

THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

# TOWARD A CYCLICAL MODEL OF RESOURCE ALTERATION

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## ABSTRACT

Strategy work is principally about resource alteration. As managers attempt to alter their organizational resources, they need to ask two questions: “What are our resources?” and “How can we use these resources?” Managers will probably have little difficulty answering these questions in the case of tangible resources, e.g., tools, money, and facilities. However, in the case of intangible resources e.g., intellectual property, brands, and goodwill, these questions become more difficult to answer. And in the case of abstract resources, e.g., attention, creativity, and culture, the answers become even more elusive.

The mainstream advice to managers is that they should accurately assess their organizational resource base and unambiguously understand how these resources link to performance before they attempt to alter resources. This dissertation investigates how resource assessments actually take place in practice, how resource understandings shape resource alteration choices, and how resource alteration, in turn, shapes how managers understand their organizational resources. Three fine-grained studies highlight the contentious aspects of resource alteration. The studies show how managers try to find advantageous uses of resources they do not yet possess in order to solve problems that they often do not fully understand. The studies show also how managers, depending on their hierarchical and functional area memberships, come up with different answers to what resources they have and how these resources can be used. Not more or less accurate, just different.

A theoretical model is proposed that depicts resource alteration as a perpetual cycle. By combining cognitive theory and practice theory, the model attempts to capture how activity configurations shape both practical and conceptual resource understandings and how these resource understandings predispose actors to certain resource alteration choices. The model also proposes that the resulting feedback on these resource alteration proposals, in turn, alter activity configurations. On the basis of the dissertation’s findings and the theoretical model, managers are advised to consider three dimensions of resources—asset characteristics, coordinated activities, and enacted rules—when they attempt to answer resource related questions.

*Keywords: Resource, resource understanding, resource alteration, cognitive theory, practice theory, fine-grained, micro-level.*



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Gothenburg, April 2017

Peter Altmann

## LIST OF PUBLICATIONS

This dissertation includes an extended summary of the four appended papers listed below. The papers are referred to in the text by their Roman numerals.

- PAPER I **Altmann P**, Engberg R. 2016. Frugal innovation and knowledge transferability: Innovation for emerging markets using home-based R&D. *Research-Technology Management* **59**(1): 48–55.
- PAPER II Enberg R, **Altmann P**. 2015. Regulation and technology innovation: A comparison of stated and formal regulatory barriers throughout the technology innovation process. *Journal of Technology Management & Innovation* **10**(3): 85–91.
- PAPER III **Altmann P**. 2016. When shared frames become contested: Environmental dynamism and capability (re)configuration as a trigger of organizational framing contests. In Galavan RJ, Sund K, Huff A. (Ed.) *Frontiers in management and organizational cognition* (pp. 33–56). West Yorkshire, UK: Emerald Group Publishing Limited.
- PAPER IV **Altmann P**. 2017. *Resource schema divergences and cognitive conflicts during resource alteration: The role of everyday practices*. Manuscript being prepared for a fourth round of review at Strategic Management Journal.

Authors' contribution in co-authored papers:

I: Both authors collected and analyzed data using an insider-outsider approach. The first author (outsider) was mainly responsible for manuscript preparation and revision.

II: The first author (insider) developed the study topic and was mainly responsible for collecting data and conducting initial literature reviews. The second author (outsider) had a passive role during interviews and later transcribed them. Both authors analyzed data and prepared the initial manuscript. The second author revised the manuscript.

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# 1. Introduction

Resources are essential to all economic activity. Firms convert resources such as raw materials and know-how into products like laptops, frozen food, and TV broadcasts. These products are then distributed to people using additional resources such as firm brands, logistics, and payment processors to facilitate exchanges and transfers. Other resources are then involved in the final use of products and services. For instance, electricity is used to power your laptop.

There is no doubt that resources are central to a firm's immediate and future performance. Despite this importance, it is surprisingly difficult to answer what a resource actually is. Wernerfelt (1995: 172) succinctly captures growing concerns around what constitutes a resource when he refers to resources as "an amorphous heap." His description is telling, considering that what one firm views as a resource another may not, that the way one firm views a resource is often different from how another firm views that resource, and that individuals within firms often disagree on what a resource actually is and what it should be used for. Despite a growing interest, we still know little about what resources are (Lockett, O'Shea, & Wright, 2008) and even less about how resources are altered (Eggers & Kaplan, 2013; Regnér, 2008, 2015). Whatever a resource is, firms are keen to have better resources than their competitors, and scholars are zealous in their study of how resources and resource alterations are linked to performance.

## 1.1. Problem discussion

Two of today's most dominant resource focused strategic management theories—the resource based view (RBV) and the dynamic capabilities (DC) perspective—have predominantly explored resources with a coarse-grained focus. While this coarse-grained focus has resulted in a knowledge corpus around what constitutes a sought after resource and what managers should do given the resources at their disposal, it offers little insight into what managers actually do with these resources (Barney & Arikan, 2001).

In hindsight, it is evident that Kodak should have pursued the digital imaging revolution it ignited and that Nokia should have used their organizational resources to develop a different product portfolio. But knowing what managers should do with resources is not necessarily helpful in explaining what they actually do with resources. Micro-level studies show that what managers actually do with resources depends on these managers' intra-organizational task environments (Regnér, 2003); resources and their uses are context dependent.

A growing body of micro-level studies highlights the importance of making explicit what constitutes a resource, how actors understand resources and their uses, and how resource alteration unfolds. These studies draw on multiple streams of literature to inform their findings. In doing so, however, the different streams of literature have produced contrasting answers.

For instance, Danneels' (2011) investigation of Smith Corona shows that managers' mental representations of resources (i.e., how they understand the properties of their resources and the potential uses of these resources) determine how they attempt to alter the way these resources are used. His investigation shows also that a firm's survival may depend on its managers understanding their firm's resources in ways that are similar to how their customers and other

industry actors outside the firm understand these same resources. Relatedly, Tripsas and Gavetti (2000) show us that firms may fail when the resource understandings differ within a firm. These studies link resource alteration outcomes to resource understandings that differ either between a firm and its external environment or within a firm between its task environments.

In contrast, Dougherty (1992a) shows that the activities that are unique to a certain functional area—e.g., procedures, routines, and methods of working—determine what members of that functional area can understand. She uses these differences in activities to explain why issues related to divergent understandings exist. We know that these various procedures, routines, and methods of working continuously evolve as actors work together toward common goals (Barley, 1986; Jarzabkowski, Lê, & Feldman, 2012). Relatedly, Feldman (2004) argues that a firm's resources enable activity that in turn generates new resources. While these authors agree that resource understandings are inextricably linked to ongoing activity, they generally oppose the idea that shared resource understandings determine resource alteration, and some even question whether resource understandings exist as mental representations at all.

Scholars also disagree on how divergences in resource activities and/or resource understandings affect performance. Some link divergences to failures and barriers (e.g., Danneels, 2011; Dougherty, 1992a). Others do not. Floyd and Lane (2000: 166) explain that “managers in functional areas will tend to interpret environmental cues through their professional or occupational lenses and reach different conclusions as to appropriate roles and actions.” From this view of resource activity, divergences are a source of variation that firms can use to successfully renew themselves as environments change (Burgelman, 1991). Here, it is not the divergence itself that is problematic but a lack of ability to coordinate various task environments. But, even successful firms, for instance 3M, have experienced well-coordinated failures (Garud & Rappa, 1994).

While a complement to existing coarse-grained studies, micro-level investigations show that the link between resources and their uses is poorly understood. There is an agreement around the view of organizations as consisting of multiple environments where actors perceive resources and their uses differently. However, the literature contains inconsistencies as to how these divergences matter and for what they matter. Also, the micro-level literature disagrees on what a resource is, what resource understanding involves, and how resources can be altered, if at all. These inconsistencies are problematic if we are to bridge the gap between what we know managers should do with resources during times of change and what we know about what they actually do as they alter resources. Here, Wilson and Jarzabkowski (2004: 15) advise researchers to “investigate strategy through the microscope” and to examine resource related activity with a fine-grained focus.<sup>1</sup>

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<sup>1</sup> A fine-grained study is not to be confused with a micro-foundations study. While both focus on the micro-level, a fine-grained study investigates what actually takes place as actors understand and alter resources. In contrast, a micro-foundations study investigates how micro-level mechanisms enable macro-level outcomes (cf Foss & Felin, 2005, 2009).

## 1.2. Research objective

To date there are limited fine-grained accounts of how resource alterations unfold within firms (Regnér, 2008, 2015). We know that an organization is made out of different, but interlinked, task environments (Daft & Weick, 1984; Ocasio, 1997). We know also that these task environments are in charge of specific aspects of a firm's agenda and deploy resources accordingly (Joseph & Ocasio, 2012; Dougherty, 1992a). Finally, we know that the way resources are altered depends on the interaction between managers at different hierarchy levels and across functional roles (Floyd & Lane, 2000; Kaplan, 2008a; Jarzabkowski, 2003). However, much work remains to better understand what resources are, how resources are understood, and how resource alterations unfold while considering a firm's idiosyncratic task environments. Thus,

**the purpose of this dissertation is to extend theory on how resource understandings and resource alterations unfold within and between a firm's different task environments.**

To achieve this purpose, this dissertation investigates what a resource understanding constitutes, what resource alteration activities actors in different task environments engage in, and the relationship between resource understandings and resource alterations. These key concepts are defined next, followed by a note on theory.

## 1.3. A note on definitions

Although it is difficult to answer what a resource is (cf. Wernerfelt, 1995), it is also necessary to make explicit definitions used in this dissertation. These definitions have evolved iteratively through literature reviews and the analysis of empirical data.<sup>2</sup> There are four key concepts used for the purpose above: resources, resource understandings, resource alteration, and task environment. In this research study, these concepts are defined as follows:

- (1) Resources are inputs and/or outcomes of value generating activity. Resources are considered multidimensional and this dissertation focuses on three dimensions: asset characteristics, enacted rule environments, and coordinated activity.
- (2) A resource understanding refers to how an actor working with a resource understands this resource and its potential uses. This includes an understanding of each of the three resource dimensions outlined in (1).
- (3) Resource alteration is a change related to either of the three resource dimensions outlined in (1).
- (4) Task environment refers to the context of resource activities. The organization's hierarchy levels represent its vertical task environments. Relatedly, its functional areas represent its horizontal task environments. Task environments are unique as they: (1) shape what is interpreted and how it is interpreted (Daft & Weick, 1984), (2) focus actor's limited attention on issues and answers in context dependent ways (Ocasio, 1997), and (3) represent places where specific incentives, cultures, and routines, shape how coordinated resource activities unfold (Ren, Kiesler, & Fussell, 2008).

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<sup>2</sup> These definitions will be discussed in detail in Chapter 2 and Chapter 3.

#### 1.4. A note on theoretical perspectives

There is a growing body of fine-grained studies that rely either on cognitive theory or on practice theory. Cognitive theory is focused on actors' mental processes (e.g., attention, problem solving, thinking, perception etc.) and their mental representations (the hypothetical symbolic representation of external reality that exist in the mind). Practice theory is focused on how reality is fundamentally constituted by social activity taking place in specific contexts.

These two theoretical perspectives are incommensurable both in their ontology and their conceptualization of a resource as a theoretical construct. For instance, a resource cannot exist as a mental representation corresponding to an external reality at the same time as that resource's existence is inextricably linked to that reality. Moreover, cognitive theory and practice theory disagree on what constitutes a resource understanding and what resource alteration involves for actors who are members of different task environments.

To illustrate the incommensurability between cognitive theory and practice theory, and how it matters, consider the following two studies. Danneels (2011) investigates how cognition explains why Smith Corona's typewriter and mechanical calculator business areas were wiped out by electronic calculators and PCs. He concludes that managers had inaccurate resource schemas, i.e., mental representations of their organization's resources and the potential uses of these resources. This suggests that there exists a mapping between a mental representation of an external reality and the actual external reality such that this mapping can be judged in terms of its accuracy. Here, resource alteration is determined by mental representations of both resources and their value generating uses. In contrast, Feldman's (2004: 295) proposal of a "practice-based theory of organizational resourcing" suggests that resources are part of a cyclical process where assets enable actors to act in ways that enables the creation of new assets. Here, resource alteration is seen as an ongoing process where the generative mechanism of alteration is inherent in a set of resource activities. In Danneels' view, mental representations can be inaccurate and these inaccuracies need to be resolved to successfully alter resources. In Feldman's view, resource understandings are, at most, pluralistic as opposed to more or less accurate.

Cognitive theory and practice theory offer contradictory insights about what constitutes a resource understanding and about the relationship between resource understandings and resource alteration; they are ontologically incommensurable. While incommensurable, this dissertation intends to use both and it argues that there exists at least two reasons for using both when conducting fine-grained investigations.

The first reason relates to this dissertation's practice oriented purpose, i.e., to investigate, with a fine-grained focus, how resource understandings and resource alteration unfold within a firm. Weick (1995) argues that conducting research at times necessitates a degree of ontological oscillation. This is true when ontological oscillation allows the researcher to "understand the actions of people in everyday life who could care less about ontology" (p. 35). Ontological oscillation has been used by empirical studies that explore resource understandings, resource alterations, and the relationship between them (cf. Dougherty, 1992a; Garud & Rappa, 1994).

The second reason relates the benefits of including cognition in accounts of practice. Marshall (2008, 2014) argues that combining cognitive theory and practice theory enables insights

into why practitioners carry out practices the way they do. Marshall (2014: 111) explains that a strict separation of the mental realm and the activity realm, while perhaps ontologically sound, leads to an “epistemologically impenetrable knot” which limits cumulative knowledge building. Chapter 2 elaborates further on the choice to combine cognitive theory and practice theory and develops this dissertation’s two research questions.

## **1.5. The studies**

This dissertation is based on three studies. The first study, Study A, examined what asset characteristics decision makers considered in the context of technology innovation for emerging market entry. The study revealed that decision makers altered resources based on their evolving perceptions of markets and asset characteristics. Paper I was developed based on these findings.

The second study, Study B, followed the development and launch of a new corporate strategy. The study revealed how the task environments of actors shape the way they assess and attempt to alter resources. Appended Papers III and IV were developed based on these findings. Paper III shows how attempts to reconfigure existing ways to deploy resources are bound to a practitioner’s task environment. Paper IV provides a fine-grained account of strategy work. It shows how new resource understandings emerge and escalate into cognitive conflicts.

The third study, Study C, examined how product developers conduct technology development in an environment subject to regulatory setbacks. It revealed discrepancies between formal rules and enacted rules and how these discrepancies are tied to task environments. These differences caused tensions between actors, tensions that made it hard for them to respond to the external threat. Appended Paper II was developed based on these findings.

This dissertation uses the above described studies to develop its main contribution: a theoretical model that depicts resource alteration as a perpetual cycle involving both cognitive dimensions and practice dimensions.

## **1.6. The disposition**

Following this introduction, Chapter 2 first introduces readers to economic theory and management theory focused on resources, resource understandings, and resource alteration. Chapter 2 then turns attention to cognitive theory and practice theory and uses these to develop two research questions. Chapter 3 builds on insights from the previous chapter and develops an analytical framework of the resource alteration options that are available to a firm’s actors. Chapter 4 first describes the research design and the research method, and then provides a personal account of the overall research journey. Chapter 5 presents a summary of the appended papers. Chapter 6 answers the research questions and discusses the empirical findings. Chapter 7 uses the empirical results to propose a cyclical model of resource alteration. Chapter 8 concludes this dissertation and offers advice to managers and suggestions for future research.

## 2. The research on resource alteration

This chapter begins with a brief historical overview of the resource focused strategic management literature. This overview serves a dual purpose. Firstly, it introduces readers to how resources, resource understandings, and resource alteration have been conceptualized in the extant strategic management literature. Secondly, the overview highlights the three resource aspects that are of central concern to this dissertation's fine-grained investigations: asset characteristics, coordinated resource activities, and mental representations. The chapter concludes by critically evaluating how using both cognitive theory and practice theory can guide such fine-grained investigations and develops this dissertation's two research questions.

### 2.1. A brief historical overview of resource focused theories

#### 2.1.1. Resources as part of mental representations: 1970s

The studies of Dan Schendel and colleagues at Purdue University represent an early influx of resource related thinking from economics into strategic management. In their work, they assume both resource heterogeneity and that resources have an inherent value that is mediated by mental representations.

Schendel and Patton (1978) provide guidance to managers who need to choose between resource alteration options. The authors argue that managers must allocate scarce resources across various mutually exclusive performance goals that need to be balanced (these goals are commonly associated with specific functional areas and roles). Schendel and colleagues view resource alteration as an allocation of resources in a context of multiple goals. These goals are interdependent and the resources are discrete entities. For instance, money does not change as a resource when reallocated from an R&D budget to a marketing budget.

Schendel and Patton (1978) provide a model that reveals the performance implications of managers' mental representations of the relation between various performance variables (e.g., the firm's resources). They state that:

Management's actions are guided by *perceptions of the relationships* between the resources at its disposal, constraints forming the competitive environment, and organizational goals and objectives. These perceptions are based largely on experience and past performance (Schendel & Patton, 1978: 1620–1621, my emphasis).

The authors make explicit that it is mental representations that guide managers' actions and that these representations are shaped by managers' past activity. Note that it is not the resources that are perceived but the relationship between resources and other variables (cf. Penrose, 1959).

#### 2.1.2. Resources as a firm's main source of rents: 1980s

One of the more significant developments in 1980s was the emergence of the RBV. Wernerfelt's (1984) article "A Resource-based View of the Firm" departs from Penrose's (1959) conceptualization of firms as bundles of resources, and conceptualizes resources using Porter's (1980) structure-conduct-performance perspective and Andrews' (1971) work on the strengths and weaknesses of particular resource positions.

In Wernerfelt's work, resources are central to a firm's performance. He emphasizes asset characteristics as the locus of value generation. Wernerfelt investigates the asset characteristics that make a given resource part of a dependence and is interested in why certain resources enable performance advantages. To Wernerfelt, asset characteristics that enable resource position barriers (an analogue to Porter's entry barriers)—either through some perceived distinctive benefit or through cost advantages (cf. Conner, 1991)—will enable a firm to generate above average rents from its resource activities.

While Wernerfelt's conceptualization of resources builds on Penrose's work, it does not include her focus on mental representations as mediators between asset characteristics and productive opportunities. Instead, Wernerfelt conceptualizes resources as having an inherent value generating potential. From this perspective the "distinctiveness in the product offering or low costs are tied directly to distinctiveness in the inputs—resources—used to produce the products" (Conner, 1991: 132).

In general, attention in the RBV is focused on abstract asset characteristics that enable persistent performance advantages—i.e., characteristics that make a resource valuable, rare, inimitable, and non-substitutable (VRIN)—and not on the resource itself (Barney, 2001).

### **2.1.3. Resources as components of a coordinated production system: 1980s–1990s**

Teece (1982) argues that firms use resources in unique ways by drawing on their firm specific routines and experiences. He draws on Nelson and Winter's (1982a) evolutionary theory, which focuses on experiential learning codified as organizational routines. This evolutionary view suggests that a firm's specific characteristics are acquired over time through its experiences (i.e., Lamarckian inheritance). Teece focuses on the resources that a firm can 'discover' through experiential learning and 'develop' through routines (see also Barney, 1991).

Following Wernerfelt (1984) and Teece (1982), the resource focused strategic management research increasingly treats resources as the *de facto* locus of competitive advantage (cf. Kraaijenbrink, Spender, & Groen, 2010). Subsequent work focuses on how resources link to performance. Researchers argue for the benefits of monopolistic control over scarce resources, where these resources are necessary for a wide range of downstream producers, and where there exist no obvious substitutes. Researchers argue also that resources with these benefits can enable sustained performance benefits. For instance, Dierickx and Cool (1989) discuss resources in the context of asset accumulation and points to benefits related to degrees of substitutability and imitability. Asset characteristics and a production system that can utilize complementarities between these asset characteristics are brought to the fore.

By the 1990s, the RBV had risen to a dominant position within the resource focused strategic management literature and kept its objectified view on resources. The resource based theory proposed by Grant (1991) builds on the foundations set by Wernerfelt, Teece, and Barney in terms of the properties of valuable resources. In Grant's work, the role of routines as a source of new knowledge is brought to the fore. Grant's argument is that managers can identify and classify resources and appreciate strengths and weakness of these resources in a fairly straight forward way. The advantages a firm enjoys comes from identifying firm capabilities where

resources act as inputs. These capabilities are extended when managers decide to expand the boundaries of the firm's activities. As new things are done over time, these things become new capabilities by the simple mechanism of accumulated experience of them being done. With the knowledge gained, new complementarities with existing (and new) resources unlock (see also Rumelt, Schendel, & Teece, 1991).

The routines perspective shows how a firm's unique history matters for its resource understandings and resource alterations. However, it treats Penrose's (1959) focus on mental representations as peripheral. This is not to say that the concept of mental representations does not feature in the 1980s–1990s RBV literature. In some cases, mental representations are afforded a brief mention. For instance, Peteraf (1993) mentions managers' perceptions of the benefits of resource enabled choices (see Peteraf's discussion on the *ex ante* limits to competition). Mahoney and Pandian (1992) argue that “this notion that the firm's current resources influence managerial perceptions and hence the direction of growth is a cognitive proposition” (p. 365).

In other cases, cognitive processes are brought to the fore. For instance, Ginsberg (1994) makes an explicit attempt to link mental models of managers to sustained competitive advantage. Ginsberg builds his argument on the recognition that actors are cognitively limited which both constrain their ability to make rational resource related choices (Amit & Schoemaker, 1993), and underlie differential firm performance (Schoemaker, 1990). He argues for a focus on “the cognitive and social processes through which human and organization resources are converted in group capabilities” (p. 155). Studies also investigate managers' perceptions about their firm's external environment (e.g., Porac, Thomas, & Baden-Fuller, 1989; Ginsberg, 1990), theorize about what is a feasible alteration given an organization's existing resources (Ginsberg, 1994), and focus on cognitive capacity (Ginsberg, 1990). Notably, these investigations do not explore mental representations of resources *per se*.

#### **2.1.4. Resources that alter other resources: 1990s–2000s**

In the 1990s, DC researchers began focusing on those organizational resources that enables the purposeful alteration of other resources during times of change (cf. Helfat et al., 2007). The DC literature is vast and has changed its focus since its inception (for recent reviews see Wang & Ahmed, 2007; Ambrosini & Bowman, 2009; Barreto, 2010; Vogel & Güttel, 2013). But it is founded on two main schools: (1) the Eisenhardt school, which considers the ability to alter resources as rooted in processes and rules (cf. Eisenhardt & Martin, 2000), and (2) the Teece school, which considers the ability to alter resources as rooted in firm specific routines (cf. Teece, Pisano, & Shuen, 1997).

Both the Eisenhardt school and the Teece school build on evolutionary theory (Arndt & Bach, 2015; Galvin, Rice, & Liao, 2014, 2015). While neither emphasizes mental representations, the Eisenhardt school mentions divergence in ‘thought worlds.’ Eisenhardt and Martin (2000) argue that coordination is important because it “enhance[s] innovation by breaking down the thought worlds that arise because people with different expertise not only know different things, but know those things differently” (p. 1109). They argue that there exist best practice routines aimed to bring together task environment specific experiences and knowledge “by which managers alter their resource base” (p. 1111). In both schools, routines are specific to

firms. While this specificity is emphasized in the Teece school, the Eisenhardt school also acknowledges it through idiosyncratic enactments of best practice routines.

The Eisenhardt school focuses on the coordination mechanisms by which variation in ‘thought worlds’ matters. By contrast, the Teece school is Lamarckian in that routines are carriers of firm-specific acquired traits.<sup>3</sup> The Eisenhardt school is distinct also in its focus on the evolutionary elements of adaptation and specialization. Here, the pace of industry change determines the evolutionary path of firms. Eisenhardt and Martin argue that stable environments promote variation (analogous to how species adapt to become specialized to a specific resource in a stable environment) whereas dynamic environments favor generalists (due to the necessity to be flexible in changing environments). The authors focus specifically on intra-firm variation and argue that temporary performance advantages rest on a firm’s ability to quickly develop or adapt ways of working with idiosyncratic resource endowments. Note how this applies both in stable environments—where specialization affords resource utilization benefits (similar to how Williamson (1991) views economizing)—and dynamic environments—where adaptation enables quick moves from obsolete resource deployments to competitive ones.

