Operations management involves optimally deploying firm resources to meet customer demand. In service operations, particularly knowledge-intensive services, the resource to be optimized is most often labor. A dramatic transformation in the delivery of knowledge-intensive services has occurred over the past 25 years, yet traditional operations management models do not address adequately how to structure work in such an environment. Three main factors characterize the transformation. First, as previously closed economies in countries such as India and China opened, global labor markets were flooded with low-priced, high-quality talent. Second, advances in information and communication technologies created the possibility of distributing and collaborating on work globally. Third, scientific progress resulted in a need for increasingly specialized knowledge to solve problems. Together, these factors increased the pace of work fragmentation — (i) the division of tasks into smaller, more focused pieces and (ii) the distribution of each piece to the best source anywhere in the world. While tasks grow increasingly fragmented, they typically still must be integrated into a complete service offering.

Thus, understanding the operational consequences of work fragmentation means investigating performance not only at the organizational-level, but also at the level that the work gets done – individuals and teams. My research discovers key levers to improve knowledge-intensive, service operations in a world of fragmenting work by building and testing empirical models focused on two industries: technology services and healthcare services. In my 11 publications and 9 working papers I identify factors that permit individuals, teams, and organizations to deliver successful operational outcomes. My work examines the understudied role of human behavior in operational improvement, which requires not only grounding my work in operations, but also building on organizational behavior research. Therefore, my research uses archival data and field experiments, for an interdisciplinary perspective that contributes to service, technology, and healthcare operations.

The figure below summarizes my work, noting the setting and the level of analysis. In the remainder of this 6-page statement, I walk through my contributions and discuss future opportunities.
1. Operational Learning and Improvement in Fluid Teams

My first area of contribution is how to improve operational outcomes in fluid teams – teams where individuals work together on a project, then disperse to other projects. My research identifies three levers for fluid team performance: team familiarity, organizational knowledge access, and project estimation. While fluid teams exist in many settings, an archetypal industry is Indian IT services. This industry grew from $300 mm in export revenue in 1993 to over $76 bn in 2011, and would not exist in its present form without the changes discussed above. For the past 7 years I have studied this industry, visiting India over 16 times and interviewing management teams at leading companies, as well as individuals at all levels in their organizations. I have collected multiple archival datasets from one firm. My dissertation on this topic received awards from Academy of Management, INFORMS, and Sloan Industry Studies.

The first lever I identify for improving team performance is team familiarity, individuals’ prior shared work experience. While much of the existing learning literature focuses on benefits that come through the repetition of task, my research alters this paradigm by focusing on the benefits from the repetition of interaction. In “Team Familiarity, Role Experience, & Performance” (w/ Huckman & Upton, Management Science, 2009). We combine data on software projects and team members to examine how changes in composition and structure affect performance. We find team familiarity has a positive relationship with effort, schedule, and quality performance and that role experience, ones’ experience in the role of engineer or manager, is related to improved performance.

The paper “Fluid Tasks and Fluid Teams,” published in Manufacturing & Service Operations Management (w/ Huckman) in 2011, builds from this base to examine how two aspects of fluid teams, team familiarity and diversity, help teams respond flexibly to changing tasks. As prior work highlights the positive and negative effects of experiential diversity, we separately examine intrapersonal team diversity (are individuals on the team more or less specialized) and interpersonal team diversity (similarity in experience across the team). We find that intrapersonal diversity is related to better performance when tasks change, while interpersonal diversity is related to worse performance. Also, team familiarity appears to help teams cope with higher interpersonal diversity and still deliver high performance.

The third paper, “Unpacking Team Familiarity,” was published in Production and Operations Management in 2012. Prior work on team familiarity has focused on whether individuals have worked together, not on which individuals have worked together, and under what conditions. I separate team familiarity by geographic location and members’ roles and find differential performance relationships.

In “Dynamically Integrating Knowledge in Teams: A Resource-Based View of Team Performance,” (w/ Gardner & Gino) published in Academy of Management Journal in 2012, we extend the study of fluid teams outside the of software services. This paper examines a global consulting firm to explore how relational (i.e., team familiarity), experiential, and structural resources affect a team’s ability to integrate
knowledge. We combine perspectives on teams and capabilities to develop a theoretical framework explaining why teams differ in their ability to convert member knowledge and expertise into performance. We find that team familiarity is a key factor in a team successfully integrating its members’ knowledge.

