within the USACE Europe District (Tenure)*, *government service level (Status)*, and *education level (Education)*, each of which are associated with workers' productivities by proxying their general- or firm-specific human capital levels (Huckman and Pisano 2006; Gardner, Gino and Staats 2012). Given that these three variables are correlated, we construct a composite measure for use in our models. We calculate

these variables by averaging the individual characteristics of employees on a particular project in a particular month and then averaging these monthly terms across all months of the project.

*Project Characteristics.* Construction projects are complex endeavors and more complex projects routinely require more members to facilitate completion. This leads us to proxy project complexity through project member size. We define *Project Member Size* as the resources assigned to a project, which should influence its ability to remain on schedule; the employees are the primary resource at the disposal of the organization. Table 2.2 provides summary definitions of all variables included in the models based on accessibility.

**Table 2.2: Variable List**

<b>Variable</b>	<b>Overview</b>
<b>On-Time Delivery</b>	(1) A dummy variable of on-time delivery of projects to intended customers.
<b>Multiple-Team Membership (MTM)</b>	(2) The number of additional projects in which team members are engaged.
<b>Unanticipated Turnover</b>	(3) The proportion of turnover influenced by the five-year rule.
<b>Anticipated Turnover</b>	(4) The proportion of turnover not influenced by the five-year rule.
<b>Policy Impact*</b>	(5) The density of employees on a project whom are identified as immediately influenced by the project.
<b>Tenure*</b>	(6) Employee tenure in the Europe District.
<b>Education*</b>	(7) Employee education level.
<b>Status*</b>	(8) The general service level (GS).
<b>Project Member Size*</b>	(9) The number of members on a project team.

\*Control Variables

#### 2.4.4 Empirical Approach

We aim to estimate models that capture the effects of MTM and turnover on on-time delivery. Because our data is a complete history of each project over eight years, but are limited to a binary dependent variable, we need to ensure we select a model that accounts for heteroscedasticity. We thus chose to use a logistic regression model, with robust standard errors.

Therefore, to test our hypotheses, we estimate the following models:

**Model 1:**

$$\log it(On.Time_i) = \beta_0 + \beta_1(MTM_i) + \beta_2(MTM_i^2) + \beta_3(Controls_i)$$

Hypothesis 1 predicts that MTM will show an inverted U-shaped relationship with performance and so  $\beta_1 > 0$  and  $\beta_2 < 0$ .

**Model 2:**

$$\begin{aligned} \log it(On.Time_i) = & \beta_0 + \beta_1(MTM_i) + \beta_2(MTM_i^2) + \beta_3(Unanticipated_i) \\ & + \beta_4(Anticipated_i) + \beta_5(Unanticipated_i \chi MTM_i) + \beta_6(Anticipated_i \chi MTM_i) \\ & + \beta_7(Controls_i) \end{aligned}$$

Hypothesis 2 predicts that the interaction of unanticipated turnover and MTM will be more negative than the interaction of anticipated turnover and MTM ( $\beta_5 < \beta_6$ ).

## 2.5 Results

Table 2.3 presents the correlations for all variables included in the empirical model. No pair of variables in the models indicate multicollinearity. As an additional check, we found that the largest variance inflation factor (VIF) is 2.5, which falls below the conventional threshold of ten (Wooldridge 2012).

**Table 2.3: Correlation Table**

<b>Variables</b>	<b>MTM</b>	<b>Unanticipated</b>	<b>Anticipated</b>	<b>Tenure</b>	<b>Education</b>	<b>Status</b>	<b>Project Member Size</b>
<b>Unanticipated</b>	0.467						
<b>Anticipated</b>	0.381	0.528					
<b>Tenure</b>	-0.189	-0.177	-0.266				
<b>Education</b>	-0.063	0.048	-0.165	0.611			
<b>Status</b>	-0.071	0.067	-0.150	0.741	0.821		
<b>Project Member Size</b>	0.141	0.178	0.199	-0.128	-0.044	-0.074	
<b>Policy Impact</b>	0.148	0.229	0.478	-0.094	-0.034	-0.004	-0.123

Column (1) and Column (2) in Table 2.4 presents the results from the logistic regression of on-time delivery on first MTM and then MTM and  $MTM^2$ . The main effect of the independent variable, MTM, is of note. As seen in Column (1), the coefficient on MTM is negative and statistically significant, and its magnitude indicates that a one unit increase in MTM decreases the odds of on-time delivery by 9%. However, before concluding that the relationship between MTM and performance is linear, we must examine the quadratic effect. In Column (2), we add the quadratic term to test Hypothesis 1. Examining the main effects on the independent variables, MTM and  $MTM^2$ , the coefficients on the variables are of the expected sign but not statistically significant. However, although we do not initially see a quadratic relationship, given the strong theory in support of a potential relationship we conduct additional analyses.



**Table 2.4: MTM and Turnover On-Time Delivery**

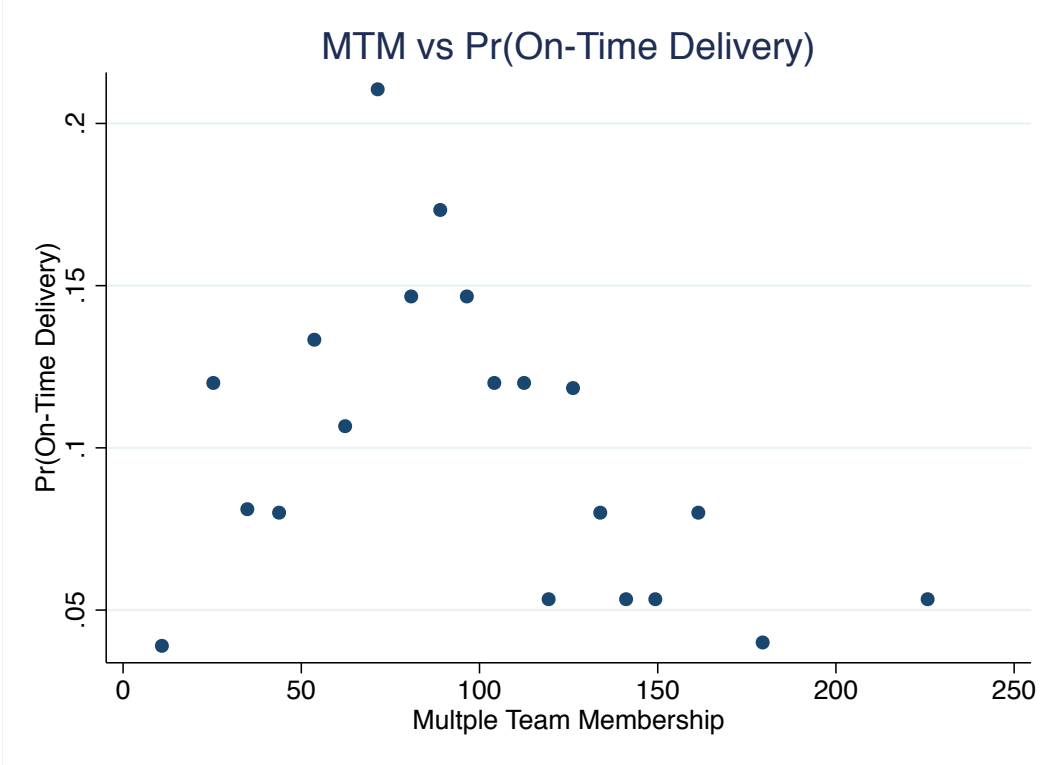
	<i>Dep. Variable: On-Time (1)</i>	<i>Dep. Variable: On-Time (2)</i>	<i>Dep. Variable: On-Time (3)</i>	<i>Dep. Variable: On-Time (4)</i>
<i>MTM</i>	-0.009*** (0.002)	0.008 (0.009)	0.002 (0.009)	0.005 (0.008)
<i>MTM^2</i>		-0.00009 (0.000)	-0.000+ (0.000)	-0.000 (0.000)
<i>Unanticipated</i>			-0.278 (0.452)	0.000 (0.000)
<i>Anticipated</i>			1.793** (0.582)	0.000 (0.000)
<i>MTM*Unanticipated</i>				-0.025** (0.009)
<i>MTM*Anticipated</i>				-0.001 (0.013)
<i>Constant</i>	-3.477*** (0.435)	-4.222*** (0.635)	-3.812*** (0.605)	-4.351*** (0.653)
<i>Tenure</i>	YES	YES	YES	YES
<i>Status</i>	YES	YES	YES	YES
<i>Education</i>	YES	YES	YES	YES
<i>Project Member Size</i>	YES	YES	YES	YES
<i>Policy Impact</i>	YES	YES	YES	YES
<b><i>Observations</i></b>	1503	1503	1503	1503

Robust standard errors in parentheses +p<0.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Our first step is to simply plot the data, but since on-time delivery takes only values in  $\{0,1\}$ , a standard scatter plot of the data is unlikely to be helpful. To more clearly visualize the data, we leveraged binscatter (Chetty, Friedman, and Rockoff 2013). Binscatter generates binned scatter plots, which solves the binary variable problem by averaging the on-time delivery variable within evenly sized bins. Figure 2.1 reports the results from this program and the plot

visually indicates an inverted U-shape. Although these observations appear to have a low incidence of on-time delivery, the skewness of the distribution may make it difficult to identify a quadratic relationship.

**Figure 2.1: Distribution of MTMs in Bins of 15**



As a result, we conduct several additional analyses to examine the underlying relationship.

First, we created indicators for the size of MTMs in bin sizes of fifteen and placed each project into the appropriate indicator. Then we estimated a model that replaced MTM and  $MTM^2$  with the indicators for each group. As shown in Table 2.5, we observe positive coefficients on the first half of the groups, with a mixed amount of statistical significance, and negative coefficients for the latter half of the groups again with a mixed amount of statistical significance. This provides initial support for Hypothesis 1. As a second step, we split the sample both before

and after the potential stationary point that Column (2) in Table 2.6 suggests to investigate the possible quadratic effect. Nelson and Simonsohn (2014) suggest this analysis as the most appropriate way to investigate a quadratic effect. In particular, by looking both before and after a potential stationary point, one would expect to see first a positive slope and then a negative slope for the regression coefficients, if in fact the relationship is inverted U-shaped. Column (1) and Column (2) in Table 2.6 presents the results from the logistic regression of on-time delivery on MTM for first the pre-stationary point data and then the post-stationary point data. The results support a quadratic relationship as the coefficient on MTM is first positive and statistically significant, and its magnitude indicates that a one unit increase in MTM increases the odds of on-time delivery by 93.5%. In Column (2), the post-stationary point data, the coefficient on MTM is negative and statistically significant, and its magnitude indicates that a one unit decrease in MTM decreases the odds of on-time delivery by 46.5%. This provides further support of our Hypothesis 1.

**Table 2.5: Regression of On-Time Delivery on bins of MTM**

	<i>Dep. Variable:</i> <i>On-Time</i> <b>(1)</b>
<i>Group 1</i>	0.262 (0.326)
<i>Group 2</i>	0.569* (0.285)
<i>Group 3</i>	0.507 (0.314)
<i>Group 4</i>	0.350 (0.315)
<i>Group 5</i>	-0.610 (0.416)
<i>Group 6</i>	-0.105 (0.353)
<i>Group 7</i>	-1.091* (0.435)
<i>Group 8</i>	-0.944 (0.500)
<i>Group 9</i>	-1.064 (0.570)
<i>Constant</i>	-4.603*** (0.497)
<i>Tenure</i>	0.469*** (0.082)
<i>Project Member Size</i>	0.031*** (0.004)
<i>Policy Impact</i>	-0.313 (0.508)
<i>Status</i>	-0.122* (0.050)
<i>Education</i>	0.037 (0.045)
<i>Observations</i>	1455

Robust standard errors in parentheses +p<0.10,\*p<0.05,\*\*p<0.01,\*\*\*p<0.001

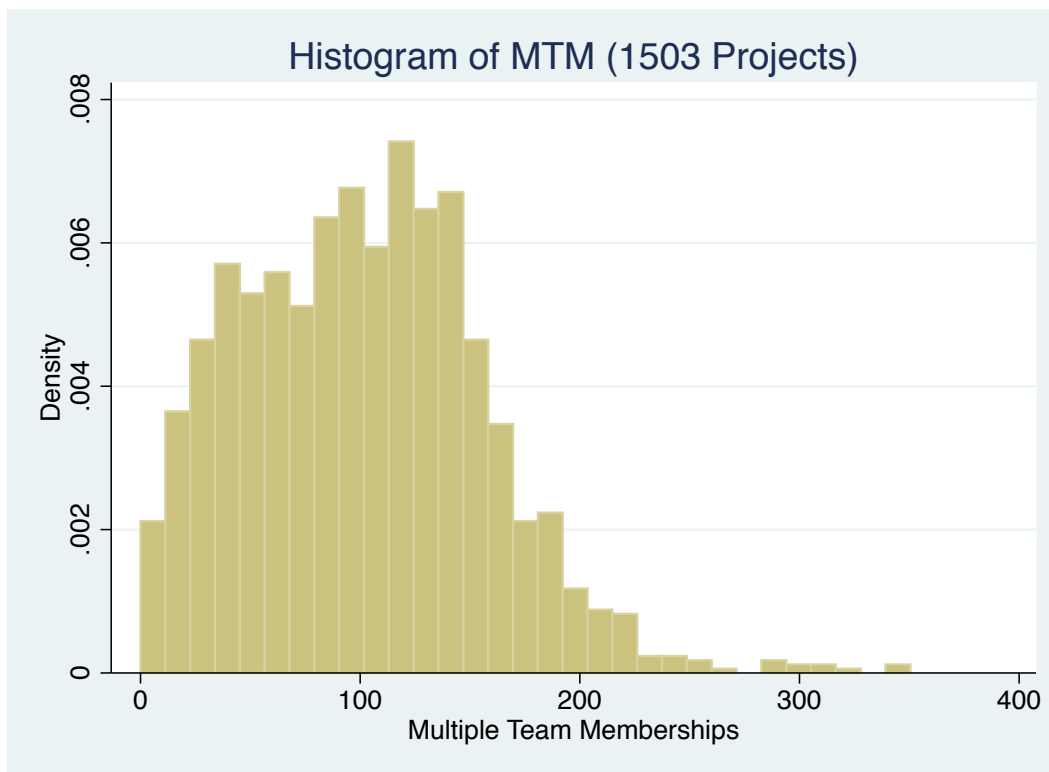
**Table 2.6: Pre- and Post-Stationary Point Models**

	<i>Pre-Stationary Point Dep. Variable: On-Time (1)</i>	<i>Post-Stationary Point Dep. Variable: On-Time (2)</i>
<i>MTM</i>	0.660*** (0.196)	-0.454* (0.195)
<i>Constant</i>	-4.500*** (0.465)	-3.779*** (0.422)
<i>Tenure</i>	YES	YES
<i>Status</i>	YES	YES
<i>Education</i>	YES	YES
<i>Project Member Size</i>	YES	YES
<i>Policy Impact</i>	YES	YES
<i>Observations</i>	564	939

Robust standard errors in parentheses +p<0.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Finally, given that a small number of outliers may make it difficult to pick up the quadratic effect, as illustrated in Figure 2.2, we conduct the same analysis as in Table 2.5 but after dropping the 5% of observations that have the most extreme values for MTM. With the added constraint to MTM, we reduce our data by 5% to 1429 observations, which we will now discuss.

**Figure 2.2: Histogram of MTMs**



Column (1) and Column (2) in Table 2.7 presents the results from the logistic regression of on-time delivery on MTM and  $MTM^2$ . Column (1) replicates the analysis with the full sample with the linear term. In Column (2), we add the quadratic term to test Hypothesis 1. Examining the main effects in Column (2) on the independent variables, MTM and  $MTM^2$ , the coefficients on the variables are as expected. As seen in Column (2), the coefficient on MTM is positive and

significant at the 5% level, corresponding to increased probability of on-time delivery as MTM increases; the coefficient on  $MTM^2$  is negative, corresponding to a decrease in the probability of on-time delivery tests the negative relationship between MTM and on-time delivery and is significant at the 1% level with a stationary point when MTM is sixty-three; providing strong support for Hypothesis 1. Finally, although the stationary point is well within the data, we conduct an additional analysis to identify the 95% confidence interval surrounding the stationary point. Using the delta method suggested by Muggeo (2003), we find an interval of [fifty-nine MTMs, 103 MTMs] which is also within the observation period.

**Table 2.7: MTM and Turnover On-Time Delivery**

	<i>Dep. Variable: On-Time (1)</i>	<i>Dep. Variable: On-Time (2)</i>	<i>Dep. Variable: On-Time (3)</i>	<i>Dep. Variable: On-Time (4)</i>
<i>MTM</i>	-0.009*** (0.002)	0.021* (0.010)	0.015 (0.010)	0.016 (0.010)
<i>MTM^2</i>		-0.000** (0.000)	-0.000* (0.000)	-0.000+ (0.000)
<i>Unanticipated</i>			-0.156 (0.454)	2.04 (0.863)
<i>Anticipated</i>			2.003*** (0.578)	1.054 (1.294)
<i>MTM*Unanticipated</i>				-0.026** (0.009)
<i>MTM*Anticipated</i>				0.008 (0.013)
<i>Constant</i>	-3.626*** (0.443)	-4.855*** (0.661)	-4.322*** (0.661)	-4.735*** (0.698)
<i>Tenure</i>	YES	YES	YES	YES
<i>Status</i>	YES	YES	YES	YES
<i>Education</i>	YES	YES	YES	YES
<i>Project Member Size</i>	YES	YES	YES	YES
<i>Policy Impact</i>	YES	YES	YES	YES
<i>Observations</i>	1429	1429	1429	1429

Robust standard errors in parentheses +p<0.10, \* p<0.05, \*\* p<0.01,\*\*\*p<0.001

We now turn to Column (4) in Table 2.4 in order to test Hypothesis 2. The coefficient on the interaction of MTM and unanticipated turnover is negative and significant at the 5% level. Thus, we see evidence that the negative effects of MTM are even greater when teams experience higher levels of unanticipated turnover than when they experience lower levels of unanticipated



turnover. We see the same pattern of results if we examine Column (4) in Table 2.7. These results support Hypothesis 2.

### **2.5.1 Alternative Explanations**

We now examine alternative explanations for our findings. All regressions results reported are available from the first author upon request. First, in a study that explores the relationship between employees working together and their volume of work and quality of performance, selection of employees on projects is a concern. If, for some reason, worse team members were assigned more projects, our results could reflect that bias. This seems unlikely since, in other settings, good team members are more likely to receive more projects. However, in our case, neither of these factors appears to be in play as typically, in the European District of USACE, the Chief of the Project Management division assigns project managers to projects based on employee availability rather than matching projects to project manager tenure or other skill attributes. In addition, employees are unable to select the projects in which they participate. Our interviews indicate that this is consistent with how other division chiefs place employees on project teams. Furthermore, the project lead has no input on project team members.

Second, the length of the projects may influence outcomes. When projects have a shorter time horizon they may be more sensitive to the disruption of MTM and *unanticipated* turnover. For example, when a team member departs, the remaining team members may become overloaded, while at the same time onboarding new members to meet project deadlines. This would lead us to expect that projects that have longer time horizons are less susceptible to these same disruptions. We find empirical support for this assertion through robustness checks. While MTM degrades project performance, *unanticipated* turnover is less of a factor when project

length is greater. One would expect that if there is more time to integrate new members to a team that there would be far less turbulence. Finally, as an alternative to the quadratic relationship that is hypothesized we examine higher order polynomials. When we add either a cubic or a cubic and quadratic term for MTM to the regression models in Tables 4 and 7, we do not see a statistically significant relationship with these terms.

## **2.6 Discussion and Conclusion**

Twenty-first century work is increasingly being completed by project teams. However, operations research examining the performance implications of such work is still relatively limited. Recent work has started to unpack factors such as specialization and variety (Narayanan, Balasubramanian, and Swaminathan 2009), team familiarity (Huckman, Staats, and Upton 2009), and team member incentives (Lu, Van Mieghem, and Savaskan 2009; Roels, Karmarkar, and Carr 2010; Gurvich and Van Mieghem 2013). In this paper, we empirically examine the important topic of multiple-team membership. Using eight years of data from the USACE Europe District, we find that MTM has an inverted U-shaped relationship with probability of a project being delivered on-time. Our findings are consistent with prior theoretical work (O’Leary, Mortensen, and Woolley 2011). We considered, but did not find empirical support for, alternate explanations for this reduction in on-time delivery, such as considering prior volume of employee team or project engagement. Extending the exploration to whether MTM creates difficulty with fragility, we examine the consequences of turnover and MTM together. We find that the interaction of MTM and unanticipated turnover is related to worse on-time project delivery. This suggests that teams with higher MTM are less able to cope with the consequences of unanticipated turnover than their lower MTM counterparts.

In the context of our setting, we find it is important to consider the magnitude of the effect size. For example, we see that after passing the stationary point we find that an incremental project results in an average decrease of 0.1% in on-time delivery. A delay of 0.1% is equivalent to an 11.7 day slip in the project schedule and the cost to the customer is approximately \$220,628 for a project that averages \$22 million. A weeklong delay of a construction project on a military installation in Europe has residual impacts on that community. Consequences might include delays in other projects, lost contracts due to non-availability, and also loss of community support. In a time of diminished resources, a delay could also absorb funds needed for future projects.