Later work focuses on organizational learning. For instance, Zollo and Winter (2002) argue that firm specific routines develop both as a result of experiential learning and as a result of more cognitive backward-looking codification of knowledge. Zollo and Winter propose that constructive confrontations between individuals with different viewpoints are important to develop a collective understanding of actions and their performance implications. This is important because it allows a shift from Lamarckian heredity to Mendelian heredity, i.e., it highlights how individual interaction determines variation, selection, and retention. However, Zollo and Winter are not interested in individuals *per se*. They see constructive confrontations as a means by which causal ambiguity around action-performance links can be reduced.

### **2.1.5. Resources and the cognitive micro-foundations turn: 2000s–2010s**

As research continued, criticism emerged against the mainstream resource views in strategic management literature. The literature is criticized for its inadequate consideration of Penrose’s (1959) focus on subjective resource value and mental representations (cf. Foss, 1998a, 1999; Becerra, 2008). Penrose (1959) argues that to understand what managers actually do when they attempt to alter resources, we need to bring to the foreground their ability to focus attention, to subjectively link resources to opportunities of productive uses, and to subsequently pursue these opportunities (Foss, 1999). Thus, not including mental representations is problematic if we are to develop a fine-grained understanding of resource related activity.

An additional criticism against resource focused strategic management theories is that they do not make clear how a firm’s actors know, or can know, what VRIN resources are *ex ante*, thereby risking tautological definitions of resources (Kraaijenbrink et al., 2010). It is also not clear how these inputs should be, and are, linked to performance generating actions (Barney & Arikan, 2001). Consider, for instance, Peteraf and Barney’s (2003: 311) argument that a firm’s

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<sup>3</sup> Galvin et al. (2015: 697) note that few papers actively consider evolutionary theory in a modern Darwinian sense. They argue that “the classic Darwinian cycle of variation-selection-retention is often not even apparent in many of the papers applying the [dynamic capabilities view] to different fields.”

resources have “intrinsically different levels of efficiency.” It is not clear how these insights can aid in the daily activities of managers who may not be able to see what is intrinsically held by a resource. Mahoney (1995: 97) argues that coarse-grained advice is inadequate because they “cannot articulate management practices that will enable firms to earn rents.” Mahoney argues also that to help managers working with resources, researchers need to develop theory that includes both mental representations and patterned resource activities. To provide such advice, researchers need to know what a resource actually is, how resource understandings and resource alterations unfold, or how resources are created in the first place (Foss, 1998b; see also Regnér, 2008; Kraaijenbrink et al., 2010).

As a response, the micro-foundations turn in strategic management set out to investigate the micro-level mechanisms behind resource related activities. Depending on the perspective these investigations draw on, researchers view and explain resource related micro-foundations differently. Some draw on behavioral traditions and evolutionary economics to conceptually explore the direction between micro-macro outcomes (Abell, Felin, & Foss, 2008). Others, building on the same evolutionary and behavioral roots, argue for enterprise-level sensing, seizing, and reconfiguring skills that mainly focus on processes, rules, and structures (Teece, 2007).

In turn, those who focus on the cognitive micro-foundations are divided into two main literature streams. The first stream focuses on managerial cognitive capabilities (Adner & Helfat, 2003; Helfat & Peteraf, 2015). These authors focus on managers’ capacity to receive data from an environment and subsequently analyze these data to inform resource alteration decisions. They focus specifically on managerial capabilities that can “build, integrate, reconfigure, and competitively reposition organizational resources and capabilities” (Helfat & Peteraf, 2015: 931). Relatedly, Eisenhardt, Furr, and Bingham (2010) explore heuristics and higher order thinking, e.g., abstraction, variety, and interruption. In this first stream, focus lies on the cognitive processes that inform resource activities. The second stream within the cognitive micro-foundations literature focuses on resource related mental representations. For instance, Gavetti (2005) explores how mental representations and hierarchy direct search activities. In turn, Daneels (2011) investigates how mental representations of resources shape the direction of resource alteration. He focuses on the mental representations of asset characteristics, and their potential uses, that influence the direction of resource alteration choices.

There are overlaps between the two cognitive micro-foundations streams, but researchers often emphasize one stream over the other. For instance, Helfat and Peteraf (2015: 832) acknowledge language, social cognition, and the relationship between mental maps and the mental activities that utilize and alter mental maps, but focus specifically on “the capacity of individual managers to perform mental activities.” Together, the two cognitive micro-foundations streams establish that it is not asset characteristics *per se* that matter for how resources are altered. Instead, attention is drawn to mental representations of resources and their potential uses, and to the cognitive capabilities linked to these mental representations (for an argument of the link see Ginsberg, 1990, 1994).

Within this micro-foundations research, there also exists studies based on what seems to be a mix between evolutionary economics and Austrian economics. In these studies, both mental

activity/representations and routines/rules matter. For instance, Feldman (2000) argues that routines have both emergent path dependent properties that are evolutionary in nature, but also effortful properties that are more cognitive. Feldman and Pentland (2003) argue that the more ostensive aspects of routines denote abstract patterns that actors use to guide the specific actions involved in these routines. Relatedly, Gavetti and Levinthal (2000) argue that strategy work involves both an effortful forward-looking, where future consequences are mentally processed, and a backward-looking reliance on experience (for the cognitive role in backward-looking see also Zollo & Winter, 2002). Similarly, Gavetti and Rivkin (2007) argue that search is situated in both practical action and cognition. Finally, Salvato (2009) focuses on the day-to-day activities of the actors involved in product development and shows how resource alteration is a process where cognitive elements and routine elements are inextricably linked.

Next follows a synthesis of the literature overview and the identification of three resource aspects that will guide this dissertation's investigations.

## **2.2. A synthesis and a way forward**

Figure 1 presents a synthesis of the discussion above. As Hodgkinson and Healey (2011: 1501) argue "there is no question that the dominant perspectives in classic and contemporary strategic management emanate from the field of economics" (see also Conner, 1991). Therefore, the development depicted in Figure 1 departs from evolutionary economics (Nelson and Winter, 1974) and Austrian economics (Penrose, 1959). Figure 1 then covers the theories mentioned in the overview above and concludes with the recent micro-foundations literature.

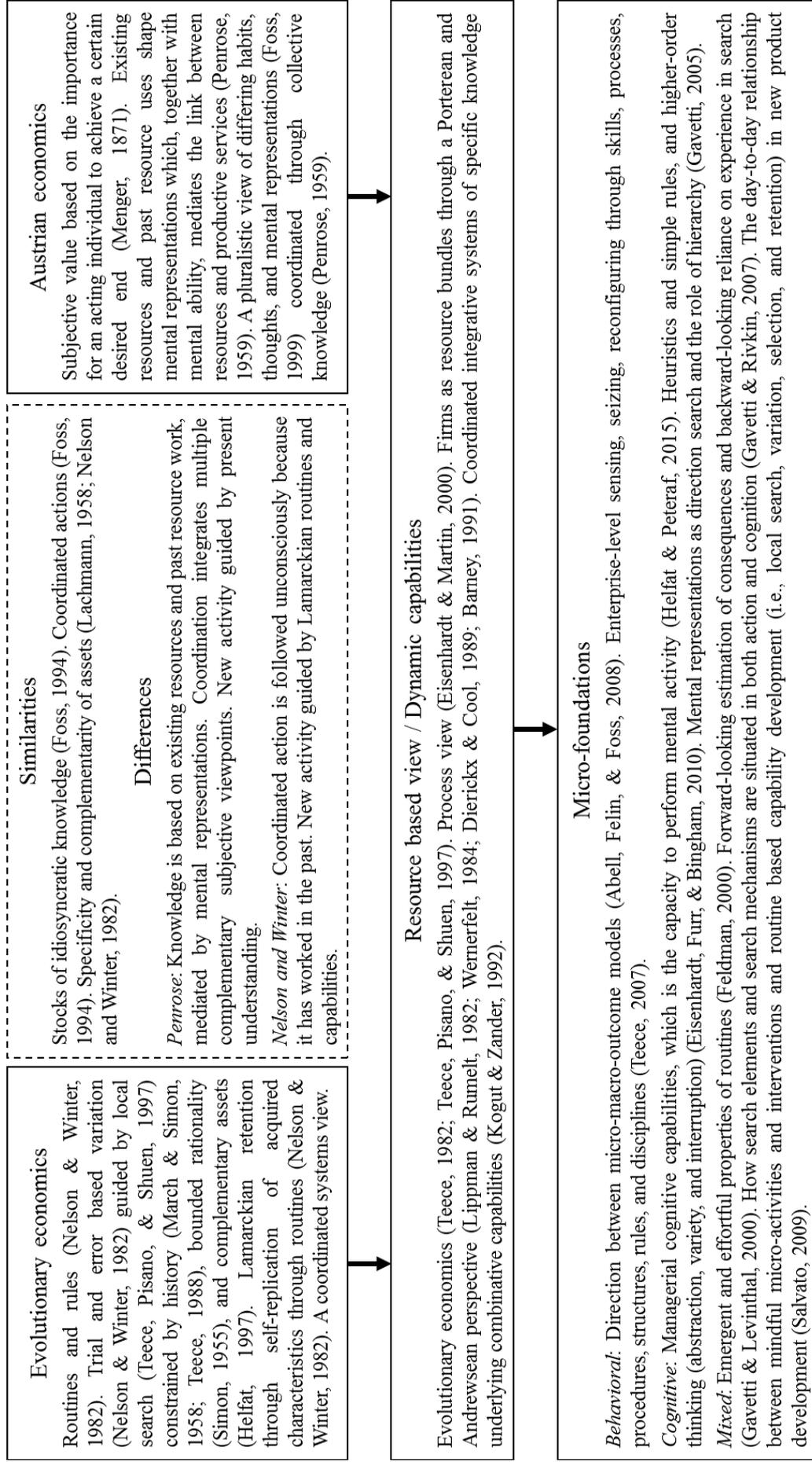
This dissertation builds on three resource related aspects identified in the extant literature: asset characteristics, coordinated resource activities, and mental representations. This dissertation develops its findings based on cognitive theory and practice theory. As cognitive theory and its micro-foundations view on resources has been reviewed above, the text below will first introduce practice theory and then contrast cognitive theory and practice theory to consider their respective strengths and weaknesses as well as their incongruences and complementarities. Two research questions are then developed.

### **2.2.1. How practice theory can inform fine-grained investigations**

Practice theory contrasts mainstream cognitive theory. The mainstream cognitive research views resource alteration as discrete patterned activities where resources (also discrete entities) have asset characteristics that actors (themselves discrete entities) understand with varying degrees of accuracy, and alter resources accordingly.<sup>4</sup> Calls have been made for a more explicit focus on the social, cultural, and material contexts of cognition; where meaning is not made solely in the mind of something external to the mind (e.g., Hutchins, 2010; Rocha, 2012). An emphasis on the contextual and situated nature of cognition suggests that meaning is not something an actor makes of an environment, but rather something that is carried by the environment.

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<sup>4</sup> The mainstream focus within cognition on information processing over a more contextual and dynamic treatment of cognition is not due to ignorance of these factors, but has important methodological roots. Contextual dynamics was too difficult to account for at the embryonic stages of the field (Hutchins, 2010).



**Figure 1. The development of resource focused strategic management theories.**

While the cognitive literature is not unified in their treatment of these ideas,<sup>5</sup> practice researchers consider them focal in their studies.

There exist multiple practice theories (Nicolini, 2012). Common to all is that they do not acknowledge dualism, i.e., the existence of a mental realm that is detached from the world of activity (Lave, 1988). Practice researchers do not view the world as a source of information to be rationally processed (however bounded this rationality may be), where resource understandings are outcomes of mental activity. For practice researchers, information does not attain meaning in the mind. Meaning is instead shaped by the specific task environment in which cognition takes place and is influenced by formal norms, rules, and routines that affect the way information is framed and interpreted (Jarzabkowski, 2004; Marshall, 2008).

The context explains the existence of idiosyncratic thought worlds, or as Dougherty (1992a: 182) argues: actors “engaged in a certain domain of activity [have] a shared understanding about that activity.” From a practice perspective, it is unlikely that there exists a correct way of understanding resources as actors’ understandings are contextual. Practice theory rejects a view of reality as a set of abstract linked variables (cf. Weick, 2003: 467). Instead, a practice approach to studying managerial activity would consider meaning as a relational “totality into which practitioners are immersed” (Sandberg & Tsoukas, 2011: 341). Here, the context and the situated nature of being shapes meaning to a significant degree.

Practice theorists also focus on dynamics. For instance, Orlikowski’s (2002) study of product development shifts attention away from knowledge (connoting elements, processes, dispositions, and outcomes) as a resource, to knowing (connoting doing and practice) as an ongoing social accomplishment. Broadly speaking, a resource from a practice perspective can be understood as a component of the arranged entities that make out the materiality of social activity (cf. Schatzki, 2002). For instance, a whiteboard, a computer, a flash drive, seats for an audience, a laser pointer may all become resources used for the practice of giving a research presentation.<sup>6</sup>

By purposefully eschewing any presupposed asset characteristic inherent to resources and rejecting the idea that resources exist as independent entities, practice researchers focus on the resource dynamics involved in ongoing organizational reality. They do so by investigating the everyday activities of practitioners over time (cf. Regnér, 2003, 2015; Gillespie & Zittoun, 2010). Here, reality is situational and represents a nexus of activities and relational totalities (Sandberg & Tsoukas, 2011). A resource within practice research is sociomaterially configured by the practices that involve actors, skills, places, instruments, activities, etc. As such, resource realities are “thoroughly constituted by contingent practices” (Orlikowski, 2015: 38) and are pluralistic (Jarzabkowski, 2004). As an example, consider Mol’s (2002) examination of how

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<sup>5</sup> For instance, Gerard P. Hodgkinson’s frontiers in MOC keynote speech in 2012 mentions how neuroscience makes it possible to locate mental representations in the brain, how the cognitive and the affective interrelate, and how distributed cognition unfolds in multiteam settings (cf. Healey, Hodgkinson, & Teo, 2009).

<sup>6</sup> This dissertation distinguishes between entities that enable situated action for a particular practitioner in a particular task environment at a particular time, and the entities that are involved in value exchanges between firms as conceptualized in the economics and management literatures (e.g., human resources, capital resources, natural resource). Thus, the focus is on what Melin (in Johnson et al., 2007: 217) refer to as “the most critical type of strategizing [that] includes activities and practices that eventually lead to a major strategic renewal.”

practice determines what a particular cardiovascular disease, atherosclerosis, is to different actors. Those working in the Pathology department consider atherosclerosis as an abnormal thickness of the inner coating of the artery. It is something that they experience through studies through a microscope. In contrast, doctors working in the clinic consider atherosclerosis as part of a diagnosis based on patient complaints. They experience atherosclerosis through patient interaction and through medical tests.

For practice theorists, objective entities and discrete states do not exist (cf. Sandberg & Tsoukas, 2011). Actors do not hold mental representations of resources, i.e., resource schemas. They hold schemata of resource actions. These are internalized practices that shape action through socioculturally and historically shaped tendencies and dispositions (Chia & MacKay, 2007). Schemata of resource actions are inextricably tied to what practitioners in a task environment take for granted and how they experience a given resource in everyday use. This is a habitual practical understanding that may not be available for conscious recall (Jarzabkowski & Spee, 2009), and that is determined by the set of organized actions and arranged entities at a given site of social coexistence (Schatzki, 2002).

For practice researchers, routines are not solely experiential where their meaning is assessed through retrospective accounts and constructive confrontations (cf. Zollo & Winter, 2002). Instead, routines are firm-specific adaptations of broader macro-practices (Johnson et al., 2007). In contrast to Zollo and Winter's (2002) general reference to performance evaluation, debriefing sessions, and collective discussions, practice scholars focus on these activities and treat them as situated and contextual. Practice researchers do not focus on the performance outcomes of various activities, but rather why exactly these activities unfold as they do, when they do.

Practice researchers view routines and rules as reflections of higher level practices, and cognition as taking place in an information environment where that environment carries meaning. Practice research centers on how resource understandings and resource alteration unfolds by including a focus on specific task environments, situated activity, and cognitive contexts (Jarzabkowski, 2005; Regnér, 2008). Practice research can contribute to our otherwise "limited accounts of the dynamics involved in the build-up, development and change of organizational assets (i.e. resources and capabilities)" (Regnér, 2008: 566). It is also suitable for fine-grained studies because practice research centers on activity configurations, situated social contexts, and social interaction across multiple task environments (Regnér, 2008).

Activity configurations are particularly interesting as they include "specific combinations of certain actors, socio-cultural contexts, cognitive frames, artifacts, and structural properties" (Regnér, 2008: 574). Regnér argues that activity configurations are suitable as a unit of analysis because this "permits a fine-grained examination of specific ingredients, which in combination may build new organizational assets" (p. 574). Activity configurations allows us to uncover actors' predispositions (Regnér, 2008), how deviations between individual and professional norms act as a source of resource heterogeneity (Jonsson & Regnér, 2009), and how external bodies shape rules and routines (Regnér, 2008). Activity configurations can also inform our understanding of the dual nature of conscious and non-conscious resource alteration activity

(Hodgkinson & Healey, 2011). Note that while cognitive theory and practice theory conceptualizes resource understandings differently, they both acknowledge the simultaneous existence of non-conscious activity as well as conscious activity.<sup>7</sup>

### 2.2.2. A reflection on cognitive theory and practice theory

One major issue with practice theory is its strong emphasis on ontology at the expense of pragmatism—an issue which practice scholars are aware of (cf. Johnsson et al., 2007; Golsorkhi et al., 2015). Consider for instance the notion within practice theory that resources do not have an existence outside of any relational totality in sites of social coexistence. How exactly does this help a practitioner? What plan of action would he or she draft? Provide instead a simple SWOT template or a Five Forces framework and strategy work can commence. It is somewhat ironic that practice theory, while perhaps ontologically more appealing, fails to spur action in the way that an Andrewsean or Porterean influenced framework does, despite the fact (or perhaps because) the latter two are based on a questionable resource ontology. Again, Weick (1995) comes to mind; people seem to care little of the ontological nature of their daily work.

A sole reliance on practice theory is epistemologically difficult and hard to turn into actionable advice. Clearly, it seems that resources have some inherent properties that are objective and independent of agency (De Gregori 1987) and where technical features exist independently of human activity (cf. Orlikowski, 2000; Barley, 1986). Coal burns. Gold is malleable. People can be creative with how they use features of a new technology. And a brand carries with it association that can be leveraged across product groups. These aspects of resources (or similarly the characteristics and capabilities of specific technologies) seem to exist and, in some sense, to be real. But a practice view rejects the idea of resources (or collective patterned activities involving resources) as interacting independent entities (Barad, 2003; De Gregori, 1987). Resources neither exist in their properties (e.g., being malleable), nor do they enter a permanent state of resources through human activity such as combination and transformation (e.g., a gold neckless). Instead, resources are brought into being through activity and in turn enable activity in specific moments, shifting the emphasis from resource as a noun to *resourcing* as a gerund (Feldman, 2004; Feldman & Worline, 2011; Quinn & Worline, 2008; Howard-Grenville, 2007). As Scott and Orlikowski (2009) point out, asset characteristics are relational and enacted in practice and therefore only relevant when used.

Note that the word ‘relevant’ does not signify existence, only meaningfulness. In other words, resources may exist, in part, independent of practice, but the term ‘resource’ is relevant only when practiced. Value is produced in the moment. Assets enabling this value production can exist outside of value production. And since a resource is an asset that is involved in a set of value generating activities, resources also come into being in the moment of their value generation (cf. De Gregori, 1987). Since value is subjective (Menger, 1871), an asset can be viewed as one or more resources depending on the actor. However, consider again how this affects the

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<sup>7</sup> This duality lies at the frontiers of cognitive research as evidenced by the topic of the 2017 New Horizons in Managerial and Organization Cognition workshop, i.e., “Methodological challenges and advances in managerial and organizational cognition,” where one major area of interest is the subconscious/automatic construct. There exist also other word pairs to describe similar constructs, e.g., reflective and reflexive, Type 1 and Type 2, automatic and deliberate, conscious and non-conscious etc. In this dissertation, these are treated as synonymous.

advice we as scholars give managers. In everyday life, it is a practical necessity to consider both value generation in the moment as well as the consideration of future moments. It is, in part, this necessity that demands that we allow an ontological oscillation in order to provide actionable advice to managers.

Finally, while the critique against cognition is fair insofar that representations should be considered as more dynamic and that environmental information is not devoid of meaning, it is also fair to criticize a view of practice as the sole locus of meaning and behavior. The issue here is that the practice-based literature has pushed cognition to the background and instead relies on ideas of socially shared predispositions that enable practices. Practitioners are either seen as unconsciously guided by a repository of practical coping (Chia & MacKay, 2007), some unspecified mindful sense of the practical reality (Giddens, 1984; Bourdieu, 1990), a knowledge of the norms and routines necessary for the enactment of practice that practitioners naturally prefer over others as it provides them with ontological security (Giddens, 1984), or some extra-individual collective memory (Bourdieu, 1990).

Somewhat harshly stated, while the mainstream cognitive literature views information as devoid of meaning prior to mental processing, the practice literature views the actual processing as devoid of representational thought. Here, meaning is instead shared and negotiated and part of some extra-individual realm that actors can gain access to or are part of. Marshall (2008, 2014) argues that including cognition in accounts of practice provides insights into how it is that practitioners carry out practices the way they do.<sup>8</sup> He further argues that:

Without any real acknowledgement of the dynamic processes of cognition, through which patterns of thinking are established and updated, practice-based theories struggle to explain how the equally patterned and largely routine character of social conduct can be sustained (Marshall, 2008: 415).

Marshall (2008, 2014), Hodgkinson and Clarke (2007), and Jarzabkowski (2004) have laid the conceptual groundwork for studies investigating the interplay between individual-level cognition and higher-level contexts and Marshall (2014), Hodgkinson and Clarke (2007), and Hodgkinson and Healey (2011) explore the interplay between the conscious and the non-conscious. Their efforts are complemented by Balogun and Johnson's (2004) empirical investigations of how strategy practices underlie sensemaking processes that change mental representations. Similarly, Melin (in Johnson et al., 2007: 216) argues that a "practice perspective is certainly relevant to both the thinking and the acting side of strategizing."

Furthermore, the theoretical foundations of practice research builds strongly on work that allows for cognition. Consider for instance Weick's notion of 'sensemaking,' i.e., "the ongoing retrospective development of plausible images that rationalize what people are doing" (Weick, Sutcliffe, & Obstfeld, 2005: 409); Goffman's conceptualization of frames where cognition is

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<sup>8</sup> To consider activity as non-representational is also problematic if we consider the recent literature on how the brain performs thinking (cf. Evans, 2008; Lieberman, 2007), how brain activity changes as novel things become habitual (Camarer, Loewenstein, & Prelec, 2005), and how the practice of strategy—i.e., strategizing—and cognition are linked (cf. Hodgkinson & Healey, 2011; Hodgkinson & Clarke, 2007).

situated in individual interaction in certain occasions that change over time (Lemert & Branan, 1997); and Giddens's (1979: 5) "duality of structure" concept where practices (as collective patterned activities) constitute social reality, and where cognizant practitioners take part in the ongoing effortful (re)production of practices. Cognition, regardless if carried by practice or not, here mediates the way practitioners act over time in such fields of practice. In sum, it is both possible and at times favorable to combine both theories to inform empirical findings.

### **2.2.3. Exemplary studies using both cognitive theory and practice theory**

Two exemplary studies illustrate how using both cognitive theory and practice theory can inform research. The first is Garud and Rappa's (1994) work on developing a socio-cognitive model of technology evolution. They show that two research groups—one from 3M and the other from Nucleus—developed cochlear implants along two different technology trajectories (single-channel and multi-channel). The technology trajectory is linked to how the two research groups interpreted two key dimensions required for FDA approval: safety and efficacy.