The second lever for improving team performance that I have studied is organizational knowledge access. Teams struggle to identify and access organizational knowledge to complete their tasks. The NSF awarded me a multi-year grant to study virtual teams and knowledge management. In “The Rich Get Richer: Enabling Conditions for Knowledge Use in Work Teams,” (w/ Valentine & Edmondson, R&R, Organization Science), we collected data on software projects, team members, and their use of a knowledge repository (KR). A KR provides access to knowledge for individuals on the periphery of organizational knowledge networks, due to inexperience, location, or lack of social capital. But, for the KR to serve an equalizing role, those on the periphery of the organization must use it. We develop a multi-level model of knowledge use in teams and show that individuals whose experience and position already provide them access to knowledge use a KR more than individuals on the periphery. In “The Team Knowledge Sourcing Paradox,” (w/ Valentine & Edmondson) we examine how the structure of knowledge sourcing (concentrated vs. distributed across team members) affects team performance.

The third lever for improving team operational performance that I have identified is correct project estimation. The competitive survival of many project-based organizations depends on delivering projects on time and within budget; however, actual performance in most industries is poor. In the “The Team Scaling Fallacy,” (w/ Milkman & Fox, OBHP, 2012), we examine a key determinant of successful estimates, team size. We identify reasons why individual estimators may focus on the gains from larger teams while ignoring potential costs. We label this phenomenon the team scaling fallacy: namely, as team size increases, individuals increasingly underestimate the number of labor hours required to complete projects. Two laboratory experiments and archival software data support our hypothesis.

My research has generated insights on team familiarity, knowledge access, and project estimation and offers exciting future directions. For example, I am exploring how familiar teams draw on expertise to solve dynamic problems and when team familiarity can hurt team performance. I will continue to examine determinants of team performance in technology (Wipro & Infosys) and healthcare services (e.g., a new project at Novo Nordisk).

2. Operational Learning and Improvement for Individuals

Individual learning research identifies the important role that task repetition plays in improvement. However not all experience yields equal learning, so my work investigates five dimensions of experience: variety, outcome, customer, firm onboarding and weather.
In three papers I examine the effect of task variety on performance. In “Specialization and Variety in Repetitive Tasks” (w/ Gino) published in Management Science in 2012, we explore how task variety affects worker productivity in a repetitive, procedural task (data entry). We propose that specialization and variety may provide different benefits over time. Using data from a Japanese bank’s loan application-processing line we find that specialization within a day is related to improved performance while variety across days improves productivity. This paper takes operations management in a new direction finding that specialization and variety can be mutually reinforcing strategies.

In my second paper examining variety, “Accumulating a Portfolio of Experience” (w/ KC) forthcoming at M&SOM, we go beyond just dividing experience into focal and related categories, but also consider how sub-tasks, and context (i.e., the organization where the work occurs) affect the variety – performance relationship in cardiac surgery. We find that surgeon focal experience is associated with a greater reduction in patient mortality than surgeon related experience. We also demonstrate that sub-task experience has different, non-linear performance relationships for focal and related experience. Finally, we find that focal experience is more firm-specific than related experience and that non-firm experience reduces the learning rate for both focal and related experience.

In my final paper exploring variety, “Enhancing Ethical Behavior Through Task Variety” (w/ Delfer & Moore, under preparation for 3rd round at Academy of Management Journal) we examine how task variety may lead individuals to make ethical choices. Combining data from the Japanese bank with lab experiments we support this hypothesis and explore the mechanism of enhanced self-control.

Second, I examine how task outcome affects learning. In the cardiac surgery setting, “Learning from my Successes and Others’ Failure” (w/ KC & Gino, 2nd round at Management Science), draws on attribution theory in psychology to investigate how individuals learn from failure and success from their own and others’ experience. Counter to conventional wisdom, but consistent with our theory, we find that individuals learn more from their own successes than from their own failures, while they learn more from the failures of others than they do from others’ successes. We also find that individuals’ prior successes and others’ failures help individuals overcome their inability to learn from their own failures.

Third, I investigate customer experience in “Customer Specificity and Learning,” (w/ Clark & Huckman, 2nd round, Organization Science). The fragmentation of work has shifted organizational boundaries and led to increased outsourcing. One dimension along which output can vary —a dimension with particular relevance in outsourcing—is the end customer. We explore this dimension of experience in outsourced teleradiology where doctors complete radiological reads for hospital customers. We find evidence for individual customer-specificity and that customer variety may increase the rate of learning from customer-specific experience. We also find that organizational customer experience yields learning and it moderates the impact of customer-specific experience at the individual level.
Fourth, experience can come not only from learning-by-doing, but also from the onboarding (joining) experience. In “Breaking Them in or Revealing Their Best,” (w/ Cable & Gino, 2nd round Administrative Science Quarterly) we implemented a field experiment in an Indian call center to explore how the onboarding experience could reduce worker turnover. Drawing on authenticity research, we propose that onboarding leads to more effective employment relationships when it starts with newcomers expressing their individual identities, rather than focusing on enculturating the organization’s identity. Our field experiment and a subsequent laboratory experiment support this hypothesis.

