

THE SOCIOMATERIALITY OF EXPERTISE:
AN EXPLORATORY STUDY OF TRAUMA SURGEONS

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DEDICATION

Without the support of my wife and two sons, this journey would not have been possible. In various ways they each participated, sacrificed, and consistently demonstrated their unwavering support. For my sons, Colt and Tucker, they sacrificed time with me and time as a family in order to support my goal. This included lost vacations and lost one-on-one time together. Instead of focusing on what was lost, as I may have done at that age, they consistently chose to focus on how we made the best of the time we had. Their support kept me moving forward and their selfless maturity inspired me.

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ABSTRACT

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The importance of knowledge workers and expertise continues to accelerate for both organizations and for economies. In addition, experts are increasingly being tasked with contributing to challenges that span their particular domain of expertise. A contemporary example is the U.S. healthcare industry where physicians are increasingly being asked to serve as active partners with healthcare administrators to solve complex challenges such as rising costs, outcome-based reimbursements, and quality of care. Unfortunately, research has shown that individuals who are highly skilled in one domain (e.g., physicians) are rarely able to transfer that expertise to other domains. This dissertation used qualitative methods to explore an alternate conceptualization of expertise and how this might influence the contribution of experts across domains. The findings from this study suggest that expertise emerges from the dynamic relationships occurring between the social and the material aspects of a situated environment. Therefore, in addition to the knowledge that is resident within an individual, knowing and expertise is also distributed across the various social and material relationships within the specific environment. The main contribution of this research is to expand the standard

conceptualization of expertise, which is based on cognitive and socio-cognitive assumptions. This study does not deny the validity of cognitive assumptions about knowledge and expertise but argues that these assumptions do not go far enough in conceptualizing expertise. This research indicates that a sociomaterial conceptualization of expertise allows for a more nuanced understanding into the various constitutive aspects of expertise and in particular a greater sensitivity to the relationship among the aspects.

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Chapter 1: Introducing and Framing the Study

In 1959, Peter Drucker first declared the importance of knowledge work and the knowledge worker (Drucker, 1965; Davenport, Thomas, & Cantrell, 2002). Almost sixty years later, Davenport (2013) notes that the importance of knowledge workers, experts, and expertise continues to accelerate for organizations and for economies. But what exactly is expertise and why is it important?

Theorists do not agree on a single definition of expertise, yet they do acknowledge that nuances in the characterization of expertise can differ across cultures. In their review of cross-national literature on expertise, Germain and Ruiz (2009) concluded that for the United States and most western European countries “expertise is the combination of knowledge, experience, and skills held by a person in a specific domain” (p.629). In addition to contributions within their specific domains, experts are increasingly being tasked with contributing to challenges that span their particular domain of expertise (Fenwick, Nerland, & Jensen, 2012). This demand for highly skilled experts to contribute across their specific domains of expertise is particularly important for the U.S. healthcare industry (Waldman & Cohn, 2008).

In the complex U.S. healthcare environment, physicians are vital participants whose decisions direct patient care and whose actions profoundly influence patient outcomes. In addition to clinical outcomes, physician actions directly impact organizational outcomes through resource expenditure and cost containment measures (Taheri, Butz, Griffes, Morlcock, & Greenfield, 2000). Reflecting the significance of their role on patient satisfaction, clinical outcomes, and cost of care, physicians are

increasingly being held ever more accountable for the overall value of the care they provide to patients (Walsh, Ettinger, & Klugman, 2009).

As a reflection of the increasing recognition of physician impact and the resulting scrutiny, third party payers, such as insurers, consider clinical outcomes when determining reimbursement rates to physicians and/or healthcare systems (Conway & Cassel, 2012; Walsh et al., 2009). In fact, by 2017 the Centers for Medicare and Medicaid Services will utilize a physician value modifier when adjusting payments. Congressionally mandated, this plan will base all physician payments on performance (Conway & Cassel, 2012). Bearing in mind the new reimbursement measures and the overall changes in healthcare, physicians are increasingly important contributors to the financial outcomes of healthcare organizations (Clark, 2012).

Given the various responsibilities of physicians as well as the considerable impact that they have on patient and organizational outcomes, it is imperative that healthcare organizations and physicians acknowledge and embrace the interdependence of their respective roles in ensuring patient value. In particular, administrative leaders can play a crucial role in supporting physicians to better navigate the complexities of leadership outside of the domain of patient care. Physicians must likewise actively embrace their responsibilities to engage as active partners with healthcare administrators to improve safety, quality of care, and reduce costs (Conway & Cassel, 2012; Walsh et al., 2009). Although there is recognition of both the challenges and the corresponding level of opportunity, viable solutions are still being sought.

In studying the relationships between physicians and healthcare executives, Waldman and Cohn (2008) identified fundamental differences between the two groups in areas such as education, socialization, and work experience. These differences have created a gap between the perspective of physicians and that of healthcare executives. This gap often results in antagonistic and adversarial relationships. Interestingly, this same research found that despite the differences in education, socialization, and work experience, these two groups share many of the same core values such as altruism and service (Waldman & Cohn, 2008). Creating this important collaboration between the two groups will require “bridging across the gap” between the reality of the physician and that of the executives (Waldman & Cohn, 2008 p.27). Both the challenges and the opportunities that are the result of this gap are as present at my research site as those in Waldman and Cohn’s study.

Background and Context

The research site for this exploratory study was a newly formed Surgical Trauma Center that is a part of a teaching hospital and regional health system. Trauma Centers are unique because they specialize in providing comprehensive medical services to patients suffering traumatic injuries incurred from incidents such as motor vehicle accidents, acts of violence (shootings or stabbings), and natural disasters. A trauma environment is focused and fast-paced, with the primary goal of stabilizing the patient such that they can be transferred from the Center to the next phase in their continuum of care. Often the cases are complex and multifaceted and mistakes can lead to the death of the patient (Klein, Ziegert, Knight, & Xiao, 2006).

This health system where this research took place, like many others in the US, is facing increasing pressures to control cost, provide high quality care, and serve the needs of all members of the community—both insured and uninsured. In contrast to the financial pressure facing the larger organization, trauma services generated a positive financial return for the health system. However, the trauma services had recently begun to face significant external competition from a rival hospital system. So in an effort to both continue to build on their existing financial success in Trauma and to simultaneously defend against further shift of trauma volume to external competition, the decision was made to create a separate Trauma Center (hereinafter Center).

The original research question guiding this study focused on the influence of feedback structures and practices on an organization's ability to engage in continuous change. By selecting a newly formed trauma surgical center as the research site, I felt assured that the study would surface numerous examples of an environment of continuous change, including aspects such as evolving roles and responsibilities, changing strategy, and the associated forms of individual resistance. While the research did, in fact, reveal an environment of continual change, the data that emerged from the interviews presented a more intriguing story. Participants consistently spoke about the important and consequential differences between the surgeons and the administrators. In particular, the participants described the different characteristics between what I began to conceptualize and refer to as the surgical or the patient-facing aspects (surgical domain) of the Center, and the non-surgical or academic and administrative aspects (non-surgical domain) of the Center. In addition to the reported differences, it was also apparent that

participants perceived that increased contribution from the surgeons in the non-surgical domain and greater collaboration among the surgeons and the administrators was key to the success the Center. It also became increasingly clear that the participants were frustrated and unsure as how to accomplish the increased contribution and collaboration, given some of the fundamental differences that they experienced. In effect, the data emerging from the participant interviews presented a compelling puzzle—the need for increased contribution and collaboration, yet seemingly irreconcilable differences between the two domains.

In order to focus my analysis and further explore this puzzle, I began to refine my research questions. After additional engagement with the study data and through ongoing dialogue with members of my dissertation committee I inductively evolved my research questions to the following:

Research Question #1: What are ways to conceptualize the expertise of a trauma surgeon?

Research Question #2: What are the characteristics associated with trauma surgeons and their professional socialization and current work environment that influence the portability of their expertise?

As previously discussed, successfully engaging physicians as active partners with healthcare administrators is critical to both patient and business outcomes. The specific knowledge, expertise, and decision authority over patient care are primary reasons they must become active partners (Conway & Cassel, 2012; Walsh et al., 2009). Traditional views on expertise reveal that individuals that are highly skilled in one domain (e.g.,

surgeons) rarely are able to transfer that expertise to other domains (Glaser, Chi, & Farr, 1988). However, my revised research questions allowed for an open frame from which to explore alternate conceptualizations (and enactments) of expertise. In exploring these questions, I also sought to better understand the limitations to transferring expertise across different domains from the perspectives of the insiders in the setting.

Rationale and Significance of the Study

In the previous section of this chapter, I described how the importance of expertise is accelerating and how experts are increasingly being tasked with contributing to challenges that span their particular domain of expertise (Fenwick et al., 2012; Davenport, 2013). I also described how conventional conceptualizations of expertise posit that expertise does not easily transfer across domains (Glaser et al., 1988). At best, these two assertions demonstrate a major challenge for the professional fields that are associated with knowledge work. At worst, these two assertions present incompatible truths—a paradox. Rather than approaching the situation from a traditional (cognitive) paradigm of expertise, my research challenges the traditional perspective and explores alternative conceptualizations of expertise. This study acknowledges the cognitive dimensions of expertise, yet argues that this standard framing does not go far enough in its conceptualization of expertise. In order to fully describe the rationale and significance of this study, it is important to further discuss the traditional view of expertise.

Standard Conceptions of Expertise

Standard conceptions of expertise position it as the cognitive knowledge, abilities, and traits of the expert (Ericsson & Smith, 1991; Barab & Plucker, 2002; Michel, 2015).

Individuals are thus considered experts because of what they know, who they are (traits), and how these traits and their accumulated knowledge allows them to act in expert ways. This conceptualization does not indicate how experts can extend their contribution by bridging from their domain of expertise across other domains without acquiring new knowledge. That is to say, in order to contribute outside their area of expertise they must develop additional cognitive knowledge and expertise in other domains. In general, this is a linear and limiting view of the source of expertise partly because the rate at which expertise can be developed is limited to the rate at which additional knowledge can be acquired. This view is also limited because of its dualistic framing that posits knowledge and traits as the property of individuals who are separate and distinct from their environment and situation (Barab & Plucker, 2002). Further, it does not account for how to support the portability of expert performance and contribution in one domain across to other domains and environments. Additionally, research has demonstrated that learning, knowing, or expertise cannot be easily abstracted from the specific context and environment within which it is observed (Brown, Collins, & Duguid, 1989; Bredo, 1994; Lave, 1988, 1993, 1997; Saxe, 1991). For example, in a study reported by Saxe (1991), researchers posing as difficult customers negotiated prices with children selling candy at a market in Brazil. During these market negotiations the children solved the researchers' covert math problems at a 99% accuracy rate. In contrast, these same children only scored 65% accuracy on a formal math test that evaluated the same skills. If expertise were, in fact, based solely on the inherent knowledge and traits of the individual, how would we explain these findings and the finding of similar studies? As is clearly

demonstrated in this study by Saxe, traditional cognitive conceptualizations of expertise do not go far enough in accounting for the role and influence of the various aspects of ones' environment. Building upon the validity of cognitive views of expertise, I incorporate more dynamic and generative ways to conceptualize expertise.

Sociomaterial Conceptions of Expertise

Researchers are increasingly exploring the constitutive and recursive nature of social and material relationships and their influence on expertise and expert performance (Barab & Plucker, 2002; Michel & Wortham, 2008; Orlikowski, 2007; Fenwick et al., 2012). This line of inquiry goes beyond the recognition of situated cognition (Brown et al., 1989) or collective mind (Weick & Roberts, 1993), and considers how the structures, practices, and relationships between the social and the material create an entanglement such that each is consequential in creating the other (Orlikowski, 2007). This sociomaterial approach purposefully avoids placing humans at the center and instead views humans as one dimension of a larger system that includes technology, bodies, tools, actions, structures, and objects. It is from the web of entangled relationships within the system that learning and expertise emerge (Fenwick et al., 2012). Conceptualizing expertise or the emergence of expertise in this way allows for nuanced exploration into the expertise of trauma surgeons.

Building upon such theory, this study explores how expertise emerges from the dynamic relationships occurring between the social, structural, and the material aspects of the surgeon's environment. Therefore, in addition to the cognitive knowledge that is resident within a surgeon, knowing and expertise exists among and across the various

structural, social, and material relationships within their specific environment.

Conceptualizing expertise in this way allows for further consideration of how expertise is emerging within the unique environment. In doing so, it may also allow for further consideration of how to actively facilitate the emergence of expertise, the extension of contribution across traditional domains of expertise, and/or how to support the portability of expertise within and across environments.

As will be discussed in greater detail in Chapters Four and Five, the theoretical framework that emerged from the study demonstrates how the dynamic relationship between the surgeons and the specific social, structural, and material aspects of the surgical domain lead to the emergence of domain-specific expert behavior and contribution. Likewise, the dynamic relationship between the surgeons and the specific social, structural, and material aspects of the non-surgical domain does not lead to the emergence of domain-specific expert behavior and contribution. In particular, the framework indicates how the ability of the surgeons to engage with potential resources in both the surgical and non-surgical domains were determinate of the surgeons' ability to demonstrate expertise and contribution within and across domains. However, to fully explicate this dynamic, it is necessary to first establish the theoretical foundation that supported the analysis of the data and the subsequent findings. In Chapter Two, I will introduce the theories, principles, and constructs that were central to this study.

In addition to addressing the puzzle of expert contribution across domains, this study seeks to add to the emerging literature that posits expertise and expert performance as emerging from the entangled relationships among the social and material aspects of a

situated environment. This shift in theoretical discourse from cognitive to sociomaterial conceptualizations has significant implications for both theorists and practitioners. The theoretical implications would include the fields of learning, socialization, and expertise. The implications for practice across various fields include areas such as professional development, leadership development, and performance management. More specifically, I believe that the results from this study can provide direct insight for opportunities to bridge the gap between physicians and healthcare executives (Waldman & Cohn, 2008). The results of this study also initiate a path of inquiry that other researchers and practitioners can extend for the further benefit of all stakeholders in the U.S. healthcare field.

Overview of the dissertation

This study was designed as a qualitative, exploratory study. The selection of the research site and the individual participants was based on purposeful selection design strategy (Light, Singer, & Willett, 1990; Maxwell, 2013). The results of this research are intended to contribute to both academic and practitioner discourse in the fields of expertise, learning, and socialization.

The dissertation is structured as five chapters. Chapter Two provides a review of the relevant bodies of literature that supported the study. These include learning, organizational and medical socialization, expertise, and practice theory. Collectively, these bodies of literature provided the conceptual blocks from which I constructed my theoretical framework. I then applied the theoretical framework as the conceptual lens through which I engaged with and interpreted the data. In addition to providing a review

of fields such as learning theory, organizational socialization, medical socialization, expertise, and practice theory, I also discuss the contributions and limitations of each field to this study.

Chapter Three contains a review of the specific research methodology and design strategy that guided this exploratory study. This includes a description of the methods for site selection and data collection and analysis. Chapter Three also describes the limitations of the design and the active strategies that were employed to mitigate threats to validity. In closing, this chapter provides an overview of the unique aspects of the research site.

Chapter Four presents and discusses the two key findings that emerged from the data. The first finding indicates that the expertise of a trauma surgeon is situated with a sociomaterial context. The second finding reveals that the expertise of the trauma surgeon does not readily transfer to the non-surgical domain of the Center. In order to sufficiently contextualize the findings, I first introduce the theoretical foundation that informed the analysis. Then, for each finding, I describe the data that emerged from the study and apply academic theory in order to analyze and explore the data. This approach provides a sound grounding to support each finding.

Chapter Five discusses the multiple implications of this study for both organizational theory and for practice. The chapter also formally explicates the theoretical framework that emerged through the course of the research. In concluding the chapter, I discuss the limitations of the study and makes recommendations for future research.

Chapter Summary

This chapter frames the study and introduces the intellectual puzzle, which this study aims to address. I first establish the increasing importance of knowledge workers and experts to organizations and economies. I then introduced the specific research questions that guided the study and described how they evolved inductively as a result of incoming data and ongoing dialogue with members of my committee. In order to fully position the purpose and unique contribution of this study, I first introduced the theoretical significance of conceptualizing expertise from a sociomaterial lens versus a cognitive or socio cognitive lens. I then provided information on both industry and site-specific trends in order to further contextualize the data and subsequent findings of this study. In order to provide sufficient theoretical grounding for this study, I will now transition to Chapter Two and provide a review of the literature that offered the conceptual lens through which to engage with the data and support the theoretical framework of this study.

Chapter 2: Literature Review

This chapter provides an introduction to the major theoretical constructs that informed my research. For each theory, I first provide a brief overview of the literature and then discuss the specific contributions and limitations of this body of work relative to my study. I begin with a brief overview of three major theories of learning. I then review the major theoretical constructs associated with the socialization and medical socialization literature. Next, I provide a brief introduction to the literature associated with the conceptualization of expertise and expert performance. After reviewing these bodies of literature, I then assert that socialization, medical socialization, and the conceptualization of expertise are grounded in a cognitive theory of learning. I further discuss that while this theoretical lens recognizes the existence of other individuals and environmental aspects, it treats them as separate entities whose existence simply influences the cognitive schema of others.

In order to demonstrate an alternate conceptualization of expertise, I introduce the field of practice theory. I first provide an overview of practice theory and some of the major contributors, both historical and contemporary. I then introduce key constructs that were applied to inform this study. In closing this chapter, I discuss how practice theory provided a dynamic lens through which to observe and conceptualize the organizational phenomenon encountered in this study.

It is important to note that each of the theories included in this literature review significantly influenced the intellectual journey and ultimately the theoretical framework that emerged from this study. For example, the understanding gained from theories of learning, socialization, and expertise was central to establish the conceptual foundation

for this study. In particular, these bodies of knowledge allowed me to conceptualize the dynamics that contribute to the cognitive development, which occurs as knowledge workers travel along their professional journey from preparing for their career through entering organizations and then performing as professionals and experts in their fields. Through understanding the dynamics associated with these bodies of knowledge, I was better able to engage with and evaluate the affordances from the field of practice theory. More specifically, practice theory provided the key principles and theoretical constructs that allowed me to conceptualize the dynamic of mutual influence that occurs during the journey of development, socialization, and practice. In order to more fully explicate the observed dynamics and the subsequent development of the theoretical framework, I will provide a brief overview of the major fields of theory that most influenced this study.

Learning Theory

Theories of learning articulate assumptions about the process through which individuals acquire the ability to operate successfully in the world. In this section, I provide a separate review of Behavioral, Cognitive, and Sociocultural theories. For each theory, I discuss its contribution and limitations.

Behaviorist theorists that prescribe to behaviorist assumptions of learning believe that humans are inherently unreflective. They reject the contention that humans act from free will (Freiberg, 1999; Magliaro, Lockee, & Burton, 2005; Wortham, 2003). From a behaviorist perspective, learning is reflected in an individual's change in behavior as a direct response to environmental stimuli. Both environmental context and teacher reinforcement direct students to produce desired behaviors (Boghossian, 2006; Wortham,

2003). Reinforcement can be both positive and negative. Positive reinforcement can include valued events or items such as good grades, praise, or food. The underlying concept is that valued events or items reinforce desired behaviors. Conversely, negative reinforcement can include bad grades, withholding food, or physical pain such as from electric shock. As with positive reinforcement, it is believed that undesired behaviors can be influenced or dissuaded by negative reinforcement. In each case, the strength, and thus the effectiveness, of the reinforcement is related to the temporal proximity between the behavior and the reinforcement (Schwartz, 1986).

Unlike like behaviorist theory, cognitive theory conceptualizes learners as being actively engaged and making sense of their world through the development of mental models or schemas. As such, learning is theorized as the process of individuals evolving their mental models based on new information that they have encountered (Wortham, 2003). Learning through both direct and indirect experience is recognized as supporting learners in evolving their mental models (Dewey, 1936; Piaget, 1970; Bandura, 1977). Indirect experience often includes exposure to more competent others through both observation and dialog. Social cognitive theory (Bandura, 1986) reflects cognitive development as a result of the reciprocal interaction of three factors: personal, behavioral, and environmental. The personal factor concerns the level of self-efficacy that the individuals have regarding their abilities. The behavioral factor concerns the degree of positive or negative feedback they receive as the result of performing or attempting to perform the target behavior. Finally, the environmental factor concerns the physical and

social aspects of one's environment and their influence on the target behavior (Bandura, 1986, 1997, 2012).

