ACQUISITION CAPABILITY DEVELOPMENT: BEHAVIORAL AND COGNITIVE LEARNING PERSPECTIVES

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Proefschrift

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To my loving and beloved parents –

you are my greatest teachers.

PREFACE

"A doctorate is an academic degree that indicates the highest level of academic achievement."
- Wikipedia

"The average Ph.D. thesis is nothing but a transference of bones from one graveyard to another."
- J. Frank Dobie

Although, strictly speaking, the above two descriptions of the Ph.D. are not mutually exclusive, the fundamental messages that they convey are clearly quite different. Needless to say, the typical academic will be more receptive to the former. Nevertheless, the latter may be more insightful, since it represents an apt – albeit somewhat harsh – reminder of what the academic arguably fears most: a lack of impact. Few scenarios, I believe, are as disturbing as that of one's research ending up in a drawer without having the opportunity to touch the minds of others. And even if one's work has an impact on others, one can only hope that it does so in a positive way.

Although these thoughts have continuously plagued me on my own journey toward the Ph.D. – and will, no doubt, continue to do so throughout my career – this journey has been, by far, the single most rewarding one I have ever undertaken. The life of a researcher has, in nearly all respects, exceeded my expectations and, in all honesty, I find it difficult to imagine any other way of spending my time that demands so much of me, yet that offers me so much in return.

More specifically, three events have served as eye-openers and have since reassured me that academic research may be the right career path for me. In order of increasing "intensity," the first one was the shift from textbooks to research papers when I joined the Ph.D. program. Almost overnight, the material touched on during undergraduate courses became infinitely more interesting. Second, the process of writing my first actual paper made me realize that conducting research oneself is even more exciting than studying that of others. Finally, the feeling of getting my first paper published in the targeted journal was simply indescribable. Although at the same time making me acutely aware of the long road of learning still ahead of me, this personal milestone suggested that all the blood, sweat, and tears had not been shed in vain. To me, this

initial publication represented a modicum of professional acceptance and a confirmation of the legitimacy of my work – one that I hope to be able to repeat many times in the future.

I'm honored and proud to have been a part of the Department of Organization and Strategy at Tilburg. Without this opportunity, I'm convinced that my future would have looked very different and considerably less interesting. It is this department that sparked my interest in academia and it is this group of individuals and their work that shaped my own research agenda. I owe a great debt of gratitude to all past and current department members who have, in one way or another, had an impact on my academic and personal development – and there are many.

Regarding (former) faculty whose courses and advice have had a major influence on me, my sincere thanks go out to Harry Barkema, Joe Clougherty, Jean-François Hennart, Xavier Martin, Hans Pennings, and a number of faculty from other departments, most notably Tammo Bijmolt, Bertrand Melenberg, and Arthur van Soest. Special thanks go to Aswin van Oijen, whose advice, feedback, and friendship has helped me a lot over the years. In fact, if he hadn't offered me a position as his research assistant, I may have never ended up pursuing my Ph.D.

Many other (former) faculty within the department have, wittingly or unwittingly, played a role in my development, either as active providers of feedback or as regular sources of pleasant conversation in the hallway: Jonghoon Bae, Eric Dooms, Sytse Douma, Rian Drogendijk, Marjan Groen, Job de Haan, Dean Hennessy, Astrid Kramer, Harold Krikke, Cindy Kuijpers, Andriew Lim, Bert Meijboom, Fons Naus, Niels Noorderhaven, Bart Nooteboom, Mark Overboom, Sjoerd Romme, Marloes Röthengatter, Alma Timmers, Bart Vos, and Filippo Wezel. Several administrators and secretaries have also helped me tremendously during my stay at Tilburg, most notably Nienke Boelhouwer, Heidi van den Borne, Sandra de Bruin, Ank Habraken, Eva Jonkman, Nancy Kanters, Ailsa Rainer, and Paul van Veen. Many thanks to all of you.

Of course, my experience as a Ph.D. student wouldn't have been the same in the absence of other (former) Ph.D. students with whom to discuss – quite often in the middle of the night – coursework, projects, and everyday life to the extent that we had any: Mark Boons, Paulo Cunha, Ilya Cuypers, Youtha Cuypers, Jean-Malik Dumas, David Kroon, Anna Nadolska, Sandra Peter, and Arne de Vet. Thanks also to Sjoerd Beugelsdijk, Oleg Chvyrkov, Alex Eapen, Martyna Janowicz, Rekha Krishnan, Dorota Piaskowska-Lewandowska, Jeff Powell, Arjen Slangen, and

Mark van de Vijver, not to mention a large number of Ph.D. students from other departments. It was a great pleasure to have all of you around as colleagues and it will continue to be a pleasure to have you as friends. I wish you all the best with your lives and careers.

Regarding research assistance, I'm truly grateful for all the help that Mark Boons, David Kroon, and Thijs Peeters have provided. This dissertation would have been close to impossible without all the effort that you guys put into data collection and coding. Mark in particular has gone beyond the call of duty numerous times to astonish me with his data management expertise.

At the Management Department of Texas A&M, I would like to thank all my new colleagues for their collegiality and support. I'm grateful to "y'all" every day for offering me the opportunity to be a part of the great research environment you've built and for allowing me to learn from you. I can't think of a better place to continue my career. Special thanks go out to Asghar Zardkoohi (my very first link to A&M) and Duane Ireland (then Department Chair) for taking me in, and to Murray Barrick (current Department Chair) for his flexibility in the final stages of writing my dissertation. Furthermore, I owe a great deal to Subrata Chakrabarty for his selflessness in helping me out with crucial data management issues in Chapter 5. Many thanks also to Phyllis Washburn and Sabrina Saladino for taking on the formidable administrative burden that the recruitment of a European "alien" undoubtedly entails.

Turning to my doctoral committee, it is a true honor for me to have such an excellent selection of scholars evaluate my dissertation and preside over my defense. As for the internal committee members – Harry Barkema, Xavier Martin, and Niels Noorderhaven – you have no idea how profound your influence on me has been during my time at the department. In large part because of you, Tilburg has become a second home to me – and one that I hope to be able to visit often in the future. As for the external committee members – John Haleblian and Maurizio Zollo – your work has been an inspiration to me for as long as I can remember and, quite honestly, I can't think of anyone else who would have been more appropriate for me to have on my committee. Thank you for taking the time to come all the way to Tilburg for me.

Needless to say, I have saved some of the best for last. Although the Dutch, including myself, may not be known for their outward enthusiasm, I feel remarkably enthusiastic about having had the opportunity to write my dissertation under the supervision of and in collaboration

with my advisor, Harry Barkema, and my co-advisor, Xavier Martin. Your willingness to work with me intensively, your tolerance of my flaws, and your efforts to hone my skills have allowed me a glimpse of the craftsmanship that I so dearly hope to master myself one day. You have been invaluable in my attempts at making this dissertation more than "a transference of bones from one graveyard to another" and I greatly look forward to continuing working with both of you.

Harry, you and your work have shaped my research agenda and goals – as well as my mind – more than anyone or anything else. Your creativity in framing papers and your theoretical thoroughness have amazed me more than once. The countless discussions we've had about our projects – especially those during the revision process – are among the most powerful and enjoyable memories I have of my time as a Ph.D. student. Xavier, I'm forever grateful for having made the last-minute decision to ask you to be my co-advisor after you joined Tilburg. Your rigorous, structured approach to theorizing and your methodological prowess have been a continued source of admiration. My heartfelt thanks to both of you for everything you have done for me, in good times as well as in times when research could not quite be at the top of my priority list. I'm proud and honored to have had the opportunity to learn from both of you and start off my career under your guidance, and I hope I'll be able to make you proud in the future.

Last but certainly not least, I would like to express my deepest gratitude to my family. My sister, Natascha, has been a source of "vicarious learning" for as long as I can remember and will, no doubt, continue to be. If path dependence is as ubiquitous and decisive as social scientists argue it to be, then the path I'm currently traveling is, to a large extent, attributable to her. My wife, Pauline, is the best "thing" that ever happened to me – as corny as it may sound. If it weren't for her endless love, companionship, and support, my happiness – and sanity – would have surely taken a turn for the worse a long time ago. Indeed, her willingness to move halfway across the world for the sake of furthering my career is a testament to her selflessness. Finally, my parents deserve more gratitude than words can tell. Without their continuous encouragement and sacrifice, my sister and I could have never received the education that we did. And without their love and care, I can't imagine what life would have looked like for me today. It is to my mother and my late father that I am honored to dedicate this dissertation.

CONTENTS

CHAPTER 1

GENERAL INTRODUCTION

On occasion, mergers and acquisitions have been evocatively dubbed "murders and executions" by the popular press – and not without reason. Based on a variety of performance measures, piles of research have provided largely consistent evidence suggesting that the average acquisition[i] fails to live up to the acquirer's expectations (for reviews, see Datta, Pinches, & Narayanan, 1992; King, Dalton, Daily, & Covin, 2004). With failure rates reported to be as high as 75 percent (Marks & Mirvis, 1998), the typical deal is considered by many to be "dead on arrival" (Sirower, 1997: 17) or, at best, "a bet against the odds" (Fubini, Price, & Zollo, 2007: 1).

The above paints a sobering picture in light of the wealth of insight into such critical success factors as strategic fit (e.g., Ramaswamy, 1997; Harrison, Hitt, Hoskisson, & Ireland, 1991; Singh & Montgomery, 1987) and organizational fit (e.g., Datta, 1991; Haspeslagh & Jemison, 1991; Larsson & Finkelstein, 1999) that has been accumulated over decades of scholarly inquiry and disseminated by business schools and consultants throughout the world. In reaction, both academics (e.g., Haleblian & Finkelstein, 1999; Hayward, 2002; Zollo & Singh, 2004) and practitioners (e.g., Ashkenas, DeMonaco, & Francis, 1998; Paulson, 2001) have proposed that things may be easier said than done. Although firms may be well aware of what it takes for acquisitions to be successful in theory, effective implementation of these insights in practice is likely to require some capability that can only be developed through experience.

Indeed, given that less complex tasks, such as those at the operating level (see Argote, 2004; Yelle, 1979) or even such mundane activities as riding a bike (Polanyi, 1958), often demand considerable experience in order to be performed effectively, it seems all the more compelling that the success of strategic activities hinges on the presence of relevant prior experience. If so, then the guidelines and heuristics offered by the literature are likely to be too simplistic and decontextualized to be of great use in practice – much like a book on how to ride a

[i] Since few, if any, deals represent true "mergers of equals," the academic literature tends to label them all "acquisitions." Following this convention, I use this term throughout the dissertation.

bike would be. Following this line of reasoning, therefore, it does not seem outside the realm of possibility that research may simply not be able to teach firms how to do acquisitions.

In this dissertation, I present four papers that build on this basic insight. Rather than viewing organizational learning as an exogenous process that largely operates in the background, as most research has done in the past, I aim to contribute to a growing body of relatively recent work that has started to conceptualize learning as a fundamental part of strategy that can be actively shaped and directed by the firm (e.g., Beckman & Haunschild, 2002; Haleblian & Finkelstein, 1999; Haleblian, Kim, & Rajagopalan, 2006; Hayward, 2002; Kale, Dyer, & Singh, 2002; Zollo & Reuer, 2008; Zollo & Singh, 2004). More specifically, I build on behavioral and cognitive theories in management as well as psychology to study the acquisition behavior of firms over extended periods of time in pursuit of key insights into how they can optimize the learning process underlying the development of acquisition capability. In essence, therefore, I posit that although research may indeed be unable to teach firms how to do acquisitions, it may nevertheless be well able to teach them how to *learn* to do acquisitions.

Organizational Learning in the Context of Acquisitions

Prior research has distinguished between two general forms of learning – cognitive search and routinization (see Gavetti & Levinthal, 2000; Levinthal & Rerup, 2006) – which can be regarded as extremes on a continuum. The former implies that the firm invests time and resources in identifying a set of alternative courses of action, then compares them, and finally selects the one that seems most promising given the task at hand. The latter, in contrast, allows the firm to economize on such active information processing by simply reverting to what it has done in the past, thus giving rise to routines that are based on prior experience and that become ever more refined over time (Cyert & March, 1963; Simon, 1945).