Finally, in “Rainmakers” (under review, w/ Lee & Gino) we examine the effect of weather on productivity. External factors (e.g., weather), affect worker productivity, but have received little attention. Most people believe that bad weather reduces productivity. Drawing on cognitive psychology, we predict the opposite as workers are less distracted by outside options when the weather is bad. Using Japanese bank data and a lab experiment we support our model.

My work examines five dimensions of experience and shows why organizations must manage employee experience profiles. Building the right experience profiles enriches performance and helps organizations build a sustainable competitive advantage. Task allocation models should consider both multiple dimension of experience and their interdependencies. My current work examines how near-misses and expected/unexpected failure affect performance. I am also working to further dimensionalize variety, while examining the interdependencies between experience types and exploring what factors lead to participation in process improvement efforts.

3. Operational Learning and Improvement for Organizations

Creating organizational flexibility is an important, unresolved question in OM, particularly in services. In “Radically Simple IT” (w/ Upton), a 2008 Harvard Business Review (HBR) article, we discuss how firms can create flexible IT systems to respond to change. In “Labor-Mix and Volume Flexibility” (w/ Kesavan & Gilland, 2nd round, Management Science), we examine how a retailer deploys labor to create flexibility for dynamic response. Finally, in “Organizational Structure and Organizational Learning” (w/ Clark & Kuppuswamy) we investigate how principles of organizational design affect flexibility and learning.

My work also finds that lean production principles help build improvable knowledge-intensive service operations. In “Lean Principles, Learning, and Knowledge Work,” in Journal of Operations Management (JOM, with Brunner & Upton) in 2011, we identify how lean transformed the operations of an Indian software services provider. In a forum piece in JOM in 2009, we explore how a lean system

Highlighted Individual-Level Contributions:

**Dimensionalizing experience**
(All individual-level papers)
- I unpack & examine the performance effects of multiple dimensions of task experience

**Task variety**
(Staats & Gino 2012, KC & Staats 2012)
- Specialization and variety are mutually reinforcing strategies.
- Task allocation models must account for this.
channels environmental perturbations into an efficient and effective system. Finally, in “Lean Knowledge Work” (2012 HBR with Upton), we identify six principles to build a lean knowledge organization.

Summary: From the rise of project-based organizations to the specialization of individuals, work fragmentation has changed operations. I have identified ways to improve knowledge-intensive service operations by focusing on individuals, teams, and organizations. To continue this work, I am launching a project to explore impact operations – using operations for economic development. Work fragmentation enables disenfranchised workers to join the global digital supply chain. My prior research informs this setting and the setting offers opportunities to answer new questions.

Teaching Statement

Global Operations Strategy: MBA 709A: To meet a need to offer a course on analyzing manufacturing and service systems I developed a new MBA elective. The course studies how to build competitive advantage through operations and targets students who wish to take an operating role or enter consulting. The class is case-based and integrates my research and teaching cases. For example, the module on lean operations uses my case (“Lean at Wipro”) and HBR article. I integrate my research on learning when I teach front-line process improvement.

Project Management: MBA 710: I took over this course when I joined UNC. I have updated all but one case and created a new module, Leading Global Project Teams, that incorporates my research. The course prepares students to be effective project managers and project team members. The class mixes lectures, cases, and exercises. The course integrates my research on fluid teams and project-based organizations. I teach my own cases on outsourcing and merger integration.

Doctoral education is important to me and I have been actively involved in our PhD program. I have taken part in doctoral admissions and the doctoral comprehensive exam. I served on Vidya Mani’s dissertation committee, I advise Honey Jhala and I also advised a visiting doctoral student. Starting this academic year, I will co-teach an empirical operations doctoral course. I have organized two study courses: a project management doctoral course and a lean operations MBA course.

Service Statement

I have been an active participant in my area. In 2009 and 2012 I co-organized our seminar series. I have taken an active role in faculty recruitment. I served on the planning committee for the Innovating the Global Supply Chain Conference, organizing the outsourcing program. I was the co-chair in 2011 and chair in 2012 for the junior faculty workshop, where I took a leadership role in creating the program.

I review for the leading journals and funding bodies in my field: Management Science, M&SOM, Org Science, POM, Research Policy, Strategic Mgmt Journal, IEEE Trans Eng Mgmt, the NSF and EPSRC. In 2009 I was recognized by Journal of Operations Management as a Best Reviewer and joined their editorial review board. I look forward to expanding my service to the OM area, school, and the university.