### **2.6.1 Theoretical Contributions**

This study contributes to the operations management literature on teams and performance in several ways. This study provides insight into how MTM and turnover influence performance outcomes. Thus, it responds to calls from the scholarly literature for more organizational-level focus on how multiple teams operate within organizations and how they influence operations (O’Leary, Mortensen, and Woolley 2011; Staats, Milkman, and Fox 2012). First, with our detailed data on projects and employees on teams, we provide evidence that supports the notion that MTM has an inverted U-shaped relationship with on-time delivery.

Second, our study builds on recent research on MTM at the organizational level (O’Leary, Mortensen, and Woolley 2011) by examining the topic outside the corporate sector. The prior study begins the theoretical conversation centered on the individual, team, and organizational mechanisms driving how MTM may influence performance. By leveraging archival data in a project-based organization, we are able to test and extend the theory. We are

able to investigate the volume of projects in an employee's portfolio of projects and how that impacts performance. Although our study takes place within a government organization, the procedures and expectations extend to different contexts.

Third, we inject the dimension of turnover into the conversation of MTM and performance. We determine that both overall turnover and how the type of turnover matters based on our study of the enforcement of the five-year rule human resource policy. By separately theorizing about and then evaluating the implications of the type of turnover on the outcome of the projects, we are able to suggest strategies to place slack into the staffing process. Introducing how a policy drives the type of turnover that influences organizational outcomes allows us to extend the discussion on turnover and its effects on organizations (Huckman, Song, and Barro 2013). Our findings of *unanticipated* turnover highlight the fact that organization-imposed policies generate unintended consequences that should be considered.

Fourth, our paper helps to make the call for the need for work on the human capital pipeline. In many firms, particularly and increasingly in services but also manufacturing, the primary operational input is labor. As a result, managing that labor is the most important operational lever. The operations management field has a long and rich tradition in developing tools and techniques for matching supply to demand in product settings. There is an open need to transform and deploy these tools for the human capital pipeline and people analytics, more generally. For example, not only can questions, such as the one asked here about optimal team construction be answered analytically, but also thinking about the system of teams opens itself to analytical inquiry. Moreover, directly analogous questions to the inventory environment—for example, how many consultants should a firm keep on its bench waiting to be deployed on future projects—would seem amenable to looking at as a safety stock problem. These new areas of

exploration will open up important theoretical avenues to operations scholars while also providing meaningful benefits to practice.

### **2.6.2 Limitations and Venues for Future Research**

This study has limitations, and its results should be interpreted accordingly. First, we use one dependent binary variable. Although this a limitation of available data, further insights could be gained through detailed analysis of continuous measures at different points in the life cycle of a project. Future research could focus on identifying MTM compositions throughout the life of a project to determine the relationship of MTM on on-time delivery during phases of a project.

Second, there is a threat of omitted variable bias that is common to many empirical models. It would be helpful to add more variables to the model, such as location of the projects or specific attributes of teams within a location, but this data was unavailable. However, location is not a threat in our analysis because 90% of the projects are done within Germany. Although we are not aware of any specific areas of bias, additional research with more granular data would nullify this potential issue in our analysis.

Third, the five-year rule may be highly correlated to experienced employees, which could contribute to the decrease in on-time delivery. Note that this would be problematic if our hypothesis focused on unanticipated turnover versus anticipated turnover. However, here we are interested in disruptions to the team. For our theoretical purpose, disruption due to unanticipated turnover and disruption due to unanticipated turnover of experience personnel are equally appropriate for our interaction hypothesis. Nevertheless, future research could focus on employee experience in a project setting where forced turnover occurs to gain insight into turnover

Finally, our results come from one organization in one industry, and it is possible that they will not generalize. To neutralize this drawback, we have detailed information on employee work and performance outcome measures. In this context, we are able to leverage the deep knowledge of a single organization with empirical tests of our hypotheses. However, future work could focus on multiple organizations and conduct a comparative study.

### **2.6.3 Practical Implications and Conclusion**

Our analysis has important implications for managers in project-based organizations. Managers within this setting must not only be cognizant of how they staff their projects, but also be aware of the additional projects in which team members are involved. We find that employees engaged in MTM can both positively and negatively impact project outcomes. In other words, some teams have too little MTM, and so the organization is leaving improvement opportunities on the floor, while others have too much MTM and so are yielding worse project performance than they could otherwise expect to have. Our results also show the fragility potentially introduced by MTM. This offers a cautionary tale and suggests that managers should be careful and thoughtful when deploying MTM in more fragile situations.

Our findings are especially timely as many organizations are moving to smaller labor forces. Although organizations cannot foresee the future, by developing appropriate policies, including MTM and turnover, it may provide important levers that managers can actively control to provide the best outcomes.

## **Chapter 3: Coming up to Speed: Tradeoffs between Contextual Specialization and Contextual Non-Specialization in Firm Performance**

### **3.1 Introduction**

Globalization has generated the creation of multinational firms that require employees who can function in many countries. Multinational firms' demands on its labor necessitates the need to manage multiple initiatives in multiple locations, many times simultaneously. The utilization of the labor force is a key component to organizational success. The current literature on organizational learning predicts that prior experience and specialization increases managerial performance (Levitt 1988; Argote and Epple 1990; Cohen and Levinthal 1990; Reagans, Argote, and Brooks 2005; Narayanan, Balasubramanian, and Swaminathan 2009; Staats 2011; Staats and Gino 2012). However, these studies are based on a firm situated in a single context. Prior research has not considered a multi-location firm that operates in multiple contexts, and organization and strategy scholars have not studied the effect of experience and specialization on performance in multi-context settings. A key decision related to deployment of human capital taken by firms is how to deploy individuals across one of several contexts. Our study introduces the idea of "*contextual specialization*", the act of focusing an individual's organizational tasks within a particular context, and "*contextual non-specialization*", the practice of dividing an individual's organizational tasks among different contexts. We investigate the degree to which *contextual specialization* or *contextual non-specialization* within a new environment, affects an employee's ability to contribute to organizational outcomes.

Prior literature that explores organizational learning examines the benefits of prior

experience to organizational success (Cohen and Levinthal 1990; Reagans, Argote, and Brooks 2005; Narayanan, Balasubramanian, and Swaminathan 2009). Prior experience provides a reference point for employees to draw from when faced with new experiences. Prior experience also allows an employee to leverage their expertise quickly and makes them more adaptable (Cohen and Levinthal 1990; Reagans, Argote, and Brooks 2005). Scholars note the limitations of prior experience are highlighted when employees anchor on their past experiences and are ineffective in a new environment due to their inability to adapt (Winter and Szulanski 2001). Past research on specialization also suggests a positive correlation between human capital specialization and organizational performance. When employees develop a special skill set they become more efficient by completing that task repeatedly. The specialization leads to increased overall productivity (Narayanan, Balasubramanian, and Swaminathan 2009; Huckman and Staats 2011; Staats and Gino 2012). However, there is a gap in the literature in understanding how learning and specialization contribute to firm performance in a multi-context setting.

Additionally, when employees are exposed to diverse task, the gain in knowledge across domains is accelerated (Paas and Van Merriënboer 1994; Narayanan, Balasubramanian, and Swaminathan 2009; Staats and Gino 2012). Through the completion of diverse task individuals acquire new knowledge. When the employee is faced with similar tasks in the future the ability to execute the requirement is easier. Task diversity may lead to sustained productivity (Edmondson 2009; Cummings and Haas 2012; Staats and Gino 2012). However the prior literature in organizational learning has not considered a multi-location firm that deploys individuals across a single context or multiple contexts and how that human capital deployment decision affects organizational performance. That is the gap in the literature we seek to fill.

We draw on prior literature to explore the concept of context and to better understand the



impact of context on team performance (Xu and Shenkar 2002; Eden and Miller 2004; Zellmer-Bruhn and Gibson 2006; Crossland and Hambrick 2011). In particular, we investigate how an employee's contextual specialization or contextual non-specialization affects her contributions to team performance over time.

We leverage a unique dataset from the United States Army Corps of Engineers (USACE) Europe District. The Europe District of the USACE has been operating for over 50 years and is currently responsible for conducting projects in 94 countries. Headquartered in Wiesbaden, Germany, the district provides engineering, construction, stability operations, and environmental management products and services to the Army, Air Force, and other United State (U.S.) government agencies and foreign governments throughout the U.S. European Command and U.S. Africa Command. Our sample is composed of 1,267 projects conducted at the USACE Europe District from January 2006 to December 2012. Our data includes 652 individual employees, and indicates the projects employees worked on each month, as well as the countries within which those projects are located. Building on prior research, we posit that the context within which an employee operates varies by country (Miller 1992, 1993; Luo and Peng 1999), which constitutes our measure of context in this study. We exploit a natural experiment generated through turnover from the enforcement of a human resource policy called the five-year rule (that will be explained in detailed later). We use this setting to study how the team contributions of newly assigned employees vary based on the degree of *contextual specialization* or *contextual non-specialization* each employee experiences.

Our unique dataset enables us to isolate the effects of *contextual specialization* and *contextual non-specialization* from the effects of individual differences in status, experience, and education. Our results highlight a tradeoff wherein *contextual specialization* improves an

individual's near-term contributions to organizational performance, at the expense of their long-term productivity. Employees who are assigned to a contextually-specialized set of projects, which are contained within a single country, are initially more likely to help their teams deliver on-time results to clients. However, over the long run, employees who are assigned to operate in a contextually non-specialized environment surpass the contextually-specialized employees in their ability to contribute to organizational outcomes. These employees typically have more prior experiences to draw on when solving problems and can anticipate potential issues that may arise.

In global firms, where employees gain critical knowledge of firm processes and norms through various assignments in one location, there is an expectation that those acquired skills will produce immediate results when employees move to new locations (Levine and Prietula 2012). However our results suggest that if the environments within which these employees work are different, organizations must decide between immediate productivity in the near-term, through *contextual specialization*, or the potential for greater productivity in the long-term through *contextual non-specialization*.

The remainder of the paper is structured as follows: sections 3.2 and 3.3 outline the theoretical framework and hypotheses, section 3.4 describes the setting, section 3.5 outlines the data and empirical approach, Section 3.6 presents our results, and section 3.7 concludes the paper.

## **3.2 Theoretical Antecedents**

### **3.2.1 Learning and Specialization**

The literature that examines the links between learning and specialization encompasses

work on organizational learning, imprinting, and specialization and has been studied by both operations and strategy scholars. Most of the past scholarship has focused on the benefits of prior experience to organizational success (Levitt 1988; Argote and Epple 1990; Cohen and Levinthal 1990; Reagans, Argote, and Brooks 2005; Narayanan, Balasubramanian, and Swaminathan 2009). We argue that there are some limits to prior experience. For instance, employees may anchor on their prior experience and be ineffective in a new environment due to their inability to adapt (Winter and Szulanski 2001; Perkins 2014). We draw on the literature from strategy and operations that outlines how employee experience contributes to organizational outcomes and argue that the perceived benefit of experience may be diminished when an employee's context changes. We consider how specialization can mitigate the negative effects caused by an employee's need to make contextual adjustments.

Work on specialization in operations suggests that the relationship between successful outcomes is enhanced through specializing the labor force. When employees are specialized they are able to complete similar tasks repetitively, thus increasing their efficiency on a particular task, which leads to increased overall productivity (Narayanan, Balasubramanian, and Swaminathan 2009; Huckman and Staats 2011; Staats and Gino 2012). One-way organizations may ensure immediate productivity is to encourage employees to specialize (Narayanan, Balasubramanian, and Swaminathan 2009; Staats and Gino 2012). Typical examples of specialization include focusing on a task (Narayanan, Balasubramanian, and Swaminathan 2009), a project (Huckman and Staats 2011), or team-based specialization (Staats 2011), which allows an employee to establish a routine. Employee's benefit by performing a similar task repetitively that helps the employee become more efficient.

Arguably, specialization may be the best practice for organizations when high

productivity is the primary focus. On the other hand, when employees are specialized they become susceptible to stagnation due to the lack of variety that their workplace provides (Slocum et al. 1985; Garud and Kumaraswamy 2005; Whitt 2006). We extend the notion of specialization from task, project, and team to context, which we operationalize as differences in location. Strategy and international business scholars have explored the relationship between geographical location and performance, but in a sole location within a multi-location firm (Ghemawat 2001; Makino, Isobe, and Chan 2004; Choudhury 2014; Perkins 2014). We further analyze organizational performance when employees are involved in projects across many locations or contexts. We consider the employees ability to contribute to successful outcomes.

### **3.2.2 Context**

Prior experience can have little impact on initial productivity when the context is substantially different (Zellmer-Bruhn and Gibson 2006; Eden and Miller 2004). Because employee productivity is essential to firm success, it is necessary to better understand how prior experience can be leveraged immediately in a new context. Scholars have explored how context influences performance (Hambrick and Macmillan 1985; Finkelstein and Hambrick 1990). Context has been defined as “the environment and broad milieu in which the innovative attempt is situated”(Hambrick and Macmillan 1985). We study a setting in which employees who are familiar with routines of an organization are additionally assigned to operate on multiple projects in multiple context. To the extent that a new context is unfamiliar, the tacit knowledge gained in previous experiences may not transfer to the new environment. Consequently, relative to more established workers (those employees who have been with the firm longer), employees entering contexts that differ from their former assignments may exhibit diminished performance while

they adapt (Groysberg, Lee, and Nanda 2008; Groysberg, Hill, and Johnson 2010). This is counterintuitive because organizations may expect that the routines that exist throughout the organization mitigate this initial unproductive employee state (Anand, Gray, and Siemsen 2011). We introduce the terms *contextual non-specialization*, the practice of spreading an individual's organizational tasks among different contexts, and *contextual specialization*, the act of focusing an individual's organizational tasks within a particular context. *Contextual specialization* may help the employee contribute to team performance more quickly and facilitate learning.

### **3.2.3 Extending Context**

Given the growth of multi-location organizations it is important to consider how best to manage employees across multiple contexts. We draw on a rich stream of the strategy literature, which focuses on “imprinting”. Imprinting argues that the ‘context,’ ‘environment,’ or ‘starting conditions’ within which institutions operate affects firms and managers (Stinchcombe 1965; Swaminathan 1996; Boeker 1987, 1989; Crossland and Hambrick 2011). However, the imprinting literature in strategy generally assumes that the focal firm faces a single context at one point in time. The present research departs from this assumption by examining a setting in which managers are situated in multiple contexts that differ along cultural, administrative and other dimensions (Ghemawat 2001; Chattopadhyay and Choundhury 2015; Perkins 2014). We introduce the term *contextual non-specialization*, the practice of spreading an individual's organizational task among different contexts.

### **3.3 Hypothesis Development**

#### **3.3.1 Contextual Specialization**

*Contextual specialization* may help the individual contribute to team performance more quickly, and to facilitate learning. Although scholars have found that specialization can influence performance (Levitt 1988; Bunderson and Sutcliffe 2003; Narayanan, Balasubramanian, and Swaminathan 2009), the role of context has not been deeply explored. In a multi-location firm for example, the environment or organizational milieu may vary among countries, with the operating environment in each country considered a separate context (Hambrick and Macmillan 1985). Additionally, if the new location crosses a state border within a nation or a national boundary, there are regulations and laws that exist in the new locale (Nachum, Zaheer, and Gross 2008; Ghemawat 2001; Choudhury 2014; Choudhury and Khanna 2014; Perkins 2014). Finally, there are economic differences among locations. For example, there is consideration for how currency exchange rates between countries impacts how business is done (Ghemawat 2001). There are also institutional factors that vary among contexts, including legal systems (Coase 1992), resource munificence (Klein 1990), and a plethora of types of employee diversity (Ang, Slaughter, and Yee Ng 2002). Familiarity with these factors as well as an understanding of the local country norms contributes to effective performance. While we do not measure these dimensions directly, we can assert that they vary across the countries we study.

Experiences gained by employees while operating in one area of a firm over time is one mechanism through which organizational learning benefits firm performance outcomes (Zollo and Winter 2002; Argote and Miron-Spektor 2011). These experiences are codified through established routines (Mollick 2012) or learning from others (Reagans, Argote, and Brooks 2005;

Jain 2013). Through implementation of such practices, the learning increases over time, generating an increased productive state in the near-term (Narayanan, Balasubramanian, and Swaminathan 2009; Staats 2011; Staats and Gino 2012). However, empirical papers that have studied individual and organizational learning have been conducted in a singular context (Levitt 1988; Levinthal and March 1993). Our research contributes a new perspective, because the degree of *contextual specialization* and non-specialization faced by employees in our setting varies across contexts. Employee experience is not the sole metric for predicting future success. It is essential to understand the customs, norms, and practices that may be specific to a particular region, and it is essential that employees are aware of these when attempting to operate (Ghemawat 2001). Further, there may be administrative differences in a new place.

As *contextual specialization*, the act of focusing an individual's organizational tasks within a particular context, increases for employees, their capacity to contribute to organizational performance may initially rise over time (Kalnins and Mayer 2004). To the extent that familiarity with local norms and cultures facilitate interactions, and an understanding of local policies enhances an individual's ability to operate, we posit that a contextually specialized individual's contributions will increase with their experience. Furthermore, contextually-specialized employees may be better positioned to integrate new team members into the organizational context. In high turnover environments, such as the setting we study, sharing experiences with newly integrated team members may reinforce the routines, practices, and norms of the organization within the context (Grant 1996; Huckman, Song, and Barro 2013).

While familiarity with a context can result in benefits for the firm, *contextual specialization* may have unintended negative long-term effects for a firm's performance. First, specialized employees may become complacent if they are engaged in the same routine for

extended periods of time (Im 2008). When complacency occurs there are potential residual effects in the form of an under utilized workforce leading to less productivity (Bothner, Kim, and Smith 2012). The same logic may apply beyond routines, to employees who are contextually specialized. Second, contextually-specialized employees may be less flexible, leveraging a narrower set of prior experiences when they encounter a new set of challenges (Fong Boh, Slaughter, and Espinosa 2007; Huckman, Staats, and Upton 2009; Kalnins and Mayer 2004; Madsen, Mosakowski, and Zaheer 2003). Organizations that have employees who operate within highly-specified routines tend to experience high levels of productivity. However, these employees often become rigid and resistant to new learning, exhibiting difficulty adapting to the operating procedures in a new environment (Szulanski 1996). The knowledge that employees gain from contextually-specialized environments may become "sticky" (Szulanski 1996).

Based on the arguments presented above, we hypothesize that employees who have a higher degree of *contextual specialization* within a firm will have an increasing capacity to contribute to organizational outcomes in the near term, but that the benefits of *contextual specialization* will diminish over time.

*Hypothesis #1: In a contextually specialized environment, experience has an inverted U-shaped relationship with performance.*

### **3.3.2 Contextual Non-Specialization**

Despite the near-term benefits of contextual specialization that we hypothesize, there are several reasons that organizations may choose to pursue the opposite strategy. *Contextual non-specialization*, the practice of spreading an individual's organizational tasks among different contexts, may, for example, promote increased employee exposure throughout the organization



(Huckman and Staats 2011). It may also allow a firm to allocate its employees more efficiently and distribute their experiences more broadly (Schilling et al. 2003).

However, there are numerous reasons to believe that contextual specialization may have near-term costs. For instance, if a highly-skilled employee is tasked with multiple projects that are located in different countries, the employee must become familiar with each separate context while working to contribute to the outcomes of each project. Operating in multiple contexts requires constant switching (Ethiraj et al. 2005; Teece 2007) and exhausts cognitive capacity (Cohen and Levinthal 1990; Paas and Van Merriënboer 1994), which may impede performance while employees are becoming accustomed to the varied contexts within which they are operating. Even if the tasks that they are engaged in are similar, the norms and practices of the contexts may be dissimilar enough to limit the transferability of experiences.

However, the negative effect of contextual non-specialization on performance may diminish over time. Through experience, the employee may become more familiar with the routines, norms, and practices within a set of dissimilar contexts and become better able to connect the similarities and identify the differences among them (Staats 2011). Relatedly, exposure to multiple contexts may help employees to potentially anticipate and avoid problems, due in part to the diversity of their experiences (Fong Boh, Slaughter, and Espinosa 2007). It has been argued that learning is transferred between related domains through deep cognitive structures (Schilling et al. 2003), which may emerge over time. Consistently, *contextual non-specialization* might be helpful in the long-term because being situated in two or more diverse context creates opportunities for a manager to recombine ideas from the two contexts and create new knowledge (Eisenhardt and Santos 2002; Gruber, Harhoff, and Hoisl 2013; Perkins 2014). Finally, increased job variety, which is consistent with contextual non-specialization, has been

associated with higher long-term employee motivation and higher productivity (Boudreau et al. 2003).

Consistent with the arguments presented above, we hypothesize that the capacity of contextually non-specialized employees to contribute to team performance will initially diminish as employees adjust to multiple contexts. However, we further predict that over the long run, this negative effect will be attenuated, such that contextually-specialized employees will ultimately contribute more to team performance.

*Hypothesis #2: In a contextually non-specialized environment, experience has a U-shaped relationship with performance.*

### **3.4 Setting**

To study our research question, we require a field site with at least four features: (1) an organization where all employees are new to the context; (2) a project-based organization; (3) project staffing that includes employees with varying attributes; and, (4) detailed tracking of individual and project variables. The United States Army Corps of Engineers (USACE) provides just such a setting. The USACE, headquartered in Washington, D.C., has approximately 37,000 civilian employees delivering engineering services to customers in more than 130 countries worldwide. The USACE is a key player in an 8.7 trillion dollar global project-based construction enterprise, which makes it important in its own right, but it shares features with many project-based organizations, thereby increasing the generalizability of this research. The operations of the USACE are very similar to those of for-profit construction services companies, like Bechtel. For example, the USACE bids for contracts, must meet client expectations, and is affected by the market in the sense that if it does not secure projects, it cannot support its employee base.