In the absence of prior experience, the firm clearly needs to engage in cognitive search in order to learn, but as it gains experience, most tasks tend to become increasingly routinized. In the context of acquisitions (as well as other strategic activities), however, the empirical evidence is marked by glaring inconsistencies, as will be discussed in detail in the next chapter. Evidently, the relationship between acquisition experience and performance is far from straightforward. Given the vast literature on the subject, it seems hardly debatable that acquisitions are complex

events. That is, they consist of numerous interdependent sub-activities, many of which need to be customized to the specific deal at hand (e.g., Haspeslagh & Jemison, 1991; Pablo, 1994; Schweizer, 2005). As a result, the extent to which the firm can routinize the acquisition process is inherently limited, thus requiring it to engage in at least some active, cognitive search for each acquisition it undertakes to find effective courses of action (Cyert & March, 1963; Simon, 1945).

Hence, both cognitive search and routinization are likely to play important roles in determining the success of acquisitions. Accordingly, I attempt to take both cognition- and routine-based forms of learning into account in this dissertation.

Overview of the Chapters

Setting the stage for the rest of the dissertation, Chapter 2 provides an in-depth review of the literature on organizational learning in strategic settings, in which acquisitions have figured most prominently. After discussing early, largely empirically driven research from the 1980s to the mid-1990s, I distinguish between and review three streams of more recent work, which have substantially enhanced our theoretical understanding of organizational learning. Specifically, whereas the early studies tended to adopt a generic and somewhat a-theoretical "learning curve" perspective, the three more recent research streams have each contributed by breaking with key simplistic assumptions of the traditional literature. As such, they shed light on the mechanisms that differentiate organizational learning in strategic contexts from that in operating settings.

The key difference between organizational learning in strategic and operating settings, as touched on earlier, lies in the degree of complexity that the firm faces, which implies that strategic activities can usually not be routinized to the extent that operating activities can. Chapter 3 examines the implications of this for the effectiveness with which acquisitions can be engaged in. As such, this chapter aims to paint a broader picture of learning than has typically been done by incorporating insights on both cognitive search and routinization of experience.

Specifically, building on behavioral theory, I study when and how firms unlock synergies from their acquisitions over extended periods of time. I argue that initial integration is inevitably sub-optimal due to local search and that, as a result, acquisitive growth tends to weaken the acquirer's performance. Eventually, this forces the firm to engage in more distant search through major episodes of organizational restructuring, which helps it to more fully unlock the

synergistic potential of its acquisitions. I then theorize about how these acquisition-restructuring cycles evolve as firms partly routinize acquisition and restructuring processes based on their experience. In essence, then, I conceptualize restructuring as a crucial second stage in the integration process and argue that prior work, by overlooking its role, may have systematically underestimated the degree to which firms benefit from their acquisitions. The theory is tested using panel data on firms undertaking almost 1600 acquisitions over the four-decade period from 1966 through 2005.

Whereas Chapter 3 intends to combine insights on cognitive search and routinization in a comprehensive behavioral theory of acquisition performance, Chapters 4 and 5 specifically zero in on the latter. To the extent that firms can routinize the acquisition process, prior research has shown that this tends to give rise to serious problems, since the heterogeneity across acquisitions makes it difficult to assess which pieces of the firm's experience base are applicable to the focal acquisition and which ones are not. First of all, Chapter 4 attempts to resolve the debate that has recently emerged on the roles that experience homogeneity and heterogeneity play in organizational learning. Although the literature has traditionally considered experience heterogeneity to be an impediment to productive learning, recent research, instead, suggests that it is an essential condition for learning to occur. Building on theory from cognitive psychology and using acquisitions as an empirical setting, I aim to reconcile these opposing arguments by suggesting that they are complementary and thus, that they are both crucial to the development of acquisition capability, although at different stages of the learning process. In particular, the dynamic theory developed in this chapter argues that the firm can shape its acquisition behavior such that the deleterious effects of experience heterogeneity are temporarily alleviated, though ultimately capitalized on. I test this theory by means of the same dataset used in Chapter 3.

Finally, Chapter 5 addresses the same basic problem of experience heterogeneity in the acquisition context, but proposes a different, though complementary, approach toward solving it. Rather than concentrating on the firm's strategic behavior, it focuses on its organizational structure. Again building on theory from cognitive psychology, I argue that acquisition capability is largely built at the level of the business unit (BU), rather than that of corporate headquarters as prior research has almost invariably assumed. Since the BU faces far less heterogeneity across its

acquisitions than the firm as a whole would, learning should, in principle, be less problematic at this level. This BU-level focus opens up an entirely new perspective on capability development. Specifically, I theorize that acquisition capability is developed through the interplay between BU-level pockets of experience located both within and across firms and that the effectiveness of this learning process depends on which experience the focal BU draws on. I test this theory using panel data on all the acquisition activity engaged in by each of the 269 BUs of 52 U.S. software firms, as well as that of their competitors, over the 40 quarterly periods from 1998 through 2007.

CHAPTER 2 [i]

HOW DO FIRMS LEARN TO MAKE ACQUISITIONS? A REVIEW OF PAST RESEARCH AND AN AGENDA FOR THE FUTURE

ABSTRACT

How do firms learn to successfully acquire other firms? We first review early work, mostly from the 1980s to the mid-1990s, testing the learning curve perspective on acquisitions and exploring some contingencies. We then discuss three more recent streams of research on negative experience transfer, deliberate learning mechanisms, and learning from others, which provide deeper insight into the contingencies and mechanisms of organizational learning in strategic settings, such as acquisitions. We conclude with an agenda for future research.

[i] This chapter is the result of joint work with Harry Barkema. It appeared in 2008 in the ***Journal of Management***, 34: 594-634.

INTRODUCTION

Worldwide acquisition activity hit an all-time record high in 2006 of $3.79 trillion (Thomson Financial, 2007). Ironically, much of the multidisciplinary literature, including two meta-analyses (Datta, Pinches, & Narayanan, 1992; King, Dalton, Daily, & Covin, 2004), suggests that most acquisitions fail. Many researchers have, therefore, explored determinants of acquisition performance and have found that the success of acquisitions hinges on synergy realization (Haspeslagh & Jemison, 1991; Hitt, Harrison, & Ireland, 2001; Larsson & Finkelstein, 1999), which in turn depends on prudent target selection (Barney, 1988; Harrison, Hitt, Hoskisson, & Ireland, 1991; Ramaswamy, 1997; Singh & Montgomery, 1987) and, in particular, on effective post-acquisition integration (Chatterjee, Lubatkin, Schweiger, & Weber, 1992; Datta, 1991; Haspeslagh & Jemison, 1991; Larsson & Finkelstein, 1999).

Despite all these insights into *what* needs to be done, however, many firms do not quite seem to know *how* to do it, since research suggests that the majority of acquisitions continue to fail (King et al., 2004). Apparently, things are easier said than done. Scholars are increasingly realizing, therefore, that learning from prior experience may be crucial in attempting to enhance the performance of acquisitions and other strategic activities (see Lei, Hitt, & Bettis, 1996). General Electric, for instance, has managed to routinize its acquisition process to the point that it is able to effectively integrate most of its acquisitions within 100 days (Ashkenas, DeMonaco, & Francis, 1998).

Although a considerable body of research has produced largely consistent evidence of learning curves in operating settings (see Dutton & Thomas, 1984; Dutton, Thomas, & Butler, 1984; Yelle, 1979), findings from the growing literature on organizational learning in *strategic* contexts is decidedly mixed. With respect to acquisitions, which account for most of the research conducted in this field, some scholars have found a positive relationship between experience and performance (Barkema, Bell, & Pennings, 1996; Bruton, Oviatt, & White, 1994; Fowler & Schmidt, 1989; Power, 1982). Others, however, have found insignificant (Baum & Ginsberg, 1997; Bruton et al., 1994; Hayward, 2002; Kroll, Wright, Toombs, & Leavell, 1997; Lubatkin, 1982; Newbould, Stray, & Wilson, 1976; Wright, Kroll, Lado, & Van Ness, 2002; Zollo & Leshchinskii, 2004; Zollo & Singh, 2004) or U-shaped relationships (Haleblian & Finkelstein,

1999; Porrini, 2004; Zollo & Reuer, 2003). This suggests that important contingencies are at play and thus, that researchers need to dig deeper.

Why is it so difficult to learn to acquire successfully? The answer is that acquisitions are far more complex than activities at the operating level, such as manufacturing, pricing, and distribution. The acquisition process consists of many interdependent sub-activities, such as due diligence, negotiation, financing, and integration, each of which is complex in itself (Hitt et al., 2001). Moreover, given that the execution of each of these sub-activities typically needs to be customized to the specific deal at hand (e.g., Galpin & Herndon, 2007; Haspeslagh & Jemison, 1991), no two deals are quite the same. As a result of these high levels of heterogeneity along multiple dimensions (Zollo & Singh, 2004), the acquiring firm is presented with a high level of causal ambiguity (Lippman & Rumelt, 1982), implying that it is difficult to disentangle "causal relationships between the decisions or actions taken and the performance outcomes obtained" (Zollo & Winter, 2002: 348) and, therefore, to learn (see also March, Sproull, & Tamuz, 1991).

Notwithstanding the importance of this fundamental insight into why the development of acquisition capability – or, for that matter, capability development in strategic contexts more in general – is a challenging task, researchers are only just beginning to understand how these difficulties can be alleviated. More insight into these issues is not only important from a research perspective, but from a managerial point of view as well. Hence, there is value in taking stock of past research, in outlining what remains to be explored, and in drawing an agenda for future work. We will first review early research that adopted a traditional "learning curve" perspective in the context of acquisitions and other modes of corporate development, as well as later studies that have investigated a host of contingencies. Then, we will discuss three more recent research streams, each of which relaxes one of the simplistic assumptions of the traditional learning curve view and thus, contributes to a better understanding of the contingencies and mechanisms of organizational learning in acquisitions. We will conclude with an agenda for future research.

A REVIEW OF EARLY RESEARCH

Although the acquisition literature is huge, only a relatively small subset of it has focused on organizational learning, which we define as the transfer of an organization's experience from

one event to a subsequent one.[i] Moreover, some of these studies have examined how firms learn from the knowledge embedded in target firms (Puranam, Singh, & Zollo, 2006; Ranft & Lord, 2002; Vermeulen & Barkema, 2001) rather than how firms learn from their acquisition experience, the topic of this paper. We will review studies published since 1980 in leading management journals: the *Academy of Management Journal*, *Administrative Science Quarterly*, the *Journal of International Business Studies*, the *Journal of Management*, *Organization Science*, and the *Strategic Management Journal*. We will also look at some as yet unpublished work. Furthermore, although the literature on organizational learning in strategic contexts seems to have started as an offshoot of the acquisition literature, researchers have studied the phenomenon in other settings as well, such as alliances and foreign direct investment (FDI). We will discuss findings from these related literatures where appropriate.

The Traditional Learning Curve Perspective

Early research on organizational learning in strategic settings adopted the traditional learning curve perspective that had thus far been widely applied in studies of learning in operating contexts, often at the level of individual workers or teams (see Dutton & Thomas, 1984; Dutton, Thomas, & Butler, 1984; Yelle, 1979). Although this perspective captures an important aspect of learning by assuming that an outcome – for instance, unit cost (e.g., Argote, Beckman, & Epple, 1990; Darr, Argote, & Epple, 1995), labor productivity (e.g., Epple, Argote, & Devadas, 1991), or, at a higher level of analysis, firm performance (e.g., Lieberman, 1987) – improves as the focal task is repeatedly engaged in over time, it is largely devoid of theory. Instead, research in this tradition tends to draw on classic work that documented continuous improvement in input-output ratios resulting from a growing stock of experience (e.g., Arrow, 1962) to make strong (implicit) assumptions about the learning phenomenon. First, it assumes that experience effects are always positive, thus failing to acknowledge that experience may be detrimental when transferred to a setting where previous lessons do not apply. Second, it equates

[i] Organizational learning could be defined more narrowly, for instance, as just positive experience transfer or, in other words, the appropriate generalization of prior experience to a subsequent event. However, for the purpose of reviewing the literature, we believe it is preferable to define it more broadly (see also Huber, 1991), such that it also includes counterproductive forms of experience transfer (e.g., Levinthal & March, 1993; Levitt & March, 1988).

experience with learning, although the former may not automatically imply the latter and more deliberate actions may often be needed for learning to take place. Finally, through its emphasis on "learning by doing," it focuses exclusively on the firm's own experience, thus largely disregarding the opportunities of firms to learn from the experience of other firms.