Garud and Rappa argue that there is a relationship between the beliefs researchers hold about technical feasibility, the technological artifacts they create, and the evaluation routines they create and use. The authors show that the two research groups designed evaluation routines for assessing safety and efficacy based on their beliefs regarding what constitutes safety and efficacy. The two research groups then developed technological artifacts reflecting their beliefs and their assessment routines. However, when the evaluation routines were employed, they in turn reinforced the researchers' beliefs. Over time, evaluation routines, which are organization specific adaptations of practices, "become the basis for constructing individual reality" and "technological claims are perceived as relevant only to those who employ the same routines while appearing as noise to those who employ different routines" (Garud and Rappa, 1994: 344). Here, evaluation criteria are shaped by researchers' assessments of key functions (Garud & Rappa, 1994; Garud & Ahlström, 1997) that become the basis of construction of a local reality (Latour & Woolgar, 1979; Garud & Rappa, 1994; Garud & Ahlström, 1997).

Dougherty's (1992a, 1992b) research also shows the benefits of considering both practice and cognition. Her work is especially relevant for this dissertation as she shows that local realities can emerge even within a firm across its departments and functional areas, i.e., laterally distinct task environments. Dougherty's work focuses specifically on product innovation, but has implications for our understanding of resource alteration.

Dougherty (1992a) draws on Fleck (1979) and argues that the differences between what actors know make it difficult for these actors to share ideas and reach agreement around what is important. This applies to a wide range of phenomena, including scientific discovery (Fleck, 1979), product innovation (Dougherty, 1992a), or as argued in this dissertation: resource alteration. Dougherty shows that cognition guides activities such as coordinating and sharing. In addition, Dougherty mentions that what actors know is mediated by how actors know. She argues that each thought world houses an "internally shared system of meaning" that directs learning based on "common procedures, judgements, and methods" (Dougherty, 1992a: 182). In her view, activity also guides cognition. Her view on this reciprocal relationship between cognition and practice suggests that coordinating resource activities between task environments is hard

because actors simply cannot agree on what a particular resource is, beyond an agreement that a particular coordinated activity is taking place (see also Feldman, 2003).

Dougherty (1992b: 79) argues that there exists “a feasible set of attributes at a particular time that a product needs to manifest to be viable” (note the analogy to market viable resource combinations in Lachmann, 1956). The problem for product innovators, she argues, is to locate this feasible set quickly and to profit from it before dynamic market forces renders the set obsolete. Dougherty includes consideration of both mental representations and actual activity. Note how she describes the process of locating a viable set of product attributes:

[T]he products attributes cannot be specified easily and could change over time. At the same time, the product and /or manufacturing technology may be new, which means that technical problems may crop up unexpectedly, or that certain attributes cannot be delivered at all. Product innovators must experiment with sets of attributes, work closely with customers, pursue multiple paths at once, and make discontinuous leaps in imagination as they attempt to craft the comprehensive package of market and technology issues into a viable product (p. 78).

For very innovative products the feasible set may be nebulous and shifting as the market and technology both emerge interactively over a period of years. For other product ideas there may be no feasible set, and discovering this fact as quickly as possible is also a positive outcome (p. 79).

Dougherty here considers cognition in terms of ideas and imaginations of feasible sets. This resembles Penrose’s (1959) notion of images of markets and the links between firm resources and productive opportunities. Dougherty considers also the practice of product innovation. She elaborates on activities such as visceralization, feasibility assessment, and fit assessment. Most notably, she considers the relationship between cognition and practice to be a reciprocal one. Consequently, mental representations differ depending on a particular actor’s area of expertise.

### **2.3. The knowledge gap and the research questions**

Functional areas are laterally distinct task environments. In her work, Dougherty (1992b) specifically avoids considering functional areas because of how this segments issues into functional area clusters and black-boxes the content and process of knowledge accumulation—i.e., how understandings evolve and shape the search of feasible product attribute sets.

However, in avoiding to consider functional areas in her framework, Dougherty’s account of market-technology knowledge creation oversees one crucial element: that of divergent assessments of feasibility. As Garud and Rappa demonstrate, product developers may come up with very different assessments of feasibility. These differences cannot be attributed to omission of visceralization as both development teams who developed cochlear implants engaged in that activity—i.e., imagined the product in use, conducted trials and experiments, developed several iterations—to a significant degree. The two teams of product developers arguably shared both what they know and how they know and yet reached different conclusions around what constitutes a feasible set of product attributes. This raises questions about the ability of actors from different functional areas to reach agreement on feasibility. In the context of

Dougherty's studies, i.e., product development, capabilities are functional area specific (Eisenhardt & Martin, 2000) and feasibility assessment is "richly grounded in expertise and professional know-how" (Dougherty, 1992b: 84). In such contexts, disagreements may remain unnoticed. But resource alteration often involves coordinated resource activities linking multiple functional areas (Javidan, 1998), which makes actors more likely to notice disagreements.

At present, it remains difficult to understand why some firms are successful in altering their resources when environments change. And while recent developments in cognitive theory provide the possibility of empirically investigating resource alteration, it is ontologically questionable to adopt a bounded rationality view of resources as independent entities. However, to avoid all separation of the mental realm and the activity realm, while perhaps ontologically sound, leads to what Marshall (2014: 111) refers to an "epistemologically impenetrable knot." Therefore, this dissertation relies on both cognitive theory and practice theory to inform its fine-grained investigations of resource understandings and resource alteration.

The above mentioned knowledge gap motivates the following two research questions:

**RQ1: How do task environment specific resource understandings shape resource alterations?**

**RQ2: How does the task environment specific practice of resource alteration shape resource understandings?**

So far this literature review has focused on theoretical conceptualizations of resources, resource understandings, and resource alteration. This has been helpful to introduce the two focal theories used in this dissertation, i.e., cognitive theory and practice theory, and to develop its two research questions. The next chapter develops an analytical framework. The framework draws on the extant literatures' conceptualization of resources as assets characteristics, task environments coordinated through rules and routines as firm-specific adaptations of practice, and mental representations of asset characteristics and their potential value generating uses.

### 3. Developing an analytical framework

Chapter 3 builds on the three resource aspects identified in the extant literature and develops an analytical framework. By clarifying both what resources are and what resource alteration options are available to a firm's actors, the framework aids in the analysis and discussion of this dissertation's empirical findings.

#### 3.1. The three resources aspects in resource focused theories

Resource focused theories generally agree that resources exist as independent entities and that resources are linked to the production of value. These theories differ, however, in their assumptions of how firms relate to resources and value, and how resources and value relate to each other. Below I use these differences to develop an analytical framework.

Table 1 provides a comparison of three groups of resource focused theories of the firm and how they conceptualize resources, value, and the link between resources and value. While there are significant overlaps between the three groups of theories, they differ in their emphasis on three resource aspects: assets characteristics, resource activities involving several task environments that are coordinated through rules and routines, and mental representations of productive opportunities stemming from past experiences and existing resources.

Theories in the first group is strongest in its focus on assets and asset characteristics. For instance, transaction cost economics (TCE) builds on the notion of asset specificity (cf. Williamson, 1983). Asset specificity refers to the inter-party relationships present in transactions. It relates to the extent to which an asset with certain characteristics can support value in a particular transaction when compared to an alternative use of that asset. In TCE, resources are conceptualized as objective entities with given asset characteristics. Similarly, RBV scholars like Barney (1986, 1991), Wernerfelt (1984), Peteraf (1993), Dierickx and Cool (1989) emphasize resources with VRIN characteristics. As described in Chapter 2, these theories emphasize coordinated resource activities and treat the role of cognition as peripheral.

Theories in the second group contrast to the first group by primarily emphasizing the coordinated production systems—i.e., the interaction between people and technology in a workplace—that transforms and combines assets. Here, routines and rules link and integrate various task environments and the unique knowledge that resides within these task environments (Nelson & Winter, 1974; Grant, 1996; Kogut & Zander, 1992). The second group shares an emphasis on a firm's specific routines and competences. These routines and competences enables a firm to both create and capture value. This second group of resource focused theories argue that while asset characteristics have a value generating potential, this value potential needs to be realized by a specific production system.

The third group shares the view of resources as assets with certain characteristics, but focuses on the productive opportunities these asset characteristics enable. A key distinction of Austrian economics is its primary emphasis on the subjective aspects of value (Menger, 1871). Here, actors in various task environments perceive resources differently and therefore can pursue different productive opportunities, i.e., they differ in their ability to turn cost into value. Value is neither inherent in the resource nor the output of a finely tuned routinized production system.

**Table 1. Theories of the firm and their conceptualization of resources and value (adapted from Kraaijenbrink & Spender, 2011).**

| Theory of the firm*              | Resources and value  | Aspect emphasis**   | Sources (e.g.,)   |
|----------------------------------|--|---|---|
| Resource based view              | Resources are asset characteristics. In RBV and DC, asset characteristics explain above average rents. In TCE, asset specificity explains the organization of economic exchanges. The supply of value and demand of value is inherent in assets. This inherent value can be discovered and realized. Resource alteration is necessary when the value generating capacity of existing resource work is rendered obsolete.   | <b>Asset characteristics.</b>                                 | Williamson (1981; 1983), Coase (1937), Wernerfelt (1984), Barney (1991).  |
| Evolutionary theory              | Resources are specific human assets and technical assets and the means by which they are integrated. Proponents assume a Schumpeterian view of resources and value and argue that firms create value by combining and integrating task environment specific knowledge and technologies through rules and routines. The assets matter not in and of themselves. What matters is how an asset is used by a production system (the patented coordinated set of skillful activities in an organization) to create value. | <b>Resource activities coordinated by rules and routines.</b> | Nelson and Winter (1974), Grant (1996), Kogut and Zander (1992), Teece et al., (1997), Prahalad and Hamel (1990). |
| Knowledge based view             |  |   |   |
| Dynamic capabilities (mid-focus) |  |   |   |
| Core competences                 |  |   |   |
| Austrian economics               | Resources are means for production. The link between a resource and a productive opportunity is subjectively recognized. Actors link asset characteristics to valued use. Actors recognize different values because they know different things in different contexts. For an asset to become a valuable resource, actors must both perceive an activity set by which both a supply and a demand of value is created, and subsequently engage in that activity set.   | <b>Mental representations. Mental activity.</b>               | Penrose (1959), Menger (1871), Foss et al. (2008), Teece (2007), Danneels (2011), Helfat and Peteraf (2015).      |

\* Alternative categorizations are possible (cf. Volberda, Baden-Fuller, & Van den Bosch, 2001). Table 1 focuses specifically on the resources in Kraaijenbrink and Spender's categorizations.

\*\* Significant overlaps exist between the theories and their emphasis. Arrows are included to more accurately reflect the emphasis in the different theories. Bold arrows indicates primary emphasis and regular arrow indicates secondary emphasis.

Instead, managers' mental representations determine how value is subjectively perceived and linked to activity (Penrose, 1959).

Despite the differences between the three groups of theories, they overlap. These overlaps are often partial and not immediately obvious. For instance, RBV scholars consider Penrose (1959) as the foundation of their work (Barney, Ketchen Jr., & Wright, 2011) and refer to the Penrosean conceptualization of firms as bundles of resources with inherent value generating potential (e.g., Wernerfelt, 1984). Similarly, DC scholars acknowledge Penrose's work but favor Nelson and Winter's (1982b) routine and capability based explanations over mental representations when explaining firm behavior (cf. Teece et al., 1997). But Nelson and Winter's work is associated with evolutionary economics, and Penrose's theory is a position against evolutionary views of the firm (Rathe & Witt, 2001, see also Penrose, 1952). Relatedly, while Penrose (1959) is considered foundational for the RBV and DC streams, Penrose herself considered resources as peripheral. To her, what is important is the productive services resources can render and how managerial ability and mental representations determine the set of these productive services available to a firm (Rathe & Witt, 2001).

Given these partial links, it is not clear what resources actually are. It is also not clear how (or even if) actors can understand resources. Finally, there exists confusion around what resource alteration actually means. To make this dissertation's focus explicit, an analytical framework is proposed next. This framework departs from the aforementioned three resource aspects identified in the extant literature.

## **3.2. The foundations of the analytical framework**

### **3.2.1. Value generation**

The assumptions developed here are a synthesis of extant theory. The most important assumption is the value generation dimension of resources. Lachmann (1956) argues that resource activities must be able to generate rents for a firm in order for that firm to exist. Conner (1991: 134) refers to this ability as the "conditions for demand relevant to the product." Simply put: there either needs to exist a market with buyers interested in what the firm offers, or the firm must be able to create such a market. Also, the firm's cost of producing its value offering must be lower than what buyers are willing to pay. And while this value generating dimension is shaped by purposeful action (Penrose, 1952), nothing can compensate for a lack of a market viable set of resource activities (cf. Danneels, 2011).

Cognitive theory has informed our micro-level understanding by highlighting behavioral biases (Zollo & Winter, 2002) and the role of mental representations (Danneels, 2011). Practice researchers have established that resource alteration takes place within a rule environment that both enables and restricts possible resource activities (Barley, 1986; Regnér, 2008). They have also shown that predispositions, which are unique to functional roles, determine how actors use a resource in a given moment and over time (Orlikowski, 2000), and that a firm's imitation behavior is shaped by predispositions that go beyond economic concerns (Jonsson & Regnér, 2009). There is a wide consensus within the literature that resource related work is a cross-functional activity. Resources thus bind together an organization's various functional areas

(Javidan, 1998) as these task environments engage in value generating activity through specific capabilities (cf. Eisenhardt & Martin, 2000; Zollo & Winter, 2002).

Next, the three resource aspects are developed further into three resource dimensions that limit the resource alteration options available to a firm.

### **3.2.2. Assets characteristics and mental representations thereof**

The distinction between asset characteristics and mental representations thereof is important because it alters the set of possible productive opportunities in two important ways.

First, the distinction between asset characteristics and mental representations thereof shifts attention from the corresponding mapping between asset characteristic and productive opportunity, to the mapping between mental representation of asset characteristic and mental representation of productive opportunity. Here, it does not matter what a particular asset characteristic is. Instead, actors' mental representations of these asset characteristics are emphasized.

Second, the distinction between asset characteristics and mental representations thereof limits the space of possible resource alterations to the mental representations of asset characteristics. It does not matter what the asset characteristics actually are. Danneels (2011) demonstrates how mental representations of asset characteristics can lead to alteration choices that are non-market viable.<sup>9</sup> This is an important consideration because it suggests that actors cannot know the set of market viable resource alteration options. Therefore, their choices do not represent a selection among available options. Instead, decision makers have to rely on their mental representations of these available resource alteration options. Consequently, the alteration options perceived to be available can include options that asset characteristics do not allow. Also, Penrose's (1959: 163) claim that "at any given time the known productive services inherent in a resource do not exhaust the full potential of the resource" is equivalent to stating that the options available to a firm's decision makers are fewer than what asset characteristics allow.

To conclude, the first important resource dimension is the mental representations of asset characteristics. It thus combines resource aspect one (asset characteristics) and resource aspect three (mental representations).

### **3.2.3. Enacted rule environments and mental representations thereof**

Garud and Rappa (1994) show how beliefs are the result of a socially negotiated order and that these beliefs govern resource alteration choices. Specifically, they show that the direction of resource alteration choices are guided by actors' mental representations of a future state of the regulatory context. Garud and Rappa show also that the institutional environment later determined the market viability of different cochlear implant technologies and limited asset combinations to those the regulatory bodies ruled safe and efficacious.

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<sup>9</sup> Note that non-market viable is what Danneels observed. I will not here entertain a discussion around his idea of inaccurate resource schemas since I disagree with the existence of a corresponding correct map onto which the schema can map. Resource schemas have, in my view, degrees of viability and not accuracy. The resource alteration choices that managers at Smith Corona pursued, were all within the space of the possible resource alterations and all fulfilled the criterion of subjectively attributed value.

The limitations from the institutional environment to resource activities lie outside the boundary setting properties of asset characteristics. Garud and Rappa's study shows how formal rules limit the possible activities a firm can competitively engage in. Many of these activities involve resources with the explicit purpose to comply with formal regulatory rules. Every formal rule environment needs a corresponding enacted rule environment. Since regulatory texts within medical devices are purposively written in an inclusive style there are no clear directions to follow. Instead, firms are required by law to enact rules that correspond to regulations through establishing a quality management system.

Where formal rules are open to interpretation, there will exist an interplay between cognition and practice (cf. Regnér, 2008). Therefore, it is important to consider *localized* enactment. For instance, ensuring safety requires human resource management (HRM) practitioners to secure competences and new product development (NPD) practitioners to establish documentation processes. These enactments are part of local realities with specific sets of activities and arranged entities that together make out the site of social coexistence. Resource alteration options are limited to those deemed feasible by the actors in various task environments.<sup>10</sup>

The union of all localized enactments need to correspond with the formal rules. This correspondence is, however, not a one-to-one mapping between well-defined rules and activities that meet these rules to a minimal satisfactory level. Because formal rules are locally enacted in idiosyncratic ways that necessitate coordination between task environments, the set of enacted rules is larger than the set of rules necessary for formal compliance. For instance, it is not enough that an actor considers only the formal rules; the actor must consider also how other actors in other task environments enact the same formal rules (e.g.: What does safety mean for others and how do they ensure it?). Members of a task environment are limited in their activities by these localized enactments of formal rules. These limitations to activities also involve activities related to asset characteristics with the potential of productive uses; thus they limit the number of possible resource alteration options available to the firm.

To conclude, the second important resource dimension is the mental representations of enacted rule environments. It thus combines resource aspect two (coordinated resource activities) and resource aspect three (mental representations).

#### **3.2.4. Coordinated resource activities and mental representations thereof**

Actors attribute meaning to their resource related activities. This meaning differs between task environments. When several task environments coordinate around a resource activity (e.g., purchasing of raw materials, using the firm's brand in different ways, building the human capital of the firm etc.) they will attribute different meaning to that shared resource activity. As such, coordinated resource activities are built around divergent mental representations. Actors do not need to agree what is coordinated or why, they just need to consider the coordinated activity as possible. The number of possible ways actors can coordinate resource related activities limits the set of resource alteration options.

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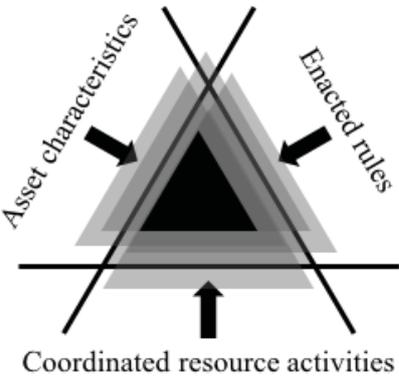
<sup>10</sup> While I only consider regulatory rules here, this argument applies to the enactment of other broader rules and norms specific to functional roles and task environments (cf. Jonsson & Regnér, 2009).

Any deviation from an existing state of coordinated resource activities necessitates a search for a new state. To reach this new state, members of each task environment must consider that state as feasible. This limits the set of resource alterations options to an intersection of what actors in various task environments consider possible. Here, actors in one task environment will either overestimate or underestimate the ability of actors in another task environment to perform in a coordinated resource activity.

To conclude, the third important resource dimension is the mental representations of coordinated resource activities between task environments. It thus combines resource aspect two (coordinated resource activities) and resource aspect three (mental representations).

**3.3. The space of resource alteration options available to a firm**

The discussion so far suggests that the space of possible coordinated resource activities, that is market viable, is limited by three resource aspects. Each of these contains a boundary independent of mental representation. For instance, asset characteristics limit resource related activities to those allowed by material properties. Enacted rule environments have a minimum requirement set by formal regulatory rules. Coordination is limited by the intersection of what each task environment is capable of. While these three determine the hard limit to the possible space within which a particular resource activity can take place, there exists an even smaller space that represents actors’ mental representations of each resource aspect. The mental representations are, in turn, shaped by both conscious and non-conscious mental activity (cf. Hodgkinson & Healey, 2011). Figure 2 tries to depict this static state of the resource alteration options available to a firm at a given moment in time.



**Figure 2. The resource alteration options available to a firm.**

In Figure 2, each of the three resource aspects mentioned above limits the space of available market viable resource activities. The first dimension, asset characteristics, limits the space to a bundle of asset characteristics under the control of the firm, and the mental representations of these asset characteristics. The second dimension, enacted rule environments, limits the space to those activities that are necessary to comply with formal rules, and localized mental representations thereof. The third, coordinated resource activities, limits the space to the ways resource related activities can be coordinated between task environments, and the mental representations thereof. The three black lines within the larger grey triangle demark the hard limits

of possible coordinated resource activities. The smaller grey triangles demark the mental representations thereof. In the intersection of these small grey triangles, there is a black triangle. This black triangle represents the resource alteration options available to the firm. Here, actors from various task environments agree that the resource activity can take place.

A resource in this framework is not a given entity but rather a relational totality that enables product outputs generating rents above their costs. Resources are part of, and outcomes of, a social accomplishment. This means that everything that enables the combination of inputs into product outputs are part of a resource totality. For instance, while a CAD software may be a resource in the design of a car, the exchange of the product output, i.e., the car, does not depend on the CAD software. Instead, the resource nature of the CAD software lies in the coordination it enables (e.g., sharing \*.cad file across developers and manufacturers and the compliance to regulatory rules by allowing for low cost tests and traceability during development).

Next, the method is described.

## 4. Method

Chapter 4 first introduces the research context and the case company. Then, data collection and data analysis is described followed by reflections on research quality. This method chapter is descriptive and written as a supplement to the method sections in the appended papers. The final part of this chapter is a personal account of the research journey.

### 4.1. Getinge AB and the medical device industry

The information below is based on data from the 2012 annual report.

#### 4.1.1. The case company

Getinge AB is a multinational corporation active within the areas of surgery, intensive care, infection control, and care ergonomics. It markets its products to healthcare and pharmaceutical customers and employs 14'919 people spread over 40 countries. Markets are geographically distributed with North America accounting for 32 per cent of sales, Western Europe for 37 percent of sales, and emerging markets for 31 percent of sales.

The company is organized into three business areas. The first business area, Infection Control (Getinge), employs 3'118 people. Its solutions are aimed at prevention and control of infections in healthcare and medical care. Its sales amount to MSEK 5'170 of an estimated market size of approximately MSEK 13'000. It offers solutions to the pharmaceutical industries and laboratories. Finally, it offers complementary IT based solutions. The solutions offered can be divided into two product areas: 1) disinfection, with washer and flusher disinfectors, and 2) sterilization, with sterilization equipment, IT-systems, and loading equipment.

The second business area, Extended Care (ArjoHuntleigh), employs 5'457 people. It markets solutions to the hospital, healthcare, home nursing, and elderly care markets and had MSEK 5'990 in sales of an estimated market size of approximately MSEK 43'000. The product range can be divided into four product areas: 1) patient handling, with shower baths, as well as lifts and transfer equipment, 2) medical beds, including hospital beds, stretchers, and couches, 3) therapy and prevention, focused on prevention of pressure ulcers and deep vein blood clots, and 4) diagnostics, with monitors for prenatal care.

The third business area, Medical Systems (Maquet), employs 6'344 people. It offers a wide range of products and services to the hospital market and has MSEK 13'089 in sales of an estimated market size of approximately MSEK 37'000. The product range can be divided into three product areas: 1) surgical workplaces, with surgical tables and lights, operating room theatres, and ceiling service units, 2) cardiovascular, with heart-lung machines, instruments and equipment for cardiac surgery, vascular surgery, and cardiac assist, and 3) critical care, with ventilators and anesthesia equipment.

#### 4.1.2. Medical devices and regulations

Regulatory texts provide an inclusive definition of medical devices. This is true both in the European Union (EU) and the U.S.

Within the EU, the definition of a medical device can be found in the Medical Devices Directive 93/42/EEC (EU, 1993):

“medical device” means any instrument, apparatus, appliance, material or other article, whether used alone or in combination, including the software necessary for its proper application intended by the manufacturer to be used for human beings for the purpose of:

- Diagnosis, prevention, monitoring, treatment or alleviation of disease,
- Diagnosis, monitoring, treatment, alleviation of or compensation for an injury or handicap,
- Investigation, replacement or modification of the anatomy or of a physiological process,
- Control of conception, and
- Which does not achieve its principal intended action in or on the human body by pharmacological, immunological or metabolic means, but which may be assisted in its function by such means; (EU, 2007).