The USACE builds and manages large-scale construction projects around the world, such as the United States (U.S.) Army’s military construction program, which has had a budget of over \$44.6 billion over the past seven years. It is organized into nine separate divisions, each of which is further parsed into a series of districts. We targeted the Europe District, which is one of six districts located outside of the continental United States. This district is an ideal venue to study the effect of context on organizational performance due to its global nature, and the high relative volume of projects completed within it.

The Europe District of the USACE has been operating for over 50 years and is currently responsible for conducting projects in 94 countries. Headquartered in Wiesbaden, Germany, the district provides engineering, construction, stability operations, and environmental management products and services to the Army, Air Force, and other U.S. government agencies and foreign governments throughout the U.S. European Command and U.S. Africa Command. Within this global context, the Europe District engages in over 2,000 projects annually. Pertinent to our analysis, the diversity of contexts within which it operates creates unique operational challenges, since there are country-specific regulations and human resource policies with which its employees (both contextually specialized and contextually non-specialized) must comply.

### **3.4.1 Natural Experiment: The Five-Year Rule**

Since the USACE Europe District operates outside the continental U.S. it is subject to a personnel policy that comes from the US Code, Title 10, US Code 156–“ROTATION OF CAREER-CONDITIONAL AND CAREER EMPLOYEES ASSIGNED TO DUTY OUTSIDE THE UNITED STATES “. The Five-Year Rule mandates that no employee may remain in an assignment outside the continental U.S. longer than five years. The rule was put in place to allow

for global assignment opportunities for the workforce. Without the enforcement of the five-year rule, most USACE employees would choose to stay in Europe for longer than five-years, because of the additional pay and opportunity to live abroad it presents (Roncoli 2013). The five-year rule forces employees to move despite their personal preferences, or the preferences of their direct supervisors. However, the five-year rule has only been intermittently enforced since its publication in 1960.

The sole prerogative over how the five-year rule is enforced belongs to the Command General of USACE, who is the chief executive of the organization. Due to the regular changes in military leadership, the individual USACE districts cannot anticipate when the five-year rule will be enforced. Hence, its historically-infrequent enforcement is effectively an exogenous event to the managers and the project teams in the Europe District. Accordingly, we are able to leverage its enforcement as an exogenous shock that creates variation in the degree of contextual specialization and contextual diversity project teams exhibit in the Europe District during the time of our analysis. Because of the swift enforcement of decisions within the organization, there is no opportunity for project managers to prepare their teams for the enforcement of the five-year rule. The data we use for this study spans from January 2006 through December 2012. For the first seven months of this window, the five-year rule was not in effect. In May 2005 a new leader assumed the position of deputy commander of the USACE, and in August 2006, he announced that the five-year rule would be immediately enforced. In discussions with the commander who made the decision to implement the policy, he chose to enact the rule when he was informed, a year into his tenure, that it was not being enforced. There was no advanced notice given to the organization prior to the rule's implementation. Thus, it is possible to use the enforcement of the five-year rule as an instrument to break the potentially endogenous assignment of employees to

contextually specialized and contextually non-specialized sets of projects. We note that when the five-year rule was implemented, the policy significantly affected the organization at all levels of tenure, experience, and education, requiring individuals with more than five years of experience in the Europe District to depart immediately, and their replacements, who were selected on a first-come-first-served basis, were randomly assigned to fill project team vacancies. Discussions with the managers revealed that there was *no science to the assembly of an individual project delivery team*.

### **3.5 Data and Empirical Approach**

The data used to explore our research question was provided by the USACE. Due to one of the author's affiliation as an officer in the U.S. Army, with appropriate clearances, we were allowed access to the organization and project performance outcome data on military construction projects. Our sample is composed of 1,267 projects conducted by the USACE Europe District from January 2006 to December 2012. Our data includes 652 individual employees, and indicates the projects they worked on each month. These data can be used to calculate how many simultaneous projects each employee participated in each month. We combine these data with project outcome data, with the outcome defined by the on-time delivery of the project. Although the outcome is project-level, all variables are at the individual level, which allows for the analysis of 336,137 observations at the employee, project, month-level. Through in depth dialogue with senior officials, we secured detailed human resource information on individual employees who participated in the projects in this dataset. Because of the sensitivity of the data, it can only be access through government servers for analysis. Through numerous detailed discussions with the organization, we were able to identify the appropriate

variables for analysis, which we detail below.

### **3.5.1 On-Time Delivery**

The primary objective measures of performance in the project management space have been well established (Gaddis 1959; Roman 1964; Dumond and Mabert 1988). For projects to be deemed successful they must be on-time or under budget, and often both (Conlon and Garland 1993). Unfortunately, budget data was not available for this study. However, we were able to obtain data describing the on-time delivery status of each project. This indicator variable serves as the dependent measure in all of our analyses.

### **3.5.2 Contextual Specialization and Contextual Non-Specialization**

We operationalize contextual specialization and contextual non-specialization by identifying the country within which each employee has conducted the most project months during her tenure in the Europe District. For each employee, we then divide the number of project months completed in this country by the total number of project months the employee has completed in the Europe District to date, thereby creating a proportion variable bounded by 0 and 1. An employee with a contextual specialization measure of 1 would be completely contextually specialized (i.e., all of that employee's projects have been conducted in the same country). By contrast, as this metric falls, the employee becomes less contextually specialized. The median employee in our dataset conducted 61% of her projects in the same country. For our analysis, we split the sample at the median, characterizing employees with an above-median degree of contextual specialization as *contextually specialized*, and employees with a below-median degree of contextual specialization as *contextually non-specialized*.

### 3.5.3 Policy Impact

As described above, the five-year rule serves as a source of exogenous variation that we exploit as an instrument in our analysis. The policy impact variable is an indicator variable that identifies individuals within our dataset who were required to leave under the five-year rule. The affected population is defined as any employee who has at least 48 months in the organization as of July 2006, the month prior to the notification of the policy enforcement, or any month after. Discussions with senior managers in the Europe District revealed that employees could not immediately depart the organization when the five-year rule was enforced. Instead, it often took up to 12 months to transition an employee out of Europe, because employees could not be transferred until a position in the continental U.S. becomes available for them. Hence, any employee with 48 or more months of experience in the Europe District was subject to the five-year rule policy. This variable serves as a critical input to the Heckman Selection Model we use in our analysis, which is described in detail in the next section.

### 3.5.4 Control Variables

To avoid biased estimators, we also accounted for numerous individual and project characteristics that may covary with on-time performance and an employee's degree of contextual specialization or non-specialization.

*Individual Characteristics.* We control for each employee's local tenure, status, education, and prior military experience, as well as the number of tasks and projects an employee has been assigned to in a given month.

We define *local tenure* as the number of consecutive months an employee has worked in the European District. Employees are more likely to have experience with a project's tasks and

team members when they have experience in that project's geographic region (Huckman, Staats, and Upton 2009; Staats 2011), and local knowledge may increase productivity (Staats and Gino 2012). *Status* is defined by the employee's general schedule level (GS). The GS is the pay scale within the U.S. Civil Service. The jobs associated with GS are primarily professional, technical, administrative, and clerical. The GS levels span from GS-1 to GS-15. The higher the GS-level the more responsibility and influence an employee has.

We codify *education* as the number of years of education an employee has on record with human resources. Employees with more education may be better able to operate on task with minimal external guidance (Tushman 1979; Cummings and Haas 2012) and may have a better ability to prioritize based on the organization's needs (Gannon 1994). We further classify whether an individual has *prior military experience*. Employees are given an ordinal category from 0-5, based on the number of years they served in the military, with 0 meaning an employee did not serve in the military, and 5 meaning and the employee retired from the military after 20 years of service. Using data from the project scheduling system, we also count the *number of tasks* and the *number of projects* to which an employee has been assigned during a given month.

*Project Characteristics.* We additionally capture and control for differences among projects, including differences in cost and employee turnover. As a measure of project scale, we introduce an indicator variable that identifies projects that have budgets over \$500,000. Such projects have a longer duration and are more complex than less costly projects.

Furthermore, similar to Hom et al. (2008), we define *project turnover* as personnel movement onto or off of a project. We construct a measure for overall project turnover by first identifying the employees who worked on a project team in the preceding month and calculating



the percentage who are no longer present in the current month.

### **3.5.5 Empirical Approach**

We wish to estimate models that capture the magnitude of the effect of individual attributes on on-time delivery. Because our data is a complete history of each project over six years, but we are limited to a binary dependent variable, we need to ensure we select a model that accounts for autocorrelations and heteroscedasticity. We thus chose to use a Heckman selection regression model. The Heckman selection model accounts for the potential selection bias that may occur in staffing projects because of turnover, meaning that managers may place employees on projects based on attempts to keep certain employees on specific projects (Heckman 1979; Evenson and Joseph 1999).

This model is a two-stage procedure that first estimates the likelihood of success with an event history for the full sample and then incorporates estimates of parameters from that model into the second-stage probit model to predict measures of changes in employee characteristics on performance (Westphal and Fredrickson 2001). In order to use the Heckman selection model there must be an instrument. Because of the exogenous shock to the organization induced by the five-year rule, we have the required instrument. The five-year rule solely influences turnover, and only influences on-time delivery through turnover. This allows us to derive unbiased estimates of the parameter coefficients while controlling for sample selection.

The Heckman Selection Model further accommodates multi-level data of the nature used in this analysis. In particular, we model project-level outcomes as a function of factors that vary at the employee-project-month level. Our analysis is akin to previous uses of the Heckman Selection Model in the literature on corporate governance, wherein for example, firm-level performance was modeled as a function of board composition and board member characteristics

(Westphal and Bednar 2005; Clarysse, Knockaert, and Lockett 2007; Dastidar 2009). We note that all specifications are clustered at the project level to ensure appropriate standard errors.

### 3.5.5 Empirical Specification

To test our hypotheses, we used Heckman probit regression models for all specifications. Specifically, we estimate the policy impact on turnover in the first-stage to explore the effect of *contextual specialization* (in Model 1) and *contextual non-specialization* (in Model 2) in the second-stage as follows:

#### Model 1:

##### First-Stage

$$\begin{aligned} Turnover_i = & \beta_1(PolicyImpact_i) + \beta_2(Status_i) + \beta_3(Education_i) + \beta_4(LocalTenure_i) + \beta_5(Contextual\_Specialization_i) \\ & + \beta_6(Status_i^2) + \beta_7(Education_i^2) + \beta_8(LocalTenure_i^2) + \beta_9(Education_i^3) + \beta_{10}(Contextual\_Specialization * LocalTenure_i) \\ & + \beta_{11}(Contextual\_Specialization * LocalTenure_i^2) + \beta_{11}(Controls_i) \end{aligned}$$

##### Second-Stage

$$\begin{aligned} Heckprobit(On\_Time\_Delivery_i) = & \beta_1(Status_i) + \beta_2(Education_i) + \beta_3(LocalTenure_i) + \beta_4(Contextual\_Specialization_i) \\ & + \beta_5(Status_i^2) + \beta_6(Education_i^2) + \beta_7(LocalTenure_i^2) + \beta_8(Education_i^3) + \beta_9(Contextual\_Specialization * LocalTenure_i) \\ & + \beta_{10}(Contextual\_Specialization * LocalTenure_i^2) + \beta_{12}(Controls_i) \end{aligned}$$

Hypothesis 1, predicts that when *contextual specialization* is high early in an employee's tenure with the organization, on-time delivery will improve in the near-term and moderate over time. Thus, we expect that the interaction of *contextual specialization* and *local tenure* will be positive for the linear term and negative for the non-linear term in Model 1.

## Model 2:

### First-Stage

$$\begin{aligned} Turnover_i = & \beta_1(Policy\ Impact_i) + \beta_2(Status_i) + \beta_3(Education_i) + \beta_4(LocalTenure_i) + \beta_5(Contextual\_Non - Specialization_i) \\ & + \beta_6(Status_i^2) + \beta_7(Education_i^2) + \beta_8(LocalTenure_i^2) + \beta_9(Education_i^3) + \beta_{10}(Contextual\_Non - Specialization * LocalTenure_i) \\ & + \beta_{11}(Contextual\_Non - Specialization * LocalTenure_i^2) + \beta_{11}(Controls_i) \end{aligned}$$

### Second-Stage

$$\begin{aligned} Heckprobit(On\_Time\_Delivery_i) = & \beta_1(Status_i) + \beta_2(Education_i) + \beta_3(LocalTenure_i) + \beta_4(Contextual\_Non - Specialization_i) \\ & + \beta_5(Status_i^2) + \beta_6(Education_i^2) + \beta_7(LocalTenure_i^2) + \beta_8(Education_i^3) + \beta_9(Contextual\_Non - Specialization * LocalTenure_i) \\ & + \beta_{10}(Contextual\_Non - Specialization * LocalTenure_i^2) + \beta_{12}(Controls_i) \end{aligned}$$

Hypothesis 2 predicts that *contextual non-specialization* diminishes on-time delivery performance in the short-run and improves on-time delivery performance over time. Thus we expect that the interaction of *contextual non-specialization* and *local tenure* will be negative for the linear term and positive for the non-linear term in Model 2.

Our hypotheses predicts the near-term and long-term productivity tradeoffs between *contextual specialization* and *contextual non-specialization*. We expect that it may be more beneficial to specialize employees when immediate gains are required. On the other hand, we predict that exposing employees to a variety of contexts simultaneously may improve their long-term performance.

## 3.6 Results

We present our primary results in Table 3.1. In particular, Column (2) and Column (4) report the results from the second-stage Heckman probit regressions of *contextual specialization* and *contextual non-specialization* on on-time delivery performance, respectively.

**Table 3.1: The Effect of Contextual Specialization and Contextual Diversity on On-Time Delivery**

	Dep. Variable: Turnover		Dep. Variable: On-Time Delivery	
	1st Stage	2nd Stage	1st Stage	2nd Stage
	(1)	(2)	(3)	(4)
<i>Contextual Specialization (CS)</i>	-0.013 (0.077)	0.055 (0.094)		
<i>Contextual Non-Specialization (CN)</i>			-0.077 (0.107)	-0.0003 (0.134)
<i>CS*Local Tenure</i>	-0.169*** (0.037)	0.213*** (0.052)		
<i>CS*Local Tenure^2</i>	0.014*** (0.004)	-0.018*** (0.005)		
<i>CN*Local Tenure</i>			0.271*** (0.052)	-0.324*** (0.072)
<i>CN*Local Tenure^2</i>			-0.021*** (0.005)	0.026*** (0.007)
<i>Status</i>	0.025 (0.021)	-0.009 (0.026)	0.027 (0.021)	-0.012 (0.026)
<i>Status^2</i>	-0.001 (0.001)	0.0005 (0.002)	-0.002 (0.001)	0.001 (0.002)
<i>Education</i>	0.612*** (0.070)	-0.817*** (0.134)	0.595*** (0.070)	-0.792*** (0.129)
<i>Education^2</i>	-0.065*** (0.007)	0.086*** (0.014)	-0.063*** (0.007)	0.084*** (0.013)
<i>Education^3</i>	0.002*** (0.000)	-0.003*** (0.000)	0.002*** (0.000)	-0.003*** (0.000)
<i>Local Tenure</i>	0.102*** (0.023)	-0.155*** (0.038)	-0.029 (0.023)	0.005 (0.030)
<i>Local Tenure^2</i>	-0.010*** (0.002)	0.016*** (0.004)	0.000 (0.002)	0.003 (0.003)
<b>Controls</b>				
<i>Veteran</i>	-0.106*** (0.019)	0.115*** (0.024)	-0.110*** (0.019)	0.120*** (0.024)
<i>High Cost Projects</i>	-0.049** (0.016)	0.075** (0.023)	-0.047** (0.016)	0.073** (0.023)
<i>Task</i>	-0.024*** (0.007)	0.036*** (0.010)	-0.025*** (0.007)	0.037*** (0.010)
<i>Projects</i>	0.024*** (0.007)	-0.036*** (0.010)	0.025*** (0.007)	-0.036*** (0.010)
<i>Policy Impact (Instrument)</i>		-0.237* (0.103)		-0.236* (0.102)
<i>Constant</i>	-2.269*** (0.218)	2.695*** (0.277)	-2.228*** (0.215)	2.672*** (0.273)
<i>Observations</i>		336137		336137

Robust standard errors, clustered by project, are shown in parentheses \*p<0.05,\*\*p<0.01,\*\*\*p<0.001  
*Notes:* This table reports the second-stage of the heckman probit regression. The first-stage leverages all variables above in addition to the variable *Turnover* as the dependent variable and the variable *Policy Impact* as the instrument variable required for this specification. The outcome variable in the second-stage is a dummy variable, which is set to 1 when the project is on-time that has the word “On-Time” in its title. Table 3.1 shows that when *contextual specialization* and *contextual non-specialization* interacts with local tenure and local tenure^2 influence on-time delivery. Controls are whether an individual is a prior veteran, the number of task an individual is engaged, the number of projects an individual is engaged, and a dummy variable for when projects are over \$500,000

Column (2) demonstrates that the effect of contextual specialization on on-time performance is moderated by local tenure. As local tenure increases, the effect of contextual specialization on on-time delivery is initially positive (coefficient=0.213;  $p<0.001$  two-tailed). However, as local tenure continues to increase, the effect is attenuated by the quadratic term (coefficient=-0.018;  $p<0.001$  two-tailed). These results offer support for the inverted-U shaped relationship between contextual specialization and on-time performance hypothesized in H1. While we do not observe a decline in performance among long-tenured, contextually-specialized employees, we find that the marginal benefit of experience for contextually specialized employees plateaus, falling below 0.1% per month after 109 months of local experience (9.1 years) (Figure 3.1).

Column (4) demonstrates that the effect of contextual non-specialization on on-time performance is also moderated by local tenure, but in the opposite direction. As local tenure increases, the effect of contextual non-specialization on on-time delivery is initially negative (coefficient = -0.324;  $p<0.001$  two-tailed). However, as local tenure continues to rise, the negative effect is arrested by the quadratic term, such that the effect of contextual non-specialization eventually becomes positive (coefficient = 0.026;  $p<0.001$  two-tailed). These results offer support for the U-shaped relationship between contextual non-specialization and on-time performance hypothesized in H2. We find that the stationary point for the average contextually non-specialized employee in our dataset occurs after 66 months of experience (5.5 years), after which point the individual's predicted performance begins to improve.

It is also interesting to directly consider the tradeoff between contextual specialization and contextual non-specialization in our dataset. Based on our model, we project that the point of equivalence from an on-time performance perspective occurs after 144 months (12 years) of local experience. However, we note that this projection is beyond the support of our data, in that the maximum local tenure observed in our dataset was 11 years (Table 3.1), and the results are thus, inconclusive. Nevertheless, the pattern suggests that although the capacity of a contextually non-specialized employee to contribute to organizational performance may eventually exceed that of a contextually-specialized employee, doing so may require considerable local experience.

### 3.7 Discussion and Conclusion

As the prior organization and human capital literature has outlined, one of the important decisions related to the allocation of human capital, is the deployment of human capital within an organization to one of several possible contexts. Our study exploits a natural experiment and six years of unique organizational data from the USACE Europe District, and informs the research question of how contextual specialization is related to individual/organizational performance. While a few prior studies in the literature favor specialization (Harrison and Klein 2007; Narayanan, Balasubramanian, and Swaminathan 2009; Staats and Gino 2012), other studies favor diversity of managerial experience and variety of tasks (Gardner, Gino, and Staats 2012; Narayanan, Balasubramanian, and Swaminathan 2009; Staats and Gino 2012). Our findings suggest that the relationship between contextual specialization and managerial productivity is more nuanced and possibly evolves dynamically over time. In other words, we present the beginnings of a dynamic view of how specialization in experience affects individual and organizational performance. We find that *contextual specialization* has a positive relation to individual/ organizational performance in the short term, but in the long term contextual specialization might have an adverse effect on individual/ organizational performance. On the other hand, *contextual non-specialization* has a negative relation to individual / organizational performance in the short run but might be related to superior individual / organizational performance in the long run. Specifically, we find that *contextual non-specialization* has a U-shaped relationship with the probability of projects being deliver on-time.