Despite the simplicity of the learning curve perspective, it has helped in gaining preliminary insight into the extent to which learning occurs in the context of acquisitions and other strategic activities. Research in the 1980s typically adopted a largely empirically driven approach, estimating models with variables that were believed to be relevant in explaining acquisition performance, including acquisition experience. Kusewitt (1985) investigated the acquisition performance of U.S. firms using both market and accounting-based measures. He found that the acquisition rate, as well as relative size, industry commonality, timing relative to the business cycle, payment method, and target profitability all significantly affected performance. Later research interpreted the negative effect of the acquisition rate variable as evidence of "a negative relationship between the number of previous acquisitions and organizational performance, suggesting 'corporate indigestion' and inefficient consolidation rather than the ability to learn to integrate effectively" (Fowler & Schmidt, 1989: 340). However, a more plausible interpretation may be that this variable, measured by the number of acquisitions per year, captured acquisition speed rather than acquisition experience.

In their own study, Fowler and Schmidt (1989) extended Kusewitt's (1985) findings by exploring another set of variables, including a more valid measure of acquisition experience: the number of acquisitions in the four years preceding the focal acquisition. Apart from significant effects for organizational age, the percentage of stock acquired, and acquisition hostility, they found a significant positive relationship between acquisition experience and market-based acquisition performance. This is consistent with evidence from early (Kitching, 1967) and more recent (Ashkenas et al., 1998; Hitt, Harrison, Ireland, & Best, 1998) qualitative research suggesting that firms with acquisition experience are better at breaking inertia and changing their organizational structure, improving the effectiveness and efficiency of the integration process.

Although the acquisition literature has the longest history of studying learning in strategic contexts, related fields offer additional evidence. For instance, Pennings, Barkema, and Douma

(1994) found positive experience effects for a variety of corporate expansion forms. Their analysis of expansions of Dutch multinationals showed that experience, measured by multi-year moving averages of the longevity of prior expansions, decreased the likelihood of divestitures of later expansions. In the alliance literature, Anand and Khanna (2000) examined alliances with at least one U.S. partner and found strong positive effects of alliance experience, measured by the number of prior alliances, on abnormal stock returns when a new alliance was announced. Similarly, Sampson (2005) found that alliance experience improved the innovative performance of subsequent alliances in the telecom equipment industry as measured through citation-weighted patent counts. In the divestiture literature, Shimizu and Hitt (2005) found that divestiture experience of U.S. firms moderated the relationship between the performance of acquisitions and the probability of their subsequent divestiture, suggesting that these firms learned when to divest.

Early Exploration of Contingencies: Types of Experience

Although research in the 1980s took a major step forward by distinguishing between different types of acquisitions in studying their performance, primarily based on industry relatedness (e.g., Fowler & Schmidt, 1989; Kusewitt, 1985; Lubatkin, 1982, 1987; Singh & Montgomery, 1987), it still treated acquisition *experience* as a homogeneous construct. By the 1990s, however, the significant effects uncovered by earlier studies had firmly placed the organizational learning phenomenon on the research agenda, even though others had found insignificant effects of acquisition experience (e.g., Newbould et al., 1976; more recent examples are Kroll et al., 1997 and Wright et al., 2002). What followed was a flurry of studies examining the effects of a variety of more specific types of experience on performance in strategic settings.

Macro-level contingencies. Strategy researchers started to explore whether learning varied by industry. Li (1995) used event-history analysis to examine the life histories of foreign firms entering the U.S. computer and pharmaceutical industries through acquisitions and other entry modes. He found that experience effects differed across industries. Using a binary measure that distinguishes between first and later entries, he found that experience in the computer industry decreased the likelihood of exit of later entries. No such learning effects were found for the pharmaceutical industry, which he attributed to firm-specific advantages such as patents and to government regulations in that industry. Hébert, Very, and Beamish (2005) also found that

acquisition experience in a given industry does not necessarily increase acquisition performance in that same industry. In the alliance literature, Hoang and Rothaermel (2005) found that the firm's R&D alliance experience increased the innovative performance of its R&D alliances in the biotechnology industry, but no such effect was found in the pharmaceutical industry.

International business scholars examined a second macro-level contingency: the country or culture. Markides and Ittner (1994) studied international acquisitions by U.S. firms and found that international acquisition experience, measured by a dummy variable indicating whether the acquirer had international activities or not, significantly increased short-term abnormal stock returns when making another international acquisition. Additional support for this was offered by Lee and Caves (1998), who found that international acquisition experience, again operationalized through a dummy variable, decreased the volatility of the acquirer's post-acquisition profits, particularly if the experience was from the same geographic region as the focal acquisition.

Barkema, Bell, and Pennings (1996) built on Cohen and Levinthal's (1990) idea that firms only learn if new experience is related to what they already know. These authors found that the general international acquisition experience of Dutch firms did not affect the longevity of their subsequent international acquisitions. However, experience with expansions in the host country of the focal acquisition had a positive effect, as did experience in the same cultural region (e.g., South America, South East Asia, and Anglo-Saxon countries), although this effect was weaker. Much like the above-mentioned studies that examined industry as a contingency, these findings on the geographic or cultural dimension suggest that experience needs a certain level of specificity in order to foster learning. These authors show that experience with expansions in nearby cultural regions does not seem to meet this requisite level of specificity, since it tended to *decrease* the survival chances of the focal acquisition, thus providing some early evidence of negative experience transfer, which we will discuss in greater detail later on. Interestingly, Gaur and Lu (2007), examining FDIs by Japanese firms, found a negative effect of host country experience, measured by the total number of subsidiary years in a given country, on FDI survival. Although they do not elaborate much on this result, it may suggest that negative experience transfer can even occur for relatively specific types of experience.

Evidence from the alliance literature also supports the idea that experience needs to be sufficiently specific to enable learning. Merchant and Schendel (2000) examined international alliances of U.S. firms. Their study did not confirm the idea that international alliance experience increased performance, as measured by the short-term abnormal stock returns when a new alliance is announced. Similarly, Barkema, Shenkar, Vermeulen, and Bell (1997) found no relationship between the international alliance experience of Dutch firms and the longevity of their alliances. They did, however, find positive learning effects if the international alliance experience was preceded by either domestic alliance experience which allowed the firm to learn about alliances first without the complexities of operating abroad, or by other international experience that enabled them to learn how to operate abroad without the complexities of cooperating with someone else, results which support the idea of an incremental learning path. Barkema and Vermeulen (1997) also found a significant positive effect of experience on the focal alliance's longevity, but only if this experience was specific to the host country. Furthermore, Reuer, Park, and Zollo (2002), examining international alliances involving U.S. firms, found that alliance experience increased performance, as measured by abnormal stock returns, if there were similarities in national culture and skills. Finally, Shaver, Mitchell, and Yeung (1997) studied the joint effect of industry- and country-specific experience. They found that the survival of FDIs into the U.S. is enhanced by prior U.S. experience, particularly if this U.S. experience was within the target industry. In sum, the review above suggests that industry- or country-specific experience fosters learning to a greater extent than more general experience and that it seems to be particularly beneficial if it is both industry- *and* country-specific.

Meso-level contingencies. More recently, researchers have begun to explore contingencies at lower levels of analysis, such as experience with a specific target or partner firm. For example, Porrini (2004) examined U.S. acquisitions of U.S. firms and found that acquisition experience, measured through the number of acquisitions in the previous four years, had no significant effect on the acquirer's profitability. However, her analyses did show that acquisition performance benefits from having been in an alliance with the focal target in the past.

The alliance literature offers evidence that supports this key role of partner-specific experience. Zollo, Reuer, and Singh (2002), examining alliances in the biotechnology and

pharmaceutical industries, found that general alliance experience did not improve perceptual measures of alliance performance, but partner-specific alliance experience did. Interestingly, however, Hoang and Rothaermel (2005) examined alliances in these very same industries and found a significant effect of general alliance experience on a binary measure of government approval for the new drug, but no significant effect for partner-specific experience.

Another example of a contingency at a lower level of analysis is presented in Bruton et al. (1994), which examined multi-industry samples of financially distressed and non-distressed acquisitions. The authors found a positive effect of acquisition experience (measured by the number of acquisitions in the previous four years) on a perceptual measure of performance, but only if the acquisition was in financial distress. They interpreted this as a signal that financially distressed targets will have few interested buyers, as it requires much effort to turn them around. Those with tacit knowledge of the acquisition process (captured by the experience measure) are more likely to bid for the target, decreasing the odds of falling victim to a winner's curse.

What Have We Learned?

Table 1 provides an overview of the early studies on organizational learning in strategic settings discussed in this section. Taken together, this research, most of which was conducted roughly between the early 1980s and the mid-1990s, taught us, first of all, that experience indeed often matters. Most importantly, it started to distinguish between different types of experience (e.g., industry-specific and country- or culture-specific), thus recognizing that experience needs to be sufficiently specific in order to be conducive to productive learning.

As the above review has shown, early research efforts focused primarily on gaining a deeper understanding of the direct link between experience and performance. As such, much of this work was driven more by the statistical tests that it conducted than any theory that it developed. Indeed, most studies subscribed to the simplistic assumptions of the traditional, somewhat metaphorical, learning curve perspective to build their arguments, largely treating the organizational learning process itself as a black box. We now turn to more recent developments in the literature, which, in contrast, pursue a deeper understanding of the contingencies and mechanisms of organizational learning in strategic settings.

TABLE 1
Summary of Early Empirical Research on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Study	Strategic Context	DV	Key IV(s)	Data Source	Sample	Key Finding(s)
Main Effect of Experience						
Kusewitt (1985)	Acquisitions	Acquirer ROA & long-term raw stock returns	Number of acquisitions per year	Archival	Acquisitions by 138 U.S. firms over 1967-1976	Negative relationship
Fowler & Schmidt (1989)	Acquisitions	Short-term abnormal stock returns	Number of acquisitions in the last four years	Archival	Acquisitions by 42 manufacturing firms over 1975-1979	Positive relationship
Kroll, Wright, Toombs, & Leavell (1997)	Acquisitions	Short-term abnormal stock returns	Binary: acquisition(s) in the preceding three to five years or not	Archival	Acquisitions by 209 manufacturing firms over 1982-1991	No significant relationship
Wright, Kroll, Lado, Van Ness (2002)	Acquisitions	Short-term abnormal stock returns	Binary: acquisition(s) in the preceding three years or not	Archival	Acquisitions by 163 firms over 1993-1997	No significant relationship
Pennings, Barkema, & Douma (1994)	Various forms of corporate expansion	Probability of survival	Multi-year moving averages of the prior expansion survival	Archival	462 expansions by 14 Dutch firms over 1966-1988	Positive relationship
Anand & Khanna (2000)	Alliances	Short-term abnormal stock returns	Number of alliances since 1990	Archival	2000+ alliances over 1990-1993 with at least one U.S. partner	Positive relationship
Sampson (2005)	Alliances	Citation-weighted patent counts	Number of alliances since 1985	Archival	464 R&D alliances in the telecom equipment industry that were entered into between 1991-1993	Positive relationship
Shimizu & Hitt (2005)	Divestitures	Probability of divestiture	Number of divestitures in the last three years	Archival	70 divested acquisitions by U.S. public firms over 1988-1998	Divestiture experience moderates the relationship between acquisition performance and the probability of divestiture
Early Contingencies						
Li (1995)	Various forms of corporate expansion	Probability of survival	Binary: first versus subsequent entries	Archival	All foreign firms entering the U.S. computer and pharma industries between 1974 and 1989	Experience effects differ across industries: experience in the computer industry decreases the likelihood of exit of subsequent entries, but not in the pharma industry