The U.S. based Food and Drugs Administration (FDA) offers a similar definition:

"an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including a component part, or accessory which is:

- recognized in the official National Formulary, or the United States Pharmacopoeia, or any supplement to them,
- intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease, in man or other animals, or
- intended to affect the structure or any function of the body of man or other animals, and which does not achieve its primary intended purposes through chemical action within or on the body of man or other animals and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes."

Medical devices are classified either as Class I, IIa/b or III in the EU, or I, II and III in the US (Ogrodnik, 2012). Class I devices are those that carry low to moderate risk to safety, Class II carry moderate to high risk, and Class III are high risk and high impact devices in terms of patient health and safety. Some of Getinge AB's offerings are also classed as a medical device through amendments. For instance, devices to be used for disinfecting other medical devices are either Class IIa or Class IIb devices (Annex IX, Rule 15, EU, 2007).

The class determines what regulations apply, and the degree of regulatory control increases with each class level. The FDA impacts both the innovation outcome and the innovation process through four main statutes: 1) Premarket Notification (known as the 510(k)), 2) Premarket Approval (PMA), 3) Investigational Device Exemption (IDE), and 4) Quality System Regulation (QSR). Table 2 provides an overview of each together with the stated purpose and examples of impact on innovation outcomes and the innovation process.

**Table 2. Overview of the four main regulatory statutes and examples of their impact on medical device development.**

|               | <b>Purpose</b>  | <b>Outcome impact (e.g.,)</b>  | <b>Process impact (e.g.,)</b>  |
|---------------|---|--|--|
| <i>510(k)</i> | To demonstrate that the device is substantially equivalent to an approved device in terms of safety and efficacy. | Innovation limited to being equivalent with pre-existing solutions.                  | Form submittal 90 days prior to marketing.<br>Provide evidence of substantial equivalency claims.  |
| <i>PMA</i>    | To demonstrate that the medical device is safe and effective for its intended use.                                | Deterrent to more radical efforts due to increased uncertainty and resource demands. | Produce scientific evidence of efficacy and safety through nonclinical and clinical investigations.<br>Provide data of quality control used during production. |
| <i>IDE</i>    | Lists procedures for the conduct of clinical studies.   | N/A  | Details process steps of how to establish evidence of efficacy and safety.   |
| <i>QSR</i>    | To ensure that manufacturers abide to statutes ensuring product safety and efficacy.                              | Outcomes limited by the requirements and specifications in place.                    | Guidelines for PMA reviews in terms of what documentation and procedures are necessary.  |

The four main statutes impact NPD to varying extents. For instance, a 510(k) demands little in additional resources to satisfy requirements to evidence claims of substantial equivalency (i.e., that product A is equivalent to B). An IDE and the subsequent PMA approval is far costlier. Note that these requirements often necessitate managing an overlap amongst several domains of knowledge (e.g., engineering, medicine, health care, and quality assurance). Successful outcomes are thus particularly reliant on cross-functional collaboration.

## 4.2. The Getinge AB studies

The appended papers build on three empirical studies (A-C) conducted at Getinge AB as summarized in Table 3. Each study is described below.

**Table 3. The three Getinge AB studies underlying the four appended papers.**

|                                | <b>A: Innovation at Getinge Skärhamn AB</b>        | <b>B: The next climb at Getinge AB/IC</b>                            | <b>C: Regulation at Getinge IC</b>                 |
|--------------------------------|--|--|--|
| <i>Period</i>                  | 2011Q3 – 2014Q1                                    | 2011Q4 – 2016Q2  | 2013Q3 – 2015Q1                                    |
| <i>Unit of observation</i>     | Technology innovation process                      | Resource alteration work   | Technology innovation process                      |
| <i>Level of analysis</i>       | Firm   | Functional area / practice   | Functional area                                    |
| <i>Data collection</i>         | Insider/Outsider, interviews, and document studies | Field work, observations, interviews, dialogue, and archival studies | Insider/Outsider, interviews, and document studies |
| <i>Appended publication(s)</i> | Paper I <sup>a</sup>                               | Papers III & IV  | Paper II   |

<sup>a</sup> Altmann and Engberg (2015) also uses data collected during study A.

The text below focuses on the studies. Paper specific method discussion are available in the appended papers. Here, I: (1) provide a context for the resulting papers, (2) clarify evolving onto-epistemological considerations, and (3) detail my role in co-authored papers.

#### **4.2.1. Study A: Innovation at Getinge Skärhamn AB**

Between 2001–2011, Getinge AB experienced a period of high growth. Annual growth rates for sales were 12,1% and for profits 17,4%. Due to a rapid increase in size (from ~900 employees to 15,000 over the past 20 years until 2015), concerns grew around the company's ability to maintain its ability to innovate. In 2011, Getinge AB and Halmstad University launched a project called "Strategic Human Resource Management for Increased Entrepreneurship and Innovation Performance." The project aimed to "increase the understanding on how to maintain the company values, the entrepreneurial orientation, employee engagement and innovative performance while growing and developing the business" (project application).

I joined this project together with Robert Enberg. Robert was a Getinge native. He started working as a project manager with mechanical design in 2006. Since then, he has worked as an R&D project manager with process related questions, part of which involves regulatory compliance for NPD. Our preliminary work was guided by a recent organization-wide internal survey which showed that the stated innovative climate and actual innovation output did not correlate. Together with a senior executive, Robert and I identified two sites for our initial investigations. One site had a high reported innovative climate and a low innovation output. The other scored high on both innovative climate and innovation output.

Study A involved interviews at two sites. Our findings revealed that the discrepancy between the self-reported innovative climate and the launch of new products was, to a significant degree, explained by development staff focusing on minor product improvements following a series of major product launches. This was a dull finding. Therefore, we focused on the site scoring high on both innovative climate and innovation output, Getinge Skärhamn AB. At this site, we conducted nine semi-structured interviews during late 2011, each lasting between 30 minutes and two hours (see Paper I for details).

At Getinge Skärhamn AB, Robert and I collected data on three medical device innovations. We initially focused on how managers from different hierarchical levels and functional areas perceived the link between product developers, a part of the firm's human resources, and the technology innovation process and the resulting product outputs. This resulted in a publication on the impact of uncertainty on how managers frame product developers as a human resource. (Altmann & Engberg, 2015).

In one of our conversations, Robert mentioned that the three innovation projects were all launched on emerging markets and that product developers and marketing managers had to alter their views on what constituted a successful product in order to succeed in their market entry. We focused our investigation on these development choices and how beliefs around what constitutes a successful product changed over time. Following a submission, our reviewers asked us to further developed ideas around the transferability of different knowledge types. This encouraged us to consider the understanding of resource characteristics as part of resource alteration choices.

The analysis was iterative and a joint effort. My main role in Study A was to use the data from the interviews (Robert was the main interviewee) to prepare the manuscript for Paper I. Robert's main role was to review my interpretation and provide clarification and additional details. This setup, where the outsider uses insider knowledge to inform data interpretation, has been used within the context of technology development (cf. Elmquist, 2007). It allows for close proximity to data without being too costly on researcher time and without requiring in-depth context knowledge on part of the outsider (cf. Balogun, Beech, & Johnson, 2015).

#### **4.2.2. Study B: The next climb**

As the company experienced its first growth related decline between 2008–2010, Getinge executives identified several permanent industry changes and began preparations for a new corporate strategy. The draft strategy, named The Next Climb, was distributed to top executives in 2012 by Johan Malmquist (the then CEO of Getinge AB).

In February 2013, I was hired as a strategy coordinator by Magnus Lundbäck, the then executive vice president of human resources and sustainability. I was to aid in strategy work with a specific focus on Infection Control and to facilitate the alignment between the NPD and HRM functional area strategies. Before entering the field, I accessed internal documents and had participated in company gatherings (cf. Paper IV). Robert and I also conducted interviews prior to and during Study B. Thus, I had a basic understanding of the company and the industry contexts. This understanding informed my observations of ongoing strategy work. As strategy work progressed, I began focusing on the delay in strategy implementation. I noticed that divergent understandings might account for some part of the delay. Over time, Study B focused on why resource understandings differed and how these differences mattered.

At first, I focused on perceptions and interpretations of the strategy itself (more specifically its content) and did not actively consider the resource alteration process *per se*. By 2013Q3, I noted that contestation emerged over the feasible use of product developers. This observation further enhanced my focus on matters cognitive. For instance, one field note contained the following remark: “do contradictory views on development staff trigger framing contests?” The salience of this observation was confirmed by a reviewer. (S)he suggested that, given my access to granular data, I should not focus on cognitive frames related to environmental changes, but instead turn my attention inward and view the organization as a dynamic environment where framing contests emerge and get resolved (or not).

Based on reviewer input, I shifted attention toward the firm's internal environment and how functional area members interpreted this environment with relation to product developers as a resource. Following a submission and a first revision attempt, I split the manuscript into two (Paper III and Paper IV). While Paper III is published, Paper IV is still in development.

#### **4.2.3. Study C: Regulation at Getinge**

Between 2009 and 2013, FDA investigators conducted 10 inspections across three Maquet facilities. They uncovered violations of the Quality Systems (QS) regulation, the Medical Device Reporting (MDR) regulation, and the Correction and Removal (CR) regulation. This caused

significant problems for Maquet and Getinge AB. Between 2009 and 2014, it recalled 45 Maquet-manufactured products and the Consent Decree, approved in 2015, has incurred costs related to quality improvement activities totaling MSEK 1'495.

While the FDA's mission is to secure patient safety, it also seeks to promote innovation that can benefit human health and wellbeing. Despite this dual purpose, regulation within the medical devices context is often considered a barrier to innovation. Robert, however, believed this preconception to be false. He and others within the industry attribute barriers to what they call the 'regulatory ghost.' The word ghost is suitable for two reasons: (1) firms are often fearful of regulation due to its associated costs and risks, and (2) these fears are baseless because most of the barriers people complain about actually do not exist as formal regulatory requirements. A literature review revealed that existing research on regulation as a barrier relied on perceptual measures. Additionally, these studies had all found that the negative impact of regulation on innovation diminished over time while the regulatory statutes remained the same (cf. Paper II).

Study C is similar to Study A in terms of method. One difference is that Study C relied more on Robert's own work where he supplemented his experiences with nine interviews representing functional roles such as quality assurance, NPD, and FDA investigators. We then analyzed the transcripts and compared statements across functionally distinct roles and with formal statutes. We sought accounts that diverged, i.e., where one statement connected an activity to a regulatory barrier whereas another did not consider the same activity as a regulatory barrier or where statements did not have a corresponding regulatory statute. Paper II presents our results.

### **4.3. Epistemology and longitudinal field immersion**

This part discusses prolonged data proximity and the knowledge this proximity grants access to. The text is organized into three parts. The first two parts discuss methods and ontology. The third part presents reflections on research quality.

#### **4.3.1. Whereof one speaks, one attributes meaning**

Longitudinal field engagement allows a researcher to build a relationship with the respondents in a specific site. This is important when the aim is to study cognition in a specific context and how cognition shapes ongoing action and interaction (cf. Kaplan, 2008b). Actors reveal their experiences in what they say and through how they act. Proximity is necessary to discover who practitioners think they are, what they think they are doing, and to what end they are doing it.

During Study A and C, Robert and I sought actors' interpretations of experienced resource activities. If one assumes that actors form mental representations of their activities, then one way to access data is to ask people about their experiences. However, this necessitates that:

- (1) that actors can and are willing to articulate their mental representations,
- (2) the researcher asks meaningful questions to access meaningful mental representations, i.e., those that reflect a reality of interest as opposed a learning of the researcher, and
- (3) that the researcher can interpret answers in a meaningful way.

The first point necessitates that respondents are willing to discuss their mental representations in honest ways. The second and third points reflect the importance of deep contextual knowledge without which it becomes difficult to understand what respondents are discussing.

My initial lack of knowledge about both the medical devices industry in general, and Getinge AB in particular, means that it is unlikely that I could ask suitable questions and interpret the answers in a usable way. This issue is mitigated by Robert's contextual knowledge. Robert can be considered able to ask relevant questions about specific projects and learnings and interpret answers meaningfully, i.e., criterion (2), in ways I could not.

It is more difficult to establish that actors were conscious about their mental representations and were willing to share these, i.e., criterion (1). But this is a commonly adopted onto-epistemological stance when conducting fine-grained investigations of cognition, i.e., researchers here assume that actors know and are mindful of what they know (cf. Kaplan, 2008a, 2008b; Danneels, 2011).

#### **4.3.2. Whereof one is silent, one cannot necessarily speak**

It can be problematic to assume that practitioners' mental representations are available for conscious recall (Chia & MacKay, 2007; Hodgkinson & Healey, 2011). Paper I shows that willing participants may not be able to communicate various asset characteristics of resources that are part of internalized practices even when asked to do so. An inability to articulate habitual activities is a central consideration when researchers assume that activity is rooted in internalized practices. It is a central consideration also when researchers assume that the mind operates in a dual process fashion (cf. Kahneman, 2011; Hodgkinson & Healey, 2011).

Regardless of theory and ontology, the aim of longitudinal field immersion is to provide accounts of localized realities. These descriptions benefit from both accessing data on actors' attributed meaning to phenomena and by showing how actors bring "forth objects or phenomena such as the strategy document and 'markets'/environment" (Samra-Fredericks, 2015: 479). As the latter is often unarticulated, accessing these data require proximity to everyday activity.

In Papers I–II, Robert and I relied mainly on interviews for data. Similarly, data collected in Paper III is also possible to account for in writing. By contrast, Paper IV moves beyond articulated data in an attempt to capture habitual tendencies and taken for granted assumptions that actors are not conscious of. These are things people know so well that they literally cannot talk about them as long as they take them for granted. Here, what is not said can matter as much as that which is said. To access this type of data it is beneficial to have knowledge of local expectancies and to have participated in the field.

An additional reason not to rely solely on articulated data is that accounts of spoken or written meaning is not suitable when studying practical action and practical reasoning (cf. Schatzki, Knorr-Cetina, & von Savigny, 2001). Rawls (2008: 716) argues that "details of practices are not recoverable from accounts." For instance, records of activity and questions posed during interviews are a poorly suited to access knowledge about a phenomena of interest. Rawls further argues that these accounts often "reflect accountability practices and not instances of events of actions" (p. 716).

From a practice approach, understanding is primarily experienced. Practitioners do not have resource schemas (i.e., mental representations), they have schemata of resource actions (cf. Chia & MacKay, 2007). Often, the practices and activities that form such schemata of resource action are quite mundane and not easy to articulate by the actors who have internalized them

and may even be unaware of them. Similarly, recent work in cognition suggests that experiential learning underlies thinking that is “unavailable to conscious awareness” (Sadler-Smith, 2009).

Aiming to account for events in the world, such as resource alteration, necessitates close access to data on what practitioners actually do *in situ* during strategizing episodes where resource alteration related choices are made (cf. Carter, Clegg, & Kornberger, 2008). Schatzki (2005: 479) refers to such a micro-level approach to longitudinal field studies as adopting a “site ontology.” This approach views resource alteration as an ongoing socially situated accomplishment where practitioners’ engage in practical reasoning (Samra-Fredericks, 2015), where it is important to look at what people are actually doing as they do what they do, and to understand why these actions make sense to them (Samra-Fredericks, 2015). Personal field experience is one such way to access data on these site-specific events.

### **4.3.3. Capturing and reporting on the habitual and the mindful**

In the appended papers, my understanding of the site was derived either from my field engagement (Papers III–IV) or through discussions informed by Robert’s experiences (Papers I–II). Analysis of the observed data related to the actual doing and how that doing was imbued with meaning as the doing unfolded. For example, in Paper IV, I gathered data from a strategy meeting on how actors used SWOT and PEST analyses to create an understanding of the organizations resources and how this sense emerged in the dialogue among the meeting participants. Here, I was equally keen to capture both what was said, and what was not said as both reveal predisposed dispositions (cf. Paper IV).

Note how the word ‘schema’ can represent mindful mental activity as well as discernable and patterned action that is not only mindful but in part habitual (cf. Chia & MacKay, 2007; Feldman, 2004; Feldman & Worline, 2011). Since actors are embedded in idiosyncratic practice sets, what they experience is necessarily pluralistic (Golsorkhi et al., 2015). The extant cognitive literature acknowledges pluralism in interpretation and attributes it to bounded rationality and/or scripts. There exist also research on the affective components that ‘tag’ experiences (e.g., Sinclair, Sadler-Smith, & Hodgkinson, 2009). In contrast, pluralism in the practice sense exists even if actors are perfectly rational due to differences in the fields of practice that the practitioners are embedded in.

To study pluralistic meanings as carried by fields of practice necessitates that: (a) the researcher is able to discern the mundane patterned activities that actors cannot articulate, and (b) it is possible to show how such activities predispose actors toward certain choices—ideally those that matter for firm outcomes (cf. Lynch, 2001; Samra-Fredericks, 2015).

As aforementioned, a degree of contextual knowledge is necessary to discern mundane patterns that actors cannot articulate, i.e., to satisfy (a). This is both time consuming (Samra-Fredericks, 2015) and “it requires an approach that goes beyond talking *to* or observing strategists: to being *with* them. This implies co-inhabitation of a set of meanings and an exploration of intended and unintended, conscious and unconscious actions and consequences” (Balogun et al., 2015: 451, original emphasis). So, while field immersion is necessary for accessing the habitual, it is not without difficulty.

I found it difficult to know when, or if, I could claim to understand the local context (not to mention provide proof of my claims). As Rawls (2008) argues, one cannot simply provide interview statements verbatim or reports of observations. To the best of my knowledge, the way to report these data is by means of reaching social agreement. This social agreement emerges during the reviewing process and shapes what is counted as acceptable evidence.

In addition to there not existing a convention on how to report these data, there is also a difficulty associated with the risk of the researcher internalizing the very mundane activities (and taking them for granted) that he/she was after describing in the first place. Exactly, how one knows when that ‘sweet spot’ between becoming aware of site specific practice sets and internalizing these is difficult to tell. But it is necessary to conduct research after one can become aware of site specific practices but before they are internalized (cf. Golsorkhi et al., 2015). For me, to find the suitable level at which to tell and show the data from this ‘sweet spot’ was a significant challenge that took several iterations of writing and continuous dialogue with research peers. Again, it seems that the ‘knowing of when the sweet spot is reached’ is the outcome of a social verdict rather than an individual one.

It is also a matter of rhetoric ability to show how activities predispose actors toward certain alteration choices, i.e., criterion (b). This necessitates that the researcher showcases the rigor behind data collection and analysis. Regrettably, there is very little guidance exactly how such reporting should be done given the lack of empirical papers based around such close involvement (Balogun et al., 2015). My own experiences with Paper IV confirm the difficulty of establishing a clear connection between fields of practice and how these shape resource alteration choices. In the end, the connectivity mapping of practices and activities to particular resource schemas (cf. Paper IV) allowed me to showcase the necessary rigor to fulfil criterion important to mention that the connectivity map represents a static picture of what is in essence a dynamic phenomenon. Being able to show how everyday practices influence an ongoing phenomenon is challenging and prone to various biases. It is difficult to provide transparent accounts of, and demonstrate where, practice defined praxis to shape the actions and interactions of practitioners. This is especially challenging considering that respondents cannot articulate such connections during interviews, but only reveal it when they engage in everyday resource alteration work. For example, in Paper IV, vignettes are used to show how practices become strategic during strategy episodes and how they shape the way resource alteration unfolds. Such close access to data has implications for research quality.

#### **4.4. Research quality: Staying close from far away**

To collect and analyze data while being close to the site and respondents necessitate consideration of the relationship between the researcher and the respondents. Cunliffe and Karunayake (2013) suggests four guiding considerations related to the relationship between the researcher and the respondents:

- (1) *Insider/Outsider-ness*, i.e., how native the researcher is and how immersed the researcher is in the study setting,
- (2) *Sameness/Difference*, i.e., the similarity between the natives and the researcher,

- (3) *Engagement/Distance*, i.e., how engaged the researcher is with the participants in their activities, and vice versa, and
- (4) *Political activism/Active neutrality*, i.e., the extent to which the researcher is involved in the agendas of various participants.

These considerations are summarized in Table 4.

**Table 4. The relationship between me as a researcher and the respondents.**

|   | <b>Paper I</b>   | <b>Paper II</b>   | <b>Paper III &amp; IV</b>  |
|---|--|---|--|
| <i>Insider / Outsider</i>                     | I was outsider and my co-author had been a native for close to a decade  |   | 16 months employment as strategy coordinator   |
| <i>Sameness / Difference</i>                  | I have a BSc in NPD and a MSc in technology management (common degrees for employees there), Robert (native co-author) has a MSc in ME                         |   |  |
| <i>Engagement / Distance</i>                  | The outsider was distanced and not involved in any direct activities, the insider was actively working with topics under investigation                         |   | Active coordination between NPD and HRM functional area strategies   |
| <i>Political activism / Active neutrality</i> | Impact of foreclosure risk on respondent answers mitigated by triangulated data: NPD documents, the insider's experiences, and reliance on historical projects | Ongoing FDA investigation likely caused respondents to shift blame (noted in data), mitigated by focus on semblance between stated and formal regulatory barriers | My eagerness to deliver results mitigated by limited potential impact of work role and ongoing academic workshops and academic peer scrutiny |

Most of the items in Table 4 represent choices or states. For instance, a researcher is either similar or not, either an insider or an outsider, or either engaged or distant. But neutrality is particularly tricky. Neutrality is not inherently good or bad, but it represents an almost paradoxical issue that is difficult but necessary to deal with.

Getting close to respondents and getting them to open up and to understand their reality as they do, is necessary in order to gain an understanding of their local realities. But the same moment when access to these data is acquired, the ability of objective assessment is lost. This is particularly tricky when these data involve internalized practices due to two main reasons: (1) to grasp the internalization of these activities it is necessary to understand them deeply, but this deep understanding may lead to an inability to later recall them in mindful ways, and (2) the inability to distinguish between activities important for personal learning of a site and activities that are part of the internalized aspect of the site.

The concern with neutrality is most noticeable in Study B. I was very eager to prove myself and to deliver actionable results in my role as a strategy coordinator. I wanted to be part of the team working with strategy, a task I felt privileged to work with and felt that this work presented a great opportunity for my overall professional career. I also wanted to do well by the person who gave me the opportunity, i.e., the executive vice president for HRM who was a stake holder in the strategy process. While this permitted close access to data, it also negatively impacted my ability to maintaining an awareness of how this proximity shaped my analysis. Consequently, my work suffered. Early manuscripts I prepared were described by a senior colleague as “very consultant like” and had little academic merit.

To overcome issues with proximity, I followed the advice of a senior academic colleague and did an analytical separation between strategy work and the resources involved in this work. My practical work had focused on the strategy process and treated resources as peripheral. In contrast, my academic work now treats resources as central. Doing so reduced concerns with neutrality since my work did not directly involve resources *per se*.

Neutrality was also an important consideration when developing Papers I and II. In Paper I, the study site (Getinge Skärhamn AB) was under threat of foreclosure during the period of data collection and analysis. It is therefore plausible that respondents' answers would portray a more positive image of the ongoing development work. This impact was mitigated by triangulated data. Documentation related to NPD was particularly helpful in confirming statements, as was Robert's experiences with one of the development projects under investigation. Also, given that the projects under study were all developed in the late 1990s and early 2000, they had limited potential impact on anyone's political agenda. Furthermore, the foreclosure was not based on innovation (which is what the study was investigating) but was motivated by scope and scale economies. Our study had no impact on these decisions.

Paper II, however, is different in that it was conducted during an ongoing FDA investigation where individuals faced real risks. Robert was also actively working with quality assurance, i.e., regulation, and had a strong underlying assumption that regulation was not a formally traceable barrier. Here, I worked with data analysis and comparing statements from respondents with regulatory text in order to identify correspondence. This shifted attention away from politicking and potential 'blame games' toward what is stated in interviews and what exists in texts. We were therefore less interested in who was in the right and focused on documenting the existence of such discrepancies.

Next, I move away from discussing the quality of the research process to discuss the quality of the research contributions.