Our study has several limitations. First, our understanding of differences in context and the magnitude of the change in context on performance outcomes is limited to the single setting that we study; in other words more work is needed to establish the external validity of our findings. Second, we use one dependent binary variable. This a limitation of available data and in

the ideal empirical context, further insights could be gained through detailed analysis of continuous measures of project performance at different points in the life-cycle of a project. Third, there is a possibility of omitted variable bias and we cannot rule out the possibility that unobservable characteristics of individuals and/or projects drive the allocation of individuals to projects. It would have been helpful to include additional variables to the model, including specific attributes of teams within a location and additional project attributes, but this data was unavailable. However, our findings make an important contribution to the organizational literature on how the specialization of experience and the diversity of tasks affects individual and organizational performance. We make an important theoretical contribution by connecting this literature to the hitherto disconnected literature on context (Ghemawat 2001, Khanna, 2015). Our empirical findings contribute to the nascent and emerging literature on how the organizational context affects individual and organizational performance (Chattopadhyay and Choudhury 2015) and contributes to the tradition of using empirical rigor in the form of a natural experiment to inform a research question where the prior scholarship has not yet arrived at a consensus. Future work can extend our findings in several ways. Firstly, future work could explore the individual level mechanisms that lead to our core finding – in other words, future work could explore whether being assigned to a setting with contextual non-specialization over time affects individual ability, individual learning or both. This line of research would contribute to the literature on individual and organizational learning (Argote and Miron-Spektor, 2011). Secondly, given the dynamic nature of how contextual specialization affects individual/organizational performance, it is conceivable that certain organizational projects, e.g. projects of short duration could benefit from contextual specialization, while other projects, e.g. projects with relatively longer duration could benefit from contextual non-specialization. Future work could outline the

tradeoffs in more detail and could arrive at ways of thinking about the point of inflexion, i.e. the duration of a project that makes it amenable to contextual non-specialization over contextual specialization. Future work could also study if there are persistent benefits of deploying individuals to settings with contextual non-specialization. In other words, our study suggests that individuals assigned to a setting with contextual non-specialization (e.g. being assigned to two contexts 'A' and 'B') is likely to contribute to superior individual and organizational performance over time, compared to individuals assigned to a setting with contextual specialization (i.e. being assigned to either context 'A' or context 'B' but not both). Future work could explore if there are persistent benefits of then re-deploying the individual initially assigned to contexts 'A' and 'B' to a new context 'C', compared to the individual initially deployed to either 'A' or 'B'. It would also be interesting to decompose contextual non-specialization into settings which have contextual diversity and settings which do not have contextual diversity. Figure 3.2 outlines this more in detail. The bottom panel of Figure 3.2 represents contextual specialization, i.e. in this case, an individual is deployed to a single, specialized context. The top panel of Figure 3.2 outlines two possible settings that represent contextual non-specialization. In both these settings, the individual is deployed to multiple contexts. However these two settings differ on the diversity of the individual contexts the individual is situated in, i.e. these two settings differ on how different the multiple contexts an individual is embedded in, are from each other. The setting on the top left represents an instance of contextual non-specialization comprising diverse individual contexts, i.e. in this setting, the individual contexts that an individual is situated in are different from each other. On the other hand, the setting on the top right represents an instance of contextual non-specialization comprising non-diverse individual contexts, i.e. in this setting, the individual contexts that an individual is situated in are similar to



each other. Future work could explore how contextual diversity affects individual/organizational performance

In conclusion, our study has several important implications for managers. Our findings are relevant for HR managers responsible for deploying human capital within an organization. Our findings suggest that employees engaged in the contextually-specialized settings can initially be extremely productive; however, over the long-term these employees begin to plateau and eventually stagnate. We also find that employees working in the contextually-non-specialized settings can initially be unproductive; however, over the long-term these employees become more productive than employees assigned to settings with contextual specialization. This tradeoff is important to understand and could help HR managers take more informed strategic staffing decisions regarding employees. Our findings could also help individual managers better plan their career trajectories within organizations and suggests that managers might be better suited to work in a contextually non-specialized setting, especially if future research establishes a persistent benefit of working in a setting that is contextually non-specialized.

## **Chapter 4: T-Shaped Managers—One Size Does Not Fit All: Exploratory Study from the Military**

### **4.1 Introduction**

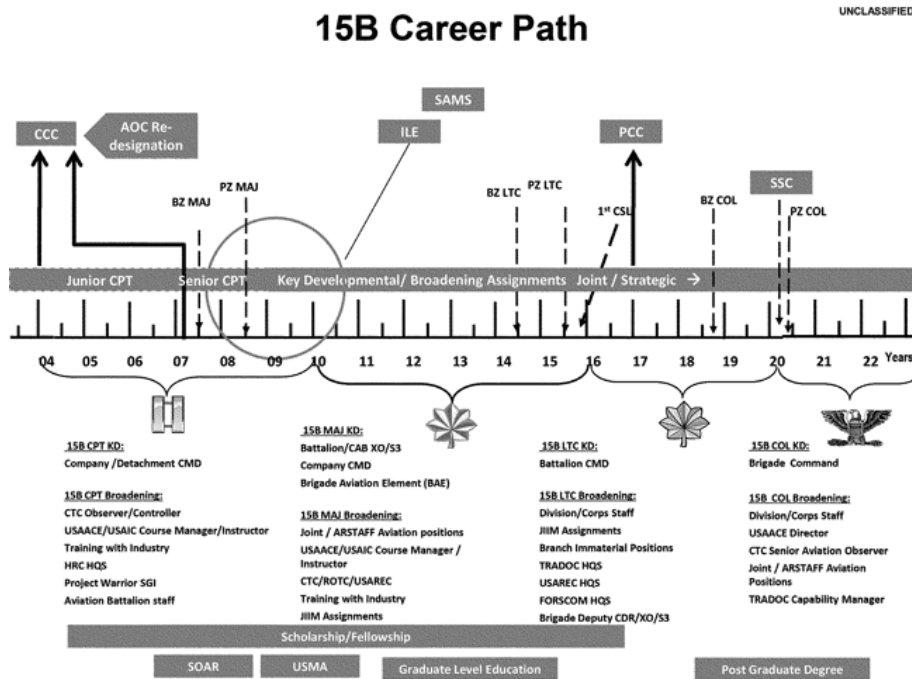
On June 11, 2003 *The Washington Post* headline read, “Rumsfeld Picks Retired General to Run Army.” Just three months prior, the United States (U.S.) Army had launched an offensive in the Middle East and the U.S. Army’s strategic focus had shifted to Iraq. The new mission was ambiguous and the U.S. Army was working diligently to adapt its force structure from large divisions to smaller, more agile fighting units. Although several generals qualified for the position and ranked high enough to lead the U.S. Army as its Chief of Staff, only a small number met Secretary of Defense Rumsfeld’s ideal. After being turned down by two other active duty generals, Secretary Rumsfeld called General Peter Schoomaker out of retirement to assume the role as the thirty-fifth Chief of Staff of the Army. According to Secretary Rumsfeld, Schoomaker had a “reputation as an innovative thinker and experience in a branch of the military known for the agility and mobility the defense secretary would like to see adopted by conventional Army units” (Graham 2003). Several officers noted that the chief’s position was sure to cause consternation among the most senior leaders in the organization; other three- and four-star generals. “Rumsfeld is essentially rejecting all three- and four-star generals in the Army,” a senior officer said, “undermining them by saying, in effect, they aren’t good enough to lead the service. But apparently he did not feel as comfortable with anybody else” (Graham 2003).

If this dilemma sounds familiar, the kinds of challenges that leaders in the military face are common throughout non-military organizations as well. Leaders are expected to be flexible and respond competently to ambiguity. They are required to manage in the midst of resource

constraints, train and develop a twenty-first century workforce, while at the same time, position the organization to accomplish its objectives. While the “innovative, experienced, and agile” leaders needed to address such challenges are becoming more valuable, they are also becoming harder to develop. The harder they are to develop, the weaker the pipeline of talented candidates to lead organizations (Avolio, Avey, and Quisenberry 2010).

The U.S. Army is often viewed as a model for leader development (Groysberg, Hill, and Johnson 2010). Its core strength is its ability to manage and develop people to accomplish a specific mission (Leonard et al. 2006). The U.S. Army, like other organizations, has a defined leader development system. This system is designed to carefully train and evaluate the soldier force. Through a series of experiences and increasing responsibility, a soldier has the opportunity to demonstrate qualification for promotion. Promotion is both predictable and expected. The U.S. Army has also created options for the soldier to broaden their scope. *Broadening experiences* are those experiences that place the soldier outside of his expertise. These broadening experiences are offered at specific times in a soldier’s career, as shown in Figure 4.1. The broadening experiences are considered part of a soldier’s professional development and can complement the soldier’s training requirements.

**Figure 4.1: An Example of an Army Officer Career Model with Broadening Experiences**



*Note:* Adapted from Department of the Army Pamphlet 600-3, "Commissioned Officer Professional Development and Career Management", December 3, 2014. The Army Officer Career Model for 15B, which is the classification for Aviation officers. This highlights the broadening opportunities at each rank.

Although companies go through periods of prosperity and periods of fiscal constraint, the need for innovative thinkers remains constant. U.S. corporations and the U.S. Army are grappling with similar leader development challenges. Both organizations have invested considerable resources to develop internal talent; however, both find that talent to be inadequate to meet the current needs. For example, in the U.S. Army, there is subjectivity and variation in the true value the organization places on broadening experiences. It is also unclear how much consideration is given to these experiences during the evaluation process. Corporate leaders have also been reawakened to the fact that they need strategic thinkers to lead their companies in the future (Oliver, Heracleous, and Jacobs 2014). They realize that operating in a globally competitive environment presents serious constraints as well as tremendous opportunities for

growth (Makino, Isobe, and Chan 2004; Perkins 2014). Nevertheless, many are struggling to develop internal systems that prepare their talent to lead the organization. During economic peaks, companies hired and developed their leadership through elaborate rotation programs (Cappelli 2008). They also offered education opportunities at significant expense to the company. For some, this was a strategic way to gain and retain top talent. During the recession, some of those programs were the first to be cut. Now, seven years later, companies are feeling the effects of those cuts to manager development.

Organizations benefit from a pool of managers who can be classified as *T-shaped managers*. The theory of the T-shaped manager was first introduced by Hansen and Oetinger (2001). These scholars determined that T-shaped managers can operate more effectively because they possess the breadth of knowledge across the organization (the horizontal part of the “T”) while maintaining the depth of functional area expertise and commitment to their individual business unit (the vertical part of the “T”) (Hansen and Von Oetinger 2001). The benefit of having T-shaped managers in an organization is a more collaborative and innovative environment that drives productivity (Hansen and Nohria 2005).

The perspective explored here is grounded in a qualitative study of senior leaders in the U.S. Army. It draws parallels between the talent management pathways of the U.S. Army and U.S. corporations. The overarching question is: *How does experience contribute to the creation of T-shaped managers and impact organizational performance?* The purpose of the study is to identify the type of experiences—tactical or strategic—that result in the desired T-shaped manager. In this study *tactical experience* is defined as those experiences that build depth on what a manager already knows about their particular function, while *strategic experiences* are those experiences that place the employee further outside of their functional expertise, thus

building breadth. Through my deep understanding of the U.S. Army's Officer development model in concert with a number of interviews, I was able to classify the menu of experiences offered to military professionals.

If a *T-shaped manager* is identified, it is not readily apparent how the manager became T-shaped. This leads to an additional question: *What experiences make a manager T-shaped?* Furthermore, if a productive and collaborative T-shaped manager is built on prior experience, a third question arises: *Are all experiences created equal?*

The United States military is a generalizable setting to explore this phenomenon. This research is based on a convenience sample of officers in the U.S. Army and open source data. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility. All interviewees are mid-career and senior-level leaders—Major (O-4) to Lieutenant General (O-9). No junior level leaders were interviewed because they have not had the opportunity to engage in experiences that develop T-shaped managers, although they do have depth but not as much breadth. All interviewees have had some type of broadening experiences, have been in a position to advise subordinates, and have received career advice throughout their years of service.

I posit from my findings that T-shaped managers are created through a set of broadening experiences and that all T-shaped managers are not the same. Specifically, The findings suggest that there are big “T” managers (BTMs) and little “t” managers (LtMs). The BTMs have the benefit of more strategic experiences where the LtMs may have either no strategic experiences or more tactical experiences. I am able to make these comparisons based on the perceptions of the value of the broadening experiences through in-depth interviews.

Organizations make decisions on where to allocate resources for employee development.

The decisions can be classified as strategic or tactical. Strategic broadening expands the scope and exposes the employee to new external networks through opportunities like executive education or through job assignments that extend the horizontal portion of the T-shaped manager's knowledge base. Tactical broadening involves experiences that deepen the level of the employee's specific skill set. This process extends the vertical portion of the T-shaped manager. I find that what the U.S. Army may express it wants in a manager and what it actually develops and promotes are in conflict.

This exploratory research exposes the idea that T-shaped managers do not just exist but are developed through a series of experiences defined by an organizations. I propose a framework for classifying experiences and offer a space for further discussions around T-shaped managers. I leverage the U.S. Army as a research setting because it is an organization that is known to be at the forefront of leader development.

The remainder of the paper is structured as follows: Section 4.2, 4.3, and 4.4 outline the theoretical framework, Section 4.5 outlines the setting, Section 4.6 outlines the data and methods, Section 4.7 presents results, Section 4.8 summarizes the results, and Section 9 offers discussion and opportunities for future research. The paper concludes with tables and figures that support the analysis.

## **4.2 Talent Management**

If people are the fundamental resource that drives organizational success, then the efficient management of the talents of people is required. Talent management is defined as “a deliberate and systematic effort by an organization to ensure leadership continuity in key positions and encourage individual advancement” (Rothwell, 1994) Some scholars have argued

that effective talent management happens as a result of a system of processes that are designed to increase an employee's productivity (Lewis and Heckman 2006; Cappelli 2008), while others assert that talent management is embedded in the fabric of an organization's culture (Tarique and Schuler 2010; Cappelli 2008). I posit that effective talent management can be achieved in both contexts depending on the industry and the skill level needed in the labor pool. Consider two scenarios: manufacturing and consulting. In a manufacturing-based firm, there is significant need for managers with tactical expertise, or LtMs, and a small number of highly trained plant supervisors, or BTMs. Contrast that with a global consulting firm where having innovative and flexible thinkers, BTMs, may be critical to the firm's global competitiveness. In the first context, continuous training is important, while in the other, employee development and exposure may be more important. In both situations, when employees are developed strategically they can offer a competitive advantage for the organization.

In U.S. corporations, business leaders create a variety of incentives to motivate their talent to be more productive. These range from pay raises and commissions based on sales performance to stock options and gifts (Hall and Murphy 2003; Rynes, Gerhart, and Minette 2004). However, many employers realize that a portion of their talent may be motivated by more than financial incentives. These firms identify those employees with high potential. They then develop pathways to ensure that the identified employees gain a strategic understanding of the organization through exposure within the firm and continued professional education. Our research seeks to understand how this type of broadening experience for the employee contributes to the sustained success of the organization.

Companies like General Motors, Citi Group, Target, and Wal-Mart place their high potential talent in a one- to two-year program to groom them for positions of greater authority.



The rotation program allows the selected employees to work for a defined period of time, in several divisions in the companies. This gives the employee experience with achieving organizational objectives and solving problems in a variety of situations. That same highly skilled employee may not get this perspective through advancement in the same department. This development practice is people-focused, and companies who invest in their talent in this way hope to bear fruitful senior leaders who are equipped to steer the organization in the future.

As organizations grapple with the challenges of talent management, there is a growing need for managers to be more than just functional experts. Managers are increasingly required to operate outside of their comfort zone in order to achieve upward mobility within and outside of the firm. We consider how managers are developed to meet the strategic and tactical needs of the company.

### **4.3 T-Shaped Management**

#### **4.3.1 T-Shaped Managers**

It is essential that organizations create a culture that encourages employees to generate new ideas and develop more efficient processes (Anderson and West 1998). The culture can improve performance and productivity of the firm by combining existing knowledge with newly acquired knowledge that is gained through external employee interactions that are outside one's specific expertise (Teece 2007). Hansen and Nohria (2006) define employees with these attributes a *T-shaped managers*.

*T-shaped managers* benefit organizations in multiple ways. First, because the employees have a broad breath of experiences, their ability to operate in ambiguity and with minimal

oversight is heightened (KC and Staats 2012). Second, due to their deep understanding of their individual business, they require minimal time to focus on internal issues and can thus focus their efforts on improving and assisting other areas within the organizations. Finally, these types of managers will have an increased awareness of where potential opportunities exist because of their broader perspective.

Although there are benefits to generating *T-shaped managers*, organizations must be cognizant of potential pitfalls. Managers may go too far outside the scope of the firm, which could create unnecessary tension between departments. For example, if an organization sends a plant manager to an executive experience that does not loosely align with the organization, when that manager returns to his previous position he may attempt to implement recently learned techniques that impede productivity. The manager's tactical expertise may be eroded due to extended time away from their primary craft (Fossum et al. 1986). This suggests that the farther a manager gets from their tactical expertise, their ability to coach and mentor direct subordinates decreases.

#### **4.3.2 Development of Capabilities**

Although the T-shaped management phenomenon has been identified, how T-shaped managers are developed, is not clearly understood. This exploratory study attempts to fill this void. Prior work on this topic contends that the horizontal portion of the T-shape is created through carefully designed experiences (Hansen and Von Oetinger 2001; Hansen and Nohria 2005). These experiences may be customized by the organization. So then, the organization ultimately determines what experiences are necessary for its employees to acquire the strategic capabilities that it values (Cyert and March 1959; Romanelli and Tushman 1994). Nevertheless,

organizations often struggle to leverage their employees for maximum organizational benefit (Appelbaum, Gittell, and Leana 2008).

In most organizations, people are the resource that ensures organizational survival (Cravens and Oliver 2006). Thus, it is in the organization's best interest to identify talented individuals and to provide them with an experience that in-turn produces a capability that the organization can then leverage for future sustainability (Collings and Mellahi 2009). For example, in hospital administration, many executives are doctors. In some instances, these physicians will attend an executive management program to provide them with basic knowledge about hospital operations outside their realm of clinical expertise. This experience equips them with the tools to better understand management at a higher level. It also generates a T-shaped manager who can now engage with the Chief Financial Officer while simultaneously discussing the impact of other support services on patient care.

#### **4.3.3 Variance in T-Shaped Manager Experiences**

Giving managers growth and development experiences is essential to firm productivity (Cappelli 2008). However, all experiences are not created equal. Some experiences provide managers with specific tools to carry out job responsibilities within the organization. An employer seeking to develop their managers in this way might invest in advanced training courses that update a skill set. For a manufacturing firm, this might come in the form of a series of short workshops or continuing education courses that focus on a specific skill.

Other experiences give the manager an opportunity to be exposed to other contexts in the organization or to extend their intellectual boundaries outside the organization. Employers who choose to develop their managers in this way might create a rotation opportunity in different

departments of the company. They might also leverage graduate or executive education programs to broaden the employee's knowledge base. These two divergent experiences expand the organization's capabilities in different ways. The former is for near-term gain, while the latter has more long-term impact. The tactical-focused development may not deepen the manager's network, while the latter exposes the manager to an environment where new networks can be established.

Different experiences generate different types of *T-shaped managers*. One type of T-shaped manager is what we term the *Little T-shaped manager* (LtM). This manager's development opportunities are tactical in nature and closely aligned with the organization's production capabilities. The other type of T-shaped manager we term the *Big T-shaped manager* (BTM). This manager's development experiences extend beyond the boundaries of the manager's skill set and have strategic relevance to the organization. BTMs have tactical depth but also have developed a knowledge base that crosses several functional areas. Organizations invest in employee development experiences based on the short-term and long-term needs. This research can inform organizations as they allocate resources for development in an effort to impact short- and long-term objectives.

## **4.4 Organizational Impact Decisions**

### **4.4.1 Short-Term Versus Long-Term Needs**

One way to frame the various experiences is by understanding how the experience influences the organization. Some experiences are closely aligned with organizational practices and functions. Experiences that are aligned with the means of accomplishing specific tasks are

*tactical experiences* (Ackoff 1974; Choi and Behling 1997). *Tactical experiences* build closely on what a manager already knows about their particular function. If an organization is focused on near-term productivity, it may require its employees have additional training on a production process. They may also be trained on how to identify factors that impede progress. A professional development event would target a specific experience to increase employee capabilities that are necessary to increase organizational performance. These experiences strengthen the vertical expertise of the T-shaped manager, however, the lateral exposure is limited. Through my findings, I posit that LtMs are created through these types of experiences.

While there is near-term benefit to *tactical experience*, these experiences may not provide the long-term capabilities required to sustain an organization. Where *tactical experiences* are the means, *strategic experiences* are the ends (Ackoff 1974). *Strategic experiences* are those experiences that place the employee further outside of their functional expertise. A certain number of individuals within organizations must focus on the trajectory of the business (Argenti, Howell, and Beck 2005). In order to do this, managers need to not only look inward but also look outward (March 1991; O'Reilly and Tushman 2013). There are instances where managers need to be placed far outside of their comfort zone. Uncomfortable development experiences hone capabilities that are necessary for the manager to potentially influence the trajectory of the organization. The experiences gained by operating in an unfamiliar environment provide the foundation for operating in ambiguity later. Where closely aligned experiences create LtM, fringe experiences develops BTMs.

The two different experiences are provided to the employee because of a decision by the firm to invest in its labor force (Sagie and Koslowsky 1994). The investment decisions are tradeoffs between developmental experiences that emphasize tactical expertise or developmental

experiences that stretch employees by placing them in situations outside of their particular expertise with the desired outcome of a more collaborative and strategic individual. This research classifies the investment tradeoffs between near-term *tactical experience* and experiences that could influence long-term organizational trajectory—*strategic experiences*.

#### **4.4.2 Exposure Needs**

We can further classify experiences by examining the impact of those that are gained inside the organization versus outside of an organization. This distinction is important because it acknowledges the multiple opportunities within an organization that when provided, enhance effectiveness and productivity. The distinction here also highlights the differences in gains achieved through external experiences. We can easily apply these classifications across different types of organizations. For example, a manufacturing firm develops employees through a series of opportunities. One opportunity may involve an apprenticeship with another manager, while another may involve certification at a local college. The former I would classify as an in-the-organization, while the latter is an out-of-the-organization experience. In this study, I refer to inside the organization as meaning inside of the Army and outside of the organization as meaning outside of the Army. This distinction is important because there are a number of experiences that organizations can leverage to extend the horizontal portion of the “T.” However, those experiences that are truly transformational normally occur when an employee is forced outside of his comfort zone. For example, when an Army officer is selected for a Senior Service Fellowship at Harvard, instead of attending the Army War College, that officer is completely separated from work environment norms. The officer is required to adapt to an environment where she is the only person with recent military experience. The officer must develop soft skills

to engage with colleague, while at the same time learning how to develop meaningful professional relationships with individuals who may have little understanding of the culture of the military.