TABLE 1 (CONTINUED)
Summary of Early Empirical Research on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Hoang & Rothaermel (2005)	Alliances	Binary: government approval for a drug or not	Number of alliances since founding of the focal firm	Archival	292 R&D alliances between 30 pharma firms and 145 biotech firms, entered into between 1980-2000	Experience effects differ across industries: alliance experience in the biotech industry increases innovative performance of subsequent ones, but not in the pharma industry Insignificant effect of partner-specific alliance experience, but positive effect of general alliance experience
Markides & Ittner (1994)	Acquisitions	Short-term abnormal stock returns	Binary: experience with international activities	Archival	276 international acquisitions by U.S. firms over 1975-1988	Positive effect of international experience
Lee & Caves (1997)	Acquisitions	Volatility of the acquirer's post-acquisition profits	Binary: international acquisition experience and experience in the geographic region of the focal acquisition	Archival	100+ international acquisitions	Negative relationships between international acquisition experience/ geographic experience and profit volatility
Barkema, Bell, & Pennings (1996)	Foreign direct investments	Probability of survival	Number of expansions since 1966	Archival	116 international acquisitions by 13 Dutch firms over 1966-1988	Insignificant effect of international acquisition experience, but positive effects of host-country and cultural region experience; negative effect of nearby cultural region experience
Gaur & Lu (2007)	Foreign direct investments	Probability of survival	Number of subsidiary years in a given country	Archival	20,000+ FDIs by Japanese firms between 1986-2001	Negative effect of host-country experience
Merchant & Schendel (2000)	International alliances	Short-term abnormal stock returns	Number of international alliances since 1986	Archival	393 international alliances entered into by U.S. firms between 1986-1990	Insignificant effect of international alliance experience
Barkema, Shenkar, Vermeulen, & Bell (1997)	International alliances	Probability of survival	Number of international alliances since 1966	Archival	All international alliances entered into by 25 Dutch firms between 1966-1994	Insignificant effect of international alliance experience, but positive effect of domestic alliance and international wholly-owned subsidiary experience
Barkema & Vermeulen (1997)	International alliances	Probability of survival	Number of international alliances since 1966	Archival	All international alliances entered into by 25 Dutch firms between 1966-1994	Positive effect of host-country experience

TABLE 1 (CONTINUED)
Summary of Early Empirical Research on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Shaver, Mitchell, & Yeung (1997)	Foreign direct investments	Probability of survival	Prior presence in the U.S./ target industry	Archival	354 FDIs into the U.S. between 1986-1992	Positive effect of prior U.S. experience, especially if this U.S. experience was within the target industry
Porrini (2004a)	Acquisitions	Change in acquirer ROA	Number of acquisitions in the last four years	Archival	437 U.S. targets acquired by U.S. firms between 1988-1997	Insignificant effect of acquirer's acquisition experience, but positive effect of target-specific experience (through previous alliance)
Zollo, Reuer, & Singh (2002)	Alliances	Perceptual alliance performance measure	Number of alliances ever entered into	Survey & archival	99 alliances in the pharma and biotech industries between 1982-1994	Insignificant effect of general alliance experience, but positive effect of partner-specific experience
Bruton, Oviatt, & White (1994)	Acquisitions	Perceptual acquisition performance measure	Number of acquisitions in the last four years	Archival	51 financially distressed and 46 non-distressed acquisitions between 1979-1987	Positive effect of acquisition experience if the target is in financial distress

RECENT DEVELOPMENTS

From the mid-1990s onward, researchers have moved beyond the traditional learning curve perspective by drawing on related disciplines, most notably psychology and sociology. This marked the beginning of a period in which organizational learning theory would mature considerably, although the literature has remained highly eclectic to this day (Bapuji & Crossan, 2004; Crossan, Lane, & White, 1999; Dodgson, 1993; Fiol & Lyles, 1985; Huber, 1991; King, 2007; Levitt & March, 1988). More specifically, the evolution of a more theoretically grounded organizational learning framework that applies to strategic settings took place through the relaxation of each of the simplistic assumptions of the traditional learning curve perspective.

Negative Experience Transfer

Haleblian and Finkelstein (1999) made an important contribution to the literature by questioning the implicit assumption that experience is always positive. Drawing on transfer theory from cognitive psychology (Ellis, 1965; Cormier & Hagman, 1987), they argue that transferring acquisition routines from one industry to another is tantamount to transferring old lessons to new settings where they do not apply. The authors hypothesize that a firm's second acquisition will, therefore, typically perform worse than its first. Although this negative trend may continue after the second acquisition, they expect that the firm, at some point, will have developed the expertise needed to identify underlying dissimilarities across acquisitions, enabling it to generalize prior experience only when it is applicable. They find, in line with their theory, a U-shaped relationship between acquisition experience (measured by the number of acquisitions undertaken since 1948) and performance (both in terms of short-term abnormal returns to the acquirer's stock and the acquirer's profitability). Moreover, this study and a follow-up piece (Finkelstein & Haleblian, 2002) show that the negative transfer effect is smaller if later acquisitions are more similar in terms of the industries in which they are embedded.

Importantly, more recent work has started to build on Haleblian and Finkelstein's influential work by theorizing how the performance of the current acquisition is affected by the heterogeneity of the entire acquisition experience base accumulated so far, thus moving beyond assessing only the similarity between the focal acquisition and the one preceding it. Hayward

(2002) argues that, although heterogeneous experience can complicate learning as well as lead to excessive bureaucratic costs (due to the firm being active in an incoherent group of businesses), experiences that are too homogeneous rule out exploration and thus, may lead the acquirer to fall victim to a competency trap. Studying acquisitions in six industries, he finds evidence of an inverted U-relationship between the similarity of the industries in which prior acquisitions are embedded and the performance of the focal acquisition, operationalized through short-term abnormal stock returns. These results suggest that the performance of the focal acquisition tends to benefit from acquisition experience that is neither too heterogeneous nor too homogeneous. Schijven and Barkema (2007) use transfer theory to propose a dynamic approach, arguing that the firm initially requires relatively homogeneous experience (within the same industry) to foster learning by avoiding too much causal ambiguity. The expertise built as a result then serves as a springboard, enabling the firm to learn from a wider variety of acquisitions and thus, to develop a more widely applicable acquisition capability. Evidence from a multi-industry sample of acquirers corroborates their theory. Partly in line with this, Bingham and Eisenhardt (2007) conduct a qualitative study of the internationalization processes of six high-tech entrepreneurial firms from the U.S., Singapore, and Finland and find that learning is more about creating expertise than refining routines, as has traditionally been suggested.

In the alliance literature, Reuer, Park, and Zollo (2002) provide complementary insights. Examining international alliances involving U.S. firms, they not only find that these firms learn from past alliances if made in a similar culture and based on similar skills, but that experience heterogeneity fosters creativity that benefits alliances, even when they differ from prior alliances. Furthermore, Piaskowska and Barkema (2007) find that experience with minority international joint ventures (IJV) increases the performance of minority IJVs (measured in terms of market performance and profitability) but decreases the performance of majority IJVs, and vice versa. Apparently, different skills are needed when managing minority and majority IJVs, with the latter requiring the focal firm to be in the driver's seat.

Another interesting direction that this literature is moving into focuses on experience spillovers across, rather than within, distinct corporate development activities. Porrini (2004: 268) argues that "alliances create opportunities for firms to gain a variety of experiences in

exchanging and integrating resources with similar and dissimilar partners and can inform integration of targets." She studies domestic acquisitions by U.S. firms and finds a U-shaped relationship between alliance experience, measured by a composite variable capturing the number of alliances and partners in these alliances, and acquisition performance (abnormal stock returns) similar to what Haleblian and Finkelstein (1999) found for acquisition experience. Similarly, in the international business literature, Nadolska and Barkema (2007) find a U-shaped relationship between international joint venture experience and the longevity of international acquisitions. Finally, building on transfer theory, Zollo and Reuer (2006) argue that alliance experience is beneficial if the acquisition requires little integration since, contrary to Porrini (2004), they believe that alliance experience teaches acquirers little about integration. In fact, they argue that alliance experience will only be positive if acquirers integrate targets, as indicated by the extent to which the target's management was replaced after the acquisition. Evidence from survey data on acquisitions and alliances by banks support their predictions, both when using long-term abnormal stock returns and accounting measures of performance.

Overall, this literature shows that experience is not a panacea, but can actually decrease performance. Specifically, while early research showed that some industries seem to be more conducive to experiential learning than others, later studies showed that transferring experiences across different industries or entry modes (e.g., acquisitions and joint ventures, or even minority and majority IJVs) can lower performance. In short, therefore, this literature offers deeper insight into when acquisition experience improves and when it may, in fact, hurt performance.

Deliberate Learning Mechanisms

The research on experience heterogeneity suggests an interesting paradox. On the one hand, heterogeneity enables firms to explore a wider variety of experiences which, in theory, engenders more scope for identifying the causal patterns required for capability development. On the other hand, this very heterogeneity may be overwhelming for boundedly rational actors due to the causal ambiguity it presents. This observation is at the core of a new emerging stream of research on how firms can best learn from such heterogeneity. One key insight is that firms need to move beyond "semi-automatic" experience accumulation toward more deliberate learning mechanisms. In essence, this challenges a second simplistic assumption of the traditional

learning curve perspective, namely that experience automatically implies learning. Earlier we discussed research which found that, in order to consistently show learning effects, new strategic moves should be in the neighborhood of earlier moves (in terms of industry, culture, or entry mode). This more recent research on deliberate learning focuses on organizational issues: What organizational mechanisms enhance the firm's ability to learn to acquire successfully?

Haleblian, Kim, and Rajagopalan (2006) move beyond the traditional notion of routine-based, semi-automatic learning by arguing that learning is enhanced through active evaluation of performance feedback about recent acquisitions. They examine acquisitions undertaken by U.S. commercial banks and find that performance feedback (measured through abnormal stock returns) not only directly influences the propensity to acquire, but also moderates the effect of experience. Hence, strong performance reinforces the positive effect of acquisition experience on the propensity to acquire and poor performance reduces this effect. That is, strong performance strengthens the firm's belief that it has effective routines, while poor performance leads to a reappraisal, thus making it part of the mechanism of building and discarding routines.

Hébert, Very, and Beamish (2005) argue that experience in itself is not sufficient for acquisition capability development, since it does not necessarily imply that the lessons will be in the right place at the right time. They propose that expatriates play a key role in transferring the experience from the acquiring firm to the acquired unit. Examining cross-border acquisitions by Japanese MNCs, they find that neither general acquisition experience nor industry experience, host-country experience, industry acquisition experience, or local acquisition experience have independent effects on acquisition performance (in terms of longevity). Significant beneficial effects are only found for some of these types of experience – local acquisition experience and, to a lesser extent, industry experience – when interacted with the presence of expatriates in the focal unit. Apparently, experience only results in learning if there are mechanisms in place that actually transfer it to where it needs to be within the firm.

Another angle on this idea of deliberate learning is offered in Zollo and Winter's (2002). These authors argue that infrequently performed tasks with high levels of heterogeneity and causal ambiguity require learning mechanisms, such as experience articulation and codification, which are "aimed at uncovering the linkages between actions and performance outcomes"

(Zollo & Winter, 2002: 342). Zollo and Singh (2004) applied this argument to acquisitions. Their analysis of survey data on acquisitions in the U.S. banking industry shows an insignificant effect of acquisition experience on performance (based on ROA). However, they did find a significant positive effect of knowledge codification (i.e., the sum of all acquisition tools which the acquirer had developed, such as due diligence and integration manuals). This positive effect increased with the level of acquisition integration, suggesting that the benefits of deliberate learning mechanisms increase with the complexity of the task and the level of causal ambiguity.

The alliance literature has also made contributions to the growing body of work on deliberate learning. Kale, Dyer, and Singh (2002) hypothesize that an alliance function – "a separate, dedicated organizational unit charged with the responsibility to capture prior experience" (2002: 750) – helps to build alliance capability. By acting as a clear, centralized point of learning regarding how to manage alliances and how to measure their performance, by continuously scanning the environment for promising alliance opportunities, and by having the organizational legitimacy to reach across divisions to obtain necessary resources, such a dedicated alliance function is argued to enhance the firm's ability to learn from its alliance experience. Analysis of survey data on U.S. firms shows that their alliance experience in itself does not significantly affect alliance performance (in terms of short-term abnormal stock returns and long-term perceptual performance measures). However, consistent with predictions, they do find that having a dedicated alliance function has a significant positive effect on performance.

In a follow-up piece, Kale and Singh (2007) delve deeper into the mechanism of learning through a dedicated alliance function. They argue that the effect of the alliance function on performance is mediated by processes which help the firm to acquire, accumulate, and leverage alliance management know-how and best practices. The extent of these processes was measured by a composite measure of the firm's formal mechanisms for articulating (e.g., periodic reporting on alliance performance), codifying (e.g., alliance manuals), sharing (e.g., task forces to take stock of prior alliance experience), and internalizing (e.g., alliance management training programs) alliance know-how. They indeed find that the positive effect of the alliance function on performance is mediated by these deliberate learning mechanisms. Heimeriks and Duysters (2007) find similar effects. Their analysis of multi-industry survey data shows that the positive

effect of alliance experience on a perceptual measure of alliance performance is partially mediated by deliberate learning mechanisms such as having a dedicated alliance function, alliance training, and incentive programs tied to alliances.