#### **4.5. Reflections on quality of research contributions**

Locke, Golden-Biddle and Feldman (2008) discuss creating theory about what is possible as opposed to what is representational and/or predictive. Pursuing accounts of the possible makes sense when the nature of work is exploratory. While the cognitive literature and the practice literature are both well developed, fine-grained accounts of resource activity are scarce. In evaluating research quality that is based on exploratory and in-depth investigations, Golden-Biddle and Locke (1993) provide three criteria: authenticity, plausibility, and criticality. Each is considered next.

Authenticity is about showing that the researcher has grasped the everyday experiences of the participants. Papers I–II were developed around Robert's accounts as an organizational native. The authenticity criterion for Papers I and II is thus fulfilled. As for Papers III and IV, my own time as strategy coordinator came after an initial period getting acquainted with the industry and the company. Although 16 months is not a long time, I believe it is adequate to grasp the situated experiences of organizational members. This is especially true in this case as Getinge AB did not provide a setting that felt foreign to me. Also, given my positive performance review as a strategy coordinator, I believe that I managed to grasp enough of the site to be able

to understand and report on the daily lives of those involved. Finally, when I presented my findings to the then vice president of human resources in early 2015, he stated that differential understandings of resources were “putting words on a problem [he] felt he had, but could not articulate.” Similarly, an R&D project manager expressed appreciation for what was considered a new perspective on why conflicts may emerge in organizations. Providing something that is practically relevant for practitioners is a sign of achieved authenticity of research contributions.

Plausibility is about telling a story that makes sense and telling it while being transparent with data. As aforementioned, there is a very fine line between able to notice that which others take for granted (requiring immersion) and going too far thus internalizing it and taking it for granted yourself (requiring distance) (cf. Golsorkhi et al., 2015). When working with Robert, I would balance his immersion. When working alone, I relied heavily on research colleagues and reviewers. In both cases, the crafting of a story that makes sense takes place in a dialogue between academics. It is this dialogue that I seek to capture in a manuscript. A constant interaction between peers is paramount to fulfilling the plausibility criterion. After all, the story has to make sense and be deemed transparent by someone else than the author. Plausibility was sought by constant interaction with, for instance, my supervisors and to a lesser extent by telling the basic idea to other academic colleagues to elicit responses.

Criticality is the third and last criterion. It is evaluated based on the ability of the text to cause readers to question taken-for-granted assumptions. Paper III and Paper IV challenge the prevailing notion that resources are objects that managers can have more or less correct understandings of. Paper I challenges the conventional wisdom that technology innovation for emerging economies must rely on localized collaboration efforts. Finally, Paper II questions the prevailing idea that regulation is a barrier for medical devices innovation. Each of these proposals have been validated to the extent that the ideas were either accepted for publication following peer review or made it into the late stage reviews in academic journals.

## **4.6. The research journey**

To describe the research journey, I use editorial decisions and reviewer comments. I do this to show how I have developed as a researcher during the PhD process without having to rely on retrospective sensemaking. The text below is not necessary to understand this dissertation’s findings. It does, however, provide insights into how these findings were developed. Readers primarily interested in the findings can jump directly to the next chapter.

The text below is organized as follows: I first discuss general insights from my attempts of publishing and then detail the publication attempt of Paper IV.

### **4.6.1. General insights from publishing attempts**

There is little that compares with the learning gained from an actual submission process. Using response letters and reviewer comments, I will here attempt to provide a relatively objective and contemporary account of a highly subjective process prone to retrospective sensemaking. I will also include my recollection of discussions with senior colleagues and supervisors.

On January 28, 2013, I submitted my first manuscript to Human Resource Management (0090-4848), an A\* journal on the ABDC2016 list and a 4 on the ABS2015 list. In that manuscript, I developed ‘a conceptual alignment model’ on how human resource practitioners ought to work to support innovation. In what mostly reads like a master program paper, I drew on practically every paper I had read about innovation and compared the papers with statements from 27 early interviews from Study B. It is hard to put words on this research output, which perhaps explains why the editorial letter only read: “desk reject.”

I submitted a slightly updated version of the first paper to Creativity and Innovation Management (0963-1690), a C journal on the ABDC2016 list and a 2 on the ABS2015 list. The paper was desk rejected on April 19, 2013. This editor, however, managed to find the words to describe the manuscript. I learned that the paper was rather broad, that its theoretical contribution is far too limited given its more practical emphasis. This guided my future efforts toward emphasizing theory over its practical implications.

I submitted two more papers during 2013. On June 8, 2013, I submitted a paper based on mix of data from both study A and Study B to the International Journal of Healthcare Technology and Management (1368-2156), an unranked journal. This manuscript was my first co-authored paper with a senior. I totally forgot about this paper as it took until December 3, 2014, before I received the following message from the editor: “the paper [has] been sent to more than 20 referees who have declined to referee the paper and we have received only one report which considered the paper marginal.” That one (poor) reviewer commented that “The layout and style of the paper needs to be brought in line with normal guidelines of scientific papers.” This feedback was helpful because, at the time, I was frustrated about not being able to estimate how far away I was from being able to get a manuscript accepted for publication.

The second manuscript submitted in 2013 was based on a study of the draft strategy that I accessed during my time as strategy coordinator. This manuscript was my second co-authored paper and was submitted to a special issue on business model innovation in the International Journal of Entrepreneurship and Innovation Management (1368-275X), a C journal on the ABDC2016 list. The paper went out to review and was rejected on November 13, 2013. Reviewers were mostly negative. However, this was the first time I had received a comment that can be considered positive. A reviewer wrote: “While I was excited after reading the abstract, I was disappointed after reading the paper.” The long list of ‘improvement suggestions’ that followed informed me about the things I did not know how to do yet. This included a failure to identify theoretical constructs in the literature review, a poor motivation for the case selection, emphasizing the wrong data, not clearly articulating the relevance, having a confusing structure, presenting a subjective account of data without any transparency by which my claims can be substantiated, and for a conclusion that is based around extensive “cherry picking.” At least I knew that I could write an exciting abstract.

If 2013 was the year of desk rejects, then 2014 was all about learning how to write. I now attempted another submission of a manuscript based on Study B. I presented a manuscript at a conference in Corsica on April the 25<sup>th</sup> 2014. I got no questions following the presentation aside

from a single comment from a gentleman who commended my “attempt” to apply social constructionism on the study of strategy processes. Having no idea what that meant, I nodded and asked for a list of readings.

A few weeks later I received a couple of books, sent to me by the audience member who I now realized was a respected author within the field. I learned a lot about the need to focus on a particular perspective when writing articles and got very good input on how to move forward with the paper. Most notably, I got confirmation on the idea that there is no ‘one single truth’ out there, an insight that I, being an engineer, was (and to a degree still am) very uncomfortable with. Regardless, I realized that throwing more boxes and arrows on the problem of reconciling different understandings would not work.

The summer of 2014 was an interesting one. On March 12, 2014, Robert and I submitted a manuscript based on study A to R&D management, an A journal on the ABDC list and a 3 on the ABS list (apparently, I am a slow learner when it comes to ambitious goals). We got a desk reject. This time it was motivated by a mismatch between method and research question. This was when I started viewing manuscripts not as combined parts, but as a whole where each section is a variation of the same overall story. Robert and I completely reworked that paper and submitted a new version to International Journal of Innovation Science on August the 8<sup>th</sup> 2014. We picked an unranked journal hoping to get into review. On April 3, 2015, we got an accept without revision. While this was my first publication I did not enjoy it. It is utterly pointless to get an accept since there is little learning. I thus aimed higher with future submissions.

By May 30, 2014, I had revised a manuscript based on Study B and submitted it to Journal of Management and Organization (1833-3672), a B-ranked journal on the ABDC list. I first received a major revision where one of my reviewers did a phenomenal job providing me good constructive feedback on how to develop the manuscript forward. My first ‘real’ review experience could not have been any better. Here is a part taken from the review letter:

“I believe that “cognitive framing contests” provide a great theoretical lens from which to understand organizational behavior and specifically the strategic dimensions of organizational decision making. [...] I can only encourage you to continue using that lens as I view that it theoretically powerful and ripe for contribution. Furthermore, I believe that your research context as well as the access you have in the organizational context (type of data) allow you to study how framing contests emerge and resolve themselves. Finally, please also allow me to complement you for your writing as I found your paper to be very clear and understandable.” (anonymous reviewer)

For a PhD student struggling with direction, these sentences were gold. Not only did I get hints on how to use cognition in my writing, I also learned that the data gathered suited the aim I had. Even if I did not realize it then, these review comments provided important clues in terms of the match between ontology, epistemology, and the particular question I was pursuing.

Furthermore, the reviewer asked me to narrow the scope of the paper, suggested some alternative research questions based on the data access I had (e.g., to focus on the process by which

actors break from past dominant cognitive frames to arrive at new ones), and expressed concerns over the transparency of my data. I was asked to focus on a particular topic and to rethink my contribution. I was asked also to not only argue *why* I did things by spouting academic jargon, but to instead clearly explain *how* I did what I did. Finally, I was told not to ask my readers to trust my observations and quotes, and instead urged to provide data tables and showcase my coding process. I proceeded to ignore most of these inputs. Not because I did not want to include them, but because it was not until two years later I understood (better) what they meant and how to put them into writing.

I completed my second revision and sent it in for another round of reviews. Although I got rejected, I also received another round of valuable feedback from that very same reviewer. Again, it is helpful to show excerpts from this letter.

“the research question has gained a great deal of clarity as well as am aware that you have been much more transparent about the data and how you got it.”

“[drop] all references to the role of environmental changes.”

“It seems to me that you have three cognitive conflict processes [one being] capability conflict”

“I would simply focus on as simple of a model as possible in this paper. Perhaps a typology of cognitive conflicts that leads to creation of framing contests regarding organizational strategy. [...] This direction would require you to refocus the paper’s introduction and literature review on strategy development literature and conceptualizing them as a framing contest. This would create a clear connection for your theory and data.” (anonymous reviewer)

Here, I gained valuable insights into what I had improved and, more importantly, what remained to be improved. I learned about what I consider a major benefit of sending manuscripts to reviews: it identifies your weaknesses and your strengths and challenges you to work with both.

On June 2, 2014, Carmen Lee and I presented a paper at a conference. This was the first manuscript prepared based on data from a parallel study on raw materials at Höganäs AB, a metal powders solution provider (not included in this dissertation). Following our presentation, an audience member asked how our paper would help managers in their daily work. Having presented a theoretical paper that linked cognition, capabilities, and resources, I found the question puzzling. My inability to answer spurred a debate among audience members around the nature of reality and what actually matters. One side of the debate argued that our model showed clearly that resources are only relevant when used regardless of ‘actual’ material properties. The other side argued that material properties exist regardless of what we know about them.

This separation between relevant and actual was an interesting one and something I really enjoyed as an engineer. To consider that there exists an objective reality, but that this reality is irrelevant as it is not what guides our activities, was highly insightful. Asking whether or not resources had a relevant existence, as opposed to an objective one, depends solely on the subject engaging with material properties of the resource in value generating ways. Although I did not realize it then, this was the moment when I developed the understanding of resources I have

today. On the 18<sup>th</sup> of September 2014, we received an invitation to submit the paper to Journal of Management and Change (unranked). We submitted a paper on October 8, 2014, and on April 25, 2015, we received a conditional accept with a minor revision. The revised manuscript was submitted on May 20, 2015 and subsequently accepted for publication (cf. Altmann & Lee, 2016). Due to the limited amount of constructive criticism, I did not learn much.

The year 2015 was about raising the bar and becoming a better researcher. I had demonstrated an ability to come up with interesting ideas, what was lacking was an ability to get these ideas down on paper. First out was a conference submission to the 2015 AOM Managerial and Organizational Cognition track's special conference in Roskilde. I had reworked the manuscript from Study B based on the helpful reviews received during earlier publication attempts. This rework included cognitive causal mapping and efforts to be more transparent with both data and the method. I submitted this revised version on February 22, 2015, and got my two conference reviewers' comments on March 24, 2015.

Reviewer 1 commented that: "The introduction section is attractive to keep readers in the research. The theory section and the method sections are developed well. Interviews and observations are reported well." Similarly, reviewer 2 commented that: "the paper is relevant and interesting." I now knew that I could keep my readers interested beyond the abstract. However, both reviewers challenged me to make my contribution more explicit, and to work more with the data to tease out interesting contributions. Also, both reviewers challenged me to better tie together the different parts of the paper. In addition, there were two comments that changed the paper's development. Reviewer 1 expressed concerns over whether or not my data supported the claim that "cognitive conflicts are caused by different cognitive structures of managers." Reviewer 1 suggested that the problem may instead lie in how understanding emerged around the strategy following its distribution and challenged me to consider alternative explanations. On a similar note, reviewer 2 recommended me to also split the paper into two papers and focus more on the micro-dynamics. Overall the paper was well received.

Another conference submission was made on February 23, 2015, based on study A. The manuscript was sent out to review and we received two reviews on May 3, 2015. One reviewer commented that the paper was "moderately interesting" and another that it was "really interesting." By now, I did not receive any major comments on structure or writing. The number of positives grew and included statements such as: "The method/approach is systematic, applied well to a discrete case study and produces logical generic 'recommendations'." There was also a comment on the direction of the paper. This comment caused disagreement among me and my co-authors that eventually made to us pull the paper from review.

In parallel, another attempt was made to publish the manuscript previously submitted to International Journal of Entrepreneurship and Innovation Management (based on Study B). This time, two co-authors joined and offered to rewrite the paper and submit it to a special issue on business model innovation announced in the Journal of Entrepreneurship, Management, and Innovation (2299-7075), an unranked journal. The paper was submitted on February 24, 2015, and on June 22, 2015, we received a revise and resubmit. All three reviewers liked what they

considered to be an interesting idea but had issues with how the paper was structured and presented. However, due to a task disagreement between me and my co-authors, we decided to withdraw the submission on July 8, 2015.

While these two early attempts in 2015 did not yield any favorable results, I gained a lot of confidence and became more certain about my opinions regarding article writing. It was also helpful because it prompted me to take a step back and reconsidered my role as a researcher and what I really wanted to work with.

In early 2015, I decided to take the opportunity to move to another academic environment and was enrolled as a PhD student at Chalmers University of Technology. I had earlier taken courses there and met with Sofia Börjesson and Maria Elmquist who had offered inputs on a course paper that I felt identified a major challenge I had to overcome moving forward, i.e., being able to actually write a paper as a whole rather than a collection of parts. At Chalmers, I found renewed focus and drive and extended my supervisor group. This change in academic environment enabled me to re-focus my previous efforts and to get some much needed help with article structuring. With my new main supervisor, Maria Elmquist, I worked a lot on how to structure arguments, how to build an article, and what ideas to include and where. This period proved invaluable for what followed.

Results came shortly after. Together with Robert, we developed a new manuscript that eventually became Paper I. On April 20, 2015, we submitted it to Research Technology Management (0895-6308), an A journal on the ABDC2016 list and a 2 on the ABS2015 list. We received a conditional accept on July 18, 2015. The five reviewers seemed positive and the editor summarized their input as: reviewers “mostly found the paper well structured, appropriately supported, and very readable. All in all, reviewers felt this was potentially a strong contribution.” One of my major weaknesses, the structure, had not only gotten better but had received favorable comments. It seems Maria’s efforts paid off.

However, not all comments were positive. The reviewers felt that the “thesis is a bit buried.” During the Paper I revision, I also learned how important rhetoric and argumentation is for article writing. The feedback from the editor and the reviewers was very helpful in learning how to write a convincing introduction that culminates in a central thesis, how language matters to bring together all the parts of a paper, and how to limit the amount of things I want to say to those supported by data. During this part of the revision I learned a lot from Maria on how to read and relate to revision letters, and how to transfer these insights into an improved manuscript. On September 10, 2015, Robert and I submitted the revised version of the paper and got accepted on October 27, 2015.

On May 9, 2015, Robert and I submitted a paper based on data from Study C to Research Technology Management. On May 11, 2015, we received an invitation to revise prior to review. The editor wrote: “While we believe that our readers are likely to find your topic timely and compelling, the article does not meet our needs in its current form. However, we are interested in your topic and would welcome the opportunity to evaluate a resubmission.” In the letter, the editor listed three major concerns to be addressed. First, data transparency was an issue. In contrast to the Paper I, this manuscript did not have a clearly visible artifact to follow. On the

contrary, Robert and I were trying to capture the regulatory ghost. His vague feeling that regulation was not an objective barrier to medical device innovation but emergent in social action and interaction was admittedly hard to prove. A second concern raised by the editor was that the context of FDA was not generalizable. A third issue was that the managerial implications were not up to the expectations of the journal's practitioner oriented target audience. On June 19, 2015, I submitted the revised manuscript. Two days later I got a reject motivated as follows:

“A single-case study—even, we think, a single-industry study—is simply inadequate to answer the questions you purport to ask, that is how regulation is perceived to affect innovation and what companies might do about it. [...] It requires readers to accept without external evidence that the perceptions of knowledge workers in a single company in fact mirror those of the entire industry.”

This rejection taught me how important it is to specify your level of analysis in the introduction. Regrettably, I had formulated an aim as follows: “the aim of this paper is to investigate why regulation is perceived as a barrier to technology innovation.” Worse yet, the text in the introduction discussed regulation at an industry level based on an attempt to address the concern with a lack of generalizability. I had written the introduction in a way that made a reader expect a multi-industry study with a large sample size. I revised the introduction and changed the aim to: “this paper investigates how well stated regulatory barriers coincide with formal regulatory barriers during the technology development process.” On June 22, 2015, we submitted the manuscript to the *Journal of Technology Management & Innovation* (0718-2724), a C journal on the ABDC2016 list. On October 10, 2015, we received an editorial decision letter with an accept but with a request for “an exhaustive revision of your bibliographic references.” With that comment I decided that I would aim higher for my next publication attempt.

The opportunity to submit to a better journal came with the “Strategy Processes and Practices: Dialogues and Intersections” special issue in *Strategic Management Journal*. As this process has been paramount to my development as a researcher, I discuss it under its own section.

#### **4.6.2. Developing Paper IV**

Since the Roskilde conference, I had also been involved in writing processes based on the Höganäs study. Here my co-author and co-supervisor Joakim Netz was responsible for the submission process. The first version of the article was developed for the NFF conference in Copenhagen between 12-14 of August, 2015, and a revised version following input from the NFF conference and additional literature studies and data analysis was presented on the SKM conference in Bochum between 21-22 of September, 2015. In the process of preparing the manuscript for these two conference papers, I had learned a lot from my co-author Joakim on how to relate and tie together the different parts of a paper from a theoretical standpoint.

I applied what I had learned into a revised manuscript based on the earlier Study B paper presented in Roskilde. By more actively considering theory, I decided to focus on one of the possible ‘splits’ recommended to me by my AOM reviewers. I submitted that manuscript on the August 31, 2015, to *Strategic Management Journal* (0143-2095), an A\* journal on the ABDC list and a 4\* on the ABS2015 list. I was rather surprised to see that the article was sent

out for review given that it was prepared rather hastily (later I found out that 80% of the submissions had been sent out for the first round of reviews).

I also received an invite on November 17, 2015, to develop my Roskilde manuscript further for publication in a book chapter. This presented me with a conundrum. While I had a manuscript in revision in Strategic Management Journal, I still did not have any concrete publications from what was a massive investment put into Study B. Essentially, I had spent years collecting and analyzing data only to receive rejects. I here went back to the Roskilde conference reviews and decided to develop a paper based on another possible 'split.' However, I decided to develop Paper III to mirror what came to be Paper IV because that idea at least passed the desk and since I was convinced I would get a reject. I did not.

On December 6, 2015, I received the invite for a high risk major revision for Paper IV. My editor wrote that: while "the reviewers found your paper, and in particular the rich Getinge Group case analysis, insightful and interesting to read, there were also a number of major concerns that came up in the review process." Three major concerns were listed:

- (1) Theoretical framing. The paper was poorly framed and the literature engagement was insufficient. A clear theoretical lens was necessary.
- (2) Empirical data. The paper did not provide enough details on methodological rigor and sufficiency of empirical evidence. Triangulation was suggested.
- (3) Novelty of contribution. The paper did not clearly state or make explicit a contribution.

In total, I received five pages of comments and highly constructive feedback. At the time, I was exuberant about this opportunity. Now, almost two years later, my enthusiasm about still being in the review process has somewhat lessened. But the lessons learned are undeniable. If I had to provide an estimate, I would say that ~90% of my development as a researcher came during the revision of Paper IV. While the earlier stages had revealed many of the dots necessary for this development, it was this revision that made me finally able to connect these dots.

Reviewer 1 stated that my "core proposition that managerial resource cognition will differ by department and therefore shape the development of dynamic capabilities is interesting" but that my case study did not demonstrate this well. In my attempt to move beyond the rather descriptive data presentation I had in the AOM conference paper version, I had now gone a few steps too far. Again, I did not manage my readers' expectations well and had confused them with poor data presentation. Reviewer 1 challenged me to better engage with the literature. I was ok with this given how the submission did not even have a theory section (I had focused all my efforts on the data presentation and the analysis of the data). While reviewer 1 was critical, he/she still felt that the core proposition was interesting and that there was a chance to complement existing data using additional methods (mostly interviews) and by dropping my reliance on archival data. This was a big concern for me since text-based data was all I had on the CEO (one of the three 'managerial' resource schemas I followed). Reviewer 2 had some different ideas.

Reviewer 2 started by stating that: “the use of resource fungibility and managerial resource schemas as theoretical lenses are interesting. In organizational settings where the nature of resources and their potential uses are contested, this is an informative lens. Secondly, the use of qualitative data provides a granular understanding of this process.” From this I took that I had finally managed to match the context with my theoretical interests, something I had struggled with previously. Reviewer 2 continued by stating that: a “lack of a theoretical lens, unclear writing and data analysis makes your paper difficult to understand or assess its import.” This was a bit of a personal setback since I felt that I had improved my writing over the past year. Also, I was challenged to more specifically show how and why I used certain data, and what the theoretical basis was for including each datum. The rest of the comments were basically about the lack of clarity and how I confused my readers. I also received reading suggestions—the work of Golden-Biddle and Locke (2007, 1993; see also Locke & Golden-Biddle, 1997)—to improve the clarity of my writing.

By late December 2015, I found myself in a rather peculiar position. On the one hand I had a high risk major revision to deal with. On the other I had a book chapter to write. What made matters worse was that I had developed Paper III on the bet that I would receive a reject for Paper IV. I put things to the side for a while and focused on reading the literature suggested by my reviewers. I decided to focus Paper III on how capability reconfiguration triggers framing contests and conceptualized the organization as ‘an environment of uncertainty.’ In turn, Paper IV was focused on how divergent resource schemas are created during the resource alteration processes and how they in turn shape this very process.

I first prepared Paper III so that I could practice the learnings from the Golden-Biddle and Locke texts. Specifically, I practiced how to weave a theorized storyline, how to shift between showing and telling data, and how I could use my data to convince. Paper III was submitted on February 5, 2016. On March 11, 2016, I got a conditional accept with minor changes. My focus now shifted to Paper IV.

I needed to apply what I had learned during my PhD studies and from the very insightful and highly appreciated input on introduction framing I had received from Shiko Ben-Menahem, a visiting researcher from ETH Zürich. I shortened the manuscript for Paper IV substantially and made it more focused. I also triangulated the findings using multiple methods and sources of data. Having also addressed many suggestions for improvement from both Maria and Shiko, I submitted my revision on April 29, 2016.

On June 20, 2016, I received another opportunity for a high risk major revision. The editor stated that: “Both reviewers commend you on the good work that you have done in the revision.” Alas, the letter did not stop there. While I had succeeded in addressing the first of the three previously highlighted concerns, i.e., theoretical framing (which I guess was low hanging fruit given how the first version lacked a theory chapter), reviewers continued to have concerns with the exact contribution (although reviewer 1 now stated that “you offer an interesting contribution”) and the clarity of empirical evidence. In essence, the reviewers and the editor challenged me to move beyond simply stating that divergences existed to show how everyday practices create them and with what consequences. Then there were pages of minor concerns and issues as well.

Reviewer 2 was more critical but now offered more direct advice on how to develop the paper further. The advice that most impacted the ongoing revision were as follows:

“I feel that you are documenting something that has already been well established. Where can you slice the data here? Can you show how particular practices (within functional areas) create or sustain divergences? Can you show through a practice based lens as to why contestation and framing fails after divergences are noticed?”