A sociocultural theory of learning posits that, beyond the practice of creating mental models in isolation, learners also construct knowledge through social interaction and the use of tools (Boreham & Morgan, 2004; Vygotsky, 1978; Wortham, 2003). Such tools can be physical, such as geographic maps, or mental, such as theoretical frameworks for assessing commercial markets (Wortham, 2003). Learning in a sociocultural context is seen as a dynamic relationship between the learners and the instructor. The instructor acts as an experienced guide that provides the learners with support as they work on reducing the gaps in their Zones of Proximal Development (ZPD). The ZPD refers to the distance between what a learner can accomplish on her own, versus what she can achieve in collaboration with peers or instructors who are more capable for the given task (Vygotsky, 1978). The term scaffolding (Wood, Bruner, & Ross, 1976) is often used when referring to the type of support that learners receive as they are developing their competence and moving through their ZPD. An example of scaffolding is when an instructor assesses a learner's current knowledge and skills, and then devises level-appropriate activities that allow the learner to engage and to actively build upon her current skill levels (Spouse, 2001).

Contributions

Each of these learning theories makes unique contributions. The systematic approach of behaviorist theory is helpful when creating an environment for acquiring desired behaviors. Calculated and scheduled instruction, guided by the use of

reinforcements, is efficient for establishing desired behaviors, outcomes, and capabilities. Reinforcements, such as praise or constructive criticism, can support experts in the process of learning to succeed in areas outside of their traditional domain. Cognitive theory highlights the importance of human reasoning and determination and considers the influence of developmental changes on cognitive processes. Unlike behavior theory, it acknowledges the ability of humans to reflect on and make decisions about external events and objects. Understanding how experts process new information is critical when presenting them with new information, particularly within a new domain. Social cognitive theory takes into account the influence of the environment. Where social cognitive theory takes a dualistic view of individuals and their environment (Packer & Goicoechea, 2000), sociocultural theory views learning as occurring within a situated environment and distributed across social relationships, cultural, material, and temporal elements (Lave, 1988; Scribner, 1990, 1997; Packer & Goicoechea, 2000). This view allows for a more comprehensive and dynamic approach to learning. In addition, acknowledging and attending to the various social, relational, and material aspects of the expert's environment may further facilitate the contribution of expertise across domains.

Limitations

Behavior Theory does not consider human cognition or motivation and ignores the social impact of learning, and thus is not a complete approach to the conceptualizing the development or transferability of expertise. Cognitive theory conceives learning as occurring through the changes in an individual's mental schemas. Thus other people, places, and things are treated as separate and independent entities, reflecting a dualism

(Sfard, 1998). This dualist conception conceives the interaction among the separate people, places, and things as simply influencing the schema of the individual learner. While not denying the important influence of mental schemas, this approach does not allow for full consideration of the dynamic relationship between the social and material aspects of an environment; thus it is too limiting for conceptualizing expertise, as expertise is not separate from the various aspects of the environment in which it exists.

Organizational Socialization

Organizational socialization refers to the process where individuals “learn the ropes” (Van Maanen & Schein, 1979, p. 3) regarding what is required to be a successful member of an organization. Both Schein and Van Maanen position socialization as a learning process that can be considered as ongoing throughout one's career (Schein, 1971; Van Maanen, 1977). Although organization socialization can be considered an ongoing process throughout one's career, much of the socialization process is focused on the socialization of new members of the organization (Ashforth, Sluss, & Saks, 2007). Research indicates that socialization is positively correlated with individuals adjusting to their new roles (Ashforth, Sluss, & Harrison, 2007; Bauer, Morrison, & Callister, 1998; Fisher, 1986; Moreland & Levine, 2001; Saks & Ashforth, 1997). In support of Van Maanen and Schein's (1979) contention that socialization is fundamentally a learning process, additional research indicates that socialization can have a significant impact on the new employee's acquisition of knowledge about the organization and the work context (Haueter, Macan, & Winter, 2003; Saks & Ashforth, 1997).

According to Saks and Ashforth (1997), there are four main theoretical constructs associated with much of the research on organizational socialization. These constructs are Van Maanen and Schein's (1979) framework of socialization tactics, uncertainty reduction theory, social cognitive theory (Bandura, 1986), and sense-making theory. I will now provide a brief introduction of each of these constructs.

The first construct is based on Van Maanen and Schein (1979), who identified dimensions or tactics that organizations could adopt in order to design their socialization process (Van Maanen & Schein, 1979; Ashforth & Saks, 1996). Each of the six tactics was reflected as having two poles representing opposing values of each tactic. Those tactics were collective vs. individual, formal vs. informal, sequential vs. random, fixed vs. variable, serial vs. disjunctive, and investiture vs. divestiture. Building upon this model, Gareth Jones (1986) proposed that the clusters formed by the dimensions associated with the respective poles represent two types of socialization: Individualized Socialization versus Institutionalized Socialization. Institutionalized Socialization includes the dimensions: collective, formal, sequential, fixed, serial, and investiture while Individualized Socialization includes: individual, informal, random, variable, disjunctive, and divestiture. Subsequent research has reinforced and proposed additional refinements of the model (Ashforth, Sluss, & Saks, 2007).

The second construct is uncertainty reduction theory, which contextualizes the influence of uncertainty and subsequent motivation to reduce the uncertainty that is often experienced by new members of organizations (Saks & Ashforth, 1997). Research has shown that socialization tactics that reduce newcomer uncertainty have a positive

influence on their job satisfaction, performance, and intention to remain with the organization (Van Mannen & Schein, 1979; Saks & Ashworth, 1997; and Morrison, 1993). Uncertainty reduction tactics mainly focus on the effective conveying of information, from both social and non-social means, that is perceived by the new members as being useful in their adapting to the new environment.

The third construct is social cognitive theory (Bandura, 1986). Bandura initially introduced much of the baseline for social cognitive theory in an article titled Social Learning Theory (Bandura, 1977). He subsequently renamed his theory to social cognitive theory to further emphasize the primary influence of cognition (Bandura, 1986). The basic premise of social cognitive theory is that an individual's development of new behaviors can be conceived as cognitive development that results from the reciprocal interaction among three factors: personal, behavioral, and environmental. The personal factor concerns the level of self-efficacy that the individuals have regarding their abilities. The behavioral factor concerns the degree of positive or negative feedback they receive as the result of performing or attempting to perform the target behavior. Finally, the environmental factor concerns the physical and social aspects of one's environment and their influence on the target behavior (Bandura, 1986, 1997, 2012).

The fourth construct supporting much of the socialization research is sense making. Sense making is a cognitive process through which new organizational members give meaning to their interactions with and observations of existing organizational members (Louis, 1980; Reichers, 1987; Saks & Ashforth, 1997). This process results in the development of schemas and cognitive maps that define

organizational reality and identities (Katz, 1980, 1982; Falcione & Wilson, 1988; Weick, 1995; Saks & Ashforth, 1997). These new schemas or cognitive maps support new members in successfully adapting to their new environment and roles.

Medical Socialization

The process of medical socialization facilitates the transition from medical student to practicing physician. As described by Broadhead (1983), the purpose of medical socialization process is to “yield the model professional who is idealized as a super individual in terms of autonomy, judgment, skills, commitment, and motivation” (Broadhead, 1983, p. 17). Key to this outcome are the teaching hospitals with residency programs that train residents to develop the skills necessary to deal with patient cases, perform clinical skills, and to conduct research (Duncan, 1996; Fox, 1990; Harrison, 1982; Wear, 1997). Through this process, residents develop their identities and role schema via exposure to medical practice and culture during such activities as labs, conferences, being “on call”, and attending patient rounds (Anspach, 1990; Hafferty, 1988; Hirschmann, 1999). Residents also begin to internalize and embody the traits that are typically associated with medical identity, including authority, emotional distance, and impartiality (Broadhead, 1983).

Like organizational socialization, medical socialization is based on a social cognitive paradigm of learning and expertise. Through exposure and the observation of more competent others, residents learn the skills, behaviors, and traits that are required to be competent physicians. The learning that is taking place in this paradigm is the result of changing mental schema as the residents observe and receive information from

experienced physicians or other experts. In effect, it is a cognitive transfer from the expert's mind to the novice mind of the resident.

Identity Work

Identity work literature explores how individuals construct, maintain, and modify their identities in relation to other individuals and social contexts. Social identity theory and self-categorization theory recognize two forms of identity (Brewer, 1991, 2003; Tajfel, 1978; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). One is personal identity, which is “individuated self—those characteristics that differentiate one individual from others” (Brewer, 1991, p. 476). Social identities are “categorizations of the self into more inclusive social units that depersonalize the self-concept” (Brewer, 1991, p. 476). An individual’s personal identity may conflict at times with one or more of her social identities. Likewise, social identity requirements may interfere with the individuality of the personal identity (Brewer, 1991, 2003).

After initial socialization into a group, one’s identity can continue to evolve through further experience, interaction, and learning. As Kreiner, Hollensbe, and Sheep (2006) state, “An ongoing process takes place in which the individual negotiates the ‘Who am I?’ question amidst social ‘This is who we are’ messages.” (p. 1032). The relationship between individuals and social contexts are dynamic. Identity work is concerned with the ways that individuals respond to this dynamic in the construction of their personal identities in ways that are compatible with their self-concept (Snow & Anderson, 1987).

Where the majority of literature on organizational identification focuses on how organizational members construct identities based on where they work, Pratt, Rockmann, and Kaufmann (2006) found that professionals tend to construct identities based on “what they do”(p. 236). In their six-year study of medical residents pursuing three different fields of medicine, it was found that regular changes occurred in the residents’ professional identities. Those changes coincided with changes in the nature of the work the residents were performing. When the work they performed did not match their view of who they were as professionals, identity changes transpired. The term work-identity integrity was used to assess how the work a resident did compared to her professional identity. Differences in work-identity integrity, known as integrity violations, led to “identity customization” (Pratt et al., 2006, p. 242). Identity customization was found in three different forms: enriching, patching, and splinting. Enriching occurred when the basic principles of professional identity persisted, but the comprehension of the identity became more profound and distinct. Patching occurred when residents used one identity (such as a medical generalist) to bolster another identity (such as surgeon). Identity splinting referred to the process by which a resident used one identity (such as the prior identity of medical student) to support another fragile identity (such as radiologist). Over time, identity patching and identity splinting transitioned into identity enriching. Their study provides insight into how professionals construct and evolve identity over time, and highlights the importance of work-identity integrity in the formation of professional identity (Pratt et al., 2006).

Contributions of Organizational and Medical Socialization

As demonstrated throughout this brief review, organizational and medical socialization are concerned with the process through which individuals become competent and contributing members of their organization or profession. A central concept of both organizational and medical socialization is the specific dynamic and supporting processes associated with developing professional identities and associated role schemas. In effect, socialization theory explicates the processes that influence the development of the traits, thoughts patterns, and behaviors associated with being a trauma surgeon. This process includes becoming competent in both their role responsibilities and their ability to accurately reflect the behaviors and norms associated with their respective organization and/or profession. In addition, socialization can be conceived as an ongoing process throughout one's career (Schein, 1971; Van Maanen, 1977). Accordingly, socialization practices may provide indication of both the potential malleability of schemas and the potential practices for the evolution of schemas.

Socialization theory was a fundamental building block in developing the theoretical framework for my study. Understanding the process through which surgical identity and schemas are developed provided a generative frame for contextualizing and analyzing behaviors and participant responses. Understanding the associated dynamics also allowed me to conceive how the socialization process can lead to both rigidity in role identity and, conversely, allow for continued evolution and expansion of identity and schemas.

Limitations

In spite of its many contributions, the organizational and medical socialization literature is limited due to its cognitive assumptions of learning. Although the four constructs underpinning much the socialization research account for the influence of individuals, materials, and relationships, they are based on dualistic assumptions. They assume that influence solely occurs through the interactions of independent entities that shape the learner's cognitive schemas. Thus, the ability of a surgeon to succeed in an organization is linked to her ability to cognitively process new information received from observations and interactions with others in the environment. A more comprehensive approach, as will be demonstrated in this study, is to conceptualize the reciprocal and mutually constitutive relationship between the surgeon and her environment. That is to say that one must conceptualize the mutual influence between aspects such as cognitive schemas and the social, material, and structural aspects of a situated environment in order to understand more fully the dynamic development process.

Expertise

The study of expertise is concerned with the specific characteristics of individuals who have demonstrated the ability to perform consistently at a level well beyond the norm for the general population. This ability could include fields as diverse as athletics, professions, and art.

Ericsson and Smith (1991) conceptualize expertise as based on the relatively stable characteristics of individuals who can consistently perform at levels, which exceed the general population. The emphasis on stable characteristics is to account for any

factors that are specific to a given environment and therefore not key to the individual's expert performance (Ericsson & Smith, 1991). Earlier work by Bloom (1985) indicated that research into the childhood of adult experts did not necessarily provide clear indicators that would cause one to anticipate their future level of expertise. There were, however, common themes among the background of all research subjects. The common themes included intensive practice, available and committed teachers, and supportive families (Bloom, 1985; Ericsson, Prietula, & Cokely, 2007). Furthering the findings of Bloom, much of Ericsson's work on expertise is founded on the notion that expertise is not an inherent trait, but a skill that can be developed. The path to expertise requires deliberate practice, often taking up to ten years or 10,000 hours of practice, and the guidance and support of a competent teacher or coach (Ericsson, Krampe, & Tesch-Romer, 1993; Ericsson et al., 2007).

In summarizing the key themes of the work of researchers, Glaser, Chi, and Farr (1988) identified the following characteristics of individuals who consistently demonstrate expert performance:

1. Experts mainly excel in their respective domains (e.g. expert physicist cannot transfer knowledge to show expert levels of disease diagnostics).
2. Experts can perceive meaningful data patterns in their domain that might be invisible to non-experts.
3. Experts are faster at performing skills and solving problems in their domain than non-experts.
4. Experts have developed greater short and long-term memory.

5. Experts conceive problems at a deeper (less superficial) level than non-experts.
6. Experts spend considerable time creating a qualitative, mental representation of the problem in order to contextualize the problem and the associated constraints.
7. Experts have substantial self-monitoring skills that support their ability to assess if they are on the correct path to solving a problem.

Contributions

The major contribution of the expertise literature to this study is its articulation of the traditionally understood pathway for developing and demonstrating expert performance. Of particular importance are the intensive experiences and intentionality that occurs during the development of expertise, and how that same intense and focused development can occur at the expense of developing broader, more diverse skillsets. It helps to further contextualize the reported strengths and limitations of the surgeon behavior. The expertise literature served as the baseline from which I was able to incorporate contributions from practice theory. That ultimately led to the conceptual foundation of this study.

Limitations

As with organizational socialization and medical socialization theories, the standard conceptualization of expertise is typically conceived from a cognitivist context. Expertise exists in the minds of the experts. In making this distinction, it is important to note that Ericsson recognized the influence that deliberate practice had on physical

capabilities. However, the body was represented as a vessel for the mind of the expert, rather than an equal and constitutive component of the expertise. Further, as Ericsson and others acknowledged the influence of other individuals and environmental factors, these were conceptualized as separate and independent entities or objects. The influence of these other individuals, entities, and objects merely resulted in the evolution of the cognitive models of the individuals undergoing socialization. Accordingly, an individual's ability to develop their capability and expertise equates to being able to continually refine their cognitive schema and maps. This refinement occurs through the absorption of new information, including through the observation and interaction with others. As will be discussed later, this is only a partial view of how learning occurs and how expertise can be conceived. In order to conceive a more dynamic conceptualization of expertise, one must explore the field of practice theory.

Practice Theory

The field of practice theory is a “relatively unsettled intellectual landscape” (Feldman & Orlikowski, 2011 p. 3) that does not have a unified approach or a commonly accepted canon defining the field (Schatzki, 2001; Gherardi, 2006). Some scholars refer to practice theory as a “family of theories” (Reckwitz, 2002), while others suggest that practice theory is simply a “specific approach to understanding the world” (Feldman & Orlikowski, 2011 p. 2). Practice theory conceives social reality (including organizations) as comprised of bodies, material objects, knowledge, discourse, structures, (psychological & physical), and practices. The focus is on the dynamic and emergent relationships among the various constituents and not the individual elements (Feldman & Orlikowski,

2011; Nicolini, 2012). Accordingly, some theorists have argued that applying a practice-based view of organizational phenomenon resolves the tendency of other theoretical traditions that describe reality in dualistic terms such as mind/body, actor/system, social/material (Ortner, 1984; Schatzki, 2001, 2002; Rechwitz, 2002; Rouse 2007). Their main assertion is that a practice-based view allows theorists to overcome a dualistic positioning by describing the dynamic relationship between social structures, practices, humans, and materials.

The foundations of the more recent developments in the field of practice theory include those who self-identify with a practice theory approach. It also includes those who do not, yet their work clearly demonstrates an emphasis on the study of practices in the world (Nicolini, 2012). Of those who self-identify with practice theory, Corradi, Gherardi, and Verzelloni (2010), identified three streams of study including: learning and knowing as situated practices (Lave & Wenger, 1991; Brown & Duguid, 1991; Cook & Yanow, 1993; Tsoukas, 1996; Raelin, 1997; Gherardi, Nicolini, & Odella, 1998; Gherardi, 2000; Orlikowski, 2002; Nicolini, Yanow, & Gherardi, 2003); technology as practice (Orlikowski, 1992; Suchman, Blomberg, Orr, & Trigg, 1999; Orlikowski, 2000); and strategy as practice (Whittington, 1996; Jarzabkowski, 2004; Whittington, 2006).

In addition, Nicolini (2012) identifies the following as examples of key contributors to the field but who do not self-identify as practice theorist: Bourdieu's praxeology (Ozbilgin & Tatli, 2005); activity theory (Blackler, 1995; Engestrom, 1987; Engestrom & Middleton, 1998; Engestrom, Miettinen, & Punamaki-Gitai, 1999; Engestrom, 2008; Blackler & Regan, 2009); and ethno-methodology and workplace

studies (Garfinkel, 1967; Suchman, 1987; Drew & Heritage, 1992; Heath & Luff, 1996; Luff, Hindmarsh, & Heath, 2000; Heath & Button, 2002; Llewellyn, 2008; Heritage, 2009; Llewellyn & Hindmarsh, 2010).

Key Principles of Practice Theory

There is not a uniform body of work that defines practice theory or a standard approach that is shared by all theorists. Different practice theorists place greater or lesser focus on certain aspects of the reciprocal relationship between structure, practices, and agency; no cohesive practice theory system exists (Schatzki, 2001; Gherardi, 2006). It is perhaps because of the wide lens of practice theory that it is being recognized as a new way for theorists to see, experience, and describe organizational phenomenon (Schatzki, 2002).

Although practice theory does represent a broad approach to conceptualizing practice, all theorists typically subscribe to the belief that practices occur within different historical, geographical, and temporal context and agree on the following three principles: “1) that situated actions are consequential in the production of social life; 2) that dualisms are rejected as a way of theorizing; and 3) that relationships of mutual constitution are important” (Feldman & Orlikowski, 2011, p. 1241). These three principles will now be discussed in further detail.

Actions are consequential in the production of social life. “Activity and mind are social in their content as well as in their origins; they are social activity and social mind” (Marx, 1845, p. 157). An important maxim in practice theory is the notion that one exists in connection with others; social life emerges continuously through everyday

practices. Individuals experience other beings and objects conceptually and emotionally, and ongoing everyday practices form social life. Practice theory maintains that daily actions are consequential in constructing the structural frameworks of social life (Nicolini, 2012; Feldman & Orlikowski, 2011; Schatzki, 2001).