The above-mentioned research strongly suggests that experience accumulation is a necessary, but insufficient, condition for successful acquisition capability development. Instead, deliberate organizational learning mechanisms turn out to be crucial in dealing with the high levels of complexity and causal ambiguity that firms encounter in strategic settings.

Learning from Others

Around the mid-1990s some researchers began to question a third implicit assumption of traditional learning curve theory, namely that firms only learn from their own experience. They opened up a new field of study by arguing that firms may also learn from other firms, based on sociological theory of imitation (DiMaggio & Powell, 1983) and psychological theory of vicarious learning (Bandura, 1977). Vicarious learning enables a firm to explore a variety of ways of performing tasks without incurring any costs and risks that might be associated with experimenting with alternative actions (Miner & Haunschild, 1995). That is, it enables a firm to engage in "exploratory learning" (March, 1991), even though each of the firms from which it learns may only be "exploiting" their experiences within their own domains.

There is a substantial body of evidence that imitation is a widespread practice in strategic contexts. Haunschild (1993) examines large acquisitions of U.S. firms in multiple industries and finds that firms imitate the acquisition behavior of other firms to which they are tied through board interlocks, at least in the case of horizontal acquisitions. She and her co-authors also find (1) that firms rely on their interlock partners for information on how much to pay for targets, especially when they are uncertain about their value (Haunschild, 1994), (2) that they rely more on interlock partners which are similar to them and less so if there are alternative information sources (Haunschild & Beckman, 1998), and (3) that they decide which investment bank to hire based on how often others have used that bank (frequency-based imitation), how many large and successful firms have used it (trait-based imitation), and how high the average premium is that firms using that bank have paid (outcome-based imitation) (Haunschild & Miner, 1997). Interestingly, Westphal, Seidel, and Stewart (2001) observe that, apart from imitating their

interlock partners, also imitate their imitative behavior (i.e., "second-order imitation"). They find that greater similarity in acquisition behavior between interlock partners and their competitors leads to greater similarity in acquisition behavior between the focal firm and its competitors.

Focusing on the imitation of competitors' acquisition behavior rather than that of interlock partners, Baum, Li, and Usher (2000) uncover that Ontario nursing home chains tend to acquire targets near those of competing chains' recent acquisitions. Furthermore, Yang and Hyland (2006) find that U.S. public firms in the financial services industry are more likely to engage in unrelated, rather than related, acquisitions if their competitors undertake more unrelated acquisitions as well.

More evidence of strategic imitation is offered in a variety of related literatures. Haveman (1993) examines savings and loan associations and finds that a firm's propensity to enter a given industry increases (up to a certain threshold) with the number of highly profitable or very large firms already present. Martin and Park (2004) find that other airlines' alliances influence the focal airline's alliance formations. Gulati (1999) examines American, European, and Japanese firms in multiple industries and shows that firms with a large network of alliances are more likely to enter new ones, suggesting that the network itself is a rich source of information for alliance opportunities. In international business, Guillén (2002) uncovers that South Korean firms imitate their competitors' expansions into the People's Republic of China, especially if the competitors also came from South Korea. The tendency to imitate decreases after a firm's first entry, suggesting that firms use imitation as a temporary substitute for experience. Similarly, Henisz and Delios (2001) study international plant location decisions by Japanese MNCs and find that a firm is more likely to set up a plant in a given country, the more other firms had done so in the past, especially if those other firms were from the same industry and if the focal firm had little experience with foreign expansion. Finally, Lu (2002) examines the foreign entry mode choice of Japanese firms and finds that the focal firm imitates the entry mode patterns of other firms and that this imitative behavior decreases as it gains foreign investment experience.

Although our broad definition of organizational learning – the transfer of prior experience to a subsequent task – allows for the inclusion of the above-mentioned studies on imitation as organizational learning research, some might argue, using a narrower definition, that they do not

offer any definitive insights into actual learning, since they do not examine the performance effects of such imitative behavior. More specifically, the focal firm may copy the practices of another based on legitimacy, rather than efficiency, considerations (DiMaggio & Powell, 1983) or based on the belief that the other firm has expertise that it itself lacks. Neither of these scenarios necessarily implies learning, since the imitative behavior is not induced by an enhanced causal understanding of the strategic activity at hand.

Nevertheless, several studies have set out to examine such vicarious learning directly. Beckman and Haunschild (2002) use institutional theory from sociology (DiMaggio & Powell, 1983) and social learning theory from psychology (Bandura, 1977) to argue that firms can learn to acquire more successfully by tapping into the experience of their network partners (in terms of board interlocks). Their results corroborate this idea by showing that the premium paid by the focal firm tends to be lower and its abnormal returns higher if the acquisition experiences of its network partners are more heterogeneous (in terms of, for instance, premium paid, acquisition size, and acquirer industry), suggesting that vicarious learning from the diverse experience of partners helps firms to increase the success of their own acquisitions.

In the alliance literature, Sarkar, Echambadi, and Ford (2003), drawing on the same theories from sociology and psychology and using survey data on alliance-related internal learning processes, find that internal mechanisms fostering vicarious learning, such as managers attending seminars on alliances, benchmarking, and periodic discussions with managers from other firms about their alliances, increase the performance of their own alliances (measured through a perceptual measure). Also, these benefits appear to be particularly strong in dynamic industries, but decrease as the firm gains more alliance experience of its own.

In the international business literature on FDI survival, Shaver, Mitchell, and Yeung (1997), which we discussed in a different context earlier on, investigate the effects of industry- and country-specific experience jointly. Adopting a more standard economic approach, they find that the longevity of FDIs undertaken by foreign firms with experience in the U.S. but no target industry experience benefit from the experiences of prior foreign entrants (measured as the percentage of industry establishments controlled by foreign firms and the percentage of industry shipments from foreign-owned establishments), suggesting vicarious learning.

Finally, in the ecological literature, Ingram and Baum (1997a) examine Manhattan hotels from 1898 to 1980 and find that the operating experience of other Manhattan hotel chains increases the survival probability of the focal chain, thus implying vicarious learning. They distinguish between the operating experience of other firms in the population before and after the entry of the focal chain and found much stronger effects for the former, called "congenital learning" (see Huber, 1990), suggesting that what firms learn from others is largely limited to what founders observe prior to their own entry, and that they learn little from others afterwards because inertia and imprinting prevents effective adaptation. In fact, a follow-up study (Baum & Ingram, 1998) shows no evidence at all of learning by hotel chains after entry, though the effect of congenital learning remains, suggesting that "the experience of the industry may offer opportunities for organizational learning that the experience of the organization does not, because industry experience is more varied, and not tied to the path-dependent history of any one organization" (Ingram & Baum, 1997a: 75).

In sum, there is evidence that firms imitate the behavior of others, in the context of acquisitions and in other strategic settings, and that firms often rely on vicarious learning in an attempt to enhance their performance. Initial insight has also been gained into some contingencies (e.g., imitation and vicarious learning effects tend to become weaker after firms gain more experience) and mechanisms (e.g., managers attending seminars, benchmarking, regular discussions with other managers) of vicarious learning. However, this research can still be considered to be in an early stage and much more work needs to be done.

What Have We Learned?

Table 2 summarizes the studies discussed in this section. We have identified three growing streams of cutting-edge work that have developed from roughly the mid-1990s onwards and that move beyond merely the firm's experience in an attempt to shed light on the processes and mechanisms that underlie organizational learning in strategic contexts. In essence, each of these research streams draws on theory from sociology and/or psychology to relax one of the simplistic assumptions of the traditional learning curve perspective and, as such, has contributed greatly to the establishment of a more mature theoretical framework of organizational learning in strategic contexts: (1) research on negative experience transfer relaxes the assumption that

TABLE 2
Summary of Three Recent and Current Research Streams on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Study	Strategic Context	DV	Key IV(s)	Data Source	Sample	Key Finding(s)
Negative Experience Transfer						
Haleblian & Finkelstein (1999)	Acquisitions	Short-term abnormal stock returns & acquirer ROA	Number of acquisitions since 1948	Archival	449 acquisitions over 1980-1992	U-shaped relationship between acquisition experience and performance
Finkelstein & Haleblian (2002)	Acquisitions	Short-term abnormal stock returns & acquirer ROA	Study examines the effect of the first acquisition on the second	Archival	192 acquisitions by 96 acquirers over 1970-1990	Second acquisition underperforms the first, especially when from a different industry
Hayward (2002)	Acquisitions	Short-term abnormal stock returns & perceptual performance measure	Number of acquisitions since 1985 Industry similarity of prior acquisitions	Archival	214 acquisitions by 120 firms in six industries over 1990-1995	Inverted U-relationship between the similarity of prior acquisitions and the performance of the focal acquisition Insignificant effect of acquisition experience
Schijven & Barkema (2007)	Acquisitions	Probability of survival	Number of acquisitions since 1966	Archival	Acquisitions by 25 acquirers from multiple industries over 1966-2005	Learning is optimized if firm first focuses on homogeneous acquisitions and then moves on to more heterogeneous ones
Reuer, Park, & Zollo (2002)	Alliances	Short-term abnormal stock returns	Number of alliances in the last 10 years Skill/cultural novelty and heterogeneity measures	Archival	1318 international alliances by U.S. firms over 1995-1997	Positive effect of alliance experience if similar to the focal alliance Positive effect of experience heterogeneity if the focal alliance is dissimilar to previous ones
Piaskowska & Barkema (2007)	Alliances	Short-term abnormal stock returns & firm ROE	Number of alliances since 1966	Archival	200 international alliances by 25 acquirers over 1973-1998	Experience with minority JVs increases the performance of minority JVs and decreases that of majority JVs, and vice versa
Porrini (2004b)	Acquisitions	Short-term abnormal stock returns	Alliance experience: composite measure Acquisition experience: number undertaken in the last 4 years	Archival	398 U.S. targets acquired by U.S. firms between 1988-1998	U-shaped relationship between alliance experience and acquisition performance U-shaped relationship between acquisition experience and acquisition performance (in low-tech industries)
Zollo & Reuer (2006)	Acquisitions	Long-term abnormal stock returns & change in acquirer ROA	Number of acquisitions and alliances since founding	Survey & archival	500+ acquisitions by 47 U.S. banks since their founding	Positive effect of alliance experience on acquisition performance if integration of and management replacement within target are low

TABLE 2 (CONTINUED)
Summary of Three Recent and Current Research Streams on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Nadolska & Barkema (2007)	Acquisitions	Probability of survival	Number of acquisitions and alliances since 1966	Archival	1038 international acquisitions by 25 acquirers over 1966-1998	U-shaped relationship between international alliance experience and international acquisition performance
Learning Mechanisms						
Haleblian, Kim, & Rajagopalan (2006)	Acquisitions	Propensity to acquire	Number of acquisitions since 1988 Focal acquisition performance	Archival	2523 acquisitions by 579 U.S. banks over 1988-2001	Acquisition experience and focal acquisition performance have positive main effects on propensity to acquire Focal performance amplifies the effect of experience
Hébert, Very, & Beamish (2005)	Acquisitions	Probability of survival	Number of years since first acquisition Number of expatriates	Archival	216 international acquisitions by Japanese firms over 1986-1997	Experience only has a positive effect in the presence of expatriates
Zollo & Singh (2004)	Acquisitions	Change in acquirer ROA	Number of acquisitions since founding Number of codification tools	Survey & archival	228 acquisitions by U.S. banks since their founding	Insignificant effect of acquisition experience Positive effect of experience codification, which is amplified by higher levels of integration
Kale, Dyer, & Singh (2002)	Alliances	Short-term abnormal stock returns & perceptual performance measure	Number of alliances over 1988-1997 Presence of alliance function	Survey & archival	1572 alliances by 78 U.S. firms in multiple industries over 1993-1997	Insignificant effect of alliance experience Positive effect of dedicated alliance function
Kale & Singh (2007)	Alliances	Perceptual performance measure	Number of alliances over 1989-1998 Presence of aliance function Composite measure of deliberate learning mechanisms	Survey & archival	3647 alliances by 175 U.S. firms in multiple industries over 1994-1998	Insignificant effect of alliance experience Positive effect of dedicated alliance function is mediated by deliberate learning mechanisms
Heimeriks & Duysters (2007)	Alliances	Perceptual performance measure	Number of alliances over 1997-2001 Composite measure of deliberate learning mechanisms	Survey & archival	Alliances by 99 firms from multiple industries over 1997-2001	Positive effect of alliance experience is partially mediated by deliberate learning mechanisms