“The relationship between resource cognition theory and practice based perspective is not clear. It might be better if you choose one or the other and from the paper I sense that you want to focus more on the practice based perspective.”

I realized that I needed to substantially better my skills in practically every aspect of article writing in order to successfully complete the revision. I started by reading over 100 articles published in top journals, and the books by Johnson et al. (2007), Jarzabkowski (2005), Schatzki et al. (2001), and Golsorkhi et al. (2015). As my knowledge grew, I realized that my chosen theory streams cognition and practice were incommensurate. To get around this problem I decided to adopt practice theory as the overall theoretical lens and argue that cognition is carried by fields of practice. This allowed me to focus on practices as carriers of meaning, but also as generative for divergences. At the same time, I could still keep the resource schemas, which both reviewers found interesting, by focusing on how they in turn shaped unfolding resource alteration activities. I was also recommended to drop all references to dynamic capabilities (which featured heavily in the revised version) as this confused the reader. So I did.

While the ideas I worked with succeeded in convincing fellow researchers, I now faced another major challenge: How could I empirically show that practices create divergences? I had previously prepared a manuscript on what constitutes a meaningful micro-level for organization studies where I drew on the literature in biochemistry and nonlinear chemical dynamics. Having faced great difficulty finding a suitable method to rely on, I once again turned my attention to the literature within biology and chemistry where I found an article describing connectivity mapping (cf. paper IV). While I was happy to find something that I felt could work to address reviewers' concerns related to empirics, I was also worried because I was exploring uncharted ground. Discussions with senior colleagues helped ease some of these concerns. Björn Lantz told me that there was an obvious connection between how the connectivity mapping was applied in biomedicine and how it could be applied to my own work. Similarly, Maria showed great interest in the approach and urged me to continue working with it as it made the data mapping to theory quite clear. Shiko commented that the method seemed thorough. Finally, Robert was also impressed and felt that it made quite fuzzy concepts rather clear. With that, I had managed to generate interest from scholars doing both quantitative economic analysis and qualitative collaborative industry research, as well as received positive input from an industry practitioner.

The possibility to test the connectivity mapping ideas with the Special Issue editors came with a workshop organized for those of us who had made it to the second round of review. The workshop was held in Berlin on September 21, 2016, and presented an opportunity to not only share work but receive feedback from all the editors. I presented the connectivity map and got

confirmation that it worked as a method to connect activities with resource schemas. I presented also the revised coding approach and got positive comments. Having secured the rigor and the empirical clarity (one of the two remaining concerns) I now turned my attention to the remaining concern: contribution.

In Berlin, I shared two comments by reviewer 2 on exploring how practices create divergences and how these divergences mattered for resource alteration. Several editors agreed that these were interesting questions. I got further confirmation that this was a suitable focus by my corresponding editor who stated that the main reason for my revision opportunity was that he believed that I had the data to show how practices create resource schema divergences that lead to cognitive conflicts and the breakdown in resource alteration work.

I rewrote the entire manuscript based on the Berlin input and iterated several versions with Maria who spent hours with me going through suggestions on how to structure the paper, helped me to sharpen the contributions, and generally contributed to making the text more convincing. I also sent out a late version to Eric Knight who offered some valuable final insights. I now felt hopeful for the first time.

Hope did not help. On the 23<sup>rd</sup> of February, 2017, I received a “reject and resubmit.” The paper thus did not make it to the special issue but I was invited to submit to a regular issue where it will go out for a fourth round of review.

As for the reviewer comments, the first reviewer was not happy with the way the paper’s direction was going:

[M]y sense is that you missed an opportunity here. The previous version of your paper took a promising direction. To what extent functional differences shape the resource development process is a very interesting question which we are unable to answer yet. As I pointed out before there are several issues you have to address before you can make a contribution in this regard. But once these issues are dealt with you end up with a truly attractive paper.

My sense is that you decided to take a different direction with the paper rather than addressing these issues. I would still like a more careful consideration of the exact role of the two functions you study to determine how much influence they have on the development of new resources. And I would also need further clarification on how you were able to study the development of new competences, considering your period of observation versus the time it takes to develop them.

With what I know today, I would guess that reviewer 1 wishes me to draw more on the work of for instance Danneels (2002) and Floyd and Lane (2000) in how competences are developed within organizations in a product development context. Reviewer 2 had a different opinion:

The authors have revised their manuscript to address many of the reviewers’ concerns about the theoretical framework and methodology [...]. I commend the authors for their extensive revisions to reposition the manuscript.

So, while reviewer 1 did not like the extent and direction of the revision, reviewer 2 seemed to be more in favor of it. Reviewer 2 also noted several improvements to clarity, but he/she continued to raise concerns:

I find this paper interesting in terms of its research question and the data collected through field research. It addresses an important question in the field of strategy. There are some paragraphs in the paper where the writing and analyses is creative (e.g. use of Lamb et al's work for coding). However, lack of definition of key concepts, identification of what a resource is and what resource schemas are being considered in this study (human resources versus organizational resources) and integration of concepts (e.g. keying and bridging) throughout the manuscript makes it difficult to understand the paper and its contributions.

The irony of writing a dissertation on what resources and resource related phenomena actually are and then failing to clearly define them in my own manuscript is not lost on me.

Going forward, I will have to make a choice between the two reviewers. This choice is also reflected in the options I was given related to being assigned a new editor. One option is Richard Whittington, which would suggest that I focus on addressing the concerns of reviewer 2. Another option is Steven Floyd, which would be preferable if I focus on competences and the comments of reviewer 1. Either way, much work remains.

The next chapter presents a summary of the appended papers.

# 5. Summary of appended papers

In this chapter, each of the four appended papers are briefly presented. The full versions are appended at the end of the dissertation. The papers are presented in the order that their underlying studies were completed.

## 5.1. Paper I

The purpose of Paper I is to propose home-based R&D focused on emerging market needs as an alternative to localized partnerships when developing frugal innovation in high-tech firms. On a theoretical level, Paper I shows that the perceived knowledge transferability shapes what strategy practitioners consider a suitable frugal innovation approach.

The analysis of three development projects reveals that the assumed transferability of both technical knowledge and local market knowledge determines development trajectories. Paper I shows that when the transferability of local market knowledge was assumed low and the transferability of technical knowledge assumed high (i.e., difficult to understand the local market but easy to transfer technical knowledge to local market partners) practitioners chose to rely on local market presence. Following failure, practitioners concluded that the local market knowledge was more transferable than was the technical knowledge. They then chose to rely on home-based R&D. To succeed, the firm's technical knowledge and market knowledge was combined to re-conceptualize the core product (sterilizer) as well as to question several long-standing assumptions that led to the prior failures.

By showing that practitioners do not necessarily include important asset characteristics in their resource alteration choices, Paper I highlights how the habitual and the mindful play a key role for resource understandings and resource alteration choices.

## 5.2. Paper II

The purpose of Paper II is to illustrate localized divergences between stated regulatory barriers (by organizational members) and formal regulatory barriers (those found in the FDA regulatory framework). The study is based on an insider-outsider research approach and investigates a recent burdensome regulatory inspection at Getinge Infection Control.

Paper II identifies discrepancies between formal rules as stated in regulatory texts, and enacted rules as norms and behavioral expectations that emerge locally as formal rules are operationalized within the firm. The findings show that out of the eight stated barriers, only one corresponds to a formal requirement.

Paper II shows also how different task environments within a functional area underlie different enactments of formal rules. Because of these differences, tensions emerge between professional workgroups. These tensions are hard to resolve due to divergences between task environments. Members of one work group are also ill-informed about the task environment of another work group. Paper II suggests that actors attribute what they consider unfavorable actions of others to generalized role behaviors. For instance, quality assurance staff may view product developers as creative individuals who simply do not like rules and therefore actively work against rules. Similarly, product developers may view quality assurance staff as overly

bureaucratic. Paper II suggests that this role attribution is detrimental for engaging in the dialogue and collaborative work necessary to minimize the discrepancy between formal regulatory rules and enacted (and overly cumbersome) regulatory rules.

### **5.3. Paper III**

The purpose of Paper III is to investigate how the resource alteration process is shaped by differences in managerial beliefs related to what the organization is capable of and the nature of these capabilities. Paper III focuses on the process of: (1) how an existing capability is deconstructed into its building blocks (e.g., resources), (2) how these building blocks are assembled into new capabilities, and (3) how (1) and (2) trigger attempts of framing contests.

The analysis shows that functional area managers displayed reliance on both habitual thinking (specifically the reliance on past patterns of cross-functional interaction) as well as active thinking related to the identification of gaps, problems, and solutions. The findings show that functional area managers neither agree on the nature of past patterns of cross-functional interaction, nor the nature of resources as capability buildings blocks. The findings show also that when these disagreements become known, tensions emerge that can trigger framing contests.

The findings show also that divergent resource understandings may not be readily apparent to actors. This is because schema-action outcomes are equifinal, i.e., the same action (e.g., a cross-functional resource exchange) can result from two divergent, even contradictory, resource understandings. Functional area members have no way of knowing that this is the case. It is only when the divergence manifests in alteration proposals that these actors find troublesome that they become aware of the divergences.

Paper III shows that practitioners can have different, even contradictory, mental representations or resources underlying long existing coordinated activity. This is significant because it identifies the locus of shared/collective understandings to be activity and as opposed to mental representation. Paper III also points out that both mindful strategizing and alteration choices are bound by the task environment of practitioners.

### **5.4. Paper IV**

Paper IV investigates the process of how new strategy commitments are resourced within an organization that is experiencing unambiguous changes in its competitive environment. Specifically, it investigates how practices (within and between functional areas) create resource schema divergences as resource alteration unfolds. It then links these divergences to emerging cognitive conflicts, i.e., disagreements among practitioners pertaining to a particular task (cf. Jehn & Mannix, 2001; Floyd & Lane, 2000).

The findings show how strategy practitioners draw both on different practices as well as the same practices differently during the resource alteration process. During early stages of resource assessment (where the resource properties are evaluated in relation to a new commitment) practitioners draw on practices in ways distinct to their functional areas. These idiosyncrasies create resource schema divergences that, over time, escalate into cognitive conflicts.

Paper IV shows that an inability to solve these conflicts may hinder continued resource alteration work. This inability is linked to two types of practices. The first is the locus of divergent meaning, the second the target of emerging conflict. Paper IV shows also why these created divergences obstruct resource alteration. Although shared understanding is not necessary for a coordinated resource activity, Paper IV shows that settling on a new coordinated resource state can be difficult as proposed resource alterations make more or less sense to functional area practitioners depending on their task environments. Paper IV contributes here by showing that resource understandings are inextricably linked to how these resources are used in specific task environments.

Following Table 7, which summarizes the appended papers, the next chapter analyzes and discusses the empirical observations of the appended papers.

**Table 7. Summary of papers.**

| <b>Paper</b> | <b>Approach</b>                                      | <b>Main finding(s)</b>   | <b>Practical implications</b>   | <b>Theoretical implications</b>   | <b>Level of analysis</b>     | <b>Unit of analysis</b>                            |
|--------------|--|--|---|---|------------------------------|--|
| I            | Insider-out-<br>sider case<br>study                  | Home-based R&D is an available option for emerging market entry when the transferability of technical knowledge is lower than the transferability of local market knowledge.   | To reassess evaluation systems and assumptions related to technology development when facing new market conditions. To adjust the NPD goals and the NPD process in accordance to emerging insights. | Challenges existing wisdom in frugal innovation literature related to reliance on local market partners.  | Firm                         | Innovation in the context of emerging market entry |
| III          | Insider-out-<br>sider case<br>study                  | There exist localized discrepancies between formal regulatory rules enacted of these task environment specific idiosyncrasies and attribute the behavior of others to role characteristics.  | Approach innovation in a regulatory context in a holistic and inclusive way. Ensure awareness of the regulatory frameworks and the local enactments of rules. Do not equate behavior to attributes. | Institutional isomorphism may be limited to the task environments and knowledge-base of certain professional work groups.   | Within functional area work  | Innovation in a regulatory context                 |
| III          | Longitudinal<br>field work<br>(active participation) | Functional area managers may not agree on how resources should be allocated. These disagreements are linked to task environments and their respective knowledge-base. Actors are not aware of these divergences, which become apparent only when one functional area proposes alterations that another functional area finds unfeasible. As conflicts emerge, they can trigger framing contests. | Functional area members may find inconsistencies in resource alteration proposals laid out by another functional area due to task environment specific differences in resource representations.     | Actors' task environments and knowledge-base matter for how they alter resources. Resource alteration work involves finding advantages in particular deployments of resources in the presence of between functional area disagreements regarding resources and the services they can/should render. | Between functional area work | Resource deployment                                |

**Table 7. Summary of papers (cont.).**

| <b>Paper</b> | <b>Approach</b>                                | <b>Main finding(s)</b>   | <b>Practical implications</b>   | <b>Theoretical implications</b>  | <b>Level of analysis</b> | <b>Unit of analysis</b> |
|--------------|--|--|---|--|--------------------------|-------------------------|
| IV           | Longitudinal field work (active participation) | During resource assessment, actors draw on past practices to develop representations of asset characteristics. Using different practices, and the same practices differently, creates resource schema divergences. Over time, these emerging resource schema divergences can escalate into cognitive conflicts that obstruct settling on a new coordinated resource state. | Provides guidelines on how to distinguish elements of resource related cognitive conflicts into parts of self-interest, and parts of asset characteristics. To not equate agreement in strategic commitment with agreement to how this commitment is to be resources. | Actors rely on practice sets during instances of resource assessment. These practice sets diverge, as do the outcome of resource assessments. Thus, resource schema divergences are created. | Practice                 | Resource cognition      |

## 6. Analytical discussion

The purpose of this dissertation is to extend theory on how resource understandings and resource alteration unfold within and between a firm's different task environments. This chapter discusses the empirical results. The discussion is organized under two headings, each corresponding to one of the two research questions. It ends with an overall synthesis of the results. The motivation behind this structure is to analyze purpose from two different theoretical perspectives, i.e., cognitive theory and practice theory, and then to combine the two in order to develop this dissertation's theoretical model.

### 6.1. How task environment specific resource understandings shape resource alteration

Danneels (2011) shows that the way managers understand their organizational resources, and the potential uses of these resources, determines the direction in which they alter them. He argues that when these understandings are incorrect, the success of resource alteration outcomes is far from certain. Based on his findings, Danneels advises managers to engage in activities that increase the accuracy of their resource schemas.

Extending Danneels' findings, this dissertation considers differences in mental representations between task environments (cf. Dougherty, 1992a). It is well known that different task environments matter for how an existing resource activity is altered (Zbaracki & Bergen, 2010; Tripsas & Gavetti, 2000; Regnér, 2003; Floyd & Lane, 2000) and that context matters for cognition (Hutchins, 2010; Rocha, 2012). The studies in this dissertation add to our understanding of how task environment specific resource understandings shape resource alteration in several ways. Table 8 contains a summary of these findings.

#### 6.1.1. The habitual and the mindful, their configuration, and impact on resource alteration

Hodgkinson and Healey (2011) argue that the literature has hitherto focused on the mindful and non-affective dimensions of resource alteration. This view on resource alteration choices as dispassionate and rational has led to what Hodgkinson and Healey (2011: 1503) refer to as "an impoverished portrayal of dynamic capabilities."

This dissertation's findings draws attention on how the mindful interacts with the habitual during resource alteration to produce organizational outcomes (cf. Levinthal & Rerup, 2006; Salvato, 2009). The findings also provide insights into the cognitive context of activity configurations (cf. Regnér, 2008). Specifically, the three studies (A–C) revealed that the mindful and the habitual simultaneously shape resource related mental representations. Study B showed that actors are mindful of their own professional, organizational, and strategic contexts without necessarily being mindful of the derived sense in these contexts. For instance, human resource practitioners attributed a decline in innovative ideas to a decline in the number of creative individuals. In contrast, product development practitioners attributed the same decline in ideas to a cumbersome innovation process.

**Table 8. Overview of findings and their relation to research question 1.**

| Study   | Empirical results  | Implies that  | Answer(s) to RQ 1  |
|---------|--|---|--|
| B (IV)  | During strategy work, actors are mindful of the practices they draw on to assess resources. The meaning derived from these practices is, however, habitual.  | Actors are mindful of their contexts but do not critically reflect on the sense they make using these contexts.                                   | Actors' rely on both their habitual knowledge and their mindful knowledge, related to resources, when working with resource alteration. The non-conscious and the conscious work in parallel to shape actors' resource alteration proposals. |
| A (I)   | Actors do not initially consider the transferability of technical knowledge when deciding a foreign market entry approach.   | That which actors take for granted, or conclusions generated therefrom, is not brought to conscious awareness during resource alteration choices. |  |
| B (III) | Mental representations of existing cross-functional communication shape how actors believe resources can be combined.  |   |  |
| B (IV)  | The consideration, and perceived ability, to alter a cross-functionally shared practice differs between task environments.   |   |  |
| B (III) | Actors in a task environment base resource alteration proposals on their perceptions of organizational capabilities and the ability of other actors in other task environments to deliver requested input. |   |  |
| C (II)  | Actors within a task environment expect others to behave in role specific ways.  |   |  |
| C (II)  | Actors within a functional area only consider a part of the task environment of other actors within the same functional area.  |   |  |
| C (II)  | Actors within a task environment enact rules based both on formal rules and their general perceptions of how other actors enact their rule environments.   | Enacted rules contain multiple correspondences.   | Actors in stable environments do not view things the same way, but rather a minimum of the same things. This limits the resource alteration choices available to a firm.   |
| B (III) | Actors seek to economize their resource activities when they perceive the organizational environment as stable.  | Once shared activity is stable, actors economize their part of delivery.  |  |

The finding that the habitual and the mindful co-exist contrasts the conceptualization of shifts between the two modes of thinking (cf. Louis & Sutton, 1991). Instead, it confirms recent findings related to an actor's simultaneous reliance on both the mindful and the habitual during the conduct of their activities (Levinthal & Rerup, 2006; Hodgkinson & Healey, 2011). It adds also to Salvato's (2009) account of how the mindful and the habitual underlie an evolutionary process of NPD capability renewal by showing how attempts of such a capability renewal can be contested across task environments due to divergences in resource related mental representations that emerge in the daily activity of strategy work.

When taken together, the three studies (A–C) provide insights beyond exploring the relationship between the mindful and the habitual. They show also why actors derive habitual sense from the practices they mindfully draw on. For instance, Study A shows that actors did not initially consider the transferability of highly technical knowledge. Actors took various resource related activities for granted even though these activities proved necessary for adapting the technology to local market conditions. Because of their habitual tendencies, actors did not include certain asset characteristics into consideration in their resource alteration proposals.

It is important to consider alternative explanations for the observed lack of consideration for technical knowledge transferability. One such alternative explanation is that decision makers purposefully limited the transfer of technical knowledge. This may be the case, for instance, when actors evaluate the risk of revealing proprietary technical expertise relative to the risk of market failure due to insufficient product quality. There exist at least two instances when this is a valid explanation: (1) when those in charge of transferring technical knowledge feel threatened by those who receive it, and (2) when the transferred technical knowledge is considered part of a core competence of great competitive value. Neither applied in the reported case.

The foreign market site was not threatening the existence of the home-based site. Additionally, the quality concerns were not linked to any technical knowledge that actors considered as a source of competitive advantage. The observed shift toward home-based development is better explained by managers becoming mindful of knowledge transferability, consequently altering their mental representations of resource properties and their uses. The transferability of technical knowledge was overlooked because the decision makers, who all had decade long experiences with technical product development, took technical knowledge for granted. And that which is taken for granted, cannot be part of mindful resource alteration decisions. In Study A, the limits of resource alteration options were primarily limited by asset characteristics and mental representations thereof. These mental representations predisposed actors to certain resource alteration choices.

Asset characteristics and mental representations thereof account only for a part of the resource alteration choices made by decision makers in the three studies. Coordinated resource activities and mental representations thereof matter too. For instance, Study B shows how actors within different task environments viewed the existing resource related exchanges in different ways. HRM practitioners framed the existing state of coordinated resource activities as them supplying a specific type of product developers and nurturing a specific type of innovative climate, both to secure short term financial benefits. Product developers, in turn, believed that human resource managers supplied all their human capital needs. Both views made sense given

the coordinated resource activities prior to the strategy work investigated in Study B. These differing views did, however, predispose actors to task environment specific resource alteration proposals. Functional area managers for NPD, believing that all human resource needs can be supplied, developed strategies based on this assumption.

Study C provides additional insights into how actors make resource alteration decisions based on a configuration of the mindful and the habitual. Study C shows how actors within one task environment expect actors from another task environment to behave in role specific ways. Actors developed these expectancies by attributing activities associated with regulatory compliance to role specific character traits. For instance, quality assurance staff saw product developers as creative individuals who reject control. Consequently, quality assurance staff believed that product developers consider regulation as a barrier because of the associated controls. Enacted rule environments, and representations thereof, matter for how actors make sense of other task environments and their respective actors. And what actors know about what others are capable of in specific rule environments, shapes their resource alteration proposals.

To conclude, task environment specific resource understandings shape resource alteration through the configuration of habitual and mindful resource related activities that underlie task environment specific resource understandings. Actors who are members of different task environments are therefore predisposed to certain resource alteration choices. These predispositions depend in part on their mental representations of asset characteristics, coordinated resource activities, and enacted rule environments; and in part on what actors can bring to consciousness as they develop resource alteration proposals.

### **6.1.2. From shared mental representations to sharing elements of mental representations**

Tripsas and Gavetti's (2000) study of Polaroid illustrates how considering both the habitual and the mindful extends existing theory. Their study shows that senior executives pursued renewal based on beliefs in an instant imaging business model, which discouraged development efforts aimed at digital imaging. In contrast, managers closer to the market argued for an increased emphasis on digital imaging.

Considering only the mindful aspects of resource understandings, Tripsas and Gavetti argue that differences in industry signals predisposed managers in different task environments to different resource alteration choices. Hodgkinson and Healey (2011: 1504) argue that by logical extension "providing the two parties with the same information would have yielded consonant representations." They then suggest an alternative interpretation and argue that environmental information triggers an affective response, which means that managers in different task environments will draw different conclusions about the same data.

On the basis of the three studies, this dissertation extends views focused only on the mindful (Tripsas & Gavetti, 2000) and the affective (Hodgkinson & Healey, 2011) by suggesting that the task environment specific activity configuration—the habitual and the mindful resource related activities—underlie mental representations of resources and schemata of resource actions that predispose actors to certain resource alteration choices. This dissertation argues that the task environments themselves explain a low consonance in resource alteration proposals.

This dissertation's findings confirm previous studies that show how actors cannot agree on resource alteration choices. However, it does not view this low consonance as a result of actors being members of different information interpretations systems (cf. Daft & Weick, 1984; Tripas & Gavetti, 2000) or because they experience discomfort (cf. Hodgkinson & Healey, 2011). Instead, this dissertation suggests that actors in different task environments cannot agree because their task environments underlie specific configurations of habitual and mindful resource activities. Consequently, actors have task environment specific resource understandings. This explains divergences both if we assume that actors are perfectly rational and devoid of emotion, as well as if we assume that actors are non-rational and affective.

Contrary to ideas of shared understandings, this dissertation suggests that actors cannot view resources the same way and questions whether any amount or type of activity will lead to more accurate mental representations (cf. Danneels, 2011). Instead, the dissertation proposes that actors view a minimum of the same resource activities that are shared across task environments.

Study B and C also contribute to a growing attention to social cognition, i.e., mental representations about relationships and interactions between people throughout the organization (cf. Helfat & Peteraf, 2015). They do so by confirming that attributions are largely automatic. Actors can take for granted certain interactions and relationships between various task environments, and expect actors to act in functionally defined ways. Additionally, Study B and C provide insights into the set of available resource alteration choices available to firms operating in traditionally stable environments. Study C shows enacted rule environments correspond to perceptions of both formal rules and the way other task environments enact their rule environments. Study B suggests that actors seek to economize resource activities when existing cross-functional resource exchanges have remained stable for some time.