Prior work found that there is a premium placed on CEOs who are generalists (Custodio, Ferreira, and Matos 2013). However, organizations cannot sustain themselves if all employees are purely generalists. Therefore, an additional aspect to consider, is how experiences contribute to the further development of specialist versus generalist. There are certain experiences that can further develop these two types of desired employees in organizations. For example, the executive education opportunity discussed earlier contributes to the development of a more generalist employee. An employee who prepares and takes the exam to be certified as a public accountant is nurturing specialist attributes. The specialist engages in more task-oriented activities, while the generalist must be familiar with the initial task but also have general familiarity with tasks in other departments as well.

The T-shaped managers or leaders are created when the organization develops an employee in specific ways. The framework discussed is illustrated in Figure 4.4. Briefly, I classify manager development as follows, utilizing the United States Army as the organizational context. First, BTM (specialist) can be defined as transactional leaders because the organization develops this leader in the tactical/out of the Army quadrant. Second, the BTM (generalist) is defined as an adaptive leader because the organization develops this leader in the strategic/out of organizational quadrant. Third, the LtM (specialist) is defined as an operational leader because the development experiences are in the tactical/in the Army quadrant. Finally, the LtM (generalist) can be defined as a cross-functional leader because they have a strategic orientation that lies in the strategic/in the Army quadrant.

## 4.5 Organizational Setting

To further explore the idea of the T-shaped managers, I chose to use a setting known for developing leaders—the U.S. Army. It is the perfect setting to explore this because (1) it has a clear developmental model for its employees, (2) it requires continuous professional development opportunities, (3) it is a large organization whose human resource practices has been replicated, and (4) it is in the process of personnel reduction that reveals whether an adequate pipeline of future leaders exists.

Maintaining a large Army force comes at a significant expense to a country. Nevertheless, it has been considered a necessary burden for nations to bear. The key to maintaining a ready military force is developing talented and capable leaders. The nations that maintain extensive militaries have acknowledged this need since the dawn of warfare. Yet today, the U.S. Army stands to lose critical combat leadership skills and experience in its officer corps as the organization is forced to downsize with the conclusion of missions in Iraq and eventually Afghanistan. The nation must address how the American military can retain the best officers to lead the future force in the face of such a massive drawdown. By implementing best business practices and lessons learned by the Department of Defense (DOD) following the major conflicts of the last century, the military is developing policies and mechanisms that better assess, retain, and employ its most talented officers. Drawing on lessons learned in over the past century, these policies are being shaped in an attempt to retain innovative leaders for the future force. In this section, we examine the Army officer development model. We seek to understand how the Army officer model influences the development experiences of Army officers. We also explore how these development experiences impact the organization's leadership capabilities.



#### **4.5.1 The Scope of the Problem**

The United States has been at war in two separate theaters for almost ten consecutive years. The Army, in particular, was required to rapidly expand to address the pressing need for combat forces. Prior to the events of 9/11, the U.S. Army's personnel end strength was just over 480,000 soldiers with approximately thirty-two active duty combat brigades. During the war years, the force structure grew to over 570,000 soldiers with forty-five active duty combat brigades. The former Secretary of Defense, the Honorable Robert Gates, supported by the Chief of Staff of the Army (CSA), stated that in 2014 the Army would begin a deliberate reduction in personnel to pre-9/11 levels. More recently, the current Secretary of Defense, the Honorable Chuck Hagel, accelerated this force structure reduction due to budget concerns incurred from sequestration. The Army will immediately decrease to 450,000 in the near future with the possibility of a further manpower decrease to 420,000. This would make for the smallest standing U.S. Army since before World War II. The CSA has stressed that the largest concern is ensuring the Army retains its most talented officers for future service as senior leaders. This concern has merit.

Following Operation Desert Shield/Desert Storm in 1991, the Army conducted a reduction in forces that deactivated eight of eighteen divisional units in less than four years—equating to over 220,000 soldiers. Yet, the reduction in manpower was not the problem; it was the loss of the talented officers who exited the Army before arriving at their full potential.

Maintaining a professional, well-trained, all-volunteer force is essential to national security. The United States is able to extend its military reach across the globe, which is a capability that separates it from every other country in the world. The power of the U.S. military lies in its manpower. After each major conflict in the twentieth century, however, the reduction

of the military manpower component has been too severe, according to historical analysis. The country faces a difficult decision as we conclude a decade of war. We must weigh current security and domestic needs against future national strategic requirements. Nevertheless, the U.S. Army has plans to reduce its personnel end-strength by over 50,000 personnel by fiscal year 2014 and over 120,000 by the end of 2015. It is essential that a responsible drawdown occurs, and military leaders need to be focused on properly assessing their human capital. This research posits that the military can draw insights from the corporate sector.

In order to prevent the Army from making a similar mistake, one that has been made repeatedly over the last century following periods of conflict, this work can provide insights for the development of personnel policies. This study offers support for talent development through deliberate alignment of officer experiences. The study discovers pathways for creating little “t” shaped managers (LtM) and big “T” shaped managers (BTM).

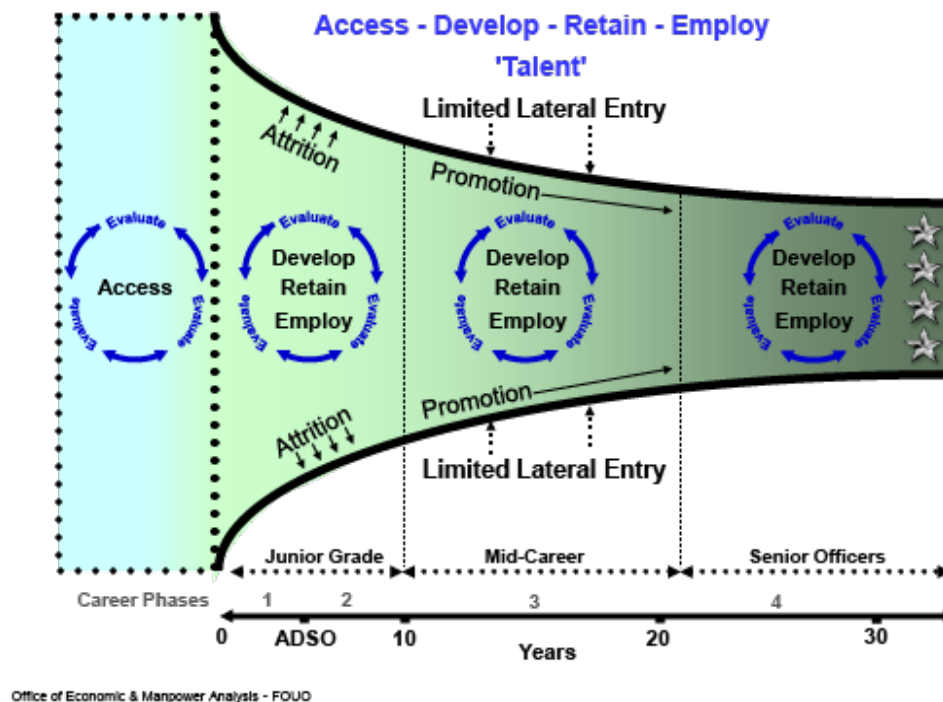
There is increasing recognition that although force reduction is important, retaining the right individuals is even more important. Unlike previous force reductions, the military does not want to divest itself of high-performing officers who are the future general officers and senior leaders. The military is making a conscious effort to develop and retain its talent, as the next section highlights personnel management.

#### **4.5.2 Personnel Model**

The Army personnel system is similar to a pyramid. The organization has a large requirement for junior leaders and less of a requirement for more senior leaders. The organization is rank-based, which means that it is hierarchal and at each level there is voluntary and involuntary attrition. Voluntary attrition occurs when soldiers leave after completing their

service obligation. Involuntary attrition occurs when soldiers are separated by the organization due to inadequate performance or if not selected for promotion. In the midst of natural attrition at each level, development, training, and retention of high-performing officers must continue to occur. See Figure 4.2.

**Figure 4.2: Army Officer Career Model**



*Note:* Adapted from “Senior Officer Talent Management: Fostering Institutional Adaptability,” by M.J. Colarusso and D.S. Lyle, 2014, *Strategic Studies Institute and U.S. Army War College Press*, p. 34.

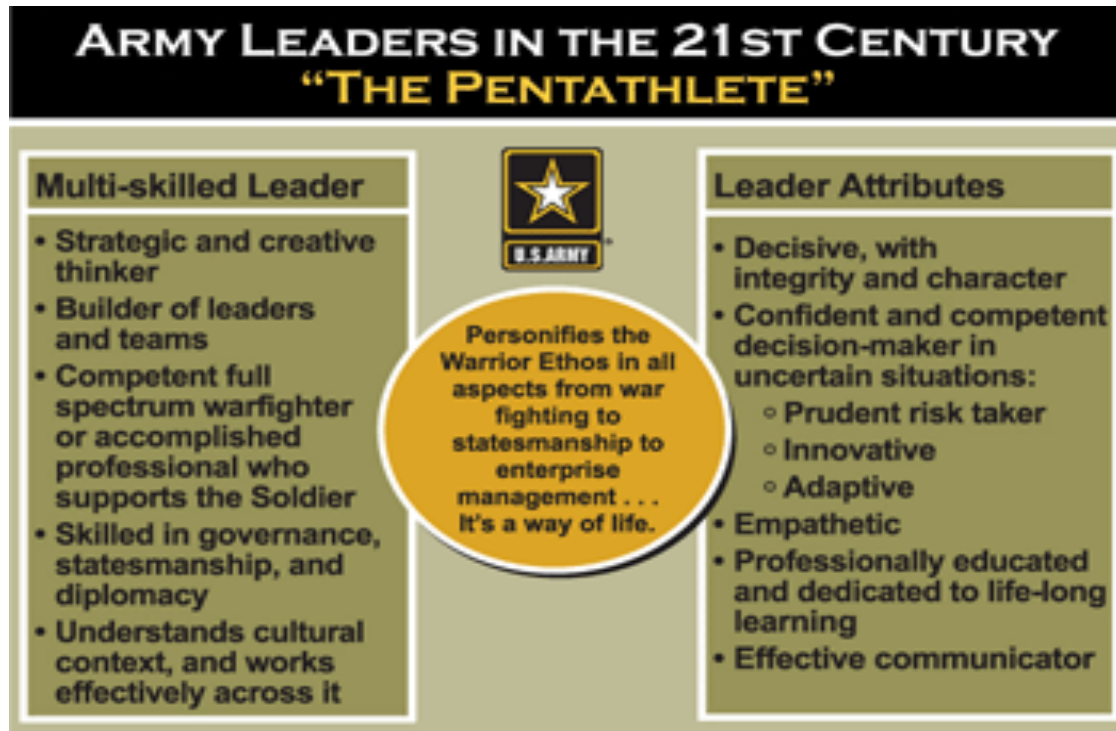
The primary differences between the Army system and the civilian sector are first, the system does not allow entry at different ranks. This means that every officer begins at the base of the pyramid. Second, the Army invests significant time and energy on leader development because it must generate senior leaders whose potential may not be realized for twenty years.

The leader development model is referred to in the Army as the Army Officer

Development Model and is codified in Department of the Army Pamphlet (DA PAM) 600-3: Commissioned Officer Professional Development and Career Management (Army 2014). The regulation details metrics and time gates required by the Army to progress within the organization.

Over the past fifteen years, the Army has focused on developing its leaders. General Pete Schoomaker, who was brought out of retirement to become Chief of Staff of the Army in 2003, recognized that officer experiences is essential to organizational effectiveness in the near and long term. An imprint that was made on the Army by General David Petraeus was the idea of the “pentathlete,” as shown in Figure 4.3. The pentathlete was described as a strategic and creative thinker able to operate in ambiguity.

Figure 4.3: 21<sup>st</sup> Century Army Leader Development Model



The Army recognized that in order to develop pentathletes, it must take a closer look at the development experiences an officer receives during a career. The experiences were defined as “broadening experiences.” DA PAM 600-3 defines broadening as follows:

Broadening is the purposeful expansion of an individual’s capabilities and understanding provided through opportunities internal and external to the Army throughout their career that are gained through experiences in different organizational cultures and environments, resulting in a leader skilled in sustainment from the tactical through strategic levels in multiple environments. The essence of broadening is to challenge the officer mentally in situations well outside their comfort zone and force them to apply critical thinking to complex problems. (Army 2014).

These assignment opportunities exist at each rank from Captain (O-3) through Colonel (O-6). They can be as short as a three-month leadership program at a civilian university or as long as a thirty-six-month graduate or post-graduate studies program. Broadening experiences provide officers the opportunity to develop capabilities for organizational success.

The Army considers broadening experiences as binary events—either an officer has had one or he has not. There is little consideration given to the variance in experiences. Because all officers are considered to be tactical experts in a functional area (the vertical portion of the T-shape), the broadening experience allows the officer to develop his horizontal portion of the T capabilities. The current Chief of Staff of the Army General Raymond Odierno’s primary initiative is the development of “Adaptive Army Leaders for a Complex World” (Odierno 2013). This highlights the need to manage talent and broaden leaders through experiences more carefully.

## **4.6 Data and Methods**

### **4.6.1 Data Collection**

To understand how organizations determine which experiences result in the development of the capabilities of T-shaped managers, I gathered data from sources within the U.S. Army (Yin 1994). From the spring of 2014 to the spring of 2015, I conducted field research. I interviewed military officers and senior government civilians. Due to my affiliation as an officer in the U.S. Army, with appropriate clearances, I was allowed access to the organization. Data collection included face-to-face interviews with the military officers and civilians and additional supporting documents and artifacts from the organization. I recorded and transcribed all interviews and made extensive handwritten notes. The variation in research sources helps to triangulate perception outside and within the organization. This process also increased validity and “provided for multiple measures of the same phenomenon” (Yin 1994).

I conducted interviews with a convenience sample of thirty people. Because I am a military

officer with more than eighteen years of service, I possess an in-depth knowledge of the organizational norms. As an insider, I had an unusual level of access to individuals for this exploratory research. The interviews ranged from thirty-five to ninety minutes. The participants' military service ranged from ten to thirty-seven years of service. Fifteen of the participants are mid-career, while the other half are senior leaders within the military.

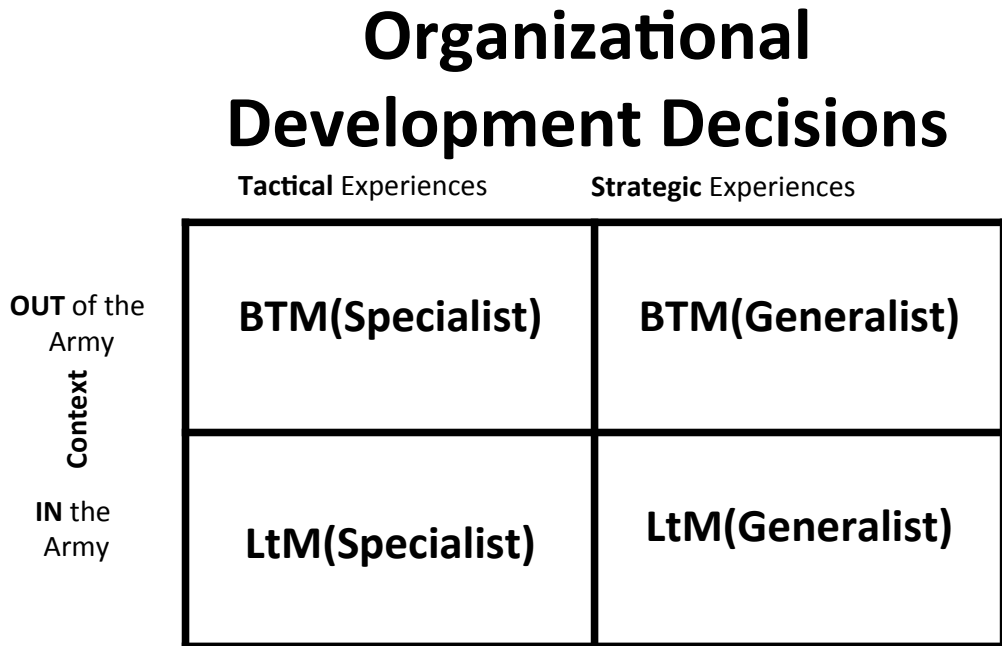
#### **4.6.2 Data Analysis**

I conducted data analysis in four stages in order to classify Army leaders in terms of their broadening experiences (*strategic* versus *tactical*). The first stage involved open coding to establish dimensions on which I could compare the Army leaders. With the first nineteen interviews, I engaged in line-by-line coding to identify key concepts (Strauss and Corbin 1997). Next I grouped these concepts into themes. Several interesting themes began to emerge in the early phase of research, including the consensus among those interviewed at how broadening in the Army was defined, and in addition, how broadening experiences differed and contributed to leader development. In short, there were perceptions that there was a contradiction between what kind of leaders were needed in the senior ranks and who was actually promoted. I divided all phase one interviews into meaningful units and coded them using the phase one coding scheme. Next, I coded passages in the remaining eleven interviews with the goal of elaborating the dimensions upon which I could compare the Army leaders. In addition to the major theme that “all broadening is not the same,” another theme that also emerged was “timing of the experience in the officer development timeline.” The emergence of this second theme prompted me to look more closely for examples and potential consequences of the categories selected (Strauss and Corbin 1997).

In stage two, I leveraged an open-source web-based qualitative research software, Dedoose, in order to apply my emerging coding scheme to all interviews, which meant I divided the interviews into meaningful units for analysis. Each unit or passage could be assigned up to twenty-four codes, and almost all units were assigned multiple codes. I coded by (a) determining the maximum number of codes to assign to each unit, (b) adding the maximum numbers for all units to determine the total number of codes, and (c) counting the number of codes per interview. The final step involved sorting units by major code categories. In the final step of stage two, the dimensions for comparing different Army leaders based on their different broadening experiences arose as follows: tactical versus strategic; in the Army versus out of the Army; specialist versus generalist; and task versus environment. Examples include officer developmental and trajectory concerns, timing of broadening, and utilization of officers post broadening. Since it was clear from my data that a specialist can be defined as an individual who is an expert at a particular task, which is more in line with the tactical versus strategic requirements of the job, I then grouped the tactical, specialist, and task dimensions together to make this relationship clear. In addition, I also grouped strategic, generalist, and environment dimensions together to account for the idea that strategic experiences in my data are experiences that place individuals in an environmental change and a generalist has the ability to operate in multiple environments that expect him or her to think “outside the box.” From this detailed analysis, I was ultimately able to develop four provisional categories: BTM (specialist) versus BTM (generalist) and LtM (specialist) versus LtM (generalist). See Figure 4.4a.

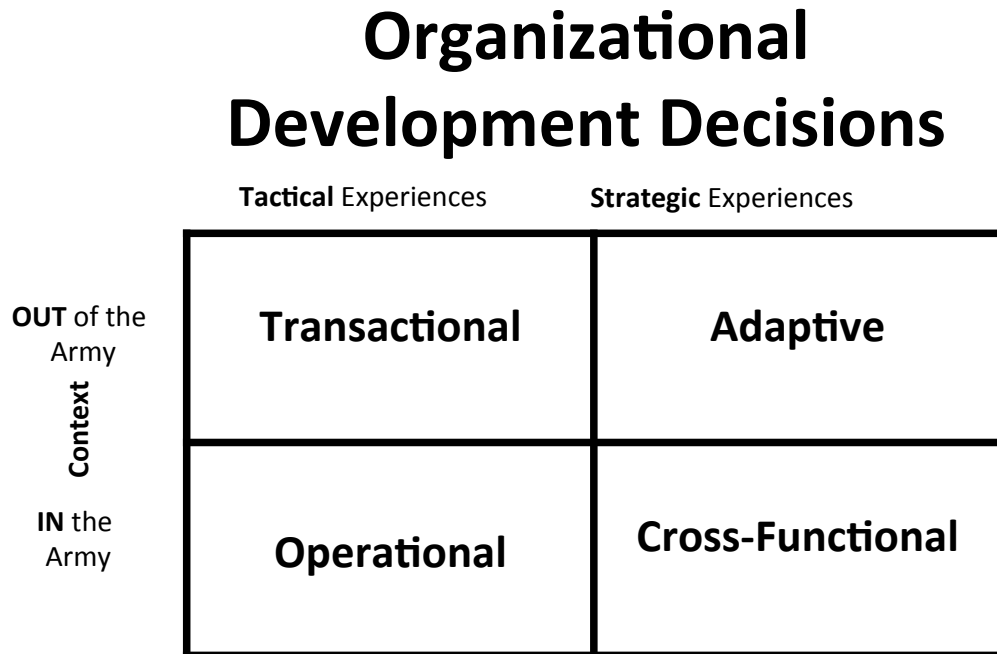


Figure 4.4a: Framework for T-Shaped Manager Development



In stage three, I reevaluated and renamed each provisional category in order to classify Army leaders into different “types” based on their broadening experiences: *transactional*; *adaptive*; *operational*; and *cross-functional*. See Figure 4.4b.

**Figure 4.4b: T-Shaped Manager Classification**



In stage four, I collected and coded experiences of 345 active duty Army senior leaders to explore the connection to broadening experiences and senior leader trajectory. I then calculated the total number of broadening experiences to focus on descriptive statistics. Next, I further identified total broadening by rank, commissioning source, branch, year group, gender, and race.