TABLE 2 (CONTINUED)
Summary of Three Recent and Current Research Streams on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Learning from Others						
Haunschild (1993)	Acquisitions	Number of acquisitions in a given year	Number of acquisitions by tied-to firms over a variety of periods Number of acquisitions by focal firm in the last three years	Archival	Acquisitions by 327 U.S. firms in multiple industries over 1981-1990	Focal firm imitates the acquisition behavior of tied-to firms Positive effect of own experience on subsequent number of acquisitions undertaken
Haunschild (1994)	Acquisitions	Acquisition premium paid	Premiums paid by tied-to firms	Archival	453 acquisitions by U.S. firms in multiple industries over 1986-1993	Focal firm imitates tied-to firms in terms of how much premium to pay, especially when acquisition value is uncertain
Haunschild & Beckman (1998)	Acquisitions	Number of acquisitions in a given year	Number of acquisitions by tied-to firms over a variety of periods Industry similarity between focal and tied-to firms	Archival	Acquisitions by 327 U.S. firms in multiple industries over 1981-1990	Focal firm imitates the acquisition behavior of tied-to firms more strongly if the tied-to firms are more similar to the focal firm
Haunschild & Miner (1997)	Acquisitions	Probability of a given investment bank being selected for an acquisition	Number of, size of, and premium paid by prior adopters	Archival	539 acquisitions by U.S. firms in multiple industries over 1988-1993	Focal firm imitates the investment bank choices of others based on frequency, trait, and outcome
Westphal, Seidel, & Stewart (2001)	Acquisitions	Similarity in acquisition activity between focal firm and its competitors	Similarity in acquisition activity between tied-to firms and their competitors	Archival	433 Fortune 500 firms over 1986-1995	Greater similarity in acquisition behavior between tied-to firms and their competitors led to greater similarity in acquisition behavior between the focal firm and its competitors
Baum, Li, & Usher (2000)	Acquisitions	Propensity to acquire	Various similarity measures	Archival	170 acquisitions by 32 Ontario nursing home chains over 1971-1996	Focal firm tends to acquire near the targets of its competitors
Yang & Hyland (2006)	Acquisitions	Related versus unrelated acquisition	Number of related/unrelated acquisitions by competitors in a given year	Archival	6465 acquisitions by 1762 U.S. firms over 1981-2000	Focal firm imitates the industry relatedness of its competitors' acquisitions
Haveman (1993)	Diversification	Propensity to enter a given industry	Various density measures	Archival	313 savings and loan associations over 1977-1987	Focal firm's propensity to enter an industry increases as the number of highly profitably/very large firms in the industry increases

TABLE 2 (CONTINUED)
Summary of Three Recent and Current Research Streams on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Martin & Park (2004)	Alliances	Propensity to form alliances	Number of alliances by focal firm since 1945 Number of alliances by competitors since 1945	Archival	Alliances of 32 international passenger airlines over 1982-1994	Inverted U-relationship between the number of alliances by the focal firm and its propensity to form alliances Inverted U-relationship between the number of alliances by competitors and the focal firm's propensity to form alliances
Gulati (1999)	Alliances	Propensity to form alliances	Number of alliances since 1970	Archival	2400 alliances by U.S., European, and Japanese firms over 1981-1989	Focal firm's propensity to form alliances increases with its interfirm network of prior alliances
Guillén (2002)	Various forms of corporate expansion	Propensity to expand into China	Number of firms that had previously established a plant in China	Archival	506 South Korean firms listed on the Seoul stock exchange as of 1995	Firms imitate their competitors' moves into China, especially those of competitors from the same home country
Henisz & Delios (2001)	Foreign direct investments	Propensity to establish a plant in a given country	Number of years since first foreign subsidiary Number of prior plant locations by the focal firm and others	Archival	2705 international plant locations in 155 countries by 1658 Japanese firms over 1990-1996	Focal firm is more likely to set up a plant in a given country if more have done so in the past, especially if they were in the same industry and the focal firm has little experience Focal firm's international experience positively impacts its propensity to set up a plant
Lu (2002)	Foreign direct investments	Wholly-owned versus non-wholly-owned	Total number of years of experience with each subsidiary	Archival	1194 Japanese foreign subsidiaries in 1999	Focal firm imitates the entry mode decisions of prior entrants, especially if it has little experience
Beckman & Haunschild (2002)	Acquisitions	Acquisition premium paid & long-term abnormal stock returns	Measure of the diversity of experiences of network partners	Archival	Acquisitions by 300 U.S. firms over 1986-1997	Heterogeneity of the experience of its network partners enhances the focal firm's acquisition performance
Sarkar, Echambadi, & Ford (2003)	Alliances	Perceptual performance measure	Composite measure of experiential learning mechanisms Composite measure of vicarious learning mechanisms	Survey & archival	182 U.S. firms from multiple industries	Positive effect of experiential learning mechanisms Internal mechanisms that foster vicarious learning about alliances increase the focal firm's alliance performance, especially in dynamic industries and if the firm has little experience

TABLE 2 (CONTINUED)
Summary of Three Recent and Current Research Streams on Organizational Learning in Strategic Settings
In Order of Appearance in Study

Shaver, Mitchell, & Yeung (1997)	Foreign direct investments	Probability of survival	Prior presence in the U.S./ target industry	Archival	354 FDIs into the U.S. between 1986-1992	Prior foreign entrants' experiences positively impact the performance of the focal firm's FDIs
Ingram & Baum (1997)	Firm entry and exit	Probability of survival	Focal firm's total number of years of experience with each of its units since 1896 All other firms' total number of years of experience with each of their units since 1896	Archival	1135 U.S. hotel chains over 1896-1985	Inverted U-relationship between the focal firm's own experience and its performance Experience of other hotel chains enhances the performance of the focal chain, especially experience that was accumulated prior to the focal chain's entry
Baum & Ingram (1998)	Firm entry and exit	Probability of survival	Focal firm's total number of hotel rooms made available since 1898 All other firms' total number of hotel rooms made available since 1898	Archival	558 Manhattan hotels over 1898-1980	Inverted U-relationship between the focal firm's own experience and its performance Experience of other hotel chains accumulated prior to the entry of the focal chain enhances the performance of the focal chain, but that accumulated subsequent to its entry does not

experience is always a good thing, thus allowing for a considerably more detailed understanding of the link between experience accumulation and performance; (2) research on deliberate learning mechanisms breaks with the assumption that learning automatically follows from experience accumulation, arguing that the latter is often a necessary but insufficient condition for the former and thus, shedding light on the mechanisms of learning that operate in between experience accumulation and performance; and (3) research on imitation and vicarious learning relaxes the assumption that the firm only learns from its own experience, thus conceptualizing an additional input of experience into the firm's learning activities. For all their individual contributions, however, these research streams have largely developed independently, thus resulting in a literature that has remained fragmented and eclectic.

AN AGENDA FOR FUTURE RESEARCH

Now that we have both reviewed early research on organizational learning in strategic contexts and identified three streams of recent and current theory development and testing in this literature, we will discuss some of what we believe to be fruitful avenues for future research. More specifically, we will discuss salient gaps that remain within each of today's three major research streams as well as point to promising research questions that span across several of them. We will close off with a brief discussion of some of the issues that researchers typically encounter in trying to measure experience and performance.

Negative Experience Transfer

Too much experience heterogeneity complicates the identification of causal relationships. Thus, having acquisition experience from a variety of settings (e.g., industries and geographical/cultural regions) is often problematic for firms in early stages of capability building. In contrast, experience in similar settings enables relatively inexperienced firms to learn effectively and to improve performance. This picture is suggested by the collective evidence on learning curves in strategic settings such as acquisitions, which has typically shown (1) insignificant relationships between general acquisition experience and performance, or U-shaped relationships that indicate that firms in early stages inappropriately generalize lessons across dissimilar settings (Haleblian & Finkelstein, 1999), and (2) stronger and more consistent

support in studies that examine specific subsets of experience, rather than lumping together disparate types of experience.

Building on this, the combined theory and evidence seem to point to important dynamics underlying organizational learning in strategic settings. Developing strategic capabilities, such as how to acquire or form alliances, initially requires experience that is not too heterogeneous (e.g., experience in the same or similar industries, in the same or similar geographic/cultural regions, or with the same or similar firms), such that learning is not impeded by excessive levels of causal ambiguity. Once firms have managed to identify causal relationships between activities and performance in relatively simple settings, they are likely to be able to take on greater variety and disentangle which courses of action are productive under which conditions. For instance, by first building expertise in one industry and then gradually expanding into others (Schijven & Barkema, 2007), firms might be able to develop strategic capabilities early on while minimizing the likelihood of negative experience transfer.

Although, in order to optimize the learning process, firms should not take on too much heterogeneity early on, research suggests that steps should not be too small either. New experience can be *too* similar to prior experience and, as a result, stifle learning. In fact, learning opportunities seem to be greatest somewhere in the middle, where some portion of the new experience is closely related to the firm's prior experience, while the remaining portion, though still somewhat related, is fairly novel (cf. Cohen & Levinthal, 1990). Consistent with this idea, Hayward (2002) finds that firms are most successful if new acquisitions are moderately related to their prior experiences, rather than highly similar or highly dissimilar. Likewise, in the international business literature, Barkema and Drogendijk (2007) find that learning effects are greatest in the middle, when the steps entering new cultures are neither too small nor too large.

In summary, while firms initially need a period of limited strategic variation to enable effective learning, they then need additional complexity in order to continue learning and develop more widely applicable capabilities.[i] Researchers are only beginning to understand

[i] We do not argue that firms should always optimize learning, since they have multiple goals, including short-term profitability, which may require the exploitation of current capabilities rather than the development of new ones. However, we believe that learning and capability building should be one of the objectives when selecting strategic moves and its importance may depend on, for instance, the strategy of the firm and industry conditions.

which specific sequences of strategic steps facilitate capability development and what the relevant contingencies are. Needless to say, therefore, this is an important area for future work.

Deliberate Learning Mechanisms

The emerging literature on how firms learn from their experience in strategic settings shows the complexity of the process and the importance of putting organizational mechanisms into place to facilitate learning, which does not seem to happen "automatically." Expatriates as conduits of information, experience codification, training programs, and dedicated departments all appear to play a role in making sense of experience and sharing it within the firm. In reality, it takes time for firms to develop these mechanisms (e.g., Barkema & Schijven, 2008), if indeed they are able to develop them at all, which may help to explain why so many acquisitions fail.

Our current understanding of which organizational mechanisms enable productive learning in strategic settings is still limited. Future work may examine, for instance, which of those mechanisms facilitate intra-firm sharing of strategic capabilities and under what conditions. Although a growing stream of research has been investigating the role of these mechanisms in interpreting the firm's experience in strategic settings (e.g., Kale et al., 2002; Zollo & Singh, 2004), there seems to much less work on how the lessons learned are subsequently transferred to where they need to be within the firm, one notable exception being Hébert et al.'s (2005) work on expatriates. Perhaps the knowledge-based argument (Grant, 1996; Kogut & Zander, 1993) that firms are more efficient than markets in transferring knowledge has led many researchers to implicitly assume that the "conduits" through which this knowledge actually flows are of little importance within the firm, although some work has argued otherwise (Szulanski, 1996).

An interesting topic for future research would be whether learning is more effective if those involved in making sense of experience, for example managers working in a dedicated corporate development unit, are also sent to disseminate it throughout the firm. Indeed, the performance of the firm may suffer if only one of these two mechanisms is in place. For instance, costly investments in deliberate forms of learning are unlikely to benefit the firm if valuable knowledge remains within the confines of the corporate development unit.