To conclude, task environment specific resource understandings shape resource alteration, in part, through shared elements of resource understandings. Actors who are members of different task environments cannot share mental representations of resources. Rather than viewing certain things in the same way, they view a minimum of the same things. This limited number of resource related activities determines the consonance of all resource alteration proposals.

## **6.2. How task environment specific resource alteration shapes resource understandings**

As resource alteration unfolds, actors' resource understandings change. Here, resource activities underlie evolving resource understandings (Penrose, 1959) or simply just generates new possibilities for resource uses (Feldman, 2004). To this background, three specific aspects of the relationship between resource alteration and resource understandings are highlighted in Table 9 and discussed below: (1) environmental feedback and how it impacts activity configurations that underlie resource understandings, (2) sharing resource alteration proposals as a trigger for this feedback, and (3) how resource understandings are created.

**Table 9. Overview of findings and their relation to research question 2.**

| Study                | Empirical results   | Implies that  | Answer to RQ2  |
|----------------------|---|---|--|
| A (I)                | By moving the habitual to the mindful, external feedback reorganizes the composition of what actors know about resource related activities.   | Receiving feedback following resource alteration proposals is a key source of altering resource related understandings.               | The environmental feedback, following the sharing of resource alteration proposals, alters what actors become mindful of and what falls into habitual activity.  |
| A (I)<br>B (III, IV) | Feedback following resource alteration proposals can cause actors to reconsider aspects of perceived asset characteristics.<br>Actors become aware of divergent mental representations during the sharing of resource alteration choices. | Stable environments promote inertia due to a drift away from shared understandings of what underlies a coordinated resource activity. | Sharing resource alteration proposals triggers environmental feedback. Actors can reject change proposals they consider unfeasible. Proposals that do not effect coordinated activity cause a drift away from shared understandings. Actors need not be aware of these drifts. |
| B (III)              | Shared understanding of a coordinated resource activity is not necessary for sustaining an already established resource activity.   | Actors can engage in shared activity without sharing an understanding of that activity.   | Actors can engage in shared activity without sharing an understanding of that activity.  |
| B (IV)               | Actors that are members of different task environments may derive different meaning from a cross-functionally shared practice.  | Multiple fields of practice shape resource related meaning. Some practices determine meaning, others create and maintain conflict.    | Resource understandings are created during resource assessment.  |
| B (IV)               | Certain functional area specific practices shape idiosyncratic resource understandings; other cross-functionally shared practices shape resource related conflict.  | Multiple fields of practice shape resource related meaning. Some practices determine meaning, others create and maintain conflict.    | Resource understandings are created during resource assessment.  |
| B (IV)               | Resource related mental representations are created during resource assessment when actors draw on a combination of strategy practices, role specific practices, and organizational practices.  | Multiple fields of practice shape resource related meaning. Some practices determine meaning, others create and maintain conflict.    | Resource understandings are created during resource assessment.  |

### 6.2.1. The role of task environment feedback

Task environment feedback alters the configuration of mindful and habitual resource activities. This argument is similar to that of how patterns of resource commitments emerge through trial and error learning (cf. Mintzberg & Lampel, 1999; Mintzberg, Ahlstrand, & Lampel, 2005).

Study A shows how the realization that emerged around the transferability of technical knowledge and the transferability of local market knowledge resulted from learning. The process unfolded in a way which is typical of logical incrementalism, i.e., that strategies unfold in a series of small decisions that are evaluated periodically where each decision is based on trial and error based learning (Quinn, 1978). Awareness around transferability was thus learned based on performance outcomes.

However, this dissertation suggests that it is not necessarily a gap of resource related understanding that explains unsuccessful resource alteration outcomes. Study A shows that it is precisely because technical knowledge was obvious that it was not considered. Here, feedback enabled practitioners to bring to consciousness that which is taken for granted. In doing so, feedback can also enable actors to alter their mental representations of asset characteristics. Study A shows how Getinge Skärhamn AB practiced technical knowledge on a daily basis. It was thus a taken for granted part of the local reality akin to what Chia and MacKay (2007: 217) refer to as “habituated tendencies and internalized dispositions.” It was only when reports of quality concerns were made available that strategy practitioners actively considered the transferability of technical knowledge. Here, practitioners had to learn what they knew so well that they (literally) could not remember.

Study B reveals another important aspect of feedback. In focusing on intra-organizational feedback between different task environments, Study B reveals how actors become aware of divergences in mental representations during the sharing of resource alteration proposals. Again, by highlighting the mindful and the habitual, this dissertation suggests an alternative view on why resource alteration proposals may experience significant resistance in an organization. Here, resistance is not explained primarily by differences in thought worlds (cf. Dougherty, 1992a) or by power struggles and discomfort (cf. Helfat & Peteraf, 2015; Hodgkinson & Healey, 2011). While these aspects have merit, Study B highlights how actors in one task environment resist the resource alteration proposals of another task environment simply because these actors consider the proposed resource alterations to be unfeasible.

In all three studies, feedback opened up the possibility to alter the configuration of what actors were mindful of and what was habitual. However, Study C provides one additional insight. Actors may notice signals that open up the possibility for habitual resource activities to become mindful without necessarily altering their configurations. For instance, in Study C, product developers framed documentation as a barrier to NPD activity. Quality assurance staff did not interpret this as a signal of an overly burdensome enactment of formal regulatory rules (as Paper II shows it was) but rather explain the complaint through role attribution. Quality assurance staff believed that these complaints were a natural consequence of the product development practice (e.g., through expectancies of creativity, disruption, innovation, new ideas, etc.) and, by association, with the individuals that engage in product development activities. Correspondingly, product developers viewed quality assurance staff as inhibiting development

work, through for instance documentation, because quality assurance as a practice is about control and those working with it like control.

Meanwhile, both NPD staff and quality assurance staff considered what they do as supportive of innovation and contributing to the company's goals related to the practice of regulatory compliance. For example, quality assurance saw regulation as a set of common sense practices that ensure safety and help develop better products; product developers were proud to be engaged in work that is aimed to improve the quality of life for patients. Therefore, feedback did not have any major effect on altering resource understandings.

To conclude, between task environment feedback can possibly, but not necessarily, alter what actors become mindful of and what they take for granted.

### **6.2.2. The sharing of resource alteration proposals as a trigger for feedback**

The practice of sharing resource alteration proposals is part of an ongoing effort to maintain or find a state of coordinated resource activities. Feedback either maintains the coordinated resource activities in place or causes a breakdown. In both cases, feedback also has the possibility to alter what actors are mindful of and what they take for granted.

Zollo and Winter (2002) discuss constructive confrontations as a means by which information exchanges take place that can reduce the ambiguity related to action-outcome linkages. This dissertation identifies task environment resource related exchanges as the site for possible confrontations. These confrontations are, however, not constructive in the sense that they reduce ambiguity. These confrontations are cognitive conflicts between task environments that know different things and the same things differently. The conflicts are constructive because they allow the actors to find a new state of coordinated resource activities that all actors consider possible. These conflicts emerge when two task environments who are linked by a resource exchange cannot agree on how to alter that resource in a way that alters the exchange. For instance, one task environment may argue for acquisition of new resources, another for leveraging existing ones. Paper III and Paper IV illustrates one such case. Specifically, Paper III shows that managers may be agree in their representations of environmental changes while diverging in their representations of internal capabilities to respond to these changes. These types of conflicts must be resolved as the firm attempts to alter its resources. By bringing the contentious aspects of resource alteration to the fore, this dissertation extends the current literature's emphasis on processual analysis and normative models.

Interestingly, the findings reported in this dissertation reveals that a state of coordinated resource activities can exist despite an underlying divergence in mental representations of resources and the resource activities. Paper III identifies equifinality in schema-action outcomes as a possible reason why two different, and even contradictory, resource schemas can exist at the same time around a shared schemata of action. The findings suggest that a set of coordinated resource activities can exist and emerge around divergent mental representations. In fact, it suggests that a collective understanding is impossible as both cognitive and processual limitations (cf. Quinn, 1978; Regnér, 2015) prohibit it. Task environments cannot understand something in the same way even if they coordinate around the same resource activity.

Coordinating resource activities is possible even in the presence of various degrees of resource schema divergence since actors just need to agree that a certain activity takes place (but not why it takes place). During change, as resource alteration proposals are shared, actors can realize that the coordinated activity was shared only in action and not in thought. This materializes as a disagreement around alteration proposals. Since finding a new set of coordinated resource activities poses challenges when representations of possible resource related actions differ, actors need to engage in framing contests of the kind Kaplan (2008a) describes. But in contrast to Kaplan's emphasis on initial state frame divergences, this dissertation suggests that framing contests pool experiences and viewpoints, make them explicit, and allow actors to find a new state of coordinated resource activities they can agree on. There is no need for frame divergences to be reduced. All that is necessary is to find a state of coordinated resource activities that actors (from all involved task environments) agree can take place.

So far, I have only discussed feedback as a result of dynamics. But stable environments provide a different type of feedback. The lack of any reaction to a resource alteration is also a form of feedback. During times of relative stability, there exists little reason for actors to discuss existing coordinated resource activities. This state is however far from static. Feldman (2000; 2004) establishes that even patterned actions repeated over time are inherently generative and dynamic. Paper III suggests that this inherent capacity to alter existing resource uses is directed in its impact. This means that it is only alterations that have a cross-functional impact that will trigger a response from other functional area practitioners. Those changes in resource uses and resource representations limited to a specific functional area will go unnoticed by other functional areas. Over time, actors' resource representations will change as the task environment economizes its activities to lower the cost of its expected deliverables.

However, since actors in other environments are not necessarily aware of these changes as long as no shared resource activity is affected, the conditions for an initial state agreement, i.e., the original basis on which that coordinated resource activity was established, will change even if the coordinated activity is maintained. Stable environments thus lead to inertia over time as resource understandings diverge.

Additionally, this dissertation confirms that mental representations can differ in magnitude of a specific characteristic such as fungibility (Danneels, 2011), but shows also that mental representations can differ in their composition. Paper III shows how NPD practitioners represented their exchange with HRM practitioners as one where the latter supplied all human capital needs. This representation was seen as dated by human resource practitioners, who argued that decades of increasing focus on incremental short term performances had shaped cross-functional exchanges to supplying human resources capable of incremental development only. These divergences could support the existing coordinated activity and remained hidden. They surfaced only when resource alteration proposals were shared and in the feedback from other task environments.

If we accept this equifinality in schema-action outcomes, then resource alteration becomes a search for congruence in schemata of resource actions. Seen as such, the successful response to environmental change involves a search for a new coordinated state of resource activities that has a superior rent generating capacity. Similarly, success in stable environments becomes

a search for specialization that does not disrupt existing agreements of coordinated resource activities. Prolonged periods of stability lead to specialization through the firm's different task environments, which makes finding a new set of coordinated activity difficult. This argument contrasts those made by for instance Jarzabkowski (2004). She argues that firms are "more prone to adaptive practices when they are populated by diverse and heterogeneous communities" (p. 539). Jarzabkowski identifies micro-communities of activity inside firms as a generative force of new resource related actions and directs attention to Regnér's (2003) study of how strategy creation processes differ at the periphery of an organization and at its center, and Burgelman's (1983) study of internal venturing.

However, there exist multiple examples where firms did not succeed in leveraging their internal heterogeneity in order to alter existing resources when environments change. Kodak is one obvious example where existing resources were successfully redeployed into new technical capabilities, but where the firm failed to reach a new coordinated resource state that would capitalize on these resource alterations. Similarly, environmental changes have been reported to cause disagreement within a firm between heterogeneous groups as to what the breakdown entails for resource alteration (see for instance Kaplan, 2008b; Zbaracki & Bergen, 2010). To reconcile my findings and arguments with those of Jarzabkowski (2004), I propose that sharing resource alteration proposals are an important consideration. Specialization may occur with or without actors being aware of what others do. Without constant sharing (which is costly) actors will diverge and specialize in ways that lead to inertia.

### **6.2.3. The creation of resource understandings in moments of practice**

This dissertation shows that resource understandings are created in moments of practice where the mindful and the habitual interact. Actors do not carry around mental representations of resources that include all possible characteristics and their uses, but rather use practice to create mental representations in situated contexts.

During strategy work, practitioners assess existing resources (i.e., asset characteristics, enacted rules, and coordinated resource activities) in relation to their representations of a desired future state. As practitioners engage in resource assessment activities, recollections of the past are related to the desired future state and resource schemas are created. Since task environments differ between functional areas, the created resource schemas differ too.

These differences in interpretation and functional area specific reliance on historical practices is evidenced by the use of strategy tools such as SWOT. For instance, a reported decline in the number of suggested ideas to an idea box, was seen by HRM practitioners as indicating lowered creativity and thus associated with a weakness, a W in the SWOT. Linking the decline to lower creativity was done without much reflection. In contrast, NPD practitioners drew different conclusions based on their specific experiences. It is in those moments, that historic and situated non-strategic uses of everyday practices, e.g., the idea suggestion box, becomes strategic for the active assessment of the resource base. Actors create resource related mental representations in these moments of practice. Paper IV shows that in using strategy practices like SWOT and strategy away days, strategy practitioners rely not on a *tabula rasa* approach characterized by active thinking—which such an episode is argued to elicit (cf. Louis & Sutton, 1991; Chia & MacKay, 2007)—but rather draw on everyday practices in an unreflective way

during these episodes of active thinking. During resource assessment, practitioners draw on a collection of practices. There seems to be less of a ‘switching’ between modes of thinking, and rather the simultaneous application of both habitual and mindful thinking.

These arguments contrast those of Danneels (2011: 27), who argues that managers can access understanding of resource characteristics through the practice of resource assessment—including activities such as “frank debate,” “eliciting brand association,” and “judging the fit between dominant associations with possible extensions.” Danneels assumes the existence of inherent asset characteristics which assessment can reveal. Paper IV does not share these assumptions. It shows that it is not clear exactly what an accurate resource schema is or what an honest self-assessment may reveal to strategy practitioners (aside from task disagreements).

Resource assessment outcomes are task environment specific. Relatedly, Orlikowski (2000; 2002) argues that resource properties emerge as a result of practice. The materiality of a resource is not the sole determinant in its value generating potential. Rather, practice determines how a resource—in Paper IV human resources and in Orlikowski’s studies technology—is understood and deployed in value generating ways. Here, practice becomes essential to the very nature of a resource. To illustrate how a practice ontology relates to the accuracy of resource representations, consider Orlikowski’s findings that service technicians use a software-hardware architecture differently than do consultants in terms of knowledge sharing. Is it possible to claim that a certain use corresponds to a more accurate resource schema?

My own field observations suggest that actors cannot know which resource assessment are correct. Instead, they may interpret the created divergences, and the subsequent cognitive conflicts, as resistance to change and/or political games. Interestingly, Paper IV reveals that the locus of divergent resource understandings may be different than the locus of emerging cognitive conflicts. The former is shaped by the practices closest to actors’ professional roles, the latter by coordinated resource activities. This adds to the difficulty of resolving conflicts because they emerge in places different from their underlying causes.

Additionally, Paper IV shows that the mindful and the habitual are not opposites characterizing different instances, but are in fact part of the same instance. This adds to a growing body of evidence that the habitual and the mindful are in fact active at once in any given instance (cf. Hodgkinson & Clarke, 2007; Hodgkinson & Healey, 2011). Practitioners draw on historical practices to derive resource related meaning in mindful ways. In other words, they are aware of the practices and specific moments of practice they use during their strategy praxis. Practitioners are however not aware of the habitual tendencies of their meaning attribution. That is to say, they tend to derive meaning from instances of practice in a largely habitual fashion and do not reflect much on the conclusions they draw. And as long as strategy work unfolds in a setting where participating practitioners represent a homogenous task environment, habitual tendencies will remain unchallenged. Resource schemas that emerge during strategy work are thus specific to the task environment in which they emerge.

These arguments have implications for how we understand prior findings. Consider for instance Porac et al.’s (1989) account for events among the Scottish knitwear manufacturers. While the authors attribute events to mental models and perceptions of who the competition is,

it is very likely that such perceptions are carried by fields of practice. Here, knitwear strategy practitioners would mindfully and purposefully consider their competitive environment, but reach conclusions influenced by habitual and taken for granted 'truths' such as those underlying the cognitive taxonomies that Porac et al. (1989) account for. That is to say, concepts in the cognitive taxonomies like 'fashion,' 'natural fibers,' and 'high quality' are imbued with meaning in specific contexts and in specific times (cf. Schatzki, 2005), therefore what is brought to mindful consideration is often based on the habitual and taken for granted. The mindful allows for considerations to be made; the habitual shapes the considerations made.

The next chapter develops a cyclical theory of resource alteration based on this discussion.

# 7. The resource alteration cycle

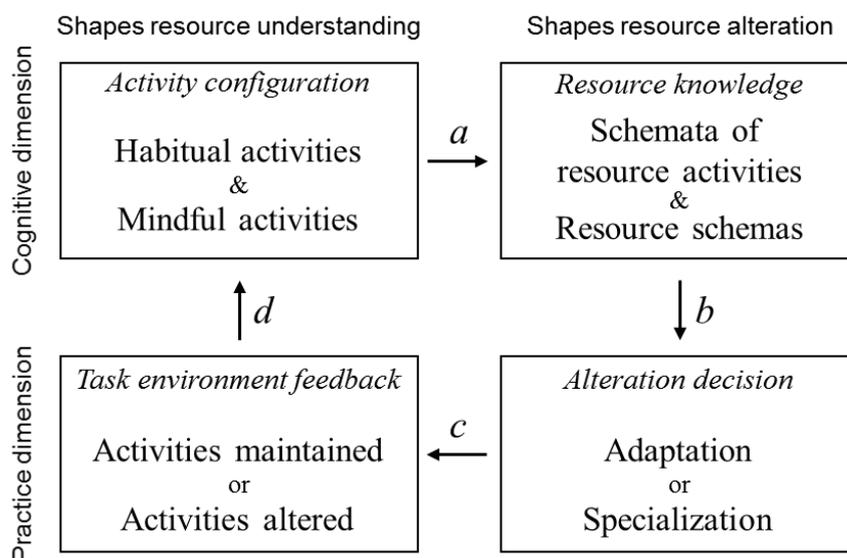
In Chapter 2 the literature review resulted in two how-based research questions. The first asks how resource understandings shape resource alterations. The second asks how resource alterations shape resource understandings. Chapter 7 builds on the analytical discussion in the previous chapter and extends existing resource alteration theory by proposing a model of resource alteration as a perpetual cycle.

## 7.1. Introducing a model of resource alteration

The model aims to describe the relationship between resource understandings and resource alteration by accounting for both cognitive dimensions and practice dimensions. It focuses on four relational components:

- (1) the configuration of activities that are mindful and habitual,
- (2) the combination of resource schemas and schemata of resource actions that make up an actor's knowledge of a resource,
- (3) the resource alteration decisions made, and
- (4) the feedback on the choices made in (3) that either maintains a current state of resource coordination or cause a breakdown in an existing state of resource coordination.

The first two, activity configuration and resource knowledge, are primarily cognitive dimensions. The last two, alteration decision and task environment feedback, are primarily practice dimensions. The entire process is depicted in Figure 3. Each task environment has its own unique resource alteration cycle.



**Figure 3. The resource alteration cycle.**

These components and their linkages are kept separate for analytical reasons. In reality, they represent different aspects of a relational totality. Each is discussed next.

## 7.2. Activity configuration

It is clear that the way actors interact with asset characteristics impacts the way these actors understand these asset characteristics. However, resource understandings are not linked directly to asset characteristics. Rather they are linked to the employment of these asset characteristics through activities that actors are either mindful of or that are part of habitual activity.

Actors are unable to bring into awareness some aspects of reality. This argument resembles the concept of cognitive blind-spots, i.e., an inability to perceive certain aspects of the environment (cf. Porac et al., 1989; Zajac & Bazerman, 1991), but is different. Habitual activities are those that an actor performs in a routinized manner, that is part of an internalized practice, or any other aspect that an actor takes for granted and relies on for everyday activity. Habitual activity is what makes out the non-conscious part of cognition (cf. Hodgkinson & Healey, 2011; Evans, 2008; Loewenstein, Rick, & Cohen, 2008) and that is part of patterned activity that is repeated over time. Habitual activities are those we know so well that we literally cannot remember them. Actors in task environments will habitually perform some of their resource related activities, i.e., the way they interact with asset characteristics, the way they enact rules, and the way they coordinate resource activities with other actors in other task environments.

In addition to habitual activities, the set of resource related activities involves also those activities that an actor is mindful of. These are the activities that an actor actively considers and thinks about, to which he or she applies their limited attention. These are the activities that an actor can consciously recall as he or she considers asset characteristics and potential resource related activities. In contrast, asset characteristics that are part of habitual activities are not initially available for conscious recall during moments of resource alteration decisions (an observation that informed the decision availability axiom).

The idea that there exist two different systems of thought is, as above mentioned, well established (Kahneman, 2011). Historically, these two modes are considered to be like “gears” or separate parts, where under conditions of stability or ‘business as usual’ actors rely on cognitive shortcuts informed by repeated habitual activities. Thinking becomes mindful or active under conditions such as novelty, discrepancy between expected and actual outcome, and during specific requests of active thinking (Louis & Sutton, 1991). The model proposed here contrasts this view. It instead joins an emerging recognition that the two are simultaneously shaping thought and subsequent action (cf. Hodgkinson & Healey, 2011). The model separates the mindful and the habitual for analytical reasons. In reality, the habitual and the mindful are inextricably linked and make out the cognitive context of activity configurations (cf. Regnér, 2008).

Furthermore, not all mindful activity is of equal importance. Some mindful activities are more important than others in shaping resource understandings. Paper IV, shows how certain parts of an activity configuration seem to have some priority in determining the outcome when actors create resource related mental representations. This means that activity configurations may share a semblance of similarity when we consider only the observable elements, but the way they shape understanding is relational. It is this step from activity configurations to resource knowledge that is illustrated with the letter *a* in Figure 3. It is also this assumption of an ever present divergence, as opposed to shared mental representations, that distinguishes the

model developed here from more recent developments in the cognitive micro-foundations literature.

The resulting resource knowledge is considered next.

### **7.3. Resource related knowledge**

The configuration of habitual activity and mindful activity underlies an actors resource knowledge. There are two types of resource knowledge that are important for the way resource alteration unfolds. The first is a practical understanding involving resource related activities, i.e., schemata of resource activities. The second is the actor's resource related mental representations.

The schemata of resource actions builds on Schatzki's (2001) concept of shared practical understanding, i.e., the aspects of a social context that include all that which is assumed as givens by the members of that social context (see also, Bourdieu, 1990: 66–67). It is the social accomplishment's equivalent to script based thinking and is based around non-conscious application of practical knowledge that needs no component of active thinking. Schemata of resource activities make out the part of practical resource knowledge that is inextricably linked to that task environment. Here, knowledge is taken for granted, it is a 'given' to the members of that task environment. This knowledge includes the asset characteristics underlying a certain utility, the reason that certain enacted rules exist and must exist, and what constitutes an existing resource related coordination across task environments.

In contrast to these schemata of resource activities, resource schemas are the mental representations of resources that actors are conscious about in developing their resource alteration proposals. Danneels (2011) suggest that these schemas related to certain properties of certain asset characteristics and how this influences the representation of the potential uses of these asset characteristics. This dissertation expands the resource schema concept to include also the representations of enacted rule environments and the coordinated resource activities that exists. This moves the resource concept away from its increasingly objectified view toward being considered as a social accomplishment.

As mentioned in Chapter 2, there exist ontological issues, both with considering resource related knowledge as non-conscious dispositions, and as conscious mental representations. In the former, the task environment becomes a carrier of acquired characteristics, and in the latter the environment is devoid of meaning as meaning is made of it. The proposed model considers schemata of resource activities and resource schemas as two co-existing parts. Here, task environments are laden with meaning carried by fields of practice. These practices shape both how specific routines evolve, and the mental representations that are created during resource assessment.