Given the consequentiality of practice to social life, many practice theorists have a humanist orientation, highlighting the role of human agency (Schatzki, 2002). However, also greatly impacting practice theory is post-humanist work emphasizing the vital contributions of structures, objects, and technology in producing social life. The importance of material objects in social life cannot be disregarded (Schatzki, 2001; Orlikowski, 2007).

Dualisms rejected as a way of theorizing. Practice theory rejects the idea of dualisms, such as such as mind-body, subject-object, or determinism-freewill, as a way of conceiving the world. Instead, it focuses on the dynamic and constitutive relationship among factors such as individuals, structures, practices, and materials. One factor does not determine the other; each factor reciprocally impacts the other and thus factors cannot be separated (Kitching, 1988; Nicolini, 2012).

Practice theory thus supports the concept of duality, where the reciprocal relationship between elements is acknowledged. For example, Giddens (1984) states, “The constitution of agents and structures are not two independently given sets of phenomena, a dualism, but represent a duality” (p. 25).

Relationships of mutual constitution are important. Much of the research on organizational interactions focuses on agents and their environment as independent

entities (Bartunek, 1993; Bartunek & Moch, 1994; Brown & Duguid, 1991; Brown & Eisenhardt, 1997; Chatman, 1989, 1991; Eisenhardt, 1989; Fiol & Huff, 1992; Gersick, 1991; Gioia, 1992; March, 1991; Michel, 2014; Moorman & Miner, 1997; Nelson & Winter, 1982; Thachankary, 1992; Tushman & Rosenkopf, 1992). This approach fails to account for the recursive relationships among individuals and the multiple elements of their environment and the subsequent impact on the organization. Practice theory fills this conceptual void with the concept of mutual constitution (Feldman & Orlikowski, 2011; Schatzki, Knorr-Cetina, & von Savigny, 2001; Michel, 2014).

The principle of mutual constitution states that no occurrence can be viewed independently from other occurrences (Bradbury & Lichtenstein, 2000; Feldman, & Orlikowski, 2011; Nicolini, 2012; Østerlund & Carlile, 2005). Phenomena always exist in relationship to other phenomena, produced through a process of interdependent reciprocity.

Key Contributors to Practice Theory

Marx. Karl Marx introduced the importance of practice and everyday activities in the study of human phenomenon and social sciences. Prior to Marx, materialist approaches were either centered upon the notion of social life being derived from human thought or human thought being derived from observations made on the world. Marx helped lay the foundation for the notion that human thought and the social world are mutually constitutive and must be considered together, in their social and historical context, in order to understand the significance of human actions (Marx, 1845; Nicolini, 2012).

Heidegger. Heidegger contributed to the field of phenomenology with his ideas on “fundamental ontology.” A human is a being (Dasein) that exists in the context of time, place, and in relation to other beings and things in the world. In other words, a human agent exists as a being-in-the-world, and that world must be viewed in the context of time. Additionally, being-in-the-world has to be viewed in the context of being with others and things; beings, the world, and things are all intertwined and mutually influence one another. Practices are derived from and guided by one's response to being-in-the-world. Furthermore, in everyday practices, things are experienced in reference to their usefulness and relationship to their location; however, things are an unconscious part of our existence unless there is a breakdown of some sort. To demonstrate this point Heidegger used the example of a hammer. One uses a hammer to drive in a nail without consciously thinking of the hammer. The hammer is an inherent part of the act of hammering, yet one does not think of it unless it is lost or broken and unavailable for use. Likewise, one performs the act of driving a car without consciously thinking about the car. (Heidegger, 1927; Nicolini, 2012).

Wittgenstein. Wittgenstein's contribution to practice theory stems from his ideas on the nature of language in everyday practices. Words are tools, and language is an essential resource that is necessary for humans to make sense of and interact with the world around them. Practices must be viewed in the context in which they occur. Likewise, words are given meaning based on the context of their use. The relationship between a word and an object can only be understood within the comprehensive context of language. Language gives meaning to practices and actions and helps us interpret and

organize the visual reality in which we exist and from which we cannot be separated. Additionally, language only exists in the context of society; there is no such thing as a private language because the meaning of words stems from external representations as well as internal representations. The world, humans, and language are all interconnected (Nicolini, 2012; Wittgenstein, 1953).

Bourdieu. Pierre Bourdieu, a French sociologist, used “habitus” to explain “the permanent internalization of the social order in the human body” (Eriksen & Nielsen, 2001, p. 130). Conceptually, habitus is similar to Merleau-Ponty’s theory of embedded knowledge and Polanyi’s concept of tacit knowledge (Nicolini, 2012). Habitus is created through one’s socialization and participation in the world; it is the internal representation of the external world and its structures. It influences our interests, ideas, dispositions, preferences, and beliefs, thus predisposing one to certain actions and inaction. Bourdieu also acknowledged the power of human agency and creativity that allow an individual to choose to act in ways that counter the habitus (Bourdieu, 1984, 1990; Nicolini, 2012).

The construct of habitus is a central element of the theoretical framework that emerged from the study. The habitus provides a robust means to conceptualize the dynamics that were introduced in socialization theory. As will be discussed further in Chapter Four, the habitus construct also indicates why we are inclined to perceive or not to perceive certain aspects of our environment. Theorizing the affordances, limitations, and adaptability of the habitus sets the stage for both the limits of and possibilities for cross-domain contributions that will be discussed in later chapters.

Bourdieu later introduced the idea of 'field.' Field theory helps illustrate the dynamics between individuals, as well as groups of individuals. Fields are the backdrops in which individuals and their social positions interact. They are the various domains of practice (such as politics, art, religion, economy, institutions, social groups), each with their rules. Each agent's role in the field is the result of interaction between the habitus of the agent and the particular rules of the field. Fields are hierarchical, with agents having different social and power positions.

Doxa is another vital principle in the field theory. It refers to the tacit assumptions regarding rules of play and what could be considered as acceptable actions within a field. Doxa thus exerts a significant influence on an individual's actions within a particular field (Bourdieu, 1984, 1990; Nicolini, 2012).

Along with the theories of habitus and field, capital is another integral component in Bourdieu's practice theory. Capital consists of anything "rare and worthy of being sought after, in particular, social formations," including both material and non-material aspects (Bourdieu, 1977, p. 178). Beyond the more traditional material and financial concepts of capital, Bourdieu also stressed the significance of social networks, cultural fluency, education, aspects such as dress and mannerisms, and credentials one acquires through belonging to a particular social class. Economic, social, and cultural capital all convert into symbolic capital (valuable nonmaterial capital such as honor and prestige) when an individual enters into a field. This form of power thus bestows legitimacy and dominance to an individual, and Bourdieu argued that this power leads to symbolic violence (as a mode of domination) and sustains inequality (Harker, Mahar, & Wilkes,

1990; Lau, 2004). In fields, the distribution of capital creates variances in legitimacy and power. Capital, simply, is anything that can be exchanged, and its distribution and legitimacy is relentlessly disputed. In addition to habitus, capital helps determine an individual's position in the field. (Bourdieu, 1984, 1986, 1990; Nicolini, 2012).

Furthermore, Bourdieu asserts that practice, habitus, field, and doxa continually create and recreate one another through an interdependent relationship (Bourdieu, 1984, 1986, 1990; Nicolini, 2012).

Giddens. British sociologist Anthony Giddens focuses on the idea of structuration in his approach to practice theory. His work, greatly influenced by Wittgenstein, attempts to unite structures and human agency through the concept of ‘duality of structure;’ that is, structures and agency are not a dualism, but a duality. One cannot exist apart from the other. Giddens’ structuration theory emphasizes the interdependence between structure/agency, and everyday practices both shape and are shaped by the structures in which they occur (Giddens, 1984). For example, individuals reproduce social norms (structures) by continuing to conform to social norms, driven by the wish for acceptance and the desire to avoid negative emotions such as embarrassment. While stressing the autonomy of human agents, Giddens asserts that individuals obtain a sense of security through the familiarity of the social worlds they create and recreate. Human agency possesses a transformational power, yet operates within the constraints of social structures (Giddens, 1984; Nicolini, 2012). In describing this, Giddens states structures both constrain and enable practices. He posits that "the structural properties of social systems are both the medium and the outcome of the practices that constitute those

systems" (Giddens, 1984, pp. 70-71). Thus, Giddens' theory of structuration highlights the mutually constitutive relationship between human agency and structure.

Latour. Bruno Latour was one of the developers of the Actor Network Theory or ANT, which conceives of material objects as integral parts of social networks. ANT refers to human and nonhuman entities as "actants," making a distinction between the term "actor" traditionally used to describe the roles of humans. In ANT, all actants are given equal treatment; that is to say all are essential parts of the network. One actant is no more or less important than the others, as the processes of the network depend on the contribution of each actant. One actant cannot function apart from other actants in the context of the network, which is set in a particular place and time. ANT's focus on inanimate objects and their effect on social processes is a significant contribution to practice theory. Instead of viewing objects and technology as outside forces, ANT sees them as emerging from social interest, thus impacting social interactions. ANT considers the world as a multitude of networks, each consisting of various actants (e.g. objects, humans, ideas). It investigates the formation of networks, how they develop, the relationships among actants, and the associations with other networks. It asserts that if one actant is removed from or added to a network, the performance of the entire network is affected. Nevertheless, ANT acknowledges the fluidity and complexity of networks and embraces the constant evolution of networks. Similar to Heidegger's assertion that things are an unconscious part of our existence unless there is some breakdown, ANT claims that the interconnections within a network are invisible unless something in the

system goes awry. Only when something in the system is amiss does the composition of the network become apparent (Latour, 1996, 2005).

Schatzki. Theodore Schatzki describes practices as more than human activities; practices are composed of humans, shared understandings, codifications of these understandings in a common language, and material objects. He describes practices as bundles (2002) of spatially and temporally positioned material arrangements (2001), by which he means interconnected people, objects, organisms, and natural artifacts. These bundles are structured by rules and mutual understandings, and form “sites” (2002) where social life transpires. Practices and arrangements are bundled in a way that they are inseparable from one another, and these arrangements guide and support practices (Schatzki, 2001, 2002).

While his idea of material arrangements is similar to ANT’s networks, Schatzki’s approach is different because he is concerned with practices and the relationships between such material arrangements and practices. Latour recognizes human activities as being conditionally related to one another; social matters are simply associations. Schatzki recognizes the essential contribution of practices to organized material arrangements. He investigates social phenomena by studying the causality between and mutual constitution of practices and arrangements, and how practices are prefigured (2002) by material arrangements and set social interactions. Schatzki believes practices are prefigured because the composition of arrangements and established social norms qualifies potential actions. However, he acknowledges the potential for new understandings and discourse that can evolve practices and reshape material

arrangements. The evolution of a practice stems from the transformation in how people understand the practice and their connection to it. Changes in practice produce cognitive shifts, changes how elements within material arrangements relate to one another, and alters the arrangement of elements and the required resources for the new practice (Schatzki, 1997, 2001, 2002, 2010a, 2010b, 2012).

Feldman. Martha Feldman spent four years studying five routines of a university housing organization. She intended to study the micro-processes that lent to the stability of routines but was intrigued to find that, instead of the expected stability, there were numerous changes occurring within each routine. Previous research had associated routines with inertia and stability (March & Simon, 1958; Cyert & March, 1963; Nelson & Winter, 1982) and saw change as an anomaly. Change was considered the opposite of stability, occurring as a mutation (Nelson & Winter, 1982) or major crisis. Additionally, changes in routines were associated with organizational changes. Feldman observed that while changes were occurring in each of the routines she was researching, the overall operations of the housing organization were stable.

Seeking a way to understand the dynamics of change and routines, Feldman began to look at practice theory. Applying a practice lens, she was able to conceptualize routines as practices. She saw that a routine was established through its enactment; they do not exist apart from the actions of human agency. Additionally, action/structure and stability/change are the two main dualities associated with conceiving routines as practices, and these dualities are mutually constitutive. That is, "stability and change are different outcomes of the same dynamic rather than different dynamics" (Feldman &

Orlikowski, 2011, p. 1245). Human agency, working toward a desired outcome, chooses to either maintain or alter actions based on the previous outcomes their actions produced. Therefore, routines are emergent and enterprising (Feldman, 2000). There is a recursive and mutually constitutive relationship between the actions taken by human agency, and the outcomes of those actions (Feldman & Pentland, 2003, 2005, 2008; Pentland & Feldman, 2005, 2007, 2008)

In addition to her research on routines, Feldman explored the concepts of resources. Instead of seeing resources as static objects or processes with inherent characteristics, she suggests those things are simply potential resources until human agency enacts their use. Additionally, a resource is seen as a different type of resource based on how it is used, which may vary in particular contexts. For example, a rock can be used as a decorative object in a garden or as a tool to crack open a walnut. It is the way something is used that designates it as a resource and defines what kind of resource it is (Feldman, 2004). Feldman views resources through the lens of “resourcing,” which emphasizes the practices through which resources are enacted. She uses the term “resource-in-use” to describe the idea that the combination of a thing and its uses is what designates it a resource (Feldman, 2004; Feldman & Quick, 2009).

As with Bourdieu’s habitus, conceiving resources as both physical and non-physical assets that support taking action and achieving ones’ goals was another central element of my theoretical model (Giddens, 1979, 1984, 1993; Feldman 2004, Nicolini 2012; Michel, 2014). Feldman’s (2004) concept of resourcing and the enacting of

schemas were pivotal in analyzing the relational interactions and the results that were found throughout this study.

Orlikowski. Building upon Giddens' structuration theory, and its concepts of mutual constitution between structures and human agency, Wanda Orlikowski explored the relationship between technology and people in the workplace. Instead of focusing on technology and people as two separate entities, she first explored a structurational model of technology (Orlikowski, 1992). This view focused on the mutual constitution of human agency and technology in organizations and its contribution to organizational outcomes. Technology is an outcome of human actions, and at the same time is used by humans to achieve outcomes (Orlikowski, 1992, 1996). Building upon that view of organizational technology, Orlikowski found that it is the enactment of technologies, not the technologies themselves, which is critical in impacting outcomes. She defined the recurrent use of a particular technology in an organization as technology-in-practice (Orlikowski, 2000). Emphasis is on the actions that produce the outcomes, not on the outcomes, human agency, or the technologies themselves. This idea is similar to Feldman's view on resources—a resource is defined by the actions that sanction it a resource (Feldman, 2004). Further developing her theory of technologies-in-practice, Orlikowski began to look at the technology through the lens of sociomateriality. Sociomateriality asserts that the material and social elements of an environment are constitutively entangled (Orlikowski, 2007) and cannot be considered separate elements. Each has an essential impact on the other within a particular social context, and one cannot exist independently of the other.

As has already been mentioned, sociomateriality was the foundational concept that supported the reconceptualization of expertise posited by this study. The constitutive entanglement asserted by Orlikowski allows for the relational dynamics that are proposed in my research and, as will be discussed in Chapters Four and Five, indicates possibilities for how to extend the expertise and contribution across domains.

Michel. Michel's research is centered on two highly successful Wall Street investment banks, and how they conceive and navigate environments of extreme uncertainty. One of the banks (Individual Bank) attempted to reduce uncertainty as much as possible while the other bank (Organization Bank) intentionally amplified uncertainty. These two fundamentally different approaches to uncertainty were reflected throughout the various structures and practices of each bank.

In order to both minimize uncertainty and enact an expert-based competitive strategy, the bankers at Individual Bank operated from a cognitive frame where expertise is conceptualized as vested in an individual. Therefore, they were reliant on experts to deal with the complexities of the market. Although this approach can reduce uncertainty, it also introduces additional risk in complex and dynamic environments. The associated risk emerges from the tacit and explicit schemas that experts develop and enact to reduce uncertainty. This approach can be very useful and efficient in stable environments. However, when the market changes, the individual experts are less able to recognize and adjust to the changes, due to their reliance on abstract schemas rather than attention to specific environmental cues (Michel & Wortham, 2008; Michel 2014, 2015).

Accordingly, during the two years of research, Individual Bank changed organizational structures and leadership fifteen times. This enactment of inattention to specific environmental cues led to minor problems going unnoticed or misinterpreted, and thus developing into major problems. Likewise, and as a result of these crises, top management would react and replace structures and leaders based on their abstract ideas about market realities and bank strategy (Michel & Wortham, 2008; Michel 2014, 2015).

In contrast to Individual Bank, Organizational Bank conceptualized expertise as resident within the broader organization and including people, processes, practices, and structures. The bank's philosophy of amplifying uncertainty was intended to force bankers to both be attentive to the unique aspects of each situation and to rely on the resources of the bank as opposed to their individual expertise. The specific practices intended to amplify uncertainty included diminishing focus on titles and roles, refraining from establishing abstract visions and strategies for the bank, staffing based on availability, not expertise, and feedback practices that were more qualitative and forced bankers to look at others' perspectives and at the variability across situations (Michel & Wortham, 2008; Michel 2014, 2015).

These practices and structures resulted in bankers who were not predisposed to fixed schemas about their roles or market dynamics. Accordingly, they were more observant of situational cues and relied on the talents and knowledge of others in order to navigate the uncertainty. As the structures and practices predisposed the bankers to respond in this manner, their actions were reinforcing these same structures and practices and the distributed expertise of the bank (Michel & Wortham, 2008; Michel 2014, 2015).

At Organizational Bank, there were no changes in leadership or organizational structures in the two years of research. Changes in task structure did occur in response to specific market cues. In addition, the combination of attention to market cues and the lack of a fixed strategy allowed innovation to flourish as the bankers noticed and acted on opportunities. Insights emerged and evolved due to the lack of rigid schemas or assumptions about how things were supposed to work.

Another contribution of this research is the demonstration of how different structures, practices, and organizational ontologies can, over time, produce fundamentally different individuals. Both banks recruited the same profile of applicant, namely graduates from elite universities. However, over time Individual and Organization bankers were transformed into profoundly different individuals with dissimilar ontologies (Michel & Wortham, 2008; Michel 2014, 2015). These differences are reflected in their career choices after leaving Individual or Organization Bank. The alumni from Individual Bank typically remained in the financial services industry or financial roles in other industries. In contrast, alumni from Organization Bank became entrepreneurs, joined non-profits, and went into government (Michel & Wortham, 2008).

The research by Michel (2014, 2015) and Michel and Wortham (2008) indicate the influence and the implications of sociomateriality on organizational socialization and on organizational performance. The distinctions in the rigidity in schemas and the degree of attunement to environmental feedback were particularly thought-provoking as I began to analyze the data and similar phenomenon emerging from this study. In addition to helping conceptualize the phenomenon observed in my data, their work provided insight

as to how a sociomaterial lens could indicate options to further extend expertise and contribution across domains. The intentional approach to structural, social, and material aspects that was demonstrated by Organizational Bank led to greater attunement to environmental feedback and thus greater adaptability in the face of changing environmental needs. By extension, I became curious if this phenomenon might also indicate how attunement to sociomaterial dynamics might indicate an actionable pathway to enabling the emergence of greater cross-domain expertise and contribution.

Contributions

Practice theory provided an excellent meta-frame for this study. Building upon the other theories reviewed in this chapter, it allowed for a more inclusive and dynamic lens through which to analyze the data. The principle of mutual constitution, the construct of habitus, and the principles of resources-in-use and resourcing proved to be particularly influential in constructing the underlying conceptual model of this study.

Chapter Summary

In this chapter, I reviewed the theories of learning, socialization, identity, expertise, and practice theory. Each of the theories included in this literature review significantly influenced the intellectual journey and the findings that emerged from this study. The resulting interconnectivity ultimately allowed me to conceptualize the theoretical dynamics that were reflected in the data and the findings.

Engaging with the key bodies of literature allowed unique insight into the dynamics occurring in the surgical and the non-surgical domain. This insight included the rigidity of the surgical habitus and the limits it imposed in engaging potential

resources and thus the ability to contribute within a domain. In addition to explicating the basis for observed limitations, the literature also provided indications as to how to extend contribution and expertise across domains. This insight will be discussed further with supporting data in Chapter Four, and again in Chapter Five when reviewing the theoretical framework that emerged. However, before further exploring and applying the theoretical affordances that were discovered through this literature review, I will review the research methodology guiding the study.