We believe that one particularly interesting avenue for future research lies at the intersection of this sub-literature on learning mechanisms and the one on negative experience

transfer. Specifically, it seems important to study the interrelationships between the *strategic* contingencies for learning, such as how close prior experience needs to be to new strategic settings to enable effective learning, and the *organizational* contingencies studied in this line of research. For instance, having a dedicated department to make sense of experience and using expatriates, manuals, and training programs to share the lessons learned within the firm may lead to negative experience transfer and thus, *amplify* the deleterious effects of choosing a strategy that is not conducive to learning, such as acquiring in dissimilar industries or geographic/cultural regions early on in the acquisition process. Hence, reminiscent of a large body of early management research (e.g., Lawrence & Lorsch, 1967), it may be crucial for the firm to establish some sort of fit between its strategy and its organizational infrastructure in order for it to effectively build strategic capabilities.

In fact, one might question whether deliberate learning mechanisms should be established at the corporate level, as prior research has suggested. For example, if the alliances in a highly diversified firm are primarily formed at the level of individual businesses, does it still make sense to design all learning mechanisms at the corporate level? Future research could provide important insights here as well.

Learning from Others

Firms may further boost their ability to learn in strategic settings by tapping into the experience of others. The emerging research has uncovered several key contingencies and mechanisms here as well, ranging from mere observation of competitors to ongoing board interlock relationships and discussions with peers outside the firm. This research suggests that firms typically learn more from others before they gain significant experience themselves, perhaps because imprinting, inertia, and Not-Invented-Here syndromes inhibit learning from others at later stages. However, learning from others may be important even at later stages of capability building. Obviously, no one firm will have first-hand experience with all the variations in strategic actions and outcomes available in an industry, or beyond, which is why the experiences of other firms can serve as an additional rich source of data. Such vicarious learning enables a firm to engage in exploratory learning, even though other firms may simply be exploiting their knowledge within their own domains (Miner & Haunschild, 1995).

To be successful over time, most firms need to build a variety of strategic capabilities, for instance, how to acquire other firms and form alliances, and how to do this abroad. New strategic forms are emerging as well, such as corporate campuses, open source strategies, innovation networks with suppliers, clients, and perhaps end-users, and so on. Most firms must quickly learn to execute their strategies more effectively, and learning from others may be an asset that is too important to restrict to just early stages. One reason why vicarious learning may be particularly useful at later stages is that firms may need a minimum level of absorptive capacity to effectively tap into and assimilate the experience of others (Cohen & Levinthal, 1990). Restricting vicarious learning to the early stages of the firm's lifecycle may, therefore, yield relatively few real benefits. At the same time, however, the relative benefits of learning from others may decrease as the firm accumulates its own experience. Future research should provide more insight here.

Another important topic for future research is the role of conduits, that is, mechanisms through which experience flows from one party or location to another. Several studies have examined vicarious learning through such conduits (Haunschild, 1993; Beckman & Haunschild, 2002; Westphal et al., 2001). Most of these have focused on the role that board interlock partners play as experience conduits, which typically means that the focal firm is learning from firms in other industries, since rivals in the same industry, for obvious reasons, tend not to have board interlocks. An interesting question for future research, therefore, may be whether there are conduits for tapping into the experience of other firms in the same industry. Moreover, one could wonder how important such conduits are in the first place. Currently, there is a divergence within this sub-literature in that some researchers hypothesize that imitation and vicarious learning is driven by conduits (e.g., Haunschild, 1993, 1994), whereas others argue that firms can learn from other firms through mere observation (e.g., Ingram & Baum, 1997a; Shaver, Mitchell, & Yeung, 1997). Insight into how important conduits actually are, and when, could be valuable.

Again, we believe that particularly valuable contributions might lie at the intersection of the sub-literatures that we discussed. For instance, juxtaposing the research that we reviewed on negative experience transfer and that on learning from others suggests an interesting paradox. While excessive heterogeneity seems to be detrimental to learning if it concerns the firm's *own* experience, particularly in early stages of capability development (Haleblian & Finkelstein,

1999), heterogeneity in the experience of *others* appears to be beneficial, since research shows consistent positive effects for vicarious learning. Apparently, firms engaged in "on-line" learning (Gavetti & Levinthal, 2001) or "learning-by-doing," entrenched in the day-to-day complexities of executing a variety of acquisitions or other strategic moves while trying to learn from them as well, meet cognitive boundaries sooner than when they are engaged in "off-line" learning or "learning-by-observing," evaluating and learning from the variance in the experience of others. Future research could provide us with a better understanding of why this would be the case.

As another example of interesting cross-fertilization, there is a complete lack of research on the role of deliberate learning mechanisms, such as experience codification and dedicated departments, in this sub-literature on vicarious learning. This lack of research is surprising, since the experiences that a firm taps into in the case of vicarious learning are far more heterogeneous than those that it accumulates itself. Hence, the probability of misinterpreting the experience of others is greater, potentially making such deliberate investments particularly valuable. In fact, while current research suggests that firms learn little from others once they begin to gain experience on their own, firms with more experience and a greater absorptive capacity and perhaps more developed organizational mechanisms for vicarious learning could learn a lot from others. Perhaps, at low levels of experience, they could learn most from other firms in the same industry so as to limit causal ambiguity, and later on they could learn more from a variety of other industries. Uncovering the interrelationships between negative experience transfer, organizational mechanisms, and vicarious learning could lead to major contributions.

Building on this line of reasoning, it seems possible that strong conduits and deliberate learning investments are substitutes, implying that a firm that can access the experience of others accurately through direct personal contact may no longer require a dedicated team to make sense of this information, unless the implied articulation and codification would help to share the lessons and best practices in the form of manuals, training programs, and expatriates. Alternatively, one might argue that, in the absence of some form of contact through a strong conduit, the information that is being tapped into is so simplistic and superficial (e.g., newspaper announcements) that there is simply not enough richness to justify investing in deliberate

learning, suggesting that the two may be complements. Future research could examine the conditions under which each of the above-mentioned forms of learning strengthens performance.

Methodological Issues

Experience variables. A cursory glance at Tables 1 and 2 shows that several different measures have been used to operationalize experience, most notably a simple dummy that indicates the presence or absence of experience, the number of times that a strategic activity, such as acquisition, has been encountered over a specified period, and the number of years since the firm engaged in the first instance of a given strategic activity. One outlier is the very first study that we reviewed, Kusewitt (1985), which uses the number of acquisitions in a given year. Although Kusewitt may not have intended this to be a measure of experience, but rather of the rate of acquisition, some subsequent research did interpret it this way. Although most subsequent research has attempted to capture experience by counting over multiple years, this does suggest an important issue: How many years do we need in order for the measure to capture experience rather than a crude version of the rate or speed at which the firm engages in a strategic activity? The latter is clearly a different construct and thus, one needs to make sure to use a sufficiently long period of time in order to justify that the measure captures experience. In accordance with this, there has been a general trend toward measures that are based on longer periods of time.

However, such measures present their own set of problems. Most notably, whereas measures that use short time periods may underestimate the ability of firms to remember past events, those that use long time periods may overestimate this ability. Nevertheless, it seems preferable to use long time periods, since this allows the researcher to model the functional form of the experience-performance relationship directly. For instance, Baum and Ingram (1998; see also Ingram & Baum, 1997a, 1997b) discount experience using a number of different discount factors: one that assumes no depreciation in the value of past experience (i.e., discount factor equals 1), one that assumes that depreciation is initially slower than linear and slows further with time (i.e., discount factor equals the square root of the age of the experience), one that assumes a linear depreciation in the value of experience (i.e., discount factor equals the age of the experience), and one that assumes that the value of past experience depreciates more rapidly than linear initially and accelerates further with time (i.e., discount factor equals the age of the

experience squared). Since their results were strongest for the model that assumed that the value of past experience depreciates slower than linearly, it seems advisable to use experience measures based on extended periods of time. Nevertheless, the rate at which past experience depreciates may well be specific to the strategic activity under study or the empirical setting, which in itself is an interesting research question for future work. In any case, it seems that future research could make more valuable contributions to the literature by being more specific – empirically as well as theoretically – about the functional form of learning that it predicts.

Performance variables. Performance, much like experience, has been operationalized in many different ways (see Tables 1 and 2). For example, acquisition performance has been measured, most notably, through accounting profitability (e.g., ROA), short-term abnormal stock returns, long-term abnormal stock returns, survival, and perceptual performance on the part of managers or analysts. The assumption that all these measures capture the same dimensions of performance is arguably a very strong one.

By far the most widely used performance measure in the acquisition literature is the short-term abnormal stock return. However, it has been receiving increasing amounts of criticism lately. Although Kale, Dyer, and Singh (2002) found a positive and significant bivariate correlation (r = .43) between short-term abnormal stock returns and a perceptual measure of performance in the alliance literature, a recent study by Zollo and Meier (2008) finds that short-term abnormal stock returns – by far the most widely used performance measure in the acquisition literature – capture an effect that is completely distinct from most of the other performance measures used, suggesting that this measure should not be used as freely as it has been in the past. Hence, it seems advisable for scholars studying learning in the context of acquisitions to provide a theoretical rationale to justify the choice of a specific performance measure, for example, based on which aspect of the acquisition process is supposedly being learned about. If the learning pertains to the pre-acquisition stage, such as the initial selection of targets with synergistic potential, then the adoption of short-term abnormal stock returns may be justifiable, assuming that capital markets are sufficiently efficient. However, when studying the post-acquisition stage, as is increasingly done, one should seriously ask oneself whether short-

term abnormal stock returns are the most appropriate measure rather than blindly opting for event study methodology based on its popularity and widespread application in the past.

For instance, Harrison, Oler, and Allen (2005) provide evidence that the initial stock market reaction to the announcement of an acquisition is often incomplete or biased, recommending that researchers use longer-term measures to more fully capture the economic impact of the acquisition. Furthermore, Barkema and Schijven (2008), arguing that acquisitions are usually not isolated events but rather interdependent elements within an overarching sequence of acquisitions collectively aimed at implementing some corporate strategy, find that the gains that are realized from a given acquisition may often depend on other acquisitions that are undertaken later on. As a result, some of the synergistic potential of an acquisition may take decades to be unlocked. Even if capital markets were highly efficient, they could still not predict which targets the firm will acquire in the future.

In closing, most studies of acquisitions are quantitative studies using archival data. However, as more and more research theoretically moves in the direction from initial acquisition to post-acquisition integration, from strategic choices to organizational mechanisms, from learning at the firm level to lower levels (such as dedicated offices, teams, and individuals), and from static strategic postures to dynamic processes, a richer variety of methodologies may be needed, including inductive studies, ethnographic studies, more survey research in organizations, experiments (e.g., how teams or individuals learn and build capabilities), and so on. We would welcome the use of such a rich variety of methodological approaches and strongly believe that they could lead to advances in our understanding of the contingencies and mechanisms of organizational learning in strategic settings.

Conclusion

The literature on organizational learning in strategic settings is a rapidly expanding area of study that has matured considerably, both theoretically and empirically, over the last decade. The growing popularity of the three research streams that we describe shows that researchers believe that so far we've only scratched the surface in terms of understanding organizational learning and thus, that the field is wide open. We hope that our review will prove to be helpful in this collective endeavor.

CHAPTER 3 [i]

TOWARD UNLOCKING THE FULL POTENTIAL OF ACQUISITIONS: THE ROLE OF ORGANIZATIONAL RESTRUCTURING

ABSTRACT

Building on behavioral theory, we study when and how firms unlock synergy from acquisitions over extended periods of time. We argue that initial integration is inevitably sub-optimal and that, as a result, acquisitive growth decreases the acquirer's performance, eventually forcing it to engage in organizational restructuring to more fully unlock the synergistic potential. Hence, we conceptualize organizational restructuring as a second stage in the integration process. Moreover, we theorize how these acquisition-restructuring cycles evolve as firms gain acquisition and restructuring experience. We test our theory using panel data on firms undertaking almost 1600 acquisitions over a period of four decades.

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[i] This chapter is the result of joint work with Harry Barkema. It appeared in 2008 in the ***Academy of Management Journal***, 51: 696-722. Earlier versions of this project received a Distinguished Paper Award from the Business Policy and Strategy Division of the Academy of Management and appeared in the Academy of Management's Best Paper Proceedings.

INTRODUCTION

In 2006, firms acquired at an all-time record level of $3.79 trillion worldwide (Thomson Financial, 2007). However, research has suggested that in a majority of cases anticipated synergies are left unrealized (for meta-analyses, see Datta, Pinches, & Narayanan, 1992; King, Dalton, Daily, & Covin, 2004). Strategy scholars have, therefore, long been pursuing an answer to the question: How can acquisitions be undertaken more successfully?