To illustrate the parallel nature of the habitual and the mindful, consider the institutionalized strategy practice of an away-day where key decision makers use various strategy tools, such as a SWOT, in their making of strategy. One can argue that, and interviewees would probably describe, such an instance as representing an episode of active and deliberate thought, where resource schemas matter in mindful ways, and where resource related decisions represent the

outcome of such mindful moments. There exist an increasing body of literature suggesting that such statements are based on our limited awareness of our own consciousness (cf. Evans, 2008; Lieberman, 2007; Camerer, Loewenstein, & Prelec, 2005). In line with these findings, Chapter 5 discusses how actors are mindful of the historical and contextual practices they draw on, but not of the conclusions they draw. The model aims to capture this duality between the mindful mental representations and the habitual schemata of resource actions by including both in an actor's resource knowledge.

Based on this resource knowledge, actors in a task environment will propose and work toward certain resource alteration options. When actors within a task environment agree upon a choice they alter resources toward increased adaptation or specialization. It is this process that the letter *b* indicates in Figure 3.

#### **7.4. Resource alteration decisions**

The activity configurations and the resource knowledge are here both considered cognitive aspects as they relate to dynamics that take place in the mind of an individual. In contrast, alteration decisions relate to observable activity.

There are numerous ways in which resource alteration choices could be categorized. The model uses Eisenhardt and Martin's (2000) evolutionary elements of adaptation and specialization. Adaptation is often described as a composite construct, in part a deliberate aim, in part the process of adapting, and in part an outcome (cf. Schindehutte & Morris, 2001). A firm that has a high adaptation capacity is able to respond to market changes and has a higher probability of finding a new state of coordinated resource activities as compared to firms that are more specialized. Thus, adaptive firms are those that display a plasticity in their resource related activities within and between their task environments.

In contrast to adaptation, specialization involves resource dynamics that enhance survivability in stable environments. Here, stability refers to the long term *exchanges* between task environments. Alteration decisions that favor specialization are those that enable maximum utility within a given set of asset characteristics, enacted rules, and coordinated resource activities. Specialization does not directly alter coordinated resource activities, as adaptation often does, but is every bit as dynamic as adaptation. Both adaptation and specialization materialize in the same kind of observable phenomenon, i.e., work that increases fitness in an environment. The difference being that dynamic environments tend to favor generalist traits, e.g., a high level of social cognition and transactive memory (cf. Healey et al., 2009). In turn, stable environments tend to favor specialist traits, e.g., low cost production of value offerings. To understand this argument, consider Darwin's Galápagos finches. The beaks of the finches are highly specialized to specific food sources. Removing a food source would constitute environmental change that necessitates adaptation, i.e., being able to eat something else. Simply getting better at eating the food source, i.e., wasting less energy, constitutes specialization.

The resource dynamics that take place within a task environment during specialization are troublesome to spot by actors who are not members of this task environment. This is because the coordinated resource activity is likely to remain unaltered. Specialization increases resource related divergences over time between task environments. This is also why it is highly unlikely

that there will ever exist shared mental representations in organizations with distinct task environments and why coordination is only enabled by shared understanding of practical activity.<sup>11</sup>

The exchanges that happen between an organization's task environments are different from nuts and finches in at least one significant way, task environments can signal shifts to coordinated resource states more quickly than can evolutionary processes. These signals act as feedback mechanisms that either maintain or cause breakdowns in existing coordinated resource activities between task environments.

## 7.5. Feedback between task environments

Every resource alteration proposal, be it adaptation or specialization, is subject to feedback once it affects the coordinated task environment (arrow *c*). This coordinated task environment is the locus of feedback related to resource activities shared between task environments. The model considers two extreme types of feedback: feedback that maintains an existing state of coordinated resource activities, and feedback that cause breakdowns in an existing state of coordinated resource activities.

A simple case of task environment feedback relates to the specialization that every task environment tends toward when the external environment is relatively stable. Actors are here evaluated on the basis of how efficiently they can supply an agreed upon deliverable to other task environments. Most of the time, this feedback is simply in the form no input and thus maintains the coordinated resource activities already in place. Occasionally, the coordinated parts get affected by alteration decisions. When this happens, actors give feedback based on how they interpret the alteration attempt. If an actor agrees that the alteration attempt is feasible, then the alteration option is reinforced.

Over time in stable environments, actors search for a state of coordinated resource activities that: (1) makes sense to all task environments involved (but in all likelihood makes different sense), and (2) moves toward the most efficient state possible. And as the cardinality of the set of shared resource activities is reduced, the number of possible resource alteration options decreases. This reasoning is analogous to a smaller black triangle in Figure 2. Firms in stable environments are known to become rigid and to find adaptation difficult. The model presented here suggests that one reason for this rigidity is that firms, once specialized, are unlikely to be able to find a new state of coordinated resource activities since the intersection between what the involved task environments believe is possible is so small.

The second case of task environment feedback happens in dynamic environments. There exists a rich stream of literature on how divergent mental representations and divergent task environments matter (or not) for the direction of resource alteration (cf. Kaplan, 2008a; Regné,

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<sup>11</sup> Healey et al. (2009) argue that shared understanding can exist in the shape of transactive memory—meta-knowledge of other's expertise and skills. My findings in Papers II-IV suggests that transactive memory does not exist as a shared understanding of expertise and skills. Instead, what exists is a shared understanding that a particular coordinated activity takes place. Healey et al. rely on perceptual measures where respondents are asked to rate how well they believed they knew the expertise of other members and how well a team works together in a coordinated fashion. The issue here is that a respondent would rate a stable coordinated resource activity as high regardless of whether that activity was based on contradictory mental representations or a consensus one.

2003; Walsh, 1988; Dougherty, 1992a; Stacey, 1995). The model presented in Figure 3 proposes that dynamic environments are different from stable ones mainly based on how they affect the activity configurations of decision makers. In stable environments, mindful activity becomes internalized and habitual as a coordinated resource state is maintained. In dynamic environments, it is possible but not necessary, that habitual activities become mindful. I write possible but not necessary because there is nothing that prevents two contradictory resource schemas and/or schemata of resource activities to allow one and the same activity. Framing contests (Kaplan, 2008a) represent one such coordinated social interaction that makes the habitual visible (although the contest and conflict itself may not reveal the nature of the habitual since the locus of conflict, often a coordinated activity, is different than the locus of disagreement, often a core practice or belief).

Feedback alters activity configurations, which triggers a new cycle. In contrast to extant literature, feedback is here not conceptualized as a behavioral property (cf. Stacey, 1995). Instead, feedback impacts the activity configurations that shape resource understandings, which represent the cognitive context of these activity configurations (cf. Regnér, 2008). In the model, feedback (e.g., framing contests, dialectical processes, or simply silence) alters activity configurations, which alters resource knowledge and resource alteration proposals, which prompts more feedback *ad infinitum*.

## **7.6. Concluding remarks on the dynamics in the model**

The model proposed here portrays resource alteration as a perpetual cycle. It suggests that resource use over time both enables new resource alteration options as new resource related knowledge is attained, as well as makes certain unfavorable options appear favorable as important aspects become taken for granted. The model suggests also that resource knowledge is in part an experiential understanding of the resource, and in part a mental representation of the resource. Based on their resource knowledge, actors then propose and attempt resource alteration choices that they consider among available options. These alteration decisions may or may not be considered as possible by other task environments. This feedback alters the activity configuration, and the cycle begins anew.

The model makes visible the cognitive context of resource dynamics (cf. Regnér, 2008). It also includes the surrounding context that shapes the mental representations of cognizing actors. Regnér (2008) argues that increased insights into resource dynamics may contribute to our understanding of activities that create and modify organizational assets. The theoretical model proposed here provides one possible way to better understand what takes place as actors within and between a firm's various task environments work with resources. The proposed theoretical model helps us better understand what type of resource dynamics exist within a firm (i.e., adaptation and specialization), how and where cognitive conflicts emerge as actors engage in resource alteration work (i.e., pluralistic resource understandings create conflicts around coordinated resource activities), and why organizations become more rigid over time in stable environments (i.e., specialization drives actors toward viewing a minimum of the same resources).

# 8. Conclusions and implications

## 8.1. Conclusions

The purpose of this dissertation was to extend theory on how resource understandings and resource alteration unfold within and between a firm's different task environments. Based on three in-depth field studies, this dissertation shows how people throughout an organization understand resources as they use them, and use resources based on how they understand them. Resource usage and resource understandings are reciprocally linked in an ongoing cycle of resource alteration. To view resource usage and resource understandings as cyclical, sheds new light on some common aspects of everyday organizational reality. This has implications for both scholars and practitioners.

## 8.2. Implications for theory

### 8.2.1. A response to the emerging criticism in resource focused management theory

Resource focused strategic management theories, specifically the resource based view of the firm and the dynamic capabilities perspective, have been criticized for the indeterminate nature of its basic concepts, i.e., resources and value (cf. Kraaijenbrink et al., 2010; Priem & Butler, 2001a, 2001b), and routines and capabilities (Felin & Foss, 2009). There is a real lack of clear definitions in both the resource based view and the dynamic capabilities literature and they are both prone to all-inclusive tautological definitions without clear distinctions from related concepts (Wang & Ahmed, 2007; Arend & Bromiley, 2009; Barreto, 2010).

Conceptualizations of resources, resource understandings, and resource alterations are often contradictory in the resource focused management research (cf. Arend & Bromiley, 2009). For instance, while Zollo and Winter (2002) conceptualize dynamic capabilities as being historically stable resulting from acquired characteristics. Rindova & Kotha (2001) conceptualize dynamic capabilities as a co-evolutionary enactments of products, services, resources and the structures of the organization, how it functions, and the competitive advantage that this emerging system enables but not necessarily realizes. Part of the challenges facing the resource focused management theories stems from partial inclusion of intellectual roots. This is true both when researchers claim to build on assumptions of economic rationality (Arend & Bromiley, 2009), as well as for cases where researchers claim to build on Penrose (Foss, 1999). The analytical framework in Chapter 3 and the theoretical model in Chapter 7 provide two examples of how theory can be developed using multiple streams of literature where both the cognitive and the experiential is considered.

As Mahoney (1995) argues, coarse-grained conceptualizations of firms and concepts such as resources, resource understandings, and resource alterations are not suitable for guiding managers in their everyday activities. Drawing on both cognitive theory and practice theory, this dissertation joins recent calls for elucidating the micro-foundations of purposeful strategy activity (Felin & Foss, 2009; Regnér, 2008). It focuses specifically on the cognitive context of

activity configurations underlying resource dynamics (Regnér, 2008). By focusing on three resource dimensions—i.e., asset characteristics and mental representations thereof, enacted rules environments and mental representations thereof, and coordinated resource activities and mental representations thereof—this dissertation develops a tentative theoretical model presenting resource alteration as a perpetual cycle where resource understandings and resource alterations are reciprocally linked.

The theoretical model helps us understand dynamic capabilities in a different way. First, it suggests that firms do not possess a coarse-grained dynamic capability that allows it to purposefully alter its resources. Instead, this dissertation suggests that task environments are constantly engaged in resource dynamics. The ability to alter resources, or lack thereof, in response to environmental change is explained by the likelihood that the various task environments can settle on a new coordinated set of resource activities. This settlement has to be reached not by reducing divergences in resource understandings between actors, but despite of existing divergences and the divergences that are created as strategy work unfolds.

The proposed theoretical model helps us understand why settling on a new set of coordinated resource activities is particularly difficult. Resources link together task environments within an organization and resource alteration choices made by actors in one task environment can directly impact actors in another task environment. When impact is noticed, the reaction from actors in other task environments act as feedback that alters the original task environment and leads to revised resource understandings. This perpetual cycle underlies resource dynamics within an organization. The argument developed in this dissertation suggests that firms may possess ‘within task environment’ dynamic capabilities and ‘between task environment’ dynamic capabilities. The first relates to the ability of actors within a given task environment to alter resources in ways that change productive outputs. The second relates to the ability of actors between several task environments to find and settle on a new set of coordinated resource activities. Conceptualizing resource alteration as cyclical and considering dynamic capabilities as taking place both within and between task environments, helps us understand, for instance, why Kodak failed despite the fact that it initiated the digital revolution and built a coveted after patent portfolio. Kodak’s task environments displayed resource dynamics in ways that made it difficult for actors to settle on new coordinated resource activities over time.

### **8.2.2. Implications for cognitive theory and resources**

Conceptualizing organizations as comprised of multiple task environments—each with its unique set of activities—allows us to investigate how specific configurations of activities determine resource schemas and resource alteration choices.

The literature on resource schemas and resource alteration conceptualizes resources as separate entities with objectively assessable resource properties (cf. Danneels, 2011). This dissertation complements this perspective. The dissertation proposes that resources are part of task environments and that actors understand resources based on the activity configurations within these task environments. This shifts focus away from resource schema accuracies to the particular activity configurations that shape resource understandings.

Danneels (2011) argues that resource schema inaccuracies can lead to resource alteration choices that are detrimental for the firm's long term survival. In his view, resource schemas determine the direction of renewal efforts and performance outcomes depend on whether that particular resource commitment is competitive or not. In contrast, this dissertation argues that resource understandings are far more dynamic. A new strategy represents a commitment to be resourced, and during that process practitioners with divergent resource schemas search for a congruence in resource related activities. Organizations conceptualized as sets of task environments is one way to investigate resource related activities, both those activities that are unique to meaningfully selected sets of actors and those activities that are shared.

### **8.2.3. Implications for practice theory and resources**

There have been calls for investigations into how resource alteration unfolds within firms (cf. Eggers & Kaplan, 2013; Regnér, 2015). The resource alteration cycle model developed in Chapter 7 is a response that extends resource alteration theory. This cycle—moving continuously from activity configurations containing the cognitive context of actors (cf. Regnér, 2008), through resource knowledge, through alteration decision, to task environment feedback—is idiosyncratic to each meaningfully selected task environment. Here, resource alteration is conceptualized as the search for congruence in resource activities within and between task environments as opposed to a search for congruence in thought.

However, finding a new state of coordinated resource activities is costly and actors are neither aware of the range of possible resource states nor their fitness (cf. Helfat et al., 2007). This reduces the potential of realizing the value of any optimal solution. Also, the inherent dynamics of the external environment and the organization itself means that an optimum point would always be moving; moves that may necessitate quite radical adjustments for a firm. To what extent firms should engage in a search for congruence in resource activities is therefore open to question. In some cases, thinking outside the confines of existing task environments may not only be extremely difficult, but also so costly that searching for a new state is simply not feasible. Identifying these cost determinants is a subject for future research.

### **8.2.4. Implications for fine-grained studies**

This dissertation offers an alternative to research focused on shared resource schemas. Efforts to reach states such as 'common understanding,' 'accurate understandings,' 'meaning alignment,' 'shared beliefs,' and 'schema congruence' is problematic because it promotes the idea of such states as both attainable and desirable. The appended papers and this extended summary suggests that these aligned states are theoretically implausible. There exists no accurate understanding. Rather, practitioners within firms understand resources as they use them, and use resources as they understand them.

Also, knowing that schema divergence may cause problems is of little practical use when such divergences are not readily apparent to practitioners. It is necessary to equip managers with the means to surface incongruent divergences. And even then, it is not feasible to surface all incongruences, only meaningful ones. Meaningful ones are those that lead to extended periods of cognitive conflicts and an inability for task environments to become coordinated around resource activities. Paper IV illustrates how meaningful incongruences can be identified and

mapped using connectivity mapping which: (a) connects beliefs to activities, and (b) surfaces internalized practices prior to resource alteration decisions. However, there remains much to do in order to develop connectivity mapping as a tool within management research, and to validate it in practice. Hodgkinson's 2012 keynote speech at the frontiers in managerial and organizational cognition conference is a call for further attention to these matters. As is the recent call for developing methods at the intersection between strategy as practice and cognition that actively considers the unconscious (cf. Hodgkinson & Clarke, 2007).

The model proposed in Chapter 7 also suggests that prolonged periods of relative stability decrease the likelihood of successful resource alteration outcomes due to how activity configurations affect resource schemas. This is because stability reduces the overlap between what task environments—connected by coordinated resource activities—consider as possible resource alterations. Consequently, organizations may be able to alter task environment specific capabilities, yet fail in leveraging them when environmental changes necessitate an alteration in coordinated resource activities that link together multiple task environments.

Finally, this dissertation extends the practice literature through an investigation into the habitual and mindful aspects of practice. The cognitive context of strategizing represents the biggest opportunity for future research (cf. Hodgkinson & Clarke, 2007; Regnér, 2008). For instance, researchers could investigate and identify the types of activities that determine the meaning carried in fields of practice. This would entail identifying more types of mindful activities that principally carry beliefs and meaning. It is also important to identify the moments of practice that actively repel certain meanings, consequently creating 'blind spots' for what information the organization collects, or organization-wide inability to adapt to certain types of changes. Set theoretic methods are particularly suitable for informing such investigations. Set theory has the potential of extending this dissertation's focus to map out the task environments throughout an organization and identify sources of predispositions and the potential for emerging conflicts.

Here, it is important also to go beyond cold cognition and consider the affective aspects of resource related decision making. Especially since actors often (mis)interpret resource related decisions as having to do with power and politics; topics which are emotionally charged. We know that emotions shape conscious thought in often non-conscious ways. Recent developments in neuroeconomics offer intriguing insights that may help us understand the dynamics inherent in fields of practice. As Whittington (2006) notes, strategy practitioners are not passive recipients of practice but actively engage in improvised performances. Dual-process theory and neuroeconomics may help us understand the nature and cause of these improvisations.

### **8.3. Implications for practicing managers**

The three managerial implications offered here are developed with the following criteria in mind: they need to be grounded in the fine-grained reality of everyday interaction, they need to focus on the importance of practitioners' actions in producing organizational outcomes, and they need to be aimed to enable changes or reinforcement of practice pertaining to certain outcomes. Three managerial implications are offered here, related to: (1) the role of practice in

resource assessment, (2) cognitive conflicts and emerging framing contests, and (3) the use of strategy tools. These are explored next.

### 8.3.1. Resource assessment

When environments change and there is a need to respond, managers often ask two questions: (1) “What are our resources?”, and (2) “How can we use them?” There exist multiple managerial tools and advice in the literature on this subject. I contend, however, that the efforts inspired by these tools and the literature may be unfruitful, and even damaging to a firm, since they can create situations where the actors in a firm finds themselves unable to carry on strategy work. The reason for such stalemates is the assumption of objective resources that underpins many of these tools and the mainstream literature. Showing that resources are not objective and that there are multiple task environment specific understandings of resources is one of this dissertation’s main managerial contributions.

The proposed view of resources as context-specific, may seem at odds with how resources are normally conceptualized, and to an extent may even appear counterintuitive to readers. Surely, the various machines, tangible assets, raw materials and other capital resources available to firms must exist. The quick response to any such criticism is: “Yes, but it exists differently to different people—who do different things—and at different times.”

The long answer to whether or not resources exist independently of the practices specific to a task environment depends on the specific resource type. Certain resource types are more or less obvious. Culture as a resource is admittedly fuzzier and ill-definable than is uranium. But even what we consider clearly defined resources today are in many ways a result of our technological advancements. Uranium was not an energy resource until the physicist Enrico Fermi discovered the potential of nuclear fission in 1934. And flint is no longer a contested raw material for toolmaking. Admittedly, certain resources have more objective properties than others, but the objective properties we are aware of seems to change over time. Our understanding of resources has developed over time following scientific advancements. We have discovered some properties that we consider objective today, e.g., that Uranium and Radium are radioactive. Correspondingly, our regulatory rules have changed (e.g., in the early 1900s, regulations required that health drinks contain radioactivity if labeled as such).

Treating resources as subjective and in part related to how we as humans coordinate activity and make up rules as we learn about the various properties of the resources we use has another major managerial implication. Managers are urged not to consider the practice of resource assessment as a means by which some objective truth can be uncovered. The practice of resource assessment involves a series of activities through which members of various task environments form an understanding of the asset being assessed. And since different practitioners throughout an organization experience a particular resource in their own unique ways, it is unlikely that practitioners from different task environments will ever understand a resource in the same way. For instance, a human resource manager who views innovation as the outcome of individual level creativity and incentives, will interpret product developers as a resource differently than will an R&D manager who views innovation as the outcome of a process.

Practitioners need to focus on the shared practical understanding of a particular resource. That is to say, the possibility of reaching a common agreement of what resource related activities are possible. Sharing the beliefs and assumptions underlying such practical understandings are not necessary in order for various task environments (e.g., functional areas, professional workgroups, and/or hierarchy levels) to work. In fact, many coordinated resource activities unfold in settings where practitioners have contesting and contradictory beliefs of why these activities take place. These divergences are necessary for an organization to function, but it may also severely hinder successful resource alteration outcomes. Recognizing that resource understandings are pluralistic throughout an organization can help managers avoid unproductive affective conflicts, i.e., emotional conflicts, which often emerge following cognitive conflicts, i.e., task disagreements in ways developed next.

### **8.3.2. Cognitive conflicts and framing contests**

Cognitive conflicts are task related conflicts based around divergent perspectives. Framing contests are the practices by which such cognitive conflicts are settled. These conflicts are not to be confused with affective conflicts which relate to interpersonal relationships. Cognitive conflicts are strictly limited to task disagreements (cf. Jehn & Mannix, 2001; Floyd & Lane, 2000). In many ways, cognitive conflicts are good as they represent multiple viewpoints around a particular task which may improve the final solution. However, cognitive conflicts are often misinterpreted as affective conflicts. When that happens, task disputes become personal disputes.

Another misinterpretation that may occur is that of a task disagreement becoming interpreted as a political struggle. Task disagreements around resources are particularly likely to be interpreted as political games given how politicking is often associated with a control over resources. While politics may involve contests about resource interpretations, this dissertation's findings suggest that such conflicts are often task related in nature. People do not engage in such conflicts because they know that a certain interpretation will give them more power, they do so because they honestly believe that a certain interpretation is the correct one. Oftentimes, they are not even aware of how others perceive the same resource.

To this background, managers should be more open to interpreting resistance and politicking in the light of divergent resource understandings. This may open up for a more constructive dialogue where cognitive conflicts can contribute to reaching better solutions. Note also that a realization of divergence in resource understandings may be asymmetrically distributed throughout an organization. That is to say, certain members will be more or less aware of differences in how resources are interpreted. This is an important consideration. The framework developed in Chapter 7 may help managers realize and uncover these differences.

The particular context in which an individual and the resources are embedded also affect both the awareness of divergence, and the specific ways resources are understood. It is likely that untraditional career ladders (where a practitioner has experienced multiple professional communities and organizational contexts) are signs of individual capabilities that facilitate a move toward cognitive conflicts. It can help actors with avoiding role attribution when considering the input from other functional areas. Role attribution refers to misinterpreting what other people say based on what their professional roles. For instance, when product developers com-

plain about documentation, it is easy for other actors to view product developers as being uncontrollably creative and therefore likely to dislike administration. The dangers of attributing behavior to roles is that it limits cognitive conflicts and honest discussions centered on problems and solutions to those problems. Practitioners need to take these aspects into consideration when judging the actions of others. Failure to do so can easily turn a situation into the finger pointing and blame games that many of us have experienced.

Alternatively, managers can implore their organizational actors to disregard cognitive conflicts where possible, and allow coordination and resource understandings to form through resource alteration feedback rather than attempting to frontload that understanding (which may be both a costly and highly uncertain undertaking). This mode of operating gives credence to management methodologies that promote a culture among task environments where conflicts are accepted as an inevitability.

### **8.3.3. The use of strategy tools**

The third and final advice offered to practitioners is to actively consider how the past is used during strategy episodes such as strategy away days and workshops. Commonly used strategy tools such as SWOT, PEST, segmentation, brainstorming, etc., may make it difficult to question assumptions that are taken for granted.

The specific way these tools are used often involves focusing ongoing debate around a particular topic of relevance. But when people consider resources, they commonly rely on unquestioned interpretations of past resource related activities. What may seem as a mindful exercise, may merely be a mindful rearrangement of taken for granted 'facts.' To get around this issue, managers are encouraged to include representatives from the task environments with whom they coordinate resource activities. This helps stimulate cognitive conflict.

Another possibility is to introduce connectivity mapping as a strategy tool during such strategy episodes. Connectivity mapping is particularly suitable for mapping what practices are used to form certain beliefs. It surfaces taken for granted assumptions and it allows for reflection around these assumptions which is beneficial for cognitive conflicts. Connectivity mapping as a method is described in the appended Paper IV.

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