Chapter 3: Research Methodology

This chapter presents the research methodology that was used to direct and support this study. I first introduce the original purpose of the study and describe why and how the focus of the study evolved during the course of the study. I then discuss the rationale for employing a qualitative design and a purposeful site selection process. Next, I review the approach to data collection and analysis. From there I discuss the limitations of this design and then conclude this chapter by providing an overview of the actual research site.

The original research question guiding this study focused on the influence of feedback structures and practices on an organization's ability to engage in continuous change. In selecting a newly formed trauma surgical center as the research site, I felt assured that the study would surface numerous examples of an environment of continuous change. Although the initial interviews did reveal an environment of continuous change, the data that were emerging from the interviews presented a more intriguing story. The themes that emerged from my data reflected the mutually constitutive relationship between individuals and their environment. As I continued to interact with my data and the literature, I revised my research questions to the following:

Research Question #1: What are ways to conceptualize the expertise of a trauma surgeon?

Research Question #2: What are the characteristics associated with trauma surgeons and their professional socialization and current work environment that influence the portability of their expertise?

These questions were designed inductively as a result of my ongoing engagement with my data, the literature, and members of my dissertation committee. I chose to revise the focus of the study given early data and what they spoke to and because of the additional contribution that I believed the revised approach would make to both theory and practice. For example, traditional views on expertise reveal that individuals that are highly skilled in one domain (e.g., surgeons) rarely are able to transfer that expertise to other domains (Glaser et al., 1988). However, my revised research questions allowed for an open frame from which to explore alternate conceptualizations of expertise. In doing so it may also allow for further consideration of how to actively facilitate the emergence of expertise, the extension of contribution across traditional domains of expertise, and/or how to support the portability of expertise within and across environments. This additional insight and understanding could both contribute to and expand the current discourse into the sociomateriality of expertise. The insight could also have practical value for practitioners who are seeking ways to facilitate the contribution of experts across domains.

Although I revised my research questions, the original qualitative design of my study continued to provide appropriate guidance and structure. Because the nature of the research is based on exploring individuals' perceptions and experiences I chose to employ a qualitative design (Patton, 2001; Maxwell, 2013). Qualitative research allows for a dynamic balance between structure and adaptability; allowing the researcher to remain engaged with and responsive to the data, the theory, and the ongoing research

design (Maxwell, 2013). The ability to be responsive to the data was critical in allowing me to adjust the focus of my study as the data presented unexpected themes.

In the sections that follow, I provide a more detailed review of the research design and an overview of the research site. The remainder of this chapter will be divided into the following five sections: Site and Participant Selection, Data Collection Methods, Data Analysis Methods, Study Limitations and Overview of the Research Site. As a part of the site selection, data collection, and data analysis sections, I introduce and review the specific design criteria and guidelines for section. In reviewing the limitations of this study, I discuss both the inherent limitations and the practices that were employed in order to mitigate some of the limitations. In concluding this chapter I introduce the specific research site and the unique characteristics associated with the site.

Site and Participant Selection

In order to fully explore the goals and research questions, I applied *purposeful selection* (Light et al., 1990; Maxwell, 2013) as the design strategy for the selection of participants in this research. Purposeful selection is an appropriate approach when one intends to select individuals and settings that are uniquely qualified to provide information and insight relative to the goals and specific questions guiding the research (Maxwell, 2013). Given that the original goals of this study were to explore the influence of feedback structures and practices and that this involves exploring the experiences and perceptions of organizational members, purposeful selection fits these criteria.

The initial filter for selecting the organization and/or site for this study includes the following criteria:

1. The organization must have existed as a *going concern* for a minimum of three years. Going concern is an accounting term that describes an organization that demonstrates the financial viability to remain in business for given period. I selected the minimum three-year period as a reasonable timeframe within which an organization would have experienced multiple internal and external challenges and thus demonstrated a reasonable level of viability as a going concern.
2. The organization has shown the ability to adapt successfully to significant external environmental challenges such as those resulting from competitor actions, political or regulatory shifts, or technological innovations.

The original focus of the study was to understand how an *organization's internal feedback practices and structures influence its ability to engage in continuous change*.

Using the criteria listed above, I solicited site recommendations from colleagues who have direct knowledge of organizations that potentially meet the criteria. For organizations that met these criteria, I then made the final site selection based on the perceived level of richness and representativeness of the phenomenon being studied, the access to between fifteen and twenty potential interview participants, and the availability of the organization to meet the timeline of this study.

Once the research site was selected based on the criteria above, I then began the process of identifying fifteen to twenty potential interview participants based on

predetermined criteria. In selecting the list of potential participants, I relied on the advice of two organizational members who were in leadership roles at my chosen research site. One of the members was in a senior administrative role and did not have a background in direct patient care. The other advising member was also in a senior leadership role and still maintained responsibilities as a practicing surgeon. Combined, they had well over two decades of experience in a surgical care environment. Both members were extremely supportive of this study and knowledgeable of the organization and its members.

In collaboration with these members, I selected eighteen potential participants. To support the selection of participants that would provide insightful data for this study, I develop the following list to guide selection:

1. Potential participants must be a current member (e.g., employee) of the organization. This criterion allows for more convenient access and ensures that the participant continues to have a current perspective on the selected organization.
2. Potential participants must have been employed by the organization during one or more of the major environmental challenges used to select the site. This criterion is to ensure that the participant has the appropriate context and experience to inform their response and that they are not relying on second-hand perspectives.
3. The work responsibilities of the potential participants during the specified challenge from the external environmental must have required significant interdependence with one or more other members of the organization. The

assumption with this criterion is that significant interdependence better ensures a relational perspective versus an organizational member who worked autonomously or semi-autonomously.

4. Potential participants must be willing to participate in the study through their free will. Based on the belief that a member's willingness to participate increases the potential for richer data collection than one who is resistant to participate.
5. Potential participants must be able to assure their level of accessibility during the specified timeframe of the study. Given the relatively short data collection period, participant accessibility is a critical consideration.

Ultimately, I was able to recruit thirteen active participants. Although this number is lower than my initial goal of a minimum of fifteen participants, I believe that it provided accurate and sufficient data relative to the phenomenon under study. My justification for this claim is that between the fourth and sixth interview I was observing clear and consistent themes or saturation (Glaser & Strauss, 1967).

In this sub-section, I described the process and criteria that I employed to select both the research site and the participants for the study. A purposeful selection (Light et al., 1990; Maxwell, 2013) strategy was the driving logic behind my design because it ensures that the site and the individual participants will be capable of providing rich insight and understanding about the phenomenon being studied (Patton, 2001). I will introduce and describe the methods that were used to collect the data.

Data Collection Methods

The primary source of data for this study was in-depth interviews with individual participants. In-depth interviews are a classic tool for qualitative research because of their effectiveness in connecting with participants to fully explore their experience, perspective, and meaning attributed to the phenomenon or topic in question (Maxwell, 2013). To the casual observer, an in-depth interview, conducted by an experienced practitioner, can appear naturalistic and conversational in nature (Legard, Keegan, & Ward, 2003). Paradoxically, this informal experience of the interview can be attributed to the preparation and skill of the interviewer (Legard et al., 2003).

In practice, in-depth interviews allow for both structure and flexibility in the inquiry. Interviewers will typically have a guiding structure to focus the interview, yet this same structure allows the interviewer to explore opportunistically unexpected topics or leads. This flexibility supports the conversational and generative nature of in-depth interviews (Rubin & Rubin, 1995). An example would be an interview where one aspect of the interviewee's response seems disconnected to the topic at hand. In this situation, the interviewer would probe further by asking the interviewee to explain further the relationship between their comment and the topic at hand. In doing this, the interviewer and interviewee may open up a new stream of inquiry and meaning that deepens or expands the research (Legard et al., 2003).

A prescribed script consisting of a select list of open-ended questions was used to guide each interview. The questions focused on exploring, both directly and indirectly, participants' experiences of change and feedback within the organization. In addition and

consistent with the practice of in-depth interviews described above, I explored participant responses in order to capture sufficiently their experience and point of view. In the paragraphs that follow, I will specify additional detail and assumptions behind this design.

Based on significant prior experience in conducting qualitative interviews in a business setting, I scheduled each interview for sixty minutes. This timeframe did prove to be sufficient to engage the participant in an exploratory dialog at a level of depth that supported the goals of the study. The majority of interviews were scheduled with the support of the participant's administrators. By working directly with the administrative assistants, I was able to schedule consecutive interviews when possible. In managing my calendar, I scheduled the interviews to allow for ninety minutes per interview. The additional thirty minutes allowed for interviews that run longer, to check back on meaning at the end of the interview, and for sufficient time to capture and review my notes.

To support the dialogue and focus of the interviews, I developed five predefined questions that addressed the core goals of the research. The initial data collection tool is included in Appendix A. The questions were open-ended in order to provide a conversational ethos that would allow interviewees to speak to their unique experiences (Patton, 2001). I arrived at the volume of five questions based on my professional experience and conversations with other experienced researchers. The criteria for selecting a volume of five questions was to include a sufficient number of questions that sufficiently represent the scope of the study and take into account the sixty-minute

timeframe. In addition to the five scripted questions the semi-structured interview design also provided for the latitude to pursue unanticipated lines of inquiry. Examples would include situations where the interviewer asked questions that further probed into a response or situations where an unexpected response opened a new line of inquiry. This allowed for a more dynamic exchange with participants and provided rich and unanticipated data.

Each interview was conducted face-to-face and took place in a confidential location such as the participant's private office or conference room. All but one interview was recorded and transcribed. Subsequent conversations with the project sponsor were not recorded, but I did make personal notes during or after the conversation. The practice of recording and transcribing interviews allowed me to be fully present and mindfully engaged in the interview and to ensure that the data are sufficiently captured for future use (Patton, 2001). Immediately following the interview, I took ten to twenty minutes to capture my thoughts from the interview or to refine my notes. This is a personal practice that I have developed over the years and when combined with recorded and transcribed interviews, leads to a richer and more robust level of data. At the beginning of each interview participants were informed of the confidential nature of the interview, asked for permission to record the interview, and provided with a Memo of Informed Consent that was stamped by the Institutional Review Board at the University of Pennsylvania.

Developing the initial interview questions was an iterative process during which I engaged colleagues and fellow dissertation students (Candice Reimers & Peter Cavanaugh, personal communication, February 20, 2015) for feedback and advice. In

designing my research questions, I followed the guidance that a “research question formulates what you want to understand; your interview questions are what you ask people to gain that understanding” (Maxwell, 2013, p. 101). Accordingly, developing interview questions and instruments are not a linear or prescriptive process and must sufficiently take into account the topic, the audience, and the context (Maxwell, 2013). To account for this, I tested my instruments prior to conducting actual research with the project sponsor who was a member of the site where I was conducting my research and was professionally representative of the other study participants.

The initial design of the interview process anticipated two rounds of interviews. However, due to schedule conflicts with participants and the timeline of this study I was only able to conduct one round of interviews. During the first round, all participants were involved and the focus of the interview was to gain an in-depth understanding of their perceptions and experiences (Lofland & Lofland, 1995; Legard et al., 2003; Rubin & Rubin, 1995). In order to mitigate the impact of not conducting the second round of interviews, I began to test emerging concepts or themes during my ongoing first round interviews. Throughout the data collection, I also remained in contact with the organizational member serving as the organizational sponsor of my study and used her as a source of further validation, described below. These meetings were scheduled in advance based on the availability of the sponsor and the researcher. The meeting did not follow a formal agenda but did conform to a standard process of updating the sponsor on the status of the project and testing specific themes that were emerging from the data.

In my continuing dialogue with the project sponsor I approached the testing and validation of emerging concepts. I also tested these emerging concepts with subsequent participants. In part, this approach was to offset the inability to conduct member checks. Member checks are a form of participant validation considered a critical technique for establishing credibility in qualitative research (Lincoln & Guba, 1985). This process allows for sharing the data with participants to validate the accuracy or to validate the researcher's understanding of the data as presented. It is essentially a feedback loop where the interviewer and interviewee remain in dialogue regarding the interpretation and meaning that is emerging from the data. This interactive process is what lends credibility to the data (Cho & Trent, 2006). However, it is important to note that as effective as member checking can be, it has limitations. Participants may not agree with the meaning attributed by the researcher. As described by Maxwell (1992) researchers can, at best, only reconstruct the meaning that an experience holds for the participant (Maxwell, 1992). In addition, researchers have noted that member checks can be more easily validated by interviewees when used during inquiry rather than posthoc or once the data have been decontextualized and abstracted across multiple sites (Morse, 1998; Sandelowski, 1993).

In the initial research design I had included member checks to ensure optimal validity of the data being collected. Unfortunately, constraints in both the project timeline and participant availability did not allow for member checks. To mitigate the risk of data validity, I implemented a modified form of member checks described above.

Memos

Memos are a fundamental technique of qualitative research. Accordingly, I made active use of memos to support me in fully engaging with and exploring my research (Howard & Barton, 1988; Miles & Huberman, 1994; Groenewald, 2008; Maxwell, 2013). Recognizing that memos can take many forms and are essentially a tool for ongoing dialogue with one's self and one's committee, I did not attempt to anticipate fully each and every instance and where I would employ memos (Maxwell, 2013). There were two main instances where I consistently leveraged memos as a tool to support my research. The first instance was during the interview process. I established a practice of drafting personal memos at the conclusion of each interview to capture my reactions and the internal dialogue that was occurring in response to the interview. The second instance was during data analysis. Throughout the research process, I used memos in two ways. The first was to help me process or make sense of the themes that were emerging from the data. The second was to capture my reflections, questions, and decisions as I moved through the overall research process, which could be considered analogous to a field journal. In my use of memos, I employed both hand-written journals and a web-based tool known as Evernote.

Document Review

The opportunity to review existing documents was relatively limited with this study. The individual who was acting as the sponsor for the study did provide summary documentation of the preliminary vision document that was the basis for the newly formed organization. In addition, they provided bios on all participants and allowed me

to read two documents that reflected specific performance data for the organization. The sponsor did provide a printed or electronic copy of these reports. On multiple occasions I inquired about the existence and availability of reports or tools such as checklists that might serve as sources of feedback or provide relevant information to help me further understand the content and context of the site. Other than the examples mentioned above, I did not have access to further documentation. In part, I do not believe that the type of documentation that I was asking for existed or was readily available. However, I also believe that there was reluctance on the part of the sponsor and participants to provide official copies of certain information, possibly due to the strict HIPAA (Health Insurance Portability and Accountability Act) privacy laws and the litigious environment that physicians work within. It is important to note that while I experienced hesitation in providing formal documentation, I experienced all participants as extremely candid and open during the interview process. In part, I made this assessment by the level of openness and vulnerability demonstrated by participants in their willingness to acknowledge areas both within the Center and their own practice where improvement was possible.

Data Analysis

In considering how to design the study's data analysis plan, I chose a parallel process of both collecting and continually analyzing the data throughout the collection process (Coffey & Atkinson, 1996; Maxwell, 2013). I chose this approach for theoretical and practical reasons. From a theoretical perspective I viewed this early and continual engagement with the data to be generative in that emerging insights will influence my

ongoing data collection and the ultimate depth of understanding and insight that I can produce. This approach also allowed me to observe and to participate in the story that emerges from the data. The practical reason for this approach was that I anticipated the combined interviews and document review would generate a significant amount of data. Given the relatively short window for collecting, analyzing, and writing about the results, I needed to be both efficient and focused throughout the entire process. By engaging with the data as they are collected, I was further assured of having the necessary time to dedicate to each phase of my research.

Previously, I discussed my intended use of memos and their importance in both the data collection and analysis processes. However, given the significance of memos in this design I want to reinforce their use as a means to help me reflect on what I am observing from my data as well as what I am observing from my engagement with my data (Miles & Huberman, 1994; Maxwell, 2013).

As I engaged with the data I employed an open coding (Strauss & Corbin, 1997) strategy. Because this is an exploratory study and my goal was to understand the unique experience and perspective of others, I believe that this is the most appropriate approach (Strauss & Corbin, 1997; Maxwell, 2013). After the third interview and before receiving the actual transcripts, I began to establish initial themes or categories that were emerging from the data. This step allowed me to begin to determine similarities among and connections between the data (Maxwell & Miller, 2008). I used notes, memos, and personal memory to inform this first level of coding. Examples of the preliminary themes include such descriptors as trust, patient care, change, ambiguity, and identity. As

I continued to collect data, some themes fell into the background or merged into others. Once I began to receive the actual transcripts, I created a data analysis matrix in Microsoft Excel that allowed me to visualize and more comprehensively consider my emerging categories or codes.

Coding the data was an iterative process that began with the first interview and lasted well beyond the collection of the data. The process involved a preliminary coding of each new transcript to assess the alignment with existing codes and look for possibly new categories. As the data collection process progressed, codes began to move to the foreground while others move to the background based on the frequency, volume, and relevance to the phenomenon being studied. Concurrently, themes evolved through greater insight provided through ongoing data collection and engagement with the literature, committee members, and colleagues.

Study Limitations

Before discussing the design limitations of this study, it is important to discuss how my own professional experience could become a limiting factor in this research. In my professional career, I serve as a consultant and executive coach to organizations. My target client populations are organizations and individual leaders who seek to thrive in complex and dynamic environments, such as the environment in this study. Accordingly, I have a substantial amount of experience and a developed point of view about what is required to adapt and thrive in such environments. While I believe that this is beneficial in many ways, it has the potential to place my research at risk for bias if not actively accounted for. To mitigate this risk, I kept a personal journal, as described in the memo

sub-section, for capturing my experience of and reaction to the data collection and analysis. I was continually mindful to remain open and present to the process and to the data. In addition, I actively engaged my peer reviewer, Candice Reimers, and members of my committee to help me remain aware of my level of subjectivity and how to manage its influence on this study. However, as with all qualitative research, the researcher is the instrument (Jacob, 1989) and, therefore, my experiences and biases will, in some way, influence my findings.

Although I believe that this research has made a significant contribution, I also am aware that there are several ways in which it can be improved, including: increasing the number of participants, adding field observation in all domains of the Center, increasing the member checks or follow-up interviews.

The sample size of interview participants was smaller than the original design contemplated. Due to multiple intervening factors, I was only able to interview 13 participants for this research. Although the original design contemplated 20 to 25 participants, I do not anticipate that increasing the number of participants would result in different findings. I base this statement on the fact that between the fourth and sixth interview I was observing clear and consistent themes and experiencing saturation in my data collection (Glaser & Strauss, 1967).

Similarly, the addition of field observations would add an additional level of richness to the phenomenon reported by my participants. For example, I believe that including significant field observation in the surgical and non-surgical domains would

add depth and nuanced insight to the study. Although this would add further complexity due to HIPAA regulations, it would also add further richness to the study.

Finally, increasing the number of member checks and a second round of interviews would have would provide a greater volume of data and validity to the study. However, as previously, I do not anticipate that this would have changed the overall finding. Instead, I anticipate that it would have resulted in a greater volume of data to support and perhaps provide further nuance to the findings.

Given the relatively small number of participants in my research, the findings cannot be extrapolated to be representative for the larger organization (Pelto & Pelto, 1975). In considering this concern, it is important to keep in mind that this research is exploratory and based on a purposeful selection design. My goal was to understand the unique experience and perception of members who were situated in a particular environment. As such, the findings are intended to be informative only and perhaps identify the basis for further research. Additional opportunities for further study will be addressed in Chapter Five.

Overview of the Research Site

The research site for this study was a newly formed Level 1 Surgical Trauma Center that was a part of a teaching hospital and regional health system. As reflected in the chart below, I interviewed both patient care and administrative professionals. Each of the participants has over a decade of experience in the healthcare and Trauma environment and are extremely knowledgeable and committed to their field. Participants ranged in age from early thirties to late fifties, and included three women and ten men.