## **4.7 Findings**

### **4.7.1 Interviews**

Due to the exploratory nature of this research, I did not begin with any prior hypotheses. Familiarity with the literature on T-shaped management led me to believe that organizations promote the most innovative and collaborative employees within the available pool of employees (Hansen and Von Oetinger 2001; Hansen and Nohria 2005). I discovered, instead, that most employees actually experience the opposite. Those I interviewed perceived that although

deviating from the prescribed path through broadening assignments is beneficial, it can also be detrimental to a high-performing officer's career trajectory if the officer is perceived to have had an extended experience away from the tactical operations of the Army. They described the direct tension between the leadership attributes required for organizational success and the attributes of those who are selected for future promotion to the highest level of leadership. These were not directly aligned outcomes. As one participant noted, the organization is "rewarding deep tactical experience when hoping for strategic critical thinkers."

I found that all respondents closely defined broadening the same: "Broadening experiences are jobs, positions, or opportunities outside the traditional Army or military force that help an officer understand how other government or private support entities work to enable national security efforts." This was evidence that the idea of broadening experiences are ingrained in the Army's organizational culture. The organization either is extremely proficient at marketing broadening experiences or what is defined now is an organizational artifact that has been reinvented to fit the present day requirements. As noted by one participant, "When I grew up in the Army it was called a nominative assignment. A nominative assignment was defined as something that took you out of the mainstream Army and out of your comfort zone within your base branch and was designed to get you to think differently about how you did problem-solving." These comments also encouraged further exploration to determine whether certain broadening experiences were recognized as enhancing or derailing a career trajectory. This led me to believe that the organization decides based on specific needs how it will create the T-shaped managers, BTMs or LtMs. Some excerpts from the interviews are illustrated in Table 4.1 and Table 4.2. Based on the interviews, I offer these propositions about how broadening experiences facilitate the development of LtMs and BTMs:

*Proposition 1: In order to generate LtMs, an organization needs to offer a manager more tactical broadening experiences, thus allowing for the further development of depth.*

*Proposition 2: In order to generate BTMs, an organization needs to offer a manager more strategic broadening experiences, thus developing strategic critical thinkers.*

*Proposition 3: Less broadening experiences are required when individuals are in less ambiguous environments where the work and expected outcomes are predictable.*

*Proposition 4: More broadening experiences are required when individuals are in more ambiguous environments and need to be more innovative.*

**Table 4.1: Interview Excerpts**

Theme	Representative Quotations
<b>How Experiences Matter</b>	
<b>Broadening Experiences</b>	<p>“So broadening from the perspective of what the Army specifically is trying to ensure that leaders have specific experiences that are outside of the normal combat land power expertise.” (Future Brigade Commander)</p> <p>“Well, I think it’s broadening in that it exposes you to not just knowledge that you wouldn’t get otherwise because I mean knowledge has some value but it usually isn’t that transferrable.” (Staff Officer)</p> <p>“The Army senior leadership has designed a series of opportunities, experiences, education, and training for that matter that will create an officer leader who is agile and adaptive based on the velocity of instability across the globe and the fact that we can’t in the current contemporary operating environment identify the threat [is] very different from the Army I joined where, you know, it was very clear who the enemy was and we trained accordingly.” (Senior Staff Officer)</p>
<b>Tactical Experiences</b>	<p>“I would offer being an observer controller at the Joint Training Center is not broadening.” (Senior Staff Officer)</p> <p>“So, what I noticed is that guys that were products of Army ILE coupled with just their tactical experiences had a much larger learning curve than I did.” (Staff Officer)</p> <p>“Being a Combat Training Center observer controller would make you a better S3 (operations officer) or battalion commander. There’s no doubt about it.” (Executive Officer)</p>
<b>Strategic Experiences</b>	<p>“Well, as an organization, if you look at the recent trends of officers selected for brigadier generals, it will show you that officers who attended fellowships tend to do better.” (Senior Staff Officer)</p> <p>“When I was young, I worked for the Secretary of Veterans Affairs, and I thought for the most part I was going to be his handler, I was going to kind of help him as a special assistant. I remember one day I put a speech together for him to go out to Stanford to speak to a group of 500 doctors, nurses, and lawyers on biomedical ethics, how do you decide who to care for and who not to based on the medicine, the priorities and those. so I wrote his remarks.” (Senior Leader)</p> <p>“I work in the Office of the Chief Legislative Liaison right now. This is one where we really get to peel back the onion and see the legislative process but also get to see how things work in the Pentagon, because it’s a very, very different world here and understanding the Army staff is just as important as understanding how things work on the hill.” (Staff Officer)</p>

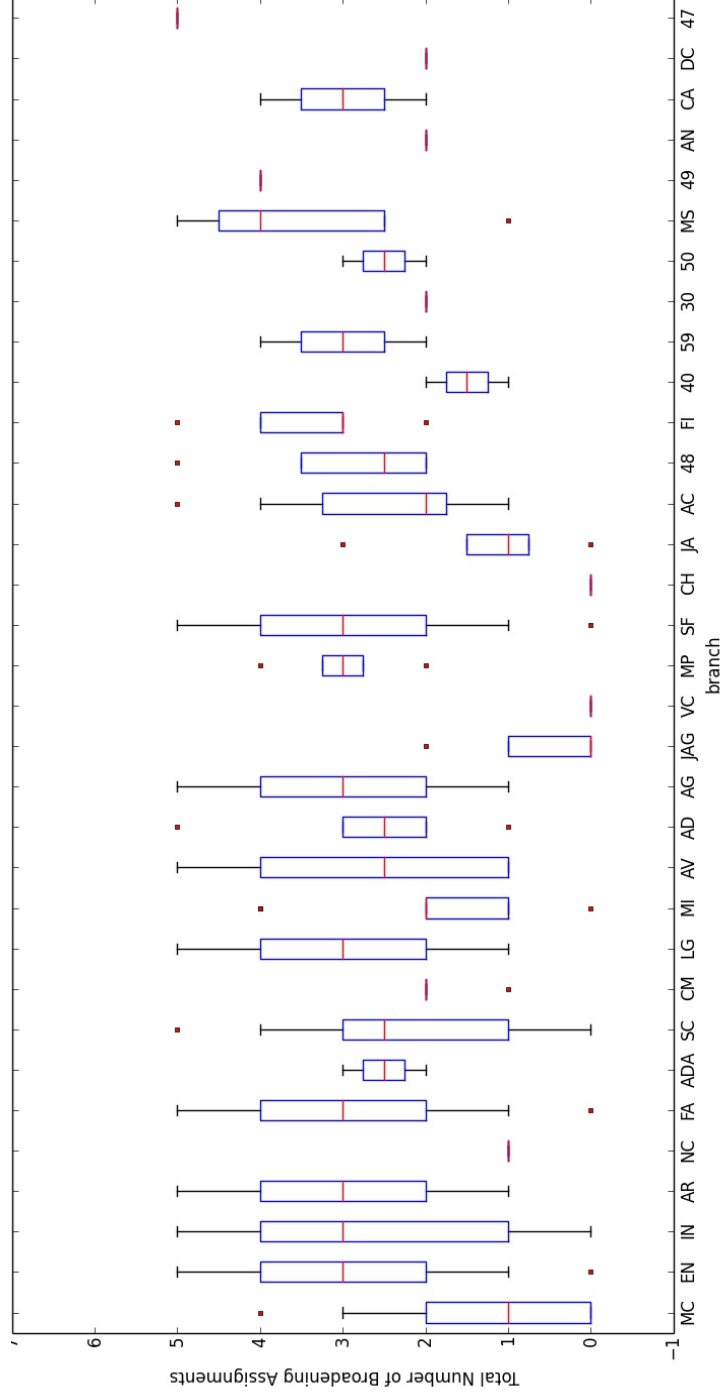
**Table 4.2: Additional Interview Excerpts**

Theme	Representative Quotations
<b>How Experiences Matter</b>	
<b>Adaptive</b>	<p>“I mean if I had an assignment in the White House working next to high-level execs or the president himself I’m probably going to learn a lot more. Although I would learn a lot in an Army headquarters, still, senior people there (in the White House, etc.) are different...clearly there’re different assignments that will give you more opportunities to improve your leadership skills out of this, to make you more aware of other things outside of your comfort zone.” (Mid-Grade Staff Officer)</p> <p>“Let’s say you have mastered the principles of being a company commander. So now let’s see if you can similarly master the planning programming budgeting system. And then if you can, then now we exclusively got a guy who can be a senior leader.” (Future Brigade Commander)</p>
<b>Operational</b>	<p>“It (being and observer controller) gives you greater experiences at the tactical level than you would otherwise have, which is going to be helpful to you, but I don’t think it helps you to become an agile, adaptive leader because you are not in the crucible, you are an observer controller, so conditions play out before you that are then able to help advise, assist your counterparts.” (Senior Staff Officer)</p> <p>“I think if the Army stays the way it is you play it safe going either route. If a young officer says I just want to be tactical or go be an OC, odds are he’s going to be a great S3, a brigade S3, and become a battalion commander.” (Former Executive Assistant)</p>
<b>Cross-Functional</b>	<p>“The Army senior leadership has designed a series of opportunities, experiences, education, and training for that matter that will create an officer leader who is agile and adaptive based on the velocity of instability across the globe and the fact that we can’t in the current contemporary operating environment identify the threat, very different from the Army I joined where you know, it was very clear who the enemy was and we trained accordingly.” (Senior Staff Officer)</p> <p>“I worked for the Department of the Army Inspector General, so definitely a different job than anything aviation related.” (Staff Officer)</p>
<b>Transactional</b>	<p>“So for instance, recruiting command, is absolutely an important job that we need captains and majors to do. But it’s not going to teach them how to think at the strategic level. But it’s going to teach them how to critically think differently and assess differently.” (Future Battalion Commander)</p> <p>“(ROTC)... there’s a little more to it because I mean you’re, for all intents and purposes, a faculty member of a university and there’s a little bit more to it, I would say, but there’s a lot of similarity.” (Current Executive Assistant)</p>

#### **4.7.2 Senior Leaders**

Historically, most of the Army's senior leadership have come from specific career fields. These career fields include the Operations Branches: Infantry, Armor, Field Artillery, Aviation, and Engineers. Figure 4.5 illustrates my results.

**Figure 4.5: Total Broadening by Individual Branch**



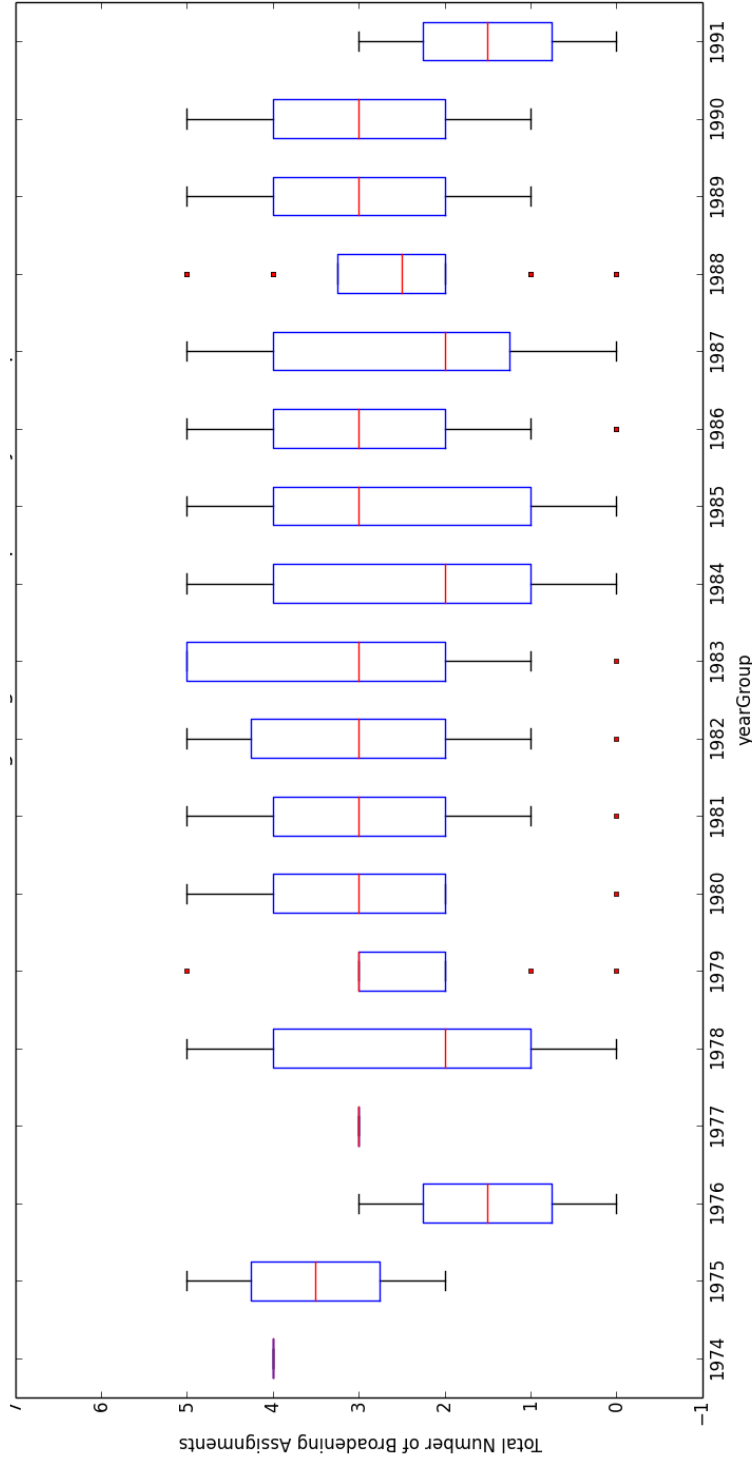
*Note:* This chart describes the average number of broadening experiences by individual branch. The red line indicates the median for the individual branch. The upper quartile is the top portion of the box. The lower bound excluding outliers is denoted by the attached line. The lower quartile is the bottom portion of the box. The upper bound excluding outliers is denoted by the attached line. The unattached dots are outliers. The Infantry (IN), Armor (AR), Field Artillery (FA), and Engineers (EN) have similar median values, while Aviation (AV) is lower. Also of note is the existence of Infantry (IN) officers with no broadening experience but who were selected to senior levels.



All Operations branches except Aviation have a median broadening assignment of three prior to being selected for general officer. Aviation has a median of two. The lower median for Aviation can be explained by the Aviation officer's unique career requirement upon entering active duty. The Aviation officer is required to complete eighteen to twenty-four months of flight training prior to arriving at their first duty assignment. It is also of note, that an officer can be in the Infantry, have no broadening experiences, and still be promoted to general officer.

The Army career model is based on the date of commissioning, or entering active duty. Figure 4.6 illustrates the total number of broadening experiences by year group (year of commissioning). I would expect that officers commissioned in the late 1980s would have less broadening experiences. Those officers reached mid-career status at the start of the second Iraq War. Most of these officers have been required to deploy multiple times, which limits their availability for additional broadening. Of note, someone commissioned in 1976 and an officer commissioned in 1991 have the same median broadening experience of one or none.

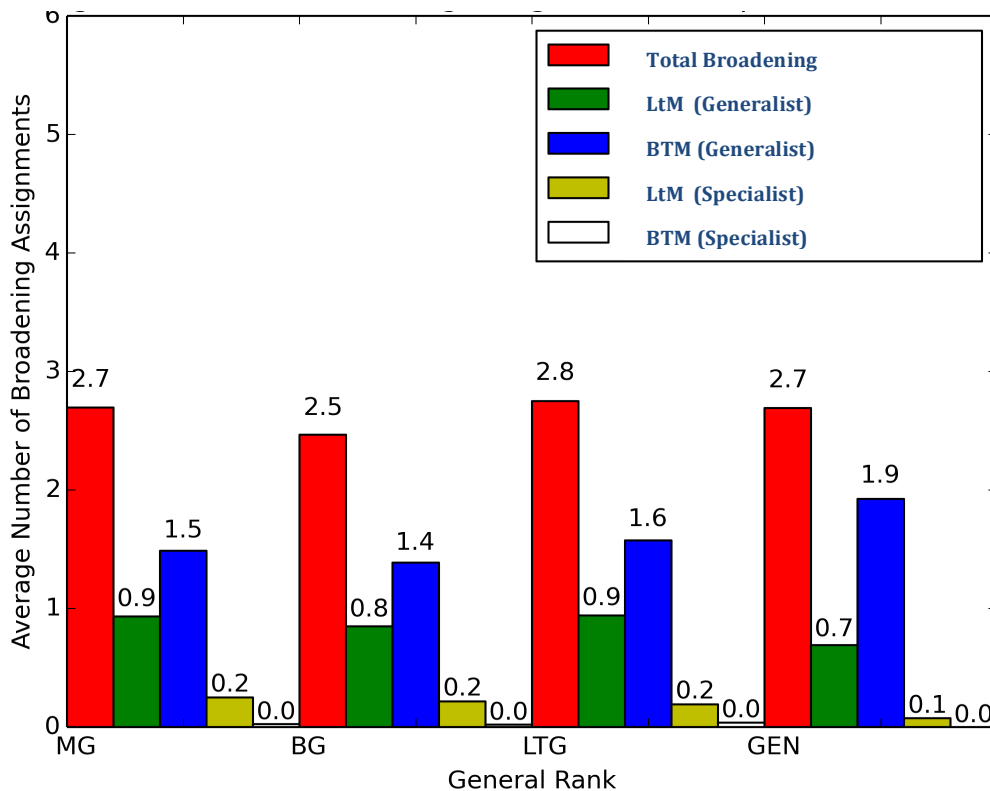
**Figure 4.6: Total Broadening by Year Group**



*Note:* This chart describes the average number of broadening experiences by individual year group (YG) (or date of commissioning). The red line indicates the median for the individual branch. The upper quartile is the top portion of the box. The upper bound excluding outliers is denoted by the attached line. The lower quartile is the bottom portion of the box. The lower bound excluding outliers is denoted by the attached line. The unattached dots are outliers. A comparison between YG 1976 and YG 1991 is of interest because it illustrates the similarity between those who lead the organization selection and those with similar backgrounds.

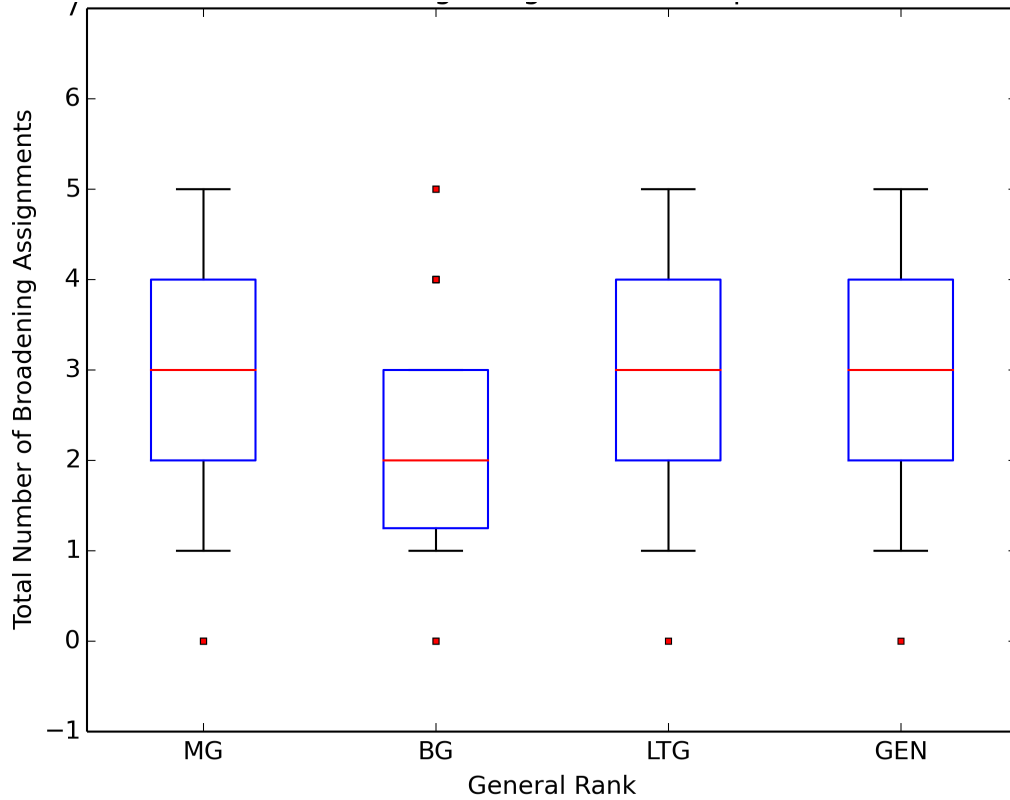
Figures 4.7 and 4.8 illustrate the different types of broadening experiences. As expected, the average number of broadening experiences is higher for senior leaders than junior leaders. What is important to highlight is the large variance between General (GEN) strategic broadening out of the Army of an average of 1.9 experiences versus Brigadier General (BG) with an average broadening of 1.4. This suggests that there may be a need for more developmental assignments to ensure that those selected for senior billets are equipped for success.

**Figure 4.7: Average Broadening by Rank**



*Note:* The X-axis represents the rank, specifically of the senior leader. The Y-axis represents the average number of broadening assignments. The red bar represents the average total number of broadening experiences. The green bar represents the average number of strategic in organizational broadening experiences. The blue bar represents the average number of strategic out organizational broadening experiences. The gold bar represents the average number of tactical in organizational broadening experiences. The white bar represents the average number of tactical out organizational broadening experiences. The largest difference is between the General (GEN) strategic out of organizational experience of 1.9 and the Brigadier General (BG) strategic out of organizational experience of 1.4.