Table 1. <i>Study Participants</i>	
Description of Role	Number of Participants
Senior Administrative Leaders	3
Management-level Nurses	2
Surgeons	8
Total Participants	13

Trauma Centers specialize in providing comprehensive medical services to patients suffering traumatic injuries incurred from incidents such as motor vehicle accidents, acts of violence (shootings or stabbings), and natural disasters. Trauma patients have injuries that are beyond the standard of care provided by the typical Emergency Department. Trauma Centers, especially Level 1 centers, are a major component of a community's healthcare system as evidenced by a study from the U.S. Centers for Disease Control and Prevention (CDC). The CDC study found that severely injured patients who have access to the specialized resources and equipment of a Level 1 center demonstrate a 25% reduction in mortality levels (CDC, 2009). A trauma environment is focused and fast paced with the primary goal of stabilizing the patient such that they can be transferred from the Center to the next phase in their continuum of care. Often the cases are complex and multifaceted, and mistakes can lead to the death of the patient (Klein et al., 2006).

The table listed below presents the criteria required to meet Level 1 verification by the American College of Surgeons (American Trauma Society, 2015).

Table 2. <i>Level 1 Trauma</i>
24-hour in-house coverage by general surgeons, and prompt availability of care in specialties such as orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, internal medicine, plastic surgery, oral and maxillofacial, pediatric and critical care.
Referral resource for communities in nearby regions.
Provides leadership in prevention, public education to surrounding communities.
Provides continuing education of the trauma team members.
Incorporates a comprehensive quality assessment program.
Operates an organized teaching and research effort to help direct new innovations in trauma care.
Program for substance abuse screening and patient intervention.
Meets minimum requirement for annual volume of severely injured patients.

This health system, like many others in the US, is facing “increasing pressures” (Participant B10) to control cost, provide high quality care, and serve the needs of all members of the community—both insured and uninsured (Participant B7). In order to address the mounting financial pressure,

Discussion began about two years ago, maybe a little longer than that, for the impending storm...laying the ground work for the financial situation for the medical center...there was an initiative that began that really was focused on helping us get through that storm.” “And that eventually resulted in reductions of workforce. (Participant B4).

In addition to the practical impact that the reduction in the workforce had in accomplishing work within the hospital and clinics, it also had a significant impact on the overall environment. As two participants stated: "It feels like we are rapidly changing

and adjusting" and that "the past year and a half (to) two years have produced a great deal of changes for us" (Participant B4). "We are an organization in change" (Participant B3A). These comments indicate the environment of continuous change, but they do not sufficiently reflect the combination of both weariness and resolution in their voices and manner. Although changes such as the reduction in workflow resulted in a physical and psychological burden on the staff that remained, they continued to be resolute in their commitment to patient care and the mission of the system.

Contrary to the financial pressure facing the larger organization, trauma services generated a positive financial return for the health system. "This small group...accounts for XY percent of the marginal revenue of the whole institution" (Participant A3).

However, the trauma services had recently begun to face significant external competition from a rival hospital system. As one participant stated:

We're getting our clocks cleaned by (rival hospital). (Rival hospital) has been very methodical in figuring out how to break into what have been traditional channels by which people got to (study hospital) and figuring out how to divert them (to rival hospital). (Participant B7).

In making this statement, the participant was acknowledging the methodical manner in which the rival hospital had positioned itself to challenge the market leadership of the research site. The comment was also indicating an awareness that because of inaction and complacency, the health system had allowed a rival hospital to take the trauma business.

So in an effort to both continue to build on their existing financial success in Trauma and to simultaneously defend against further shift of trauma volume to external competition, the decision was made to create a separate Trauma Center (hereinafter

Center). The objective, as stated by one participant was “to align goals and interests between the departments” and “value engineer at the disease condition level” (Participant B7).

The Center was established late in the fourth quarter of 2014. Beyond the competitive pressure, the motivation for forming the Center was also driven by an organizational philosophy of continually improving the delivery of patient-centric care by aligning “all of the resources that are necessary both from a discipline point-of-view, as well as a, if you will, a geographic structure point-of-view” (Participant B7). In further describing the structure and philosophy behind the Center:

When you’ve got your separate clinic management (and) your separate hospital management...value engineering of a clinical disease condition across the continuum has been extraordinarily difficult. We’re at a point in time where we need to take this kind of philosophy and approach to how do we organize ourselves around trauma. Because we’ve got many clinical disciplines that all need to collaborate together (Participant B7).

The Center supports a patient-centric view of a particular disease condition (Trauma) by "creating some cohesion" (Participant B7) of the key disciplines necessary to treat the condition, removing any administrative barriers, and signaling institutional commitment to the priority and success of the Center.

The surgical specialties represented in the newly formed center include General Trauma, Orthopedic, Burn, and Emergency. It is important to note that the newly formed Center does not include a physical alignment of the various specialties into a stand-alone clinic or hospital. Instead, the Center represents a philosophical and administrative alignment among the critical resources and processes that will serve the Trauma patients. It “rationalize(s) this process across the enterprise” (Participant B7). For example,

specific surgeons from General Trauma, Orthopedic, Burn, and Emergency services are dedicated to the Center while also retaining their affiliation their respective practice area. "It allows for specific disease condition engineering of (the) clinical care process (by re-engineering) the care process from onset of disease to stabilization of a patient across the entire continuum" (Participant B7). It is believed that this alignment will provide Trauma patients and their families with an improved experience along the continuum of care.

Conclusion

In this chapter, I introduced the original purpose of the study and then described why and how the focus of the study evolved over the course of the data collection process. I then discussed the motivations for employing a qualitative design and a purposeful site selection process. Next, I reviewed the approach to data collection and analysis and discussed the limitations of this model. I then concluded this chapter by providing an overview of the actual research site. I will now present the findings that emerged from the data and discuss the meaning that I derived from the findings.

Chapter 4: Findings

The central focus of Chapter Four is to introduce and discuss the two key findings that emerged from the data. First, I frame the unique contribution of these findings to orient the reader. Next, I introduce and discuss each finding separately, exploring the key themes and the meaning that I have made through careful analysis of the study data. I then summarize the key points of the chapter before transitioning to Chapter Five, where I discuss the implications of this exploratory research study. Throughout this chapter, I make active use of participant quotes, personal observations, and academic theory as I frame and articulate the study findings. In addition to being the primary data of this study, the participant quotes support an enhanced description of the environment and provides a fuller sense of the perspectives and the lived experiences of the research participants through sharing their perspectives in emic terms, that is, in the language with which they articulated their thoughts and experiences (Maxwell, 2013). The integration of the academic theory is crucial to interpreting fully the data and to ground the findings.

In Chapter One I described how the importance of expertise is accelerating and how experts are increasingly being tasked with contributing to challenges that span their particular domain of expertise (Fenwick et al., 2012; Davenport, 2013). I also described how conventional conceptualizations of expertise suggest that expertise does not easily transfer across domains (Glaser et al., 1988). If viewed solely from the cognitive conceptualization of expertise, these two statements could be perceived as presenting an impasse. While not denying that expertise has a cognitive basis, this research argues that this conceptualization does not go far enough and thus limits our understanding of

expertise and the possibilities for the broader contribution of experts beyond their typical domain of expertise.

The purpose of this study is to explore an alternative conceptualization of expertise in order to better understand the basis and the portability of expertise in the milieu at the center of the study. The research questions that guided the study are: *What are ways to conceptualize the expertise of a trauma surgeon? What are the characteristics of trauma surgeons and their professional socialization and current work environment that influence the portability of their expertise?* Both findings directly address each question and indicate opportunities for further study.

Introduction to Findings

The data-driven themes that emerged from this study reflect the unique and entangled relationship among the surgeons and the various structural, social, and material aspects of the surgical domain. It was from these dynamic and entangled relationships that the two findings from this study emerged. The first finding indicates that the expertise of the trauma surgeon is situated within a sociomaterial context. This means that her expertise is inextricably related to the structural, social, and material aspects of the surgical domain. The second finding indicates that the expertise of the trauma surgeon does not readily transfer to the non-surgical domain of the Center, and contextualizes this within the milieu as well as more broadly. This finding explicates the limitations that surgeons might experience in achieving a significant level of contribution in the non-surgical domain. As will be discussed later, the finding also points towards possibilities for facilitating greater contribution across domains. These findings are

generative in how they conceptualize the expertise of the surgeons and for how they provide insight into the potential portability of their expertise.

As previously discussed, the motivation for the study was to understand how to facilitate the contribution of experts in one domain across to other domains. With this study, I am seeking to understand how surgeons within a trauma surgery center could increase their contribution outside of the surgical domain. To do so, I have applied constructs from the field of practice theory to support me in exploring non-traditional conceptualizations of expertise. In particular, the principals of mutual constitution (Giddens, 1984; Bradbury & Lichtenstein, 2000; Østerlund & Carlile, 2005), habitus (Bourdieu, 1977), resources-in-use (Feldman, 2004), and sociomateriality (Orlikowski, 2007) proved particularly useful. In order to fully understand the dynamics that were discovered in this research, it is important to understand these principals within the context of the Center. Accordingly, I provide a brief introduction to the principles of mutual constitution, habitus, resources-in-use, and sociomateriality as I discuss each finding.

Before exploring each finding, it is important to note the oppositional framing of *surgical* and *non-surgical* domains that I have used throughout this study. The surgical domain refers to any acute patient-facing aspect of the continuum of care within the Center, including surgery and post-surgery care. The non-surgical domain includes the administrative and academic activities associated with the Center. The structures, practices, relationships, knowledge, and materials present in each domain are interrelated and inseparable elements of the Center and the success of the Center. This study makes

use of the oppositional descriptors surgical and non-surgical domains as a way to note distinctions, yet still acknowledge the interdependent and inseparable aspect of the two domains within the Center.

Finding 1: The Expertise of the Surgeon is Situated within a Sociomaterial Context

In this section, I first introduce the arduous process of becoming and being a trauma surgeon. Next, I describe the specific characteristics of trauma surgeons that emerged from the data and discuss how these characteristics reflect a mutually constitutive relationship between the surgeon and the surgical domain. I then demonstrate how a trauma surgeon's expertise emerges from and is situated within the sociomaterial context of the surgical domain. Throughout the section, I integrate participant quotes, personal observations, and then frame the data with relevant theory to describe and contextualize the finding.

Becoming a Trauma Surgeon

The journey to becoming a trauma surgeon is a long and demanding process. The path includes four years of undergraduate study, four years of medical school, five years of surgical residency, and potentially another one to two years in a trauma fellowship. In total, it is a 14-15 year journey requiring intelligence, tenacity, sacrifice, and commitment. However, this is only the beginning of the journey of a trauma surgeon. Being a trauma surgeon often involves working long hours, 12 to 14 hours a day and two out of every three weekends under intense conditions, involving life or death decisions. For a trauma surgeon there is no "shift mentality... (where you think), I'm eight (a.m.) to eight (p.m.), (when I'm off) I have no responsibility, I'm done... you're always on

call...you're never done" (Participant B6). These comments clearly display the demands of the trauma environment and the sacrifice and commitment that are required of trauma surgeons. What they do not display are the constitutive dynamics between surgeons and their environment.

The practices and structures associated with becoming and being a trauma surgeon have a significant influence on the behaviors, perceptions, and disposition of the surgeon. This relationship of mutual interdependence and influence between the surgeon and the structural, social, and material aspects of her environment is recursive and mutually reinforcing such that while the environment and experiences create the surgeon, the surgeon is also creating the environment. To further understand this dynamic and before exploring the sociomateriality that emerged from the data, it is important to introduce and discuss the principle of mutual constitution, habitus, and resources-in-use.

Mutual constitution. The principle of mutual constitution states that no event can be viewed independently from other events. Accordingly, phenomenon or events always exist in relationship with other phenomenon or events and each in some way produces or reinforces the other through a process of interdependent reciprocity (Bradbury & Lichtenstein, 2000; Østerlund & Carlile, 2005; Nicolini, 2012). By interdependent reciprocity, I mean that the phenomenon not only affect one another but also exert significant influence in creating one another. Thus, the relationship between the surgeon and the structures and practices of her environment can be viewed as a relationship of mutual constitution. This means that as much as the surgeon creates and reinforces the physical and psychological structures and practices of their environment,

these same structures and practices create the surgeon. In order to delve deeper into the principle of mutual constitution within the scope of this study, I engaged the construct of Habitus (Bourdieu, 1977).

Habitus. The construct of habitus is an important component to explore the mutual constitution between individuals and the structural features of organizations (Michel, 2014). As was discussed in Chapter two, habitus is developed through one's lived experience containing both conscious and sub-conscious knowledge. The habitus is the internal representation of the external world and its structures. As such, it influences our interests, ideas, dispositions, preferences, and beliefs, thus predisposing one to certain actions and inaction. In addition to shaping how one conceives the world, it also instructs as to the appropriate way to act and engage with the world (Bourdieu, 1990; Nicolini, 2012; Michel, 2014). Thus, the habitus influences how a person perceives their environment, the meaning that they give to events, and consequently, the actions they choose to take (Bourdieu, 1977). Habitus shapes both what we see as possible and what we are not inclined to perceive (Nicolini, 2012). It is important to note; however, that Bourdieu readily acknowledged the power of human agency and creativity such that an individual could choose to act in ways that countered the habitus (Bourdieu, 1984, 1990; Nicolini, 2012). The habitus thus predisposes but does not dictate our actions.

In the context of this research, the surgeon's habitus is developed through her years of intense training to become a trauma surgeon and her ongoing practice of being a trauma surgeon. The habitus thus predisposes the surgeon to the behaviors and the practices that allow her to succeed in a surgical trauma environment. In demonstrating

the domain appropriate behaviors the surgeon is also reinforcing the structures and practices of the domain, thus reinforcing the cycle of mutual constitution. At a later point in this section, I will further discuss these principles as I discuss the specific characteristics that were reported for surgeons. It is important to note that as I introduce the reported characteristics of both the surgical and the non-surgical domain, I interpret the reported characteristics as reflections of the habitus and not as static traits that are reflective of surgeons or of administrators. For example, the characteristics that were reported for surgeons are interpreted as a clear reflection of the influence of the surgical habitus on the actions of the surgeons. By extension, the characteristic that was reported as typical in the non-surgical domain could be considered as a portrayal of the influence of the non-surgical habitus on the actions of the members within the non-surgical domain (e.g., administrators). In effect, each reported characteristic is a reflection of the habitus-in-action in a mutually constitutive relationship with the structures and practices of its environment.

The following quote is a clear demonstration of how a habitus is developed and its powerful influence:

Think about where we come from, every single doc (doctor) in this institution was on a freight train barreling down the tracks. High school -- grades; college -- they had to make good grades, they kept their heads down; med school -- head down; residency -- head way down. All of a sudden, you're in a position where you need to be a social being and no one ever gave you a chance to do that.
(Participant A2)

This quote was extracted from a commentary about the intense experience of becoming a trauma surgeon. The participant was emphasizing how the training and experience build deep expertise in certain domains (e.g., trauma surgery) at the expense

of other types of expertise, such as social skills. The habitus thus instructs the trauma surgeon as to the appropriate ways of being a trauma surgeon. So, as the surgeon becomes effective in dealing with the pace of the trauma environment, she becomes less inclined to other ways of being. As will be further demonstrated by the characteristics in the section that follows, this dynamic continued to emerge throughout the data. The characteristics that emerged from the data represent how, through mutual constitution, the surgical habitus is influenced by and reciprocally influences the structures and practices of the surgical environment. In the section that follows, I will engage these constructs with the data in order to explore and to explicate the meaning I extracted from the data.

Resources-in-use. Resources are any medium, including both physical and non-physical assets, that influences and supports taking action and achieving ones' goals (Giddens, 1979, 1984, 1993; Feldman, 2004, Nicolini, 2012; Michel, 2014). In the trauma surgical environment, resources can be material items such as specialized equipment, and non-material items such as shared knowledge, trust, and communication practices (Feldman, 2004). It is important to understand that, from the perspective of practice theory, resources exist only as qualities of a given domain until they are put into use (Feldman, 2004; Feldman & Worline, 2011). Further, resources are not perceived to have inherent characteristics that identify them as resources. For example, an object such as a rock would exist as a quality of a given domain and would not be considered as having inherent characteristics as a resource until put into use in a given way. Further, the rock is a very different resource-in-use in each of the following examples: a piece of art in a garden, a paperweight on a desk, a hammer for driving tent stakes when camping.

In each example, it is the way in which the resource is used that defines it as a resource. The act of bringing potential resources into action as actual resources is often referred to as resourcing (Feldman, 2004; Feldman & Quick, 2009; Quinn & Worline, 2008). This term indicates the emphasis on the resource-in-action rather than objects with innate characteristics. As described by Feldman (2004), “resourcing is the creation in practice of assets such as people, time, money, knowledge, or skill; and the qualities of relationships such as trust, authority, or complementarity such that they enable actors to enact schemas” (Feldman, 2004, p. 296). Schemas are subconscious, thought patterns that support action and skill (Brewer & Nakamura, 1984). Thus as the habitus engages with the environment, certain schemas are enacted. As the schemas are enacted, certain qualities of an environment are made available as resources and conversely others potential resources are less accessible. As will be described in the following sections, the habitus exerts a significant influence over whether the qualities of an environment are recognized as potential resources-in-use and therefore enact the schemas that convert them to resources.

Notable Characteristics of Surgeons

From my initial interviews, the data demonstrated that both the surgeons and the non-surgeons perceived trauma surgeons as exhibiting specific, notable characteristics. Examples include the predisposition to be in control of the environment, the importance of exuding confidence, and a preference for speed and instant gratification. The comments typically emerged while participants were describing the unique aspects of the trauma environment. Both groups discussed the characteristics as if they were trait-based

and independent of context. As previously discussed, this can be a limited and limiting view of behaviors because it does not account for the influence of the social and material aspects of the environment and the mutually constitutive relationship among these aspects. Rather, a trait-based view that is independent of the situation infers that one must change the person if one is to affect the characteristic and underlying schema in any way. I will now review the reported characteristics, along with the data that support them. In doing so, I will apply the habitus construct in order to more fully explicate the behavior and the constitutive and recursive relationships at work.

Control the environment (perceived lack of control = risk). The most notable characteristic of surgeons, as reported by participants, was the surgeons' desire to be in complete control. Of the non-surgeon participants, four of the five directly spoke about the surgeon's desire for control. For the surgeon participants, four of the eight participants directly spoke about the importance to control the environment. As described by one participant "Sometimes they're (Trauma surgeons) control freaks about things" (Participant A6). The term control freak, used in various ways throughout the interviews, was intended to communicate the degree to which surgeons sought to control their environment. As explained by another participant, "There's a perception (held by surgeons) that what you can't control, you can't fix" (Participant B3A). In one sense, the role of the surgeon could be conceived of as fixing a problem (e.g., traumatic injury) such that the patient can be transferred along to the next phase in their continuum of care. Trauma cases are complex, time sensitive, multifaceted, and mistakes can lead to the death or severe impairment of the patient. In order to navigate the complexity and to

provide a reliable level of care, trauma environments are hierarchical with a clear chain of command (Klein et al., 2006). Therefore, the need to control serves as a powerful psychological structure, situated within a unique environment that influences the actions of the surgeon and the other members of the trauma care team. In turn, the surgeon's enactment of being in control sustains the psychological structures and the practices of the trauma environment. This reciprocal and recursive relationship between the surgeon and her environment is a classic example of the *habitus-in-action* and its influence.

As a further example, I was invited to attend a strategy session that was facilitated by internal consultants from the larger health system. Attendees included surgeons, administrators, and nurses. The session, as described by an administrator leader, was intended to solicit feedback and ideas from multiple stakeholders within the new Center and to begin to build a broader vision of and buy-in for the Center. I attended the general session that included all participants, and four of the breakout sessions that were attended by subsets of the larger participant group. At the kick-off of the overall session and again during the start of the breakouts that I attended, the surgeons made a clear effort to invite others, such as nurses and administrators, to take the lead. In all but one of the breakout groups, the nurses or administrators appeared reluctant to assume the lead for the group. As each of the breakout groups went about their work, I observed the surgeons struggling to restrain themselves from stepping into the leadership role. This was particularly the case when the conversation reached a temporary impasse or began to move in a direction that did not match the point of view of the surgeon. In one situation the surgeon within the group picked-up another marker and offered to help the group leader with facilitation

and capturing the comments from the group. In another instance, the participating surgeon remained in his seat, but as the leader for the breakout group captured participant notes on the whiteboard, the surgeon would help clarify what the participant was trying to say or would disagree with the comment and attempt to influence the direction of the conversation within the group. The net effect of this behavior by the surgeon was to halt the flow of the group's conversation or the participants simply would defer to the opinion of the surgeon. In all four of the breakout groups that I observed, the surgeons would eventually become aware of their behavior and its effect and attempt to allow greater participation and input from the other participants. My interpretation, based on comments from the surgeons, was that they wanted to encourage participation from the nurses and administrators, yet they seemed to struggle to control an impulse to take over control of the situation. An example is when a surgeon realized that he had taken over the facilitator role from a nurse he immediately stopped mid-sentence of his attempt to clarify the answer that the group needed to reach. He then attempted to shift the conversation back to the group with a self-effacing comment regarding his opinion and asking the group about their opinion. The group shared a few uncomfortable glances among them and then continued with the answers that they were providing before the surgeon had interrupted and taken over facilitation of the group.

I believe that this behavior demonstrates the power influence of the surgical habitus and the enactment of encoded schemas. As I continued to engage with my notes from this session and the other data that was emerging from the study, I began to understand that the ability to control the environment was a hallmark of a competent

trauma surgeon. As Participant B7 stated, "Surgeons, in particular, are control maniacs, I mean, it's trained and bred into them to have maximal control over with the situation, which makes them great at what they do". As with a prior participant comment, the term control maniac was used to indicate the intensity of the surgeon's predisposition for control. This comment also reflects the belief that the characteristic is trained and bred into them and makes them great at being trauma surgeons. In effect, the oft-reported characteristic of being in control is a central component of their expertise and a clear reflection of the surgical habitus and schemas in action. As the surgical habitus encountered situations that were interpreted as requiring leadership, the surgical schema of control was enacted. Accordingly, the surgeon attempted to take control of the situation so to provide the leadership that was perceived as needed. In Finding Two, I offer additional data demonstrating the pre-disposition for control and the limitations of this reported characteristic outside the surgical domain.

Exude confidence – even when in doubt. In the complex and volatile environment of trauma surgery, the psychological structure of the surgeon demonstrating certainty versus doubt can have a significant positive influence on the mental state of the care team and the patient. "I think that if you do not think you are the best surgeon, how do you offer to your patients that you can operate on them" (Participant A2). "As a surgeon, you're never in doubt, even when you are... the surgical team needs to have faith that no matter what happens, you (the surgeon) are in control and can fix the problem" (Participant B2). Both of these comments demonstrate the tacit belief that if a surgeon's behavior did not reinforce the psychological structure of the *surgeon being in*

control of the situation and not in doubt, it could engender doubt from the patient and/or among the care team and thus potentially endanger the performance of the team.

In a similar example a non-surgeon described his observations and experience with a newly implemented performance improvement process where feedback is provided to surgeons for areas where they can possibly improve their technique or decision-making processes. The participant spoke of how the initial responses from most of the surgeons was reluctance to admit any mistakes or indication that they were not in control of the situation and thus providing the level of care that was needed. Although some of the older surgeons still struggled with the feedback and performance improvement process, most of the others were beginning to accept it. The participant reported that the acceptance increased as the managers of the program became more intentional with the process and forum for delivering the feedback. For example, the feedback was presented in a neutral and data-based manner where the surgeons could reach their own conclusions. In addition, the feedback and data were presented in an environment with other surgeons where the emphasis was on learning and improving rather than placing blame or risking the threat of non-surgeons or patients losing faith in the capability of the surgeon. I will discuss feedback in greater detail within the second finding; however, it is important to recognize how, in this example, what was reported as a major characteristic of surgeons was influenced by attending to the structures and practices, including feedback, associated with the characteristic. Thus, as with the previously reported characteristic, the data reveal that the characteristic of exuding

confidence is mutually constituted between the structures and practices of the environment and the surgeon's enactment of those practices.

Preference for speed and instant gratification. In comparing trauma surgeons to other surgeons and to physicians in general, one participant described trauma surgeons as traveling at “80 miles an hour,” “general surgeon(s)” traveling “at 50 miles an hour,” and general physicians traveling “at 10 miles an hour” (Participant B6). He went on to clarify that the difference in speed was necessary and reflected the requirements of each environment and the physician’s role within the environment. The role of trauma surgeons is to stabilize the patient before transferring them to the next phase in their care. “(Surgeons) in trauma, they’ll get focused on the patient that presents (for) a very high, intense period of time, getting that patient stabilized and ready for discharge...it is very compressed... very acute” (Participant B7). Comparatively, the non-trauma surgeon is typically performing elective procedures that allow for a lesser pace. Trauma care is “very different...from taking care of a chronic disease patient, where you really want to get into family history and other things that may be antecedent to the development of the chronic disease” (Participant B7). Accordingly, the general physician is often attempting to diagnose and treat more complex and entangled disease conditions, thus the need for a slower, more deliberate pace. As explained by one participant, “They (general physicians) like to think about it and talk about it...some of those (patient) problems are extremely complex and that’s what needs to be done” (Participant B6). The trauma surgeon; however, does not have the luxury of time or “the patience for that slower pace” (Participant B6). Similarly, another surgeon described the gratification of encountering a

patient with severe physical trauma, such as multiple fractures, and essentially putting them back together. “We get to put things back together and you get an immediate feedback...you certainly get the job satisfaction of this looks good, or you certainly improved it.” (Participant A3). As with the previous characteristics, these comments help demonstrate the influence of the surgical habitus in action. In this instance, the comments demonstrate the influence of a predisposition for a fast paced environment that provides real-time feedback.

A less direct example of this characteristic can be found in a behavior described by each of the three administrative participants. These participants separately described accounts of what they perceived as the surgeons’ lack of appreciation or patience for the complexity and interdependent nature of the decisions facing administrators. An example would be a surgeon’s perspective that if the administrators would remove a bottleneck in radiology by adding another piece of equipment, the surgeons could increase the volume of surgery patients. From the point of view of the administrator, the surgeons were not demonstrating the patience to navigate through the many complexities associated with that decision, including financial, political, or competing priorities. The surgeons saw a problem, envisioned a solution, and were ready to move on to the next problem. They assumed that their knowledge and expertise meant that they were on point in their perspective and therefore did not conceive of the possibility that they were imposing a limited perspective onto others. Alternatively, the administrators viewed the situation in terms of the presenting problem and their perception of the potential second- and third-order consequences of any decision that might be taken. Both approaches demonstrate a

fundamentally different action style that was a reflection of the respective habitus of each domain.

As presented through the previous examples and data, the trauma environment generates unique practices and structures that support the pace of the environment and influence the actions and thus reported characteristics of the surgeon. This mutually constitutive relationship among the surgeon and the structures and practices within her environment then influence the development of a habitus with a preference for speed and instant gratification.

Trauma Surgeons' Expertise Situated within Sociomaterial Context of Surgical Environment

Thus far, I have introduced the principle of mutual constitution, the construct of habitus, and the principle of resources-in-use as a means to conceptualize the reciprocal and recursive relationship between the surgeon and the structures and practices within the surgical domain. In doing so, I also described how the habitus of the surgeon predisposes her to take action or, conversely, not perceive the need or opportunity to take action. The habitus and its influence on action and resourcing thus reinforce the structures and practices of the surgical domain. This type of practice-based perspective allows one to recognize that the reported characteristics are not simply trait or cognitive based and independent of context. Instead, these characteristics emerge from the mutually constitutive relationship between the surgeon and the structures and practices of her environment. These constructs do not, however, allow one to sufficiently conceptualize the expertise of the trauma surgeon.

For this dissertation, I use the term expertise to reflect the unique combination of knowledge, experience, and skills that result in the surgeons' capacity to act (Cooren, Taylor, & Van Every, 2006) within their environment in a manner that leads to successful outcomes (Germain & Ruiz, 2009). As previously discussed, participants consistently reported the different characteristics that are required for success within the surgical versus the non-surgical environment. The characteristics are reflections of the habitus associated with each domain and indicate aspects of expertise associated with each domain. However, the principle of mutual constitution, the construct of habitus, or the principle of resourcing do not allow one to sufficiently conceptualize the location on the surgeon's expertise, to do so I turned to the concept of sociomateriality.

As discussed in Chapter Two, sociomateriality is concerned with the relationship between the social and the material aspects of an environment. The principle asserts that the structures, practices, relationships, knowledge, and materials present in an environment cannot be conceived as independent. Sociomateriality thus expands the conceptualization of the relationship between the habitus of the surgeon and the surgical domain. Applying a sociomaterial lens allows one to conceptualize a "constitutive entanglement" (Orlikowski, 2007) between the surgeon's habitus and the surgical environment. As a contrast, interdependence reflects the influence that each aspect has on the success or effectiveness of the other independent aspect. With sociomateriality, the constitutive entanglement reflects a degree of mutual influence such that each can only subsist in the current state through the existence of the other. Reflecting the principle of mutual constitution, the structures, practices, relationships, knowledge, and

materials present in the surgical environment are entangled (Orlikowski, 2007) such that each is in some way creating the other in that particular context. In the surgical domain, the constitutive entanglement results in the emergence of the situated expertise of the surgeon. For example, the following quote describes what is often referred to as a *timeout* procedure using a checklist:

Before surgery...everyone stops, pays attention, goes through a checklist; is this the right patient, is this the right leg, is this the right operation, do we have the right implants...that's been implemented a dozen years or so...been a good thing...a communication of all parties involved and it's not just for surgery...it's any procedure on the floor....on a trauma patient. (Participant B6)

In the foreground of this example is the sociomaterial interaction between individuals, a specified process (structure and practices), materials (e.g. checklist, implants, surgical tools), and the actual body of the patient and the bodies of the surgeon and other care team members. In the background of the example are psychological structures such as shared context and goals (trauma surgical domain), specialized knowledge that is shared, and the tacit and explicit practices. Also in the background of this example are material aspects such as the physical environment (e.g., surgery room, hospital) and the various machines and tools associated with a Level 1 trauma center.

Similarly, the entanglement between the surgeon and her sociomaterial environment can be reflected through the embodiment of knowledge, as demonstrated in the quote below.

The sounds that we hear when we walk into a room that can tell us right away are they well, are they sick? Is their heart rate up and you can hear the beep, beep, beep going faster? Is their oxygen saturation low and you hear the boop, boop, boop, and you're worried that something's going on? Those things become immediate feedback. (Participant A2)

As with the previous quote, one can perceive the sociomaterial aspects that are both foreground and background. In the foreground, the auditory cues coming from the machines are received and interpreted by the surgeon. This interpretation then leads to action that will likely involve other care professionals. In the background of this example are aspects such as the machines, the knowledge and experience of the surgeon, the patient's body, the interface between the patient's body and the machines, the other care members engaged at different levels and in differing ways, and other technology and tools such as electronic medical records and/or charts.

As both of the preceding quotes demonstrate, the surgeon's cognitive knowledge, practical experience, bodily knowing, and relationship with material aspects such as machines and tools are entangled such to produce the surgeon's specific, situated expertise and ability to act. Altering or removing any of the sociomaterial aspects of the domain would in turn have a consequential influence on the other aspects and thus the expertise of the surgeon. For example, removing the machine monitoring heart rate would have a direct influence on the ability to monitor the patient's heart rate and consequently on other aspects of the environment and the continuum of care, including the surgeon's expertise and ability to act. In this example, the surgeon could resort to other ways to monitor patient heart rate, but this adjustment would have consequences for the surgeon's ability to deliver care. Likewise, if any of the other sociomaterial aspects of the surgeon's environment were removed or significantly altered, it would have a direct consequence on the surgeon's expertise and ability to act successfully in that situated environment.

In this section, I introduced the challenging process of becoming and being a trauma surgeon. I then discussed the specific characteristics of trauma surgeons that emerged from the data, using the principal of mutual constitution, the construct of habitus, and the principle of resources-in-use to discuss how these characteristics manifest through a mutually constitutive relationship between the surgeon and her environment. In effect, the surgical habitus interacts with the unique qualities of the surgical domain and exerts a significant influence over what the surgeon perceives and does not perceive. The result is that encoded schemas associated with the surgical habitus are engaged, leading to specific action on the part of the surgeon. Through this action, the surgeon engages the respective qualities of the surgical domain as resources to achieve her goals. This process of resourcing is also key in manifesting the sociomateriality of the surgeons' expertise. As the cycle of action unfolds, it then produces the recursive and mutually reinforcing relationship between the surgeon and her environment. In concluding Finding One, I will now discuss Finding Two and the limited portability of this expertise.

Finding 2: The Expertise of a Surgeon does not Readily Transfer to the Non-surgical Domain

In this section, I describe the unique aspects of the non-surgical domain that emerged from the data. In describing the domain, I also discuss the notable differences between the surgical and the non-surgical domain and how these differences indicate distinctions in the sociomaterial aspects of the two domains. Accordingly, these unique distinctions influence the portability of the surgeon's expertise and level of contribution

from the surgical to the non-surgical domain. Throughout the section, I integrate participant quotes and formal theory in order to describe and contextualize the finding.

Leading through Influence, not Control

Each of the three participants who were in administrative roles consistently reported the importance of influence as a form of demonstrating leadership within the non-surgical domain of the Center. Among the surgeons, three of the eight participants directly spoke to the same distinct difference in how leadership is demonstrated in surgical versus the non-surgical domain. As reported by one participant, “As an administrator, I don’t own anything. My job is influence, so I’m even much more comfortable in that different mindset than many of the surgeons” (Participant B3A). On one level, this statement is inaccurate because the participant does, in fact, have significant administrative authority over their area. On another level, because of their actual administrative authority, their statement is even more powerful. For example, this participant has the legitimate authority to issue mandates that affect both the surgical and the non-surgical domains. However, as the statement indicates, the participant views her job as influencing not mandating. She viewed influence as the most effective means of achieving results within her environment. The statement also clearly conveys that this is perceived as a different “mindset” than that of surgeons. In contrasting the difference between the surgical versus the non-surgical approach to leading, they stated “the surgeons want to control, but sometimes the better question is to ask how close we can come to controlling an outcome in situations where we really only have the ability to influence” (Participant B3A). The participant went on to comment that the surgeons and

administrators typically do not disagree on what is wrong, but rather on how to solve the problem. Additional commentary by the participant further indicated that she believed there was a shared commitment and intent among both the surgeons and the administrator leaders. In addition, she believed that the surgeon's insistence on control in order to affect change constrained them from being able to perceive and consider other alternatives, which might be more expedient and effective.

As stated by another participant "I think this (leading through influence) is different for, difficult for some physicians. These people (administrative and non-surgical staff) don't report to you; you're a team" (Participant B4A). The concept of team is a crucial aspect of this comment. It is important to note here that in the surgical domain, "team" is also a key concept; yet, as previously described, the trauma surgical environment has a clear hierarchy of control. As a psychological structure, the hierarchy and its associated practices support the demands that are placed on the trauma surgical environment. In the non-surgical domain, the concept of "team" has less hierarchical connotations and has a more participative approach based on influence. The distinction is important because it speaks to the point that concepts such as "team" do not necessarily have static characteristics. Instead, the concept may be of equal importance in both domains, yet it may reflect very different characteristics based on the requirements of each domain.

Further reinforcing the importance of influence, "What has made them successful surgeons is being in charge (for) the hour...they're accustomed to being the General and having lots of subordinates around them, and in this (non-surgical) environment...that is

never going to happen” (Participant B3A). This comment is an excellent example of the perception that the surgeons’ control of their environment is central to their success (their expertise), and that this same characteristic will hinder their success in the non-surgical domain. Leading and creating results in the non-surgical domain is accomplished through influence, not control.

This distinction in the approach to leading was one of the major differences between the surgical and non-surgical domains, and was clearly perceived as a challenge by both the administrators and the surgeons. The challenge was more than stylistic; the data reflected a fundamentally different way of perceiving and demonstrating leadership. For example, as discussed in Finding One, the structures and practices in the surgical domain reinforced the importance of the surgeon being in control and likewise associated the lack of control with significant risk. These structures, practices, and other influences of the surgeon habitus predisposes the surgeon to behave in a manner that is consistent with the structures, practices, and experiences that have shaped the habitus. The surgical habitus likewise influences what the surgeons perceive as alternative ways of behaving and alternative ways of being—it influences what the surgeons perceive as possible. In effect, this dynamic produces a certain predisposed manner for being and engaging with the world. By extension, one could anticipate a similar dynamic at work in the non-surgical domain, such that the unique characteristics of the non-surgical domain exert a powerful influence on the development of the administrative habitus and its influence on the administrators.

As described within Finding 1, the surgical habitus exerted significant influence in the interaction between the surgeon and the unique qualities of the surgical domain. This interaction then led to the enactment of encoded schemas, which led to specific action from the surgeon and the subsequent enrollment of environmental qualities into resources-in-use. The result of this cycle is behavior that is perceived as expert and/or appropriate to the situation and the domain. Likewise, one can conceptualize how the same cycle unfolds in the non-surgical domain. In this instance, the interaction between the surgical habitus and the unique qualities of the non-surgical domain may or may not enact encoded schemas that produce effective resourcing and domain-appropriate action. In fact, throughout my interviews with both the surgeons and administrators, the data reflected the participants' frustrations with the fundamental difference in their respective approach to leading and to accomplishing their goals. Each group was performing and being in a manner that was consistent with the structures, practices, and habitus of their domain. As a further reflection of this preferential way of being for surgeons, one participant stated "If Dr. X (new Medical Director of Center) is going to be successful, they (administration) will have to give her/him the authority to be successful... I don't see that happening" (Participant A8). This comment was made during a conversation regarding what would be required in order for the new Center to be successful. The participant, a surgeon, believed that the Center had the medical expertise to be successful but was doubtful that the Center would ultimately reach its goals without the Medical Director having full authority and control. For this surgeon, the Center leader needed absolute authority and control over major areas such as budgets, personnel, and

marketing. With the comment “I don’t see that happening” the participant was indicating his frustration with the fact the administrators just did not seem to understand that without authority and control, the Medical Director would not be successful. This sentiment is a clear reflection of the surgical habitus in action. The participant could not perceive that the Medical Director could be successful without authority and control, and he was likewise unable to grasp why senior administration could not understand this. His demeanor indicated that he was incredulous that the senior administrators did not understand the implications of their decision, which from his perspective would possibly lead to the failure of the new Center. This point of view was a direct reflection of the surgical habitus-in-action, predisposing him to what he perceived and what he did not perceive as possible, as well as shaping his interpretations of the actions or anticipated actions of others.

Similarly, the quote below reflects frustration from a surgeon for what he perceived as “mixed signals” from administrators as he tried to exercise leadership within the Center.

I’m really not sure what they (administrative leadership) are expecting. I mean, I think I know, but it seems like I keep getting mixed signals. I’m starting to get paranoid. I’m wondering if I really understand anything about this stuff (demonstrating leadership in the non-surgical domain). (Participant B2)

The mixed signals were the result of the participant being given accountability for an initiative to accomplish specific outcomes, yet given little or no guidance on *how* to accomplish the results. The participant then went about providing leadership of the initiative in a manner that he believed to be appropriate to accomplish the outcomes.

However, as described in the comment below, the participant continually made “errors of enthusiasm” (Participant B7).

He's a, always full of piss and vinegar, you know, he's very energized, very interested, he always ready to jump in and do this (lead), very interested in management and absolutely dedicated to these patients, you know, and well, you know, is engaged with the medical staff from the various ology's... Having said that, he has stepped in it, now, several times, several times, and, in part, it's been errors of enthusiasm. (Participant B7)

The errors of enthusiasm reflect a way of demonstrating leadership that was consistent with the command and control characteristic of the surgical domain, but inconsistent with those of the non-surgical domain. This surgeon-leader was well regarded in both the surgical and non-surgical domains and viewed as having significant potential for leadership roles beyond the surgical domain. The challenge and opportunity, as viewed by the respondent, was for the surgeon-leader to demonstrate leadership in a manner that is consistent with the non-surgical domain.