**Figure 4.8: Total Broadening by Rank**



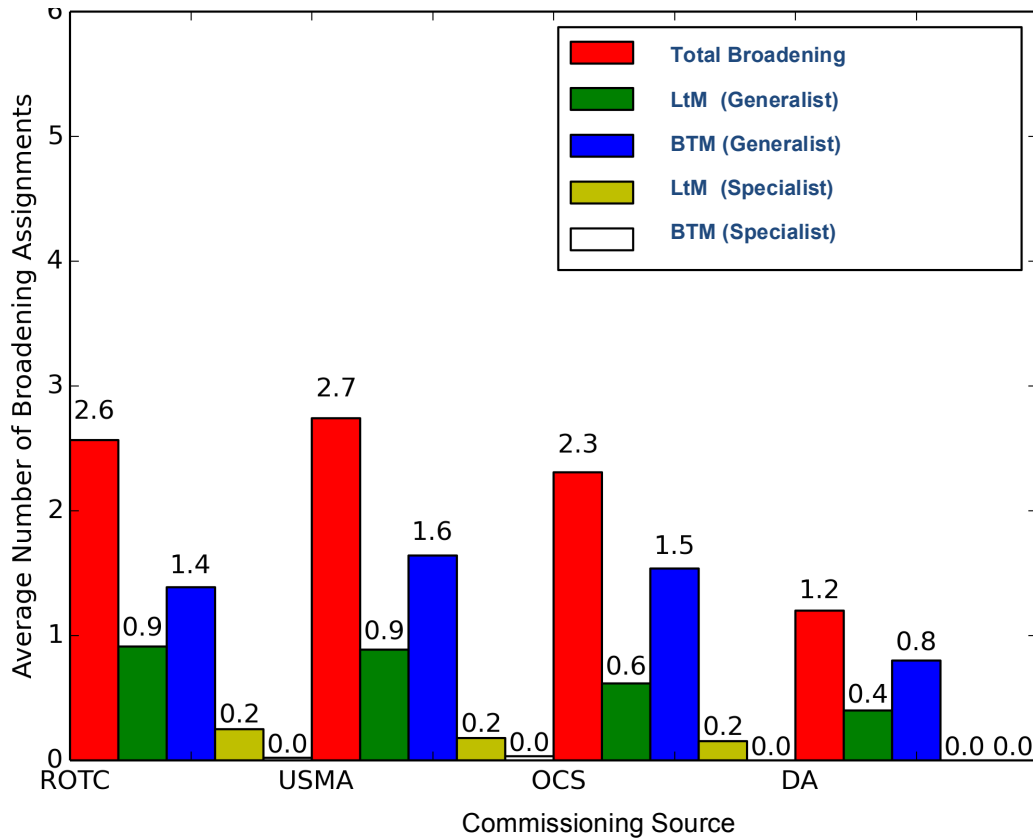
*Note:* This chart describes the average number of broadening experiences by rank. The red line indicates the median for the individual branch. The upper quartile is the top portion of the box. The upper bound excluding outliers is denoted by the attached line. The lower quartile is the bottom portion of the box. The lower bound excluding outliers is denoted by the attached line. The unattached dots are outliers.

In Figure 4.9 and 4.10, I take a detailed look at the commissioning source of those in the sample. There are four ways a person enters the Army as an officer: the Reserve Officer Training Corps (ROTC), the United States Military Academy (USMA) at West Point, the Officer Candidate School (OCS), and direct commission (DA). An individual commissioned from USMA has, on average, more broadening experiences with an average of 2.7. Students who attend West Point are exposed to other officers who have had more strategic broadening

experiences than the other commissioning sources. This could contribute to the student's future considerations. The other commissioning sources—ROTC, OCS, and DA—do not have the same density of military officers. Based on this data, I offer the following proposition on the relationship between commissioning source and broadening experiences:

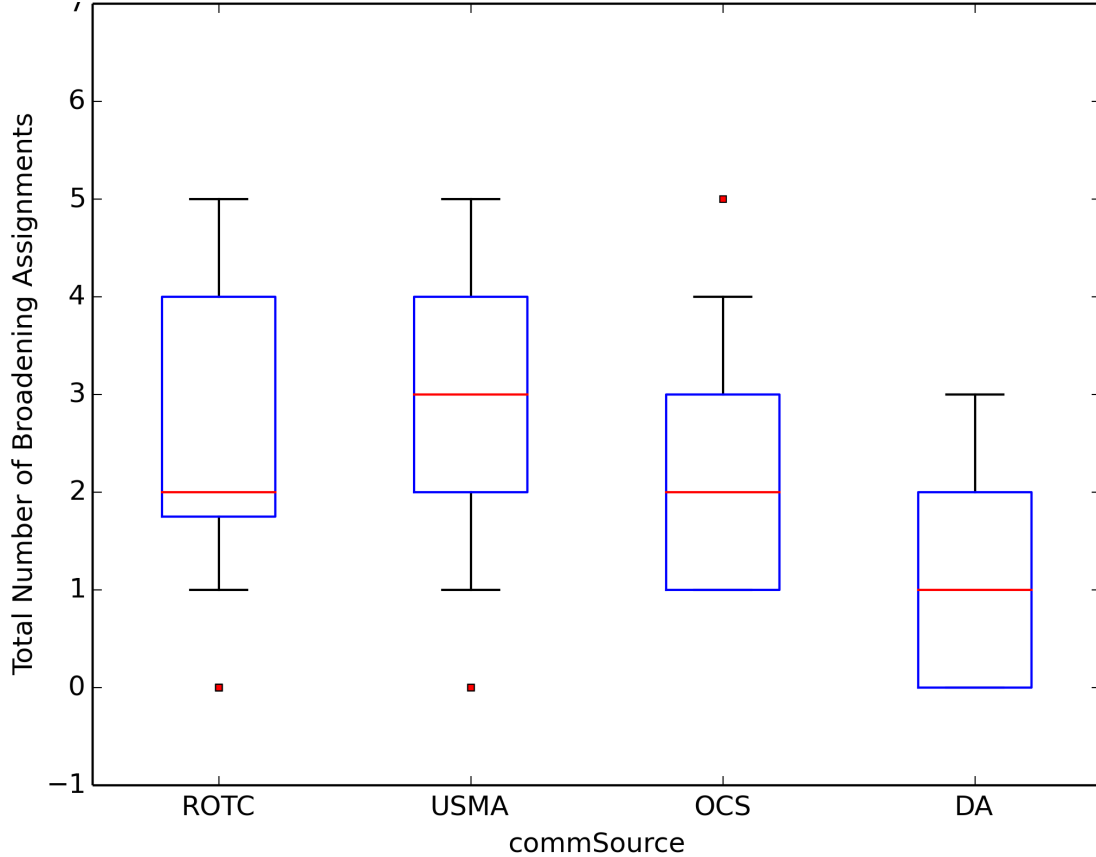
*Proposition 5: The commissioning source influences the type of broadening experiences individuals pursue. Students are exposed to role models at each source. These role models influence student's future decisions.*

**Figure 4.9: Average Broadening by Commissioning Source**



*Note:* The X-axis represents the commissioning source, the way in which one enters the Army. The Y-axis represents the average number of broadening assignments. The red bar represents the average total number of broadening experiences. The green bar represents the average number of strategic in organizational broadening experiences. The blue bar represents the average number of strategic out organizational broadening experiences. The gold bar represents the average number of tactical in organizational broadening experiences. The white bar represents the average number of tactical out organizational broadening experiences. The largest difference is that those who are commissioned from the United States Military Academy (USMA) have more broadening experiences.

**Figure 4.10: Total Broadening by Commissioning Source**



*Note:* This chart describes the average number of broadening experiences by commissioning source. The red line indicates the median for the individual branch. The upper quartile is the top portion of the box. The upper bound excluding outliers is denoted by the attached line. The lower quartile is the bottom portion of the box. The lower bound excluding outliers is denoted by the attached line. The unattached dots are outliers.

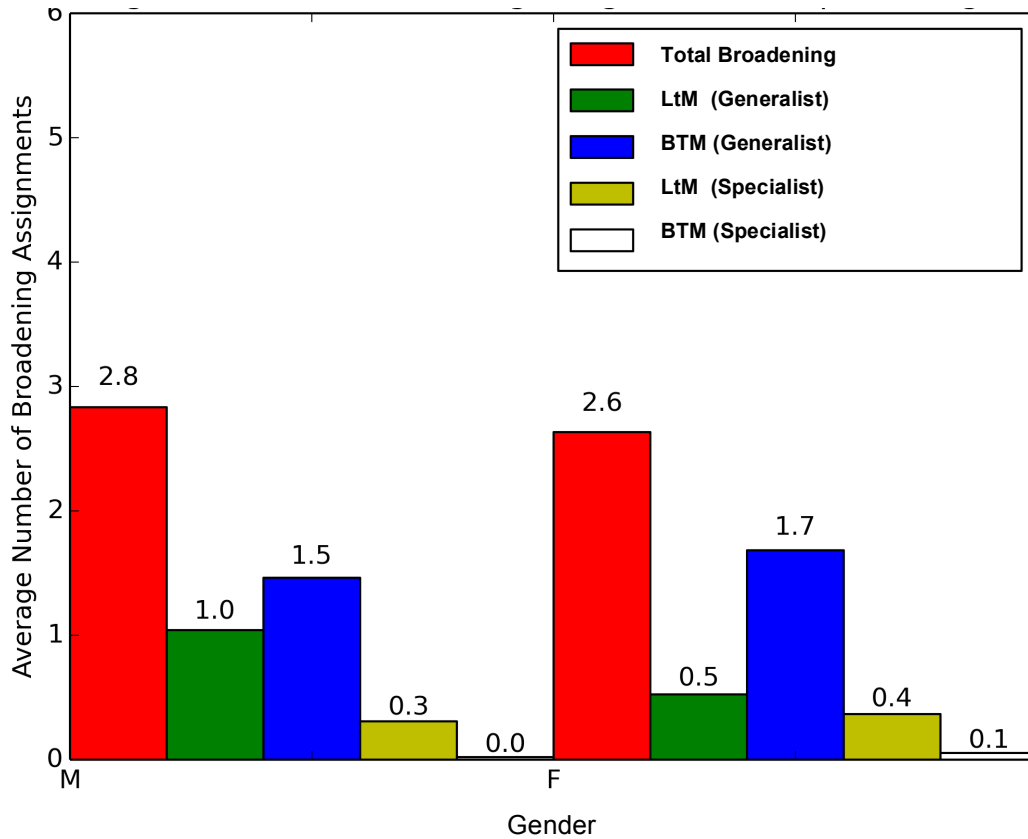
Figures 4.11 through 4.14 provide an overview of gender and race. In an organization with no lateral entry, it is essential to gain an understanding of what factors may contribute to developing the desired senior leader. Specifically, these figures illustrate that there is little difference in the average number of broadening experiences by gender (i.e., median of three). Yet, Figures 4.13 to 4.14 reveal differences in the average number of broadening experiences when the sample is segmented by race. Figure 4.13 reveals that African-American officers have an average of 3.2 broadening experiences while white officers have an average of 2.8 broadening

experiences. At first glance, this may suggest that if broadening experiences are considered as a factor of promotion, African-American officers have more of an advantage over white officers. However, there is an absence of African-American diversity at the most senior levels in the Army. Figure 4.14 reveals that African-American officers have a median of four broadening experiences, whereas white officers have a median of three. Yet, in some cases, white officers can be selected to senior-level positions without having any broadening experiences. This could suggest that African-American officers need to have a broader base of experiences to be considered for selection to the senior levels of the Army. Ultimately, the African-American officer may need to be a “Bigger” BTM (generalists) or become much more adaptive, which further highlights the importance broadening experiences may play in officer trajectory.

*Proposition 6: The timing and type of broadening opportunities influences career trajectory. If the opportunity happens early, then there is the potential to apply the lessons from the experience to multiple future assignments and cause the individual to have a broader network and extensive reputation. This strengthens the officer’s network and prospects for promotion*

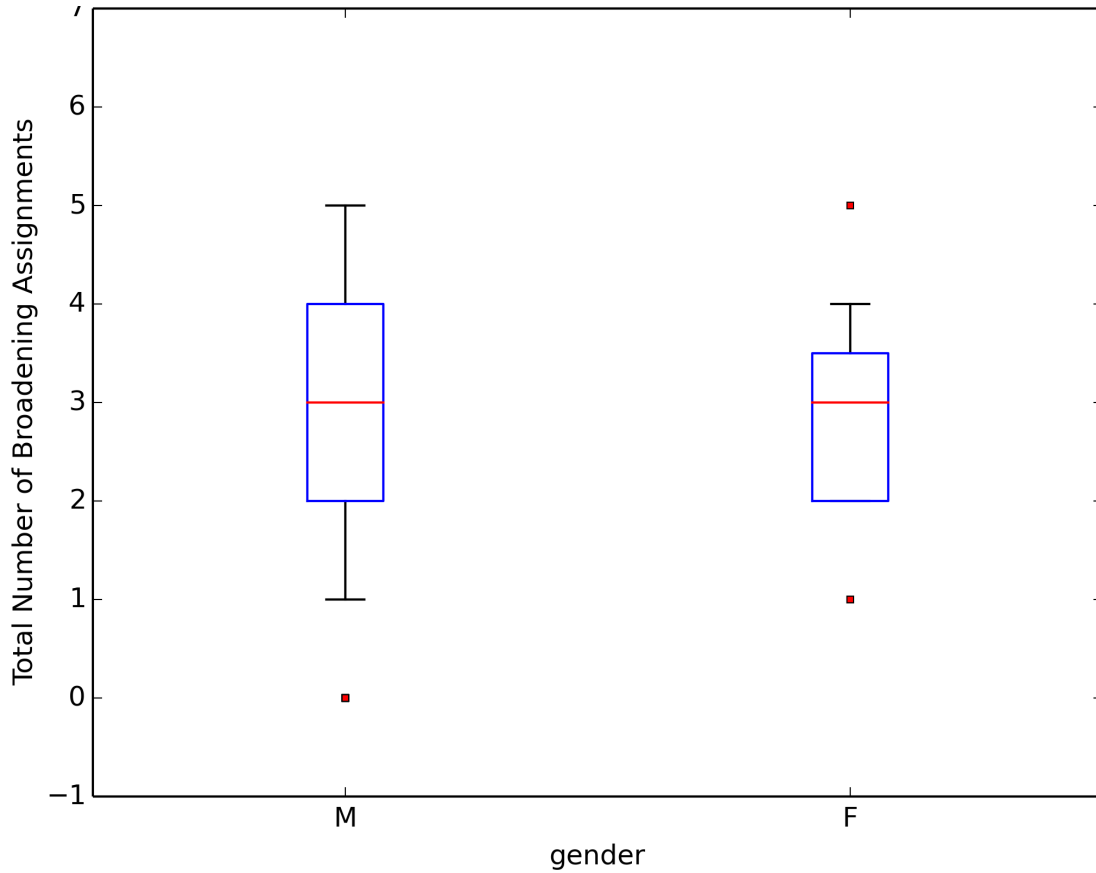


**Figure 4.11: Average Broadening by Gender**



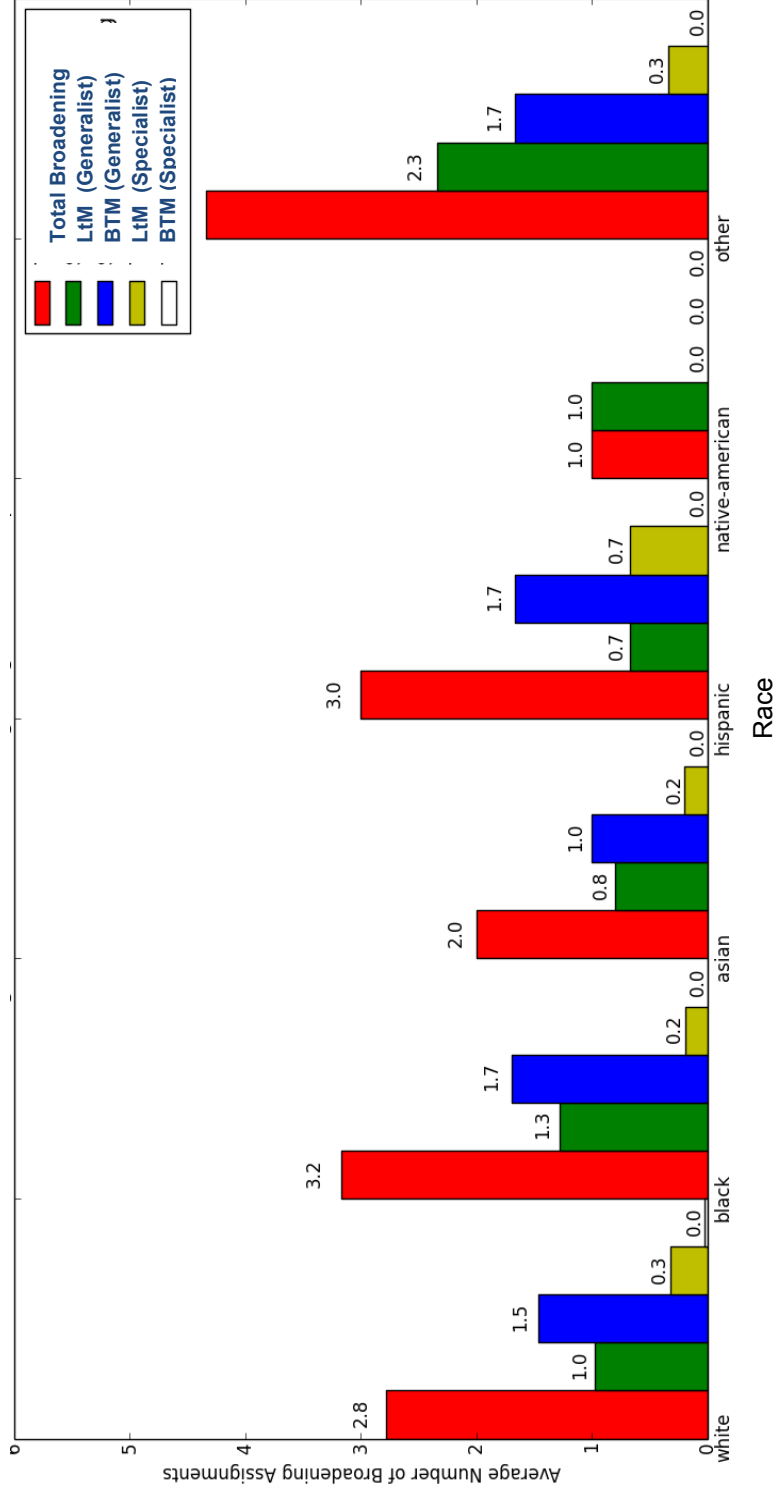
*Note:* The X-axis represents the gender. The Y-axis represents the average number of broadening assignments. The red bar represents the average total number of broadening experiences. The green bar represents the average number of strategic in organizational broadening experiences. The blue bar represents the average number of strategic out organizational broadening experiences. The gold bar represents the average number of tactical in organizational broadening experiences. The white bar represents the average number of tactical out organizational broadening experiences.

**Figure 4.12: Total Broadening by Gender**



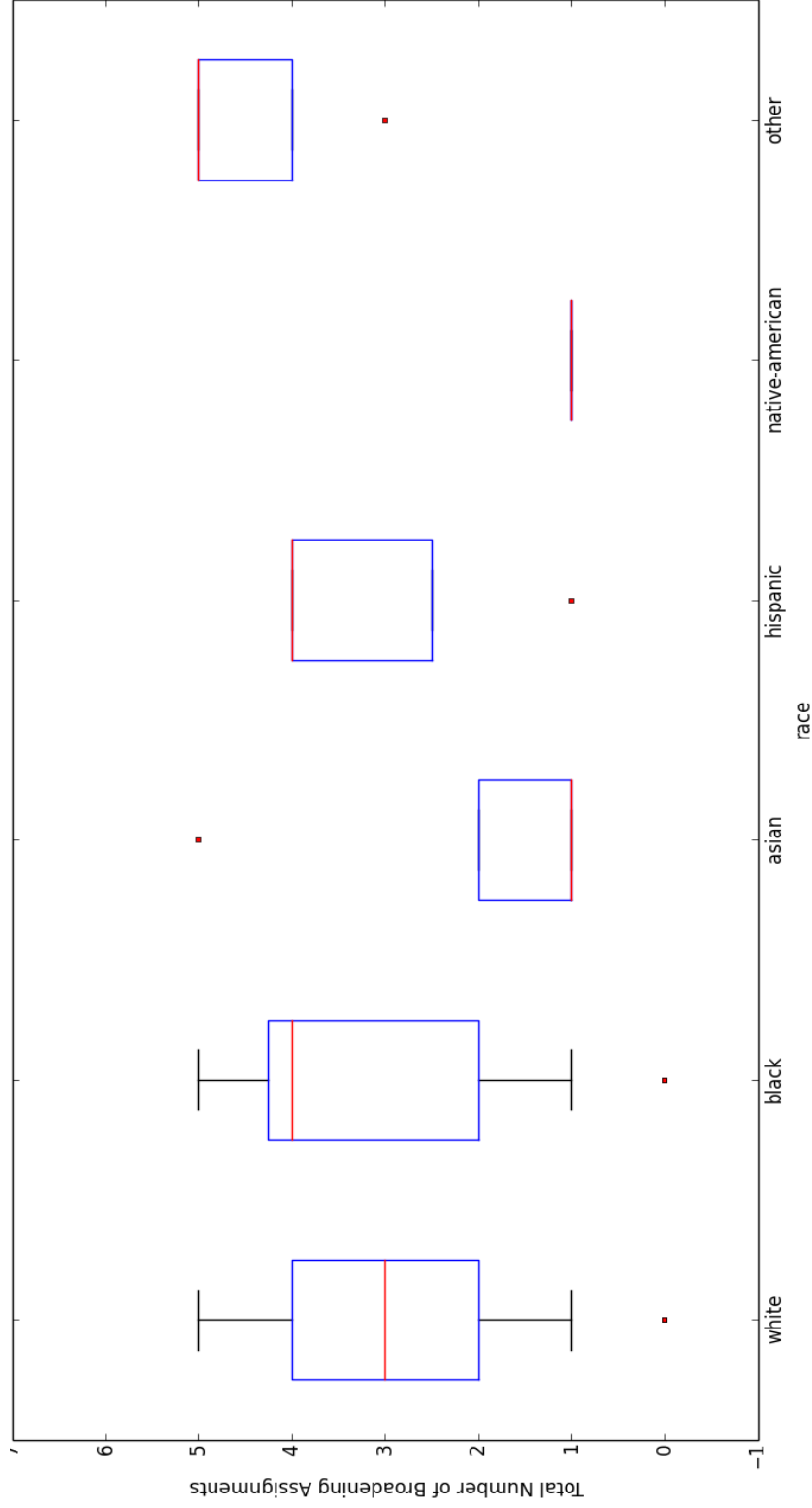
*Note:* This chart describes the average number of broadening experiences by gender. The red line indicates the median for the individual branch. The upper quartile is the top portion of the box. The upper bound excluding outliers is denoted by the attached line. The lower quartile is the bottom portion of the box. The lower bound excluding outliers is denoted by the attached line. The unattached dots are outliers.