Ultimately, this difference in demonstrating leadership was perceived as creating tension and interfering with the cohesiveness of the Center. Although both the surgeons and the administrators were equally committed to the success of the Center, the fundamental difference in how they demonstrated leadership was interfering with success. In describing what they experienced as the control mentality of the surgeons, one administrator stated, “we have a complex organization, we’re trying to coordinate things...it creates tensions that are very difficult” (Participant B7). The complexity of the organization was also inferred by the following comment from a surgeon:

You have to understand that academic trauma centers are triangles. There's the hospital, there's the academic side, and there's the individual departments and divisions. And so it's constantly a juggling game about appeasing the hospital and

making sure that we're doing our academic side, which is our research, which is our teaching capabilities, and which is our physician productivity. The hospital wants to make money on the revenue that they generate, from the patients that we take care of. (Participant A1)

Both of the preceding comments indicate the multiple stakeholders and priorities that must be navigated in the non-surgical domain. As a reminder, in the surgical domain the goal is to stabilize the patient such they can be transferred along to the next phase in the continuum of care. Comparatively, the non-surgical domain is much more complex from a leadership perspective simply due to the greater number of stakeholders and multiple priorities. Because of this, one can understand the implications and the limits of a control versus influence approach. This point was further demonstrated reflected in the comment below.

We (surgeons) want to be by ourselves and just let us have our own little structure and give us our money (budget) and let us be, you know, and we'll figure it out, but it does not work that way. We are an interdisciplinary organization. (Participant B7)

In the first sentence of this comment, the participant intended to represent the collective voice of the surgeons, as she perceived it – reflecting the surgeon habitus-in-action and a disposition for control. In the second sentence she was representing his/her own point of view that, because of the interdisciplinary nature of the organization and the associated implications, a control or hierarchical approach will never work. This belief likewise reflects the administrator habitus and disposition for leading through influence versus control.

Given the shared frustration among both surgeons and administrators regarding the approach to demonstrating leadership, why did surgeons seem to insist on control as

the primary approach? I believe that at least part of the answer can be found in the surgeons' inability to generate resources-in-action within the non-surgical domain. As previously described, the interaction between the surgical habitus and the unique qualities of each domain lead to the enactment of encoded schemas, which then leads to resourcing or the generation of resources-in-action. Domain qualities include such aspects as technology, people, materials, knowledge, skill, shared assumptions, norms, relationships or qualities of relationships such as trust and authority (Feldman, 2004). If the qualities of the domain are sufficiently familiar to enact encoded schemas, then domain-appropriate behavior results. However, if the qualities are not sufficiently familiar to enact encoded schemas and/or to enact the schemas such that they can effectively engage the domain qualities as resources-in-action, domain-appropriate behavior may not result. An example of this phenomenon could be conceived as when the surgeons continue to enact a "leadership requires control" schema within the non-surgical domain. The result is behavior that is inconsistent with the non-surgical domain. From one perspective, a researcher could question whether the surgeons had the requisite encoded schemas to demonstrate leadership via influence versus control. Alternatively, the researcher could question the degree of fit or familiarity between the surgical habitus and domain qualities such that the domain qualities were not accessible, and thus not available to be engaged as resources. Under this scenario, the inability to convert the domain qualities to resources-in-use will preclude or significantly alter what would be conceived as expert or domain-appropriate behavior. In the section that follows, I will further explore one

specific domain quality, feedback, and how the perceived absence or presence was reported to have influenced performance within both domains.

This section has illustrated that the reported characteristic of leading through influence is fundamental to the non-surgical domain. In this section, I have also illustrated the incongruence between the control characteristic of the surgical domain and the influence characteristic in the non-surgical domain. The two characteristics are fundamentally inconsistent as ways of leading. Building upon the first finding and the influence of the surgical habitus-in-action, I explained the basis for the surgeons' predisposition to leadership and how, in turn, this presents a limitation in the portability of the surgeon's expertise and contribution outside of the surgical domain.

Feedback is not an Available Resource for Surgeons in the Non-surgical Domain

Before presenting the data associated with this characteristic, it is important to introduce a definition for feedback and to present the concept of feedback as a resource. For the purpose of this study, I presented the following as the working definition of feedback: Any sources of information, within the environment, that helps you choose which actions to take or which actions you may want to adjust (Ramaprasad, 1983).

This definition was reviewed at the beginning of each interview. After providing the definition, I then paused to ask participants if this definition made sense to them, based on their experience, and then asked if they had any comments or questions regarding the definition. All participants indicated their understanding of and agreement with the definition.

Feedback as a resource. As a brief reminder, resources are defined above as any medium that shape and allow action in the world (Giddens, 1979, 1984, 1993; Feldman, 2004; Nicolini, 2012; Michel, 2014). In the surgical trauma domain, there are numerous resources-in-use at any given time. Such resources-in-use include a level of shared medical knowledge, the shared understanding of the various roles, duties, and expertise among the care team members (e.g., nurse, anesthesiologist, surgical technician), the physical tools such as scalpels, the physical bodies of the care team members, the bodies of the patient, and the technology such as that used to monitor intracranial pressure. For surgeons and other members of the care team, feedback is a ubiquitous resource-in-use throughout the surgical domain. The sources of feedback are many and varied and include the machines that monitor the physiological status of the patient, the organs and biological systems of the patient's body, the dialogue between team members during surgery, and the conversations during the hand-off from the surgery team to the members of the next phase in the continuum of care. In fact, without the plentiful sources, ready availability, and specific modes of feedback resources in the surgical domain, it is difficult to conceive how the trauma teams would succeed. It is important to note, however, that the surgeons appeared to be desensitized to the ubiquitous nature of feedback within the surgical domain. After interviewing the second surgeon, it started to become clear how feedback-intensive the surgical environment is. During my interviews with the remaining six surgeons I tested this perception. Universally, all six confirmed my observation and at the same time indicated that they had never really thought about feedback in the surgical domain in that way. As I reflected on their comments and

responses, I was reminded of the analogy used by Heidegger (1927) where a carpenter uses a hammer to drive in a nail without consciously thinking of the hammer. In this instance the hammer is such an inherent part of driving the nail (an enrolled resource-in-use) that one is not necessarily mindful of its existence as a separate entity. One often only becomes aware or mindful of the hammer once it is lost or broken and unavailable for use (Heidegger, 1927; Nicolini, 2012). Similarly, in the surgical domain, feedback was such a ubiquitous resource and inherent part of the surgical domain. It was invisible precisely because it was such a constitutive aspect of the environment and the practice of trauma surgery.

Conversely, in the non-surgical domain surgeons described an environment relatively devoid of feedback. “We get surprisingly, I would say, little formal feedback from our hierarchal structure...we get very little, little or no feedback...we don’t get that routine feedback” (Participant A3). This emblematic comment reports on the relative absence of feedback in the non-surgical domain; however, it is only a part of the story. The other part of the story pertains to the impact when feedback is not available as a resource. The absence of available feedback can have a significant influence on the ongoing development and performance of the surgeons. Additionally, it can inhibit surgeon engagement and contribute to turnover as implied below.

I think one of the things that irks me in this world, in this environment, is not enough early feedback and not enough early nurturing. So, if we give people (surgeons) an opportunity to succeed by giving them a spot, whether it’s here, there, wherever, and then we don’t give them early enough feedback to show how they can get better, then they flounder, and at the end of the day, that rudderless boat ends up in a big storm in the middle of the ocean and they’re gone. (Participant A2)

This comment refers to three specific aspects of feedback that this participant and others perceived as important: feedback provided early in surgeon's tenure, the influence of feedback in helping the surgeon to improve or to "get better," and the result of not providing feedback – "they're gone." Two of these three aspects are an indication of how feedback could potentially act as a resource-in-use for surgeons. For example, feedback provided early in the surgeon's career can help to establish clear expectations and potentially avoid unnecessary mistakes. As a reminder, practice theory views resources as any medium that helps shape and allow action in the world. Accordingly, in the quote above, feedback could serve as a resource for the surgeon if, for example, the feedback is specific in terms of the expectations and the ways in which the individual is not currently meeting expectations. Such feedback would, therefore, better allow her to gain an understanding of the ways in which they could improve. Without such specificity, the feedback would simply be a potential resource or a quality within the environment that the surgeon may or may not be able to successfully convert into a resource-in-use. Participant A6 provides a further example, "I worry more about those things (administrative, leadership, research roles). And I don't know that I get really good feedback on it...I don't necessarily get feedback on it, but I think that's an area I could improve on." There are two separate but related issues in this example. The first is that the participant did not have a clear understanding of the expected standards of performance for activities in the non-surgical domain. She continued to comment that "I have my own simple system of how I do things," but was uncertain of the effectiveness her system. In contrasting this with the surgical domain, the participant shared "But the

patient care—I mean, there are rules” that guide practice. The second issue in the initial example is the actual lack of feedback on performance. As described in the initial example, the participant is left to worry if they are doing a good job. Beyond the distraction that the participant may experience because she is worried about her performance, this example also displays a significant missed opportunity for development and greater contribution by this participant. Similarly, the absence of feedback in the academic domain also represents a missed opportunity.

I think that feedback is a real problem in academics right now. I'm asked every year, at least, sometimes every six months, to sit down with each of my faculty (surgeons), come up with their plan for the year, what their goals are? What their five-year plan is? I go through this entire process, it takes me an inordinate amount of time, and then I submit my whole thing, and I never get feedback. So we (surgeons) feel like its value but it's – we don't get that feedback; we don't get that. (Participant A1)

Examining the example above, the participant clearly perceived that there was potential value in the activity that they were asked to engage in, yet the lack of feedback on the result of the activity left the participant frustrated and uncertain of the value of the activity. In this instance, feedback from the administrators regarding whether the faculty goals were correct or aligned with institutional goals would have been a first step in positioning the feedback as an accessible resource. For example, are the goals submitted by the faculty the correct goals, or are there goals that are missing based on the priorities of the Center and the broader health system? As described below, such feedback is an underdeveloped potential resource at the Center.

Feedback as a practice is described as “average or below average” at the Center:

I think, that is a, it's (feedback) clearly underdeveloped here at (research site), it's under development in medicine, in general, although there's, again, variability

between organizations. I know some organizations that do a better job, and the kind of things that you're getting at, right now, that others do and so... we're either average or below average. (Participant B7)

This comment demonstrates clear recognition of the issue both at the research site and the healthcare industry in general. As will be discussed below, there is also clear appreciation of the opportunity for feedback to become a resource. Participant A3 was speaking to this when she commented:

I just think the world is changing, and now you have to bring as much value as possible, and so you do that by providing higher quality at lower costs. But as a physician, you don't know what your quality is unless you receive the feedback of what that quality is, and you may receive feedback from your patients and – but you have no perspective. (Participant A3)

In addition to indicating the general lack of feedback, the comment above also implies that feedback, whether on quality or any other dimension, should include what is working as well as what is not working. For feedback to be an available resource to surgeons, it must provide a positive feedback loop for what is working and thus should be continued or increased. Likewise, a negative feedback loop is important for what is not working and should be stopped or modified. The following comment speaks to the need and to the opportunity:

(Someone is) going to have to work and straighten things in the broader organization to create feedback loops that will allow for the group to self-modulate itself... We have to create that feedback... The doctors (referring to trauma surgeons) are fundamental learning machines. They really are that... if they get good feedback, they do respond and do things naturally. (Participant B7)

The previous comment speaks to three arguments that have been made throughout this section: the absence of feedback in the non-surgical domain, the need for feedback, and the potential impact if feedback is available as a resource for surgeons. In addition,

the recognition that surgeons are fundamental learning machines and that they respond naturally if given feedback is an excellent reflection of the influence of the surgeon habitus. By this, I am referring to the fact that the development of the surgeon habitus predisposes the surgeon to actively assimilate information and leverage feedback a critical resource-in-use. Likewise, the schemas, structures, and practices of the non-surgical domain can be perceived as hindering the accessibility of feedback as an available resource to surgeons. Ultimately, the absence of accessible feedback (a central sociomaterial aspect of the surgeon's expertise) in the non-surgical domain significantly limits the portability of the surgeon's contribution of expertise.

In addition to the fact that participant data indicated a substantial lack of feedback within the non-surgical domain, respondents also indicated that much of the feedback that did exist was in the form of a negative feedback loop.

There's no feedback, hardly any at all. Yeah, there's no feedback. There's really, the only feedback I get is when there's a problem, not feedback on these are things that you're doing really well, these are the things that I think you can improve on... But I rarely get any feedback both from the hospital side and the academic side except when there are issues or problems that I need to address or take care of. Otherwise it's quiet. (Participant A1)

Beyond the continued reinforcement of the general lack of feedback within the domain, the comment above highlights both the missed opportunity that a positive feedback loop can provide and the emotional impact of what is perceived as being unilaterally negative feedback. Although it cannot be sufficiently conveyed through the above quote, the participant was clearly frustrated by what she saw as singularly negative feedback. This level of visible frustration with both the lack of feedback was reported by all eight of the surgeons. Six of the eight surgeons reported what they perceived as a

preponderance of negative feedback. The main concern implied by the six surgeons was the imbalance between the positive and the negative feedback. While this imbalance certainly had a negative emotional impact on the surgeons, it also impaired their ability to improve. As I will now discuss, in order for feedback to serve as an effective compensating, it must include both positive and negative feedback loops.

As previously discussed, feedback as defined in this study is any information that allows one to adjust actions in order to achieve objectives. Accordingly, negative feedback is provided in response to actions that are perceived as counter to the objectives of the one providing the feedback. Positive feedback is provided to signal that the current actions are perceived as conducive to achieving the objectives (Black, 1934). Therefore, negative feedback loops serve to provide information (feedback) to the surgeons that their actions are not perceived as conducive to achieving the objectives of the individual, the particular domain, or the Center (e.g., stop or reduce the frequency of the particular action). Positive feedback loops provide information, which signals that the actions of the surgeon are perceived as conducive to achieving the objectives (e.g., continue or amplify the particular action). In the case of the Center, the objective could be reflected in a number of contexts, including the goals of the center or the patterns of behavior that are perceived as consistent with the non-surgical domain. Both positive and negative feedback serve as adjusting mechanisms for the surgeons. In addition to the reported lack of overall feedback within the non-surgical domain, the lack of positive feedback did not support the surgeon in understanding which actions to amplify. Similarly, the lack of positive feedback did not provide further indication of which actions were perceived as

more directionally correct. Thus, the result is further reducing the availability of feedback as a resource to the surgeons.

As reflected throughout this section, *Lead through influence, not control* and *Feedback is not an available resource for surgeons* are reported and discussed as constituent characteristics of the non-surgical domain. I will now discuss how these same characteristics exert a significant limiting influence on the portability of the surgeon's expertise and contribution to the non-surgical domain.

In the surgical trauma environment, feedback is a critical resource-in-use that emerges from the same sociomateriality, within which the surgeon's expertise is located. In fact, feedback could be conceived as a constitutive aspect of her expertise. As a result, the combination of feedback being an unavailable resource within the non-surgical domain, in conjunction with the fundamental difference between the surgeon's *Control of the environment* compared to the administrator's *Lead through influence*, limits the transferability of the surgeon's expertise and contribution into the non-surgical domain.

Summary of Finding Two

In this section, I introduced and described the main aspects of the non-surgical domain that emerged from the data. In the non-surgical domain, leaders *lead through influence, not control*, which differs from the reported *Control the environment* characteristic reported in the surgical domain. Additionally, I described how feedback, which is a critical resource for the surgeons in the surgical domain, is not readily available as a resource-in-use the non-surgical domain. The principles of feedback loops and the practice theory concepts of resourcing and resources-in-use were utilized to

explain how, in contrast to the surgical domain, the qualities, structures, and practices in the non-surgical domain hindered the accessibility of feedback as an active resource for the surgeons. In concluding the section, I described how the fundamental differences between the surgical habitus-in-action and the administrator habitus-in-action influence sociomateriality and, in doing so, inhibit transferability of the surgeon's expertise and contribution from the surgical to the non-surgical domain.

Conclusion

The purpose of this study is to explore an alternate conceptualization of expertise in order to facilitate the ability of the surgeons to more actively participate and contribute within the non-surgical domain. This chapter presents the two central findings from this study and the meaning that I have attributed to the findings. The data-driven themes that emerged indicate an entangled relationship between the surgeons and the structures of the domains in which they work. The first finding indicated that the process of becoming a trauma surgeon produces a habitus that predisposes the surgeon to displaying notable characteristics. These characteristics include a predisposition for controlling the environment, exuding confidence, and preference for speed and instant gratification. Finding One also located the expertise of a trauma surgeon in the sociomateriality of her situated environment. In reaching this finding, I applied the practice theory principles of mutual constitution and the construct of habitus to explore the mutually constitutive relationship between the surgeon and the structures and practices of her environment. To conceptualize the location of the trauma surgeon's expertise, I applied a sociomaterial

lens to demonstrate how the surgeon's expertise is situated and entangled among and the relational, structural, material, and knowledge aspects of her unique environment.

The second finding demonstrates that a surgeon's expertise is not readily portable beyond its situated environment for a set of specific reasons explored herein. To arrive at this finding, I first established the fundamental inconsistency between key characteristics of the surgical and non-surgical domains. I then revealed that feedback was a key resource and aspect of the surgeon's sociomateriality, and thus expertise, but that feedback was reported as unavailable as a resource to surgeons in the non-surgical domain. Both of these findings have significant implications for theory and for practice. In Chapter Five I discuss these implications and areas for future research.

Chapter 5: Conclusion

In this chapter, I discuss the contributions of this study and indicate the limitations of this research as well as opportunities for future research. I begin by introducing and discussing the theoretical model that emerged from this research. Next, I discuss the implications of this study. In discussing the implications, I begin with the implications for theory and for practice. I then discuss the implications for the organization where the research was conducted. I conclude by discussing the implications that this study has for me as a professional and entrepreneur. In concluding this chapter I discuss recommendations for future research.

This dissertation explores the sociomateriality and situated nature of the expertise of trauma surgeons. The data from this study also demonstrate the limited portability of that expertise even across domains within a shared context, such the surgical and non-surgical domains of a trauma surgical center. As previously discussed, the standard conception of expertise is grounded in cognitive assumptions of learning and positions expertise primarily in the head of the individual expert. This view does not fully account for the dynamic and mutually constitutive role between the social and material aspects of their situated environment. Such a limited account of expertise also does not fully contemplate the other means to accelerate performance or how to support the portability of expert performance and contribution in one domain across other domains and environments.

Theoretical Framework

The graphics listed in Figures 1 and 2 reflect the theoretical framework in action in both the surgical and non-surgical domains. In order to fully explicate the framework, I will describe the dynamics at work within both the surgical and the non-surgical domains. As with any framework, the goal is to provide a description that sufficiently approximates reality, and the concern is that doing so can come at the expense of capturing and articulating the true, intersectional complexities of the situation. In the case of this theoretical framework, that concern remains vibrant; it does not attempt to comprehensively account for the full complexities of the surgical and non-surgical domains or the complexities of the roles and responsibilities of the surgeons and non-surgeons within both domains. Rather the framework seeks to provide a theoretical basis and description for the dynamics that were observed in this exploratory study.

The fundamental difference between the two domains is the way in which the unique qualities of each domain interact with the surgical habitus. In the surgical domain this interactions leads to the emergence of expert performance and contribution, while in the non-surgical domain expert performance and contribution does not emerge. In order to further explicate the theoretical framework and the dynamics in action, I first review the surgical domain listed in Figures 1. After reviewing the surgical domain, I describe the differences associated with the non-surgical domain.