**Figure 4.13: Average Broadening by Race**



*Note:* The X-axis represents the race of an individual. The Y-axis represents the average number of broadening assignments. The red bar represents the average total number of broadening experiences. The green bar represents the average number of strategic in organizational broadening experiences. The blue bar represents the average number of strategic out organizational broadening experiences. The gold bar represents the average number of tactical in organizational broadening experiences. The white bar represents the average number of tactical out organizational broadening experiences. The largest difference is that those who are African-American have the most broadening experiences.

**Figure 4.14: Total Broadening by Race**



*Note:* This chart describes the average number of broadening experiences by race. The red line indicates the median for the individual branch. The upper quartile is the top portion of the box. The upper bound excluding outliers is denoted by the attached line. The lower quartile is the bottom portion of the box. The lower bound excluding outliers is denoted by the attached line. The unattached dots are outliers.

## 4.8 Discussion and Conclusion

Leaders in the twenty-first century must be more innovative and collaborative if an organization is to remain competitive. This means that organizations cannot solely manage through traditional succession planning, but they must be more deliberate in providing opportunities that develop specific capabilities in the management pool in order to have the pipeline of T-shaped managers it needs. Using interviews and additional data, I develop a framework for defining broadening experiences. I further explore the variance in T-shaped managers and the experiences needed to create LtMs and BTMs. I conclude with a discussion of how T-shaped managers influence organizations.

In the context of my setting, I find that respondents believe deeply that broadening experiences are very different and develop very different capabilities. For example, if a signal corps officer leaves his unit to take an assignment in the Office of the Chief of Legislative Liaison in Washington, D.C., the officer has the opportunity to expand his core competency and learn how vital communication occurs across government divisions. This exposure opens the officer's aperture and better prepares him to work with other military and non-military personnel. It also helps him understand how the Army's assets are best leveraged to accomplish national security objectives. Additionally, the data highlights that the majority of senior leaders need at least three broadening experiences to be considered for senior positions.

Although the Army is the primary setting for exploration, the development of T-shape managers is not isolated to the Army. It is an issue in the corporate sector as well. When there are prosperous times there are normally no issues allocating resources for employee development. However, when a recession arises, the investment in human capital decreases. Organizational talent management decisions contribute to whether the right pipeline of T-shaped

managers will exist.

#### **4.8.1 Talent Evaluation and Retention**

Maintaining the brightest people within an organization is not just a military concern—it is the difference between ultimate success and failure within any business or profession. As competition within the global market increases, the need for innovative personnel increases. Over the past two decades, organizations have placed a higher value on human capital. One of the concerns in any organization is how to adequately differentiate employees to promote to the future leadership positions in the organization. The metrics used to assess employees' performance and their leadership potential are critical.

The U.S. Army, like all military organizations, uses written evaluations, termed Officer Evaluation Reports (OERs), to assess its officers. The Army uses a series of promotion boards to identify and progress its talent pool with the OERs as the primary tool to highlight talented individuals within the immense Army formation. These OERs are in a narrative format and are considerably subjective. Over the past fifteen years, the OER has undergone multiple revisions to better quantify talent through a myriad of rubrics based on the translation of specific verbiage. Currently no specific metric is used to quantify broadening experiences.

The Army is a large organization working to complete its assigned mission as efficiently as possible. In order to do this, the Army requires exceptional people to ensure success. The private sector is similar; however, the ability to adjust its workforce is what separates the military from the private sector. The military has learned a great deal about personnel management from the private sector. In addition, there has been a definite focus on broadening opportunities over the past decade. The Army believes that this is a key component to developing the capabilities

that are necessary to have a pipeline of T-shaped senior leaders.

#### **4.8.2 Conclusion and Future Research**

A key implication of this paper is the acknowledgement of how the experiences given to employees in an organization translates to desired capabilities that generate the creation of the T-shaped managers needed for sustained success. The research highlights that all T-shaped managers are not created equal even in an organization that invests heavily in professional development. I recognize that in large organizations, like the Army, there is need for different types of T-shaped managers.

Through this exploratory study I identified other opportunities for future research. First, an empirical analysis on the relationship between individual experiences, development decisions, and individual work behavior would be useful. Second, an organization should determine the optimal mix of T-shaped managers based on desired firm outcomes. This would have immediate managerial implications. Finally, future research should consider how the timing of broadening experiences influences career trajectory.

If we consider the evolution of talent management, we understand that T-shaped manager development will become more common in organizations. More research in this space will contribute to the study of human capital management and strategic human resource management. Corporations can gain insight from the Army's efforts to better assess, retain, and develop its most talented officers. Although the methods used by the U.S. Army cannot be directly applied within the private sector, the techniques articulated here can be modified to fit a corporation's unique personnel and leadership structure.

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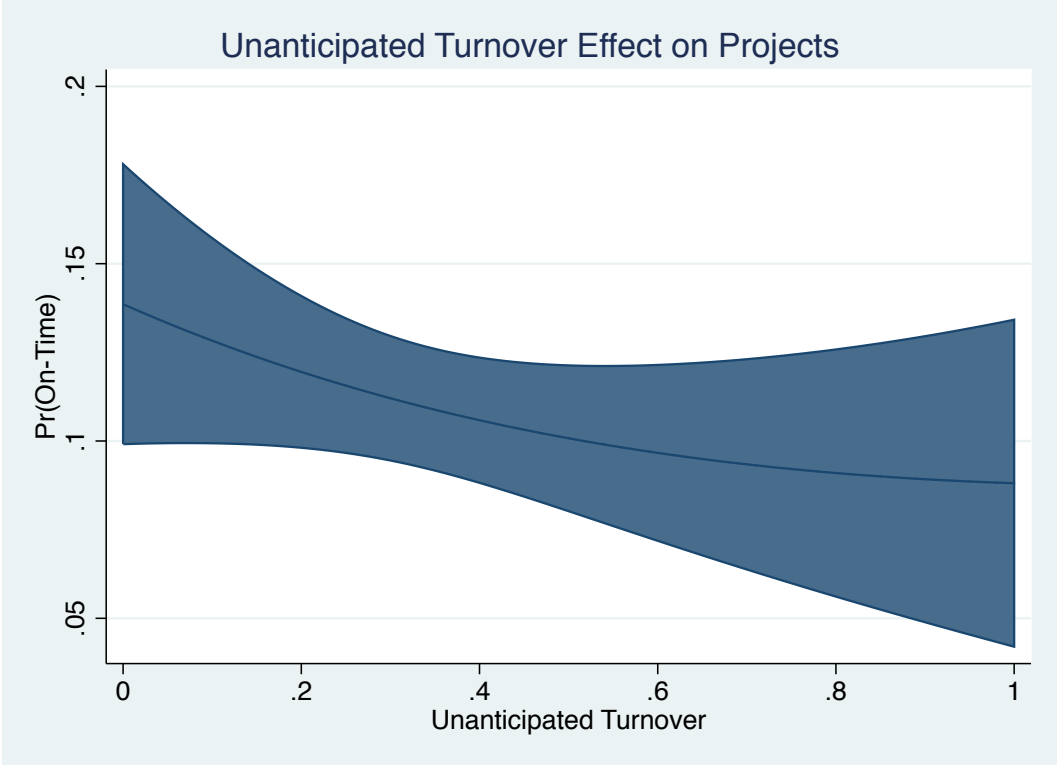
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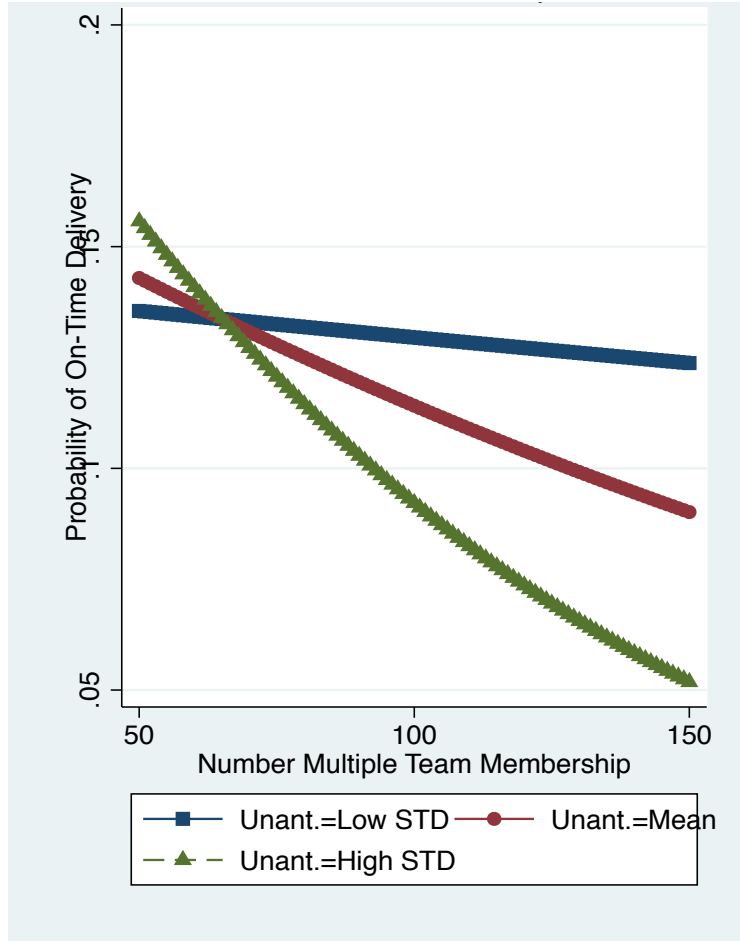
Appendix

Figure 2.3: Unanticipated Turnover Influences Outcomes



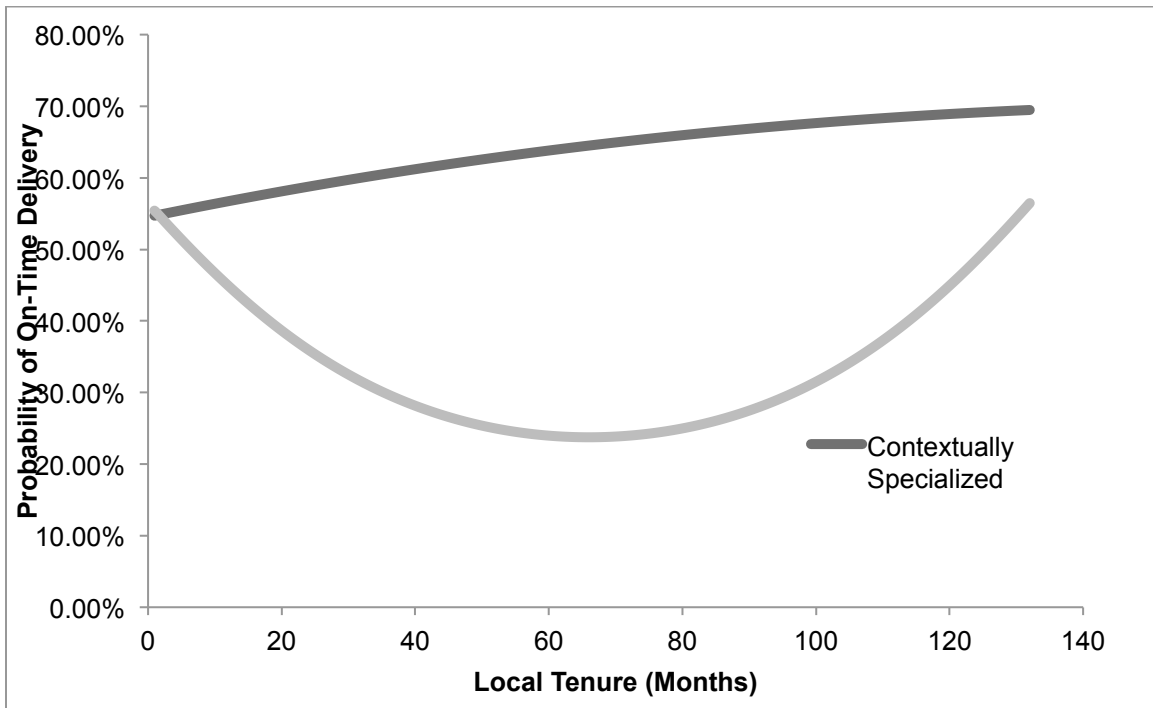


**Figure 2.4: Interaction of MTM and Unanticipated Turnover**



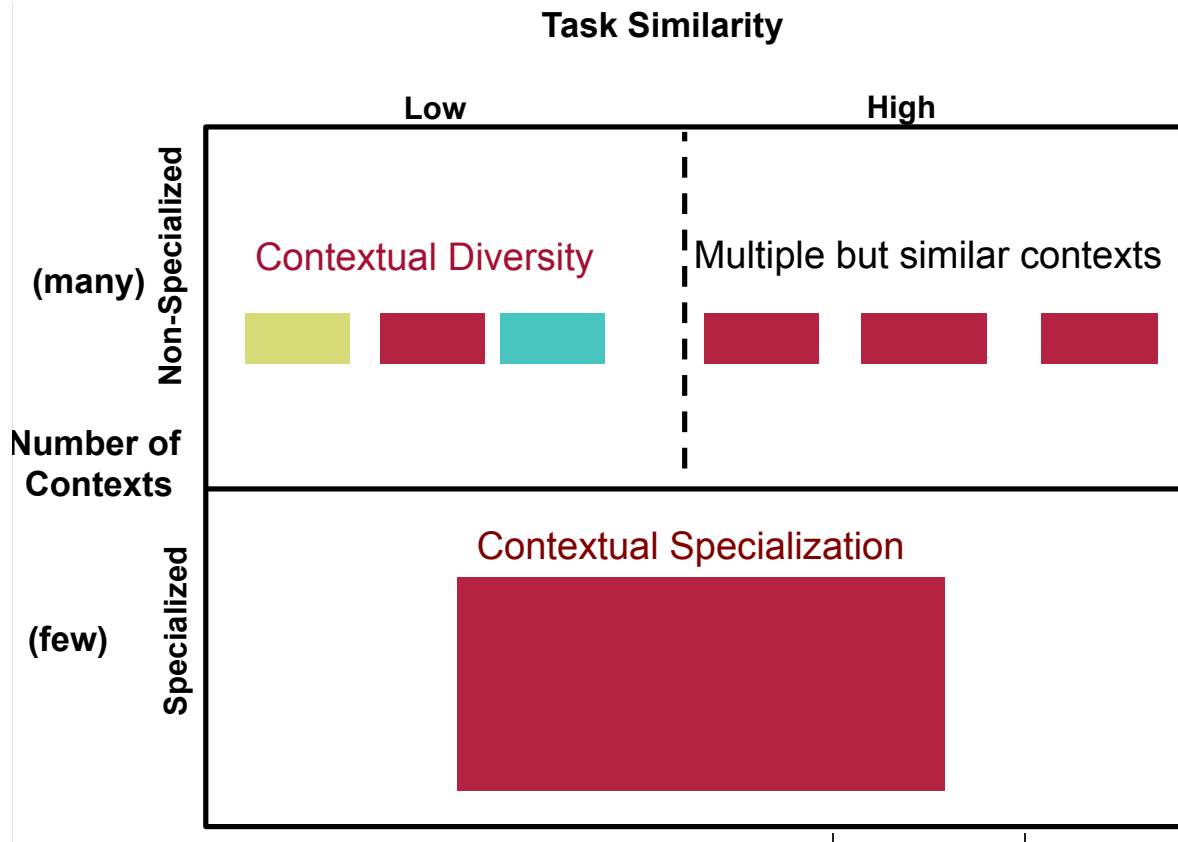
*Note:* This figure illustrates the negative moderating effect of unanticipated turnover on the relationship between MTM and On-Time delivery. The *red line* is the main effect of these interactions. We observe the distinct differences in the slopes where unanticipated turnover has a steeper negative slope than anticipated turnover's effect on the relationship to MTM and On-Time delivery. If there is an increase in unanticipated turnover and anticipated turnover by one standard deviation (*the green line*) the negative slope of unanticipated turnover is even more pronounced.

**Figure 3.1: The Tradeoff Between Contextual Specialization and Contextual Non-Specialization for On-Time Performance**



*Notes:* The marginal benefit of experience for contextually specialized employees plateaus, falling below 0.1% per month after 109 months of local experience (9.1 years). The inflection point for contextually non-specialized employees occurs after 66 months (5.5 years) of local tenure. Our model projects that a point of equivalence between contextually specialized and contextually non-specialized employees of 144 months (12 years). However, as displayed above, this projection is unsupported by our data. Maximum local tenure in our sample is 11 years (Table 3.1).

**Figure 3.2: Framework for Contextual Specialization and Contextual Non-Specialization**



*Notes:* Here, we depict how we discuss similarities in context and the number of context. The left portion represents the fewer contextual similarities and the right portion represents very similar context. The top portion represents multiple contexts (non-specialized) and the bottom of the figure represents singular context (specialized)

**Table 3.2: Correlation Table**

	On-Time Delivery	Status	Educ	Local Tenure	Context Special	Context Non-Special	Veteran	High Cost Projects	Task Projects	Turnover
Status	0.011									
Education	0.029	0.246								
Local Tenure	0.022	0.253	0.133							
Contextual Specialization	0.103	-0.116	-0.069	-0.033						
Contextual Non-Specialization	-0.100	0.135	0.068	0.017	-0.956					
Veteran	0.031	-0.056	0.022	-0.041	0.034	-0.010				
High Cost Projects	-0.002	-0.027	-0.007	0.061	-0.027	0.018	-0.016			
Task	0.054	-0.080	-0.004	0.144	0.037	-0.081	-0.089	0.068		
Projects	0.053	-0.082	-0.003	0.144	0.037	-0.081	-0.090	0.068	1.000	
Turnover	-0.134	-0.004	-0.030	-0.012	-0.097	0.096	-0.049	0.002	-0.018	-0.017
Policy Impact	-0.048	0.036	-0.020	0.139	-0.054	0.051	0.015	0.045	-0.045	-0.046

**Table 3.3: Summary Statistics**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Status (GS)</b>	345750	10.12	4.56	1	16
<b>Education</b>	345750	11.83	4.19	1	21
<b>Local Tenure (Years)</b>	345750	4.28	2.91	0	11
<b>Contextual Specialization</b>	345750	0.39	0.39	0	1
<b>Contextual Non-Specialization</b>	345750	0.25	0.26	0	0.60
<b>Veteran</b>	343751	0.25	0.74	0	5
<b>High-Cost Projects</b>	345750	0.92	0.27	0	1
<b>Task</b>	344443	91.18	93.13	1	518
<b>Projects</b>	345750	91.42	93.12	1	518

**Table 3.4: Variable List**

Variable	Overview
<b>On-Time Delivery</b>	(1) A dummy variable of on-time delivery of projects to intended customers.
<b>Status</b>	(2) The general service level (GS).
<b>Education</b>	(3) Employee education level.
<b>Local Tenure</b>	(4) Employee tenure in the Europe District.
<b>Contextual Specialization</b>	(5) The proportion of specialization in context an employee possesses.
<b>Contextual Non-Specialization</b>	(6) The proportion non-specialization in context an employee possesses.
<b>Task*</b>	(7) The magnitude of task engaged in by employees.
<b>High-Cost Projects*</b>	(8) Indicates projects over \$500,000.
<b>Projects*</b>	(9) The number of projects employees are engaged in.
<b>Veterans*</b>	(10) Indicates whether an employee is a Veteran.
<b>Turnover+</b>	(11) Projects that have Turnover.
<b>Policy Impact++</b>	(12) Employees affected by the five-year rule.

\* Control Variables;+ Selection Coefficient; ++Instrumental Variable