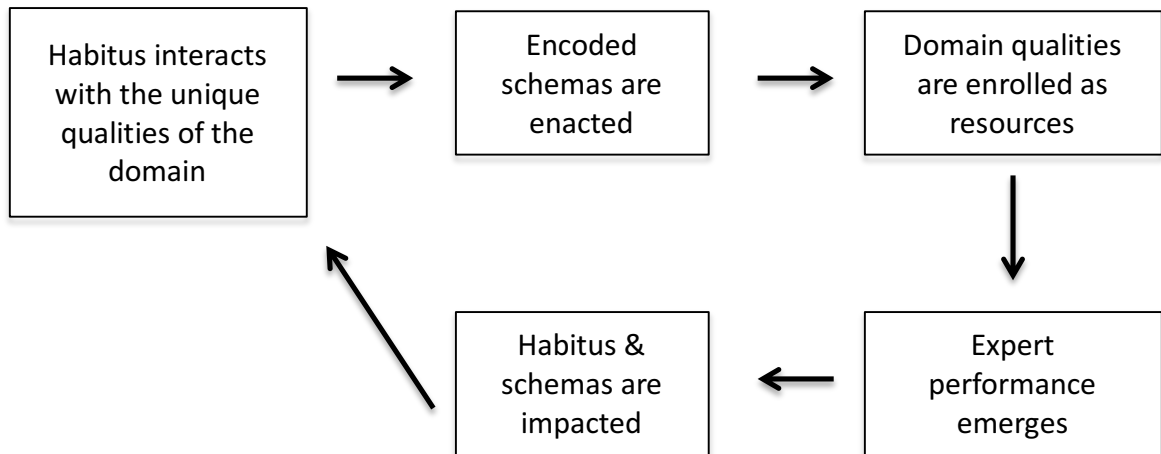


Figure 1. Surgical Domain

As previously discussed, the surgical habitus is developed through one's lived experience, containing both conscious and sub-conscious knowledge. These experiences then generate the psychological and physical structures that influence one's disposition to both experience and to act upon the world. In addition to the individual's lived experience before entering medicine, the surgeon's habitus is developed through her years of intense training to become a trauma surgeon and her ongoing practice of being a trauma surgeon. Ultimately, the surgical habitus predisposes the surgeon to the behaviors and the practices that allow her to succeed in a surgical trauma environment. In effect, they predispose the surgeon to a distinct action style.

Within the surgical domain, the surgeon encounters the unique qualities of the domain such as technologies, tools, aspects of the physical environment, work processes, shared knowledge, and relational dynamics such as trust, authority dynamics, common experience, or shared goals. As the qualities of the domain engage with the habitus of

the surgeon, encoded schemas are enacted. The associated actions that result from the schemas then successfully engage domain qualities and convert them into resources-in-use in order to produce the desired results. The net effect of converting domain qualities into resources-in-use is the production of expert performance or performance that is recognized as appropriate to the domain and context.

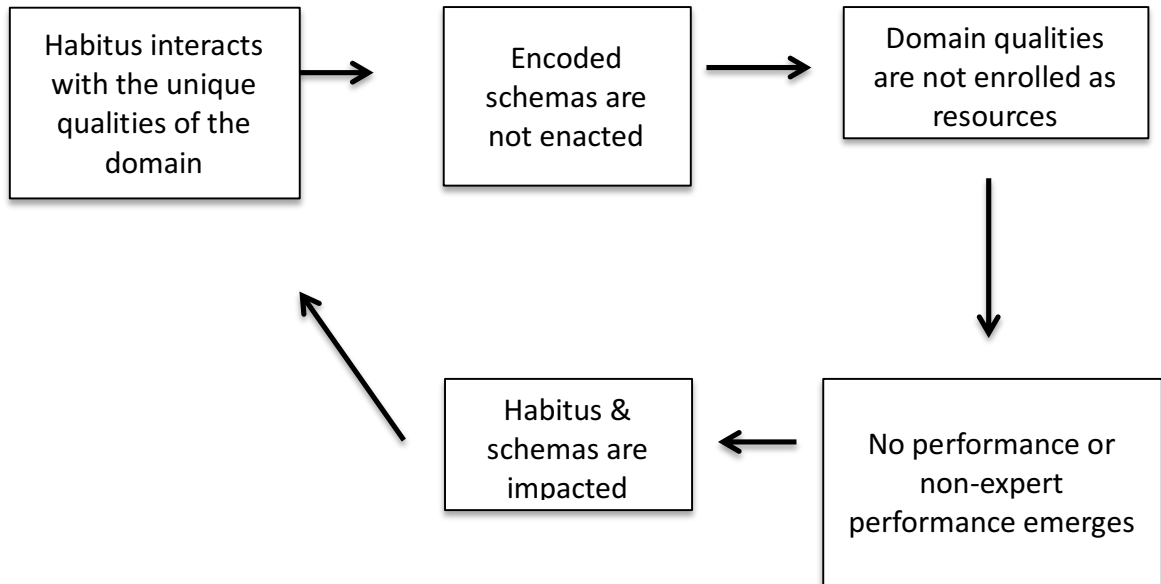


Figure 2. Non-Surgical Domain

As presented in Figure 2, when the surgical habitus encounters the unique qualities of the non-surgical domain, encoded schemas are not enacted or are not enacted to the degree such that domain qualities are effectively enrolled as resources-in-use. This lack of successful resourcing (Feldman, 2004) leads to no performance or to performance that is recognized as inappropriate to the non-surgical domain such as when the administrators claim that surgeons are attempting to lead in a manner that is inconsistent with the norms of the domain.

As described in Figures 1 and 2 and illustrated through the data presented in Chapter Four, the interaction between the habitus and the sociomaterial aspects of an environment exerts a significant influence on the emergence or lack of emergence of expert behavior and contribution. Central to this dynamic is the ability of surgeons to engage potential resources within an environment such that they can be effectively converted to resources-in-use that then facilitate the production of expertise. Conceptualizing this dynamic can have significant implications. In the section that follows, I explore the potential implications for both theory and practice.

Implications of the research

Implications for Theory

As reflected in the findings of this study, there are multiple ways to conceptualize expertise. The findings from this study suggest that expertise emerges from the dynamic relationships occurring between the social and the material aspects of a situated environment. Therefore, in addition to the knowledge that is resident within an individual (mind and body), knowing and expertise is also distributed across the various social and material relationships within the specific environment. Numerous scholars have previously implicated the importance of sociomateriality in areas such as knowledge (Lave & Wenger, 1998; Wenger & Lave, 1991), learning (Fenwick, et al., 2012; Barab & Plucker, 2002; Wenger & Lave, 1991), technology (Orlikowski, 2000, 2007, 2009), continuous change (Feldman, 2004; Feldman & Orlikowski, 2011; Michel, 2014) and ontology (Schatzki et al., 2001; Michel, 2014), just to name a few. Building upon their work, this study furthers the implications of conceptualizing the sociomateriality of

expertise by exploring how expertise emerges within a specific, unique environment. The main contribution of this research is to expand the standard conceptualization of expertise, which is based on cognitive and socio-cognitive assumptions. This study acknowledges the validity of cognitive assumptions about knowledge and expertise but argues that these assumptions do not go far enough in conceptualizing expertise. This research indicates that a sociomaterial conceptualization of expertise allows for a more nuanced understanding into the various constitutive aspects of expertise, and, in particular, a greater sensitivity to the relationship among the aspects. It is the belief of this researcher that this type of conceptualization might allow for a more generative approach to the expansion and contribution of expertise.

In addition to the expanded conceptualization of expertise, this study builds upon the principle of resourcing and demonstrates the influence among the surgical habitus, resourcing, and the emergence or lack of emergence of expert behavior and inter-domain contribution. The findings from this study implicate the opportunity for further study to better understand the dynamics at work and the potential affordances. As an example, is it possible to influence the emergence of expert behavior and contribution by better understanding and thus influencing quality of the interaction among the habitus, domain qualities, and resourcing?

Implications for the Field of Knowledge Workers

As indicated in the opening chapter, the importance of knowledge workers, experts, and expertise continues to accelerate for organizations and for economies (Davenport, 2013). Further, experts are increasingly being asked to contribute to

challenges that span their particular domain of expertise (Fenwick et al., 2012). By re-conceptualizing expertise through a sociomaterial lens, practitioners can more fully account for and contextualize the basis for expertise and expert performance. By doing so they can then explore the specific structures, practices, materials and relationships from which the expert performance emerges. This exploration includes the dynamic of action and resourcing described as a part of the theoretical framework. Based on the literature and my data, I argue that through understanding the dynamics of actions and resourcing and the constitutive elements from which they emerge, practitioners can gain insight as to how to expand the contribution of experts and expert performance outside their traditional domains. For example, by conceptualizing feedback as a constitutive resource for surgeons and understanding the dynamic among the surgical habitus, environmental qualities, and the creation of resources, one could conceive of additional ways to facilitate the extension of their expertise and contribution into the non-surgical domain. Feedback then could be contextualized, delivered (frequency, format, and process) in a manner that is more consistent with the surgical habitus and encoded schemas. Beyond the specific example of feedback, for any given situation, one could become more attentive to the situational objective, the habitus of the agents and the potential and required resources such that one could best facilitate the emergence of expert behavior and contribution.

Implications for the Organization

In addition to the reconceptualization of expertise discussed in the previous paragraphs, I believe that the broader finding regarding feedback practices hold

significant potential value for the Center. For example, executive leadership at the Center where I conducted my research has identified surgeon turnover and engagement as a business priority. The following quotes reflect the concern that was top of mind for a significant number of the participants.

There are a lot of ways to leave. You know, some people have left emotionally and just sort of stayed on and, you know, some have, you know, left; just gone and gotten a different job. Some good people have left and, you know, the sad thing is the human capital loss is huge and the institution bears all the risk.
(Participant A3)

This quote speaks to the participant's concern about the emotional, financial, and performance impact of poor surgeon engagement. In support of this concern, other research has shown that physician engagement is associated with a patient's perception of quality of care and is correlated to financial performance (Haas et al., 2000; Grembowski et al., 2005).

Similarly, one participant asserted that the absence of positive feedback and the relative prevalence of negative feedback to surgeons lead to an atmosphere of mediocrity.

In my experience at (research site), the feedback that I get is usually negative. So, it's usually not like, 'Hey, good job.' So, they're like, 'Hey, this happened. Why did you do this, or say that?' ...I would say that feedback for me is a cause of fear. When you say the word 'feedback', it's like (a negative) word association. It's disorienting to not have that (positive feedback) in an environment for people, and it leads to mediocrity. (Participant B10)

The comment that the lack of positive feedback and preponderance of negative feedback leads to mediocrity was an interesting assertion. As I analyzed this assertion within the larger dialogue with the participant, the following chain of logic emerged from the participant's comments:

1. You do not receive feedback about the positive actions and accomplishments.
2. You are not incentivized (by positive feedback or other means) to go above and beyond minimum expectations.
3. You will receive feedback about anything perceived as negative practices or performance.
4. Therefore, the environment promotes a “keep your head down and do not more than the minimum.”

This study did not set out to collect the data to support or refute the participants’ assertions, yet it did present a point of view that the existing study data could not easily refute. Whether or not the reported feedback practices influenced an environment of mediocrity, the practice of continuous improvement was reported as a priority for the Center. The focus on continuous improvement was influenced by both the recent Level 1 Trauma accreditation, which requires a formal process for identifying, reporting, and resolving performance improvement opportunities, and the stated priorities of senior management at the Center. Accordingly, improving the effectiveness of feedback practices within the Center could significantly impact the success of the performance improvement efforts.

In addition to the potential influence on performance improvement, the organization has the opportunity to build upon the study findings and to harness feedback structures and practices as a way to increase surgeon engagement and support the surgeons in becoming more active participants in the non-surgical domain. Since the feedback structures and practices in the non-surgical domain are so significantly

different, they are essentially inaccessible to surgeons. As a result, the surgeons are not able to engage with domain attributes, like feedback, such that they can be converted to resources-in-use, which support expert contribution.

This research provides additional insight to organizational practitioners, administrators, and surgeons regarding the opportunity to create feedback structures and practices that are available as a resource and in doing so transform surgeon participation. Specifically, they can further study the ways in which existing structures and practices in the surgical domain currently support dynamic feedback. The observations from the surgical domain can then provide insight into opportunities for creating effective structures and practices in the non-surgical domain. Although I would not expect the initial attempt at feedback structures and practices to “solve” surgeon engagement or organizational performance, I could foresee this as an important starting point. For example, feedback within an organization essentially acts as a compensating mechanism allowing individuals and the organization to adjust actions. Since feedback is currently a resource that is unavailable to an important constituent of the organizations (surgeons), the adaptability is mitigated. By introducing feedback (positive and negative) as an accessible resource to the surgeons, there is the potential to engage a compensating mechanism that has previously laid dormant. With this mechanism engaged, the organization has greater potential to make ongoing adjustments and evolutions.

Implications for the Healthcare Industry

Increasing physician participation and satisfaction continues to be a priority in the U.S. healthcare industry (Waldman & Cohn, 2008). In February of this year, I met the

Chief Medical Officer (hereinafter CMO) of a publically traded, for-profit organization who owns several dozen hospital campuses in over 20 states. One the top priorities of this CMO were to find a way to better engage the physicians that are associated with his organizations. He shared his view that physicians are critical members of the healthcare delivery system; however, they are increasingly becoming isolated and frustrated due to the move towards managed care. Too often physicians and healthcare executives see themselves as adversaries rather than partners, yet they both need each other and are central figures in the healthcare system. Finding a way to align interests and increase the productive participation of executives was a top priority for this executive. I have had similar dialogue with numerous CEOs and CMOs of healthcare companies, as well as physicians, over the last four to six years.

I believe the findings from this research indicate opportunities for a more nuanced understanding of how to increase physician participation and satisfaction. Perhaps further research and practice in this area will begin to shift the emphasis away from a cognitive and trait-based approach that focuses on the differences between physicians and administrative leaders, and towards understanding and engaging the sociomaterial aspects that independently and collectively shape administrators and physicians.

Implications for Practice

Reflecting on my journey through the research process, there are three key conceptual themes that stand out: mutual constitution, sociomateriality, and feedback as a resource. I now find myself increasingly aware of the sociomaterial nature of life and work settings. I am finding that, as I look for structures, practices, and resources, they

are ubiquitous to life, but they were previously often invisible – present yet invisible. I am beginning to understand how by integrating this new understanding with my current work, I can have a potentially more powerful impact through my work. For example, I now frequently use the following maxim with clients: make it easy for employees to succeed and difficult for them to fail. The intent behind this maxim is that when considering organizational changes that will improve performance, it is critical to consider the larger system of structures, practices, and potential resources that are present and those that may need to be present in order to create the type and level of success that is desired. Are leaders cultivating the structures, practices, and potential resources that facilitate the desired behaviors, and thus results, or alternatively, are they allowing systems, practices, and potential resources to exist that are inconsistent with organizational goals of that are unavailable to employees. In effect, are they cultivating a system designed to produce the results that they desire?

I have always valued the power of feedback as a means to foster and support individual and organizational learning and adaptability. As I have progressed through my doctoral studies in the CLO program, I have increasingly viewed my work as helping organizations and individuals shorten what I have been referring to as their Learning to Performance Cycle. The central thesis of this approach is that there is a process, conscious or unconscious, that organizations engage in as they adapt to changes in their environment. Further, by consciously improving the efficiency and effectiveness of this cycle, companies can improve their adaptability and thus performance in dynamic and complex environments. A central component of the cycle is feedback loops that provide

individuals and organizations with the information necessary to take and adjust action. The cycle also takes into account the concept of feedback being present but unavailable as a resource. For example, in a recent client engagement, it was discovered that important feedback from was present in the system but was not being utilized in order to adjust action and thus improve performance. In conducting the analysis, the client team and I discovered that the feedback was not being utilized, or resourced, for two separate reasons. In one instance, client employees had become habituated to using one source of performance data and were essentially ignoring additional sources of data. In a second instance, a different subset of client employees did not have the broader context of the work processes of which they were a part and therefore, while they were aware of the data, they did not recognize its relevance to their performance goals. In both instances one might argue that the influence of the employees' habitus and related schemas were not supporting their ability to effectively access the potential resources that were available in their environment.

Suggestions for Future Research

This was an exploratory dissertation study situated in a unique environment and the findings cannot be directly extrapolated to other contexts. Given that the findings that emerged from the data were not the original focus of the study, one of the first recommendations for additional research is to build upon these initial findings in a more comprehensive and focused study that includes a significantly larger number of participants. This could include a study that is designed to identify the specific sociomaterial dimensions of a given type of expertise. Additionally, a study that

identified and further explored the major sociomaterial aspects of the expertise of a surgeon or other physician would potentially have significant theoretical and practical value. The theoretical value would include the additional scholarship and insight to the literature on sociomateriality and that of expertise. The potential practitioner value would include any further insight in how to help physicians increase their contribution and impact in the broader healthcare system and to help increase physician overall satisfaction and engagement in their role. Lastly, as additional studies are produced it would be valuable to conduct a cross-case analysis to explore common themes across the various studies and perhaps identify new area for both research and practice.

Conclusion

This dissertation has demonstrated the sociomaterial and situated nature of the expertise of trauma surgeons. In doing so, the research also demonstrated the limited portability of their expertise even across domains within the same environment of the Trauma Surgery Center. To arrive at these conclusions, I engaged with the data applying a theoretical lens based on fundamental concepts of practice theory such as habitus (Bourdieu, 1977), resourcing (Feldman, 2004), and sociomateriality (Orlikowski, 2007). In arriving at my conclusions, I have affirmed the relevance of traditional conceptions of expertise (cognitive theory), yet demonstrated that they do not go far enough in their conceptualization. In addition to the cognitive knowledge that is resident within a surgeon, knowing and expertise exists among and across the various structural, social, and material relationships within their situated environment. Conceptualizing expertise

in this way allows for further consideration of how expertise is emerging within the unique environment.

The following two research questions provided the focus and guidance throughout the duration of this study:

Research Question #1: What are ways to conceptualize the expertise of a trauma surgeon?

Research Question #2: What are the characteristics associated with trauma surgeons and their professional socialization and current work environment that influence the portability of their expertise?

In addition to providing focus, the questions allowed for an open frame from which to explore alternate conceptualizations and enactments of expertise. This alternate conceptualization of expertise and its constitutive elements depict a fertile landscape for further research. It is my hope that future researchers will extend and deepen this thread of inquiry for the benefit of both academic theory and practice.

Appendix A: Interview Protocol

Potential Round 1 Interview Framework and Questions

Frame the interview:

(Dissertation research into the role of feedback in environments of continuous change)

Describe and test the definition of feedback that is being used in this study:

(Any sources of information, within the environment, that helps you choose which actions to take or which actions you may want to adjust.)

Exploring Feedback Structures

1. How do you receive feedback in your role? (As many as they can think of)
Examples include: (Personal comments, reports, monitoring devices, performance reviews, etc.)

Possible dimensions listed below

Formal & Informal channels and modes of feedback

- a. Received from others (in what structures/processes/formats, how often)
 - b. Self-observed/ reflective (probe specifics and examples)
 - c. Automated (e.g. report) (in what structures/processes/formats, how often)
 - d. Other ways
2. For each type of feedback described, what happens when/as you receive the feedback? (e.g., What do you do with the feedback?)

3. Are any of the forms of feedback more useful to you than others?
 - a. This will likely delve into issues of relevance, reliability, power, etc.
 - b. Perhaps round two of interviews will include a matrix of qualifiers for sources and forms of feedback?
4. Are there any other ways that you receive information that helps you improve your actions and impact?

Exploring the Environment of Change

1. How would you describe the environment that you operate in?
2. Can you give me examples of recent changes in the environment that impacted your role?
3. How did you learn about what would be required from the changes?
4. How did these changes impact your role?
5. How did you respond to these changes?

Appendix B: Study Participants

Table 1. <i>Study Participants</i>	
Description of Role	Number of Participants
Senior Administrative Leaders	3
Management-level Nurses	2
Surgeons	8
Total Participants	13

Appendix C: Level 1 Trauma Center Requirements

Table 2. <i>Level 1 Trauma</i>
24-hour in-house coverage by general surgeons, and prompt availability of care in specialties such as orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, internal medicine, plastic surgery, oral and maxillofacial, pediatric and critical care.
Referral resource for communities in nearby regions.
Provides leadership in prevention, public education to surrounding communities.
Provides continuing education of the trauma team members.
Incorporates a comprehensive quality assessment program.
Operates an organized teaching and research effort to help direct new innovations in trauma care.
Program for substance abuse screening and patient intervention.
Meets minimum requirement for annual volume of severely injured patients.

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