Since the 1980s, researchers have been exploring the pre-acquisition, or selection, stage of the acquisition process. They have argued that the synergistic opportunities inherent in an acquisition is contingent on the strategic fit that it offers in the form of resource similarity or complementarity, as many studies have confirmed (Harrison, Hitt, Hoskisson, & Ireland, 1991; Kusewitt, 1985; Lubatkin, 1987; Pennings, Barkema, & Douma, 1994; Ramaswamy, 1997; Shelton, 1988; Singh & Montgomery, 1987; Zaheer, Castañer, & Souder, 2004).

More recently, however, the bulk of the research attention has shifted toward a second contingency that addresses the post-acquisition, or implementation, stage of the acquisition process: organizational fit. The argument is that, although strategic fit is a necessary condition for synergy realization, it merely creates synergistic potential that can only be realized through effective integration of the acquired firm (Haspeslagh & Jemison, 1991; Jemison & Sitkin, 1986). In line with this, studies have shown that integration enhances acquisition performance (Datta & Grant, 1990; Shanley, 1994; Zollo & Singh, 2004). In fact, Larsson and Finkelstein (1999) found it to be the single most important predictor of synergy realization.

Hence, after selecting and acquiring a firm with synergistic potential, it is up to the acquirer to unlock as much of this potential as possible by building sufficient organizational fit (Pablo, 1994). However, this is a complex task that requires considerable management time and attention spent on “combining similar processes, coordinating business units that share common resources, centralizing support activities that apply to multiple units, and resolving conflicts among business units” (Hitt, Harrison, & Ireland, 2001: 86). Furthermore, it requires managing and gradually closing gaps with respect to, for instance, management style (Datta, 1991) and organizational culture (Chatterjee, Lubatkin, Schweiger, & Weber, 1992), which is often

hampered by considerable inertia, or even outright resistance, on the part of the acquired firm (Nahavandi & Malekzadeh, 1988; Walter, 1985; Weber & Camerer, 2003).[i]

Notwithstanding the many valuable insights that prior research has provided, it has nearly always adopted the individual acquisition as the unit of analysis, implicitly assuming that the firm starts with a clean slate every time it acquires. In reality, however, an acquisition is usually not an isolated event, but merely one part of an overarching sequence of acquisitions collectively aimed at implementing a corporate strategy (Kusewitt, 1985; Salter & Weinhold, 1979). The integration of each of these acquisitions requires considerable time and effort, thus often causing the burden on the acquirer's management to increase as the string of acquisitions grows, that is, as more acquisitions are added (Gary, 2005; Hill & Hoskisson, 1987; Penrose, 1959). Eventually, as Haspeslagh and Jemison suggested, major organizational change may be needed to combine all the various pieces into an "integrated network of operations" (1991: 255).

Building on behavioral theory, we develop a new theoretical framework that seeks to explain when and how firms unlock synergy as they engage in acquisitive growth over long periods of time, suggesting that the role of organizational fit extends far beyond the level of the individual acquisition. Adopting the acquirer as the unit of analysis,[ii] we conceptualize strategy as a sequence of decisions and actions taken "one at a time, over a period of years" (Fredrickson & Mitchell, 1984: 400), rather than as a preconceived, comprehensive plan. First, we argue that, for each acquisition, the firm initially engages in "local search" (Cyert & March, 1963), inevitably resulting in sub-optimal integration. As a result, a sequence of acquisitions leads to the accumulation of organizational inefficiencies, which gradually increases the need for more "distant search" in the form of major organizational restructuring.[iii] By recombining its subunits, such restructuring enables the firm to unlock the synergistic potential of its acquisitions more fully. Hence, in essence, the first part of our theory implies that acquirers go through long-term

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[i] Acquirers often create integration teams and appoint senior managers as full-time integration leaders (Ashkenas, DeMonaco, & Francis, 1998; Daniel & Metcalf, 2001), illustrating the complexity and the stakes that are involved.
[ii] Analyzing phenomena at a higher level of aggregation typically implies examining processes, both conceptually and empirically, over longer periods of time (Freeman, 1978). Contrary to most prior work, which examines periods of days or weeks up to a few years following an acquisition, our study examines a period of four decades.
[iii] As we will explain later on, organizational restructuring is fundamentally different from portfolio restructuring, which is what the term "restructuring" has typically referred to in the literature so far.

cycles of acquisitive growth and organizational restructuring and that such restructuring serves as an important second stage in the post-acquisition integration process.

Subsequently, we theorize how these acquisition-restructuring cycles evolve over time. We argue that acquisition experience enables the acquirer to learn to implement its acquisitions more successfully from the start, thereby postponing the need for restructuring. Moreover, restructuring experience fosters the acquirer's ability to unlock more synergy when the need for another restructuring does arise. We test our theory using panel data on firms engaging in almost 1600 acquisitions over a period of four decades (1966-2005).

BACKGROUND

Although behavioral theory (Cyert & March 1963; March & Simon, 1958; Simon, 1945) initially focused on decision making at the operating level, its broader applicability to strategic issues – that is, those that are "important, in terms of the actions taken, the resources committed, or the precedents set" (Mintzberg, Raisinghani, & Théorêt, 1976: 246) – was soon recognized (Carter, 1971). Two key interrelated themes within this literature are central to our theory development: search and organizational learning. Regarding the former, classic behavioral theory suggests that a search for solutions is initiated in case of failure, or anticipation of failure, to meet a goal (Cyert & March, 1963; see also Nutt, 1998). Although this may accurately depict search at the operating level, at the strategic level it is not necessarily driven by *problems*, as firms also initiate search proactively in an attempt to seize strategic *opportunities* (Carter, 1971).

However, the search process is subject to bounded rationality, meaning that the firm has "limited information, attention, and processing ability" (Greve, 2003: 12; Simon, 1945). Hence, there are constraints on the cognitive demands that the firm's management can effectively handle at any given time (Ocasio, 1997; Penrose, 1959). Faced with a complex strategic issue, it is typically "confronted with more stimuli than [it] can attend to or adequately process" (Hambrick, Finkelstein, & Mooney, 2005: 478; Mintzberg, 1973). As a result, the firm is forced to satisfice – that is, look for a course of action that is satisfactory rather than optimal (Simon, 1945) – by relying on cognitive simplifications of reality that economize on information processing (Schwenk, 1984), as has been corroborated in experimental settings (Bettman, Johnson, & Payne, 1990; Payne, Bettman, & Johnson, 1988).

By focusing the attention on just a few aspects of the situation, such simplified models limit the firm's search to a small, salient subset of the total set of alternatives (March & Simon, 1958; Mintzberg et al., 1976). Specifically, they lead the firm to engage in "local search," implying that efforts to identify satisfactory courses of action will largely be limited to the neighborhood of the problem symptom and of solutions adopted in the past (Cyert & March, 1963; Levinthal & March, 1993). Although "there is no realistic alternative in the face of the limits on human knowledge and reasoning … [such] simplification may lead to error" (Simon, 1945: 119; Tversky & Kahneman, 1974), compromising the quality of decision making and preventing the firm from finding the global, as opposed to merely a local, optimum (Levinthal, 1997). Research has indeed found that decisions tend to be less effective if the comprehensiveness with which firms search for and evaluate alternative courses of action for a given strategic move is lower (e.g., Dean & Sharfman, 1996; Fredrickson, 1984; Fredrickson & Iaquinto, 1989; Von Werder, 1999; Wong, 2004). As a result, when local search fails to yield a course of action that is sufficiently effective, at some point the firm will switch to more comprehensive or "distant" search in order to find one that is (Cyert & March, 1963).

The second key theme of behavioral theory that is of central importance to our paper – organizational learning – follows naturally from the notion of search. Over time, as the firm repeatedly performs a given organizational task, the search process triggered by that task will become increasingly routinized and refined (Levitt & March, 1988). Although a complex strategic move will likely always require substantial cognitive effort in the form of conscious and deliberate information processing, the routinization and learning that experience entails will help the firm to decide on and implement a suitable course of action more automatically, thus requiring less cognitive effort (March & Simon, 1958; Nelson & Winter, 1982; Shiffrin & Schneider, 1977). Experience, therefore, lowers the demands placed on bounded rationality. It leads the firm to consider fewer courses of action, not because bounded rationality prevents it from being more comprehensive (as is the case in the absence of experience), but because it has learned which ones are most effective for a given task (Levinthal & March, 1981).

THEORY AND HYPOTHESES

The hypotheses developed below all deal exclusively with acquisitions for which the primary rationale is the creation of synergy, such as economies of scale, economies of scope, or capability transfer (Harrison et al., 1991; Haspeslagh & Jemison, 1991; Hitt et al., 2001; Larsson & Finkelstein, 1999; Lubatkin, 1983), and which consequently require relatively high levels of integration (Datta & Grant, 1990; Haspeslagh & Jemison, 1991). We therefore test our hypotheses using only data on acquisitions that are likely to have such synergistic potential because their activities are related to those of the acquirer – horizontal, vertical[i], and related diversified acquisitions, which we jointly label "related acquisitions."

The Long-Term Cycle of Acquisitive Growth and Organizational Restructuring

Local search in the context of acquisition integration. As mentioned earlier, search at the strategic level is not only triggered by problems, but also by opportunities (Carter, 1971). Acquisitions represent such strategic opportunities. However, the complex task of integrating them and thus, establishing the organizational fit required to unlock their synergistic potential (Haspeslagh & Jemison, 1991; Hitt et al., 2001; Schweizer, 2005; Yu et al., 2005), will usually prevent the firm from considering the full set of alternative courses of action, forcing it instead to satisfice by relying on cognitive simplifications of reality (Hitt & Tyler, 1991). Such local search economizes on information processing, but increases the probability of making sub-optimal decisions on acquisitions (Duhaime & Schwenk, 1985). In line with this, research has found that anticipated synergies are typically not fully realized (Datta et al., 1992; King et al., 2004).

Cyert and March's (1963) "proximity rules" provide deeper insight into the form that such local search is likely to take. These rules imply that firms mainly search for solutions to a problem (1) in the neighborhood of the symptom – that is, in the subunit in which the problem manifests itself first – and (2) in the neighborhood of its current state – that is, avoiding solutions that break with established routines by favoring incremental over radical change. In the context of our study, the first proximity rule suggests that effective integration solutions are likely to be

[i] Vertical acquisitions usually possess resources that are complementary, rather than similar, to those of the acquirer, which can be a source of synergy as well (Harrison et al., 1991; Larsson & Finkelstein, 1999; Zaheer et al., 2004).

sought within the acquired firm itself, where symptoms of inadequate organizational fit are likely to emerge first in the form of, for instance, resistance on the part of its employees (Nahavandi & Malekzadeh, 1988; Walter, 1985) or persistent weakening of its post-acquisition performance. The second rule suggests that the acquirer will mainly consider integration approaches that do not require major changes in its organization beyond those within the acquired firm itself. Hence, it will seek to integrate the acquisition conditional on its existing organizational structure.[i]

In sum, the above suggests that, in an attempt to establish adequate organizational fit, the acquirer will satisfice by mainly considering organizational changes within the acquired firm itself, regarding its existing organizational structure as exogenous to the issue. In line with this, Haspeslagh and Jemison find that integration is often characterized by a "make them like us" syndrome on the part of the acquirer (1991: 151), especially in the case of relatively small acquisitions. Hébert, Very, and Beamish (2005) report that acquirers often send integration teams into the acquired firm to identify and evaluate synergistic opportunities. However, since these are usually small teams of business-level managers (Haspeslagh & Jemison, 1991; Palter & Srinivasan, 2006), their search activity will inevitably be local. Furthermore, Yu, Engleman, and Van de Ven (2005) uncover that initial integration efforts tend to be limited to changes within, rather than across, acquired subunits. Thus, at least initially, the acquirer tends to disregard more radical possibilities for integration, such as recombining specific subunits from across multiple existing divisions with the acquired firm so as to form an entirely new division. Taking these into consideration, however, would clearly increase the comprehensiveness of the search process. Although it will typically be financially unjustifiable to engage in such major organizational change for each individual acquisition undertaken, its potential benefits may often become very real after having undertaken a string of acquisitions over time, as we will argue later on.

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[i] Cyert and March (1963) argue that local search is often governed by a third proximity rule: search in the neighborhood of vulnerable areas, with firms favoring "changes in organizational units that are unable to claim that preservation of their current routines is essential to the organizational functioning" (Greve, 2003: 15). As they point out, "certain activities in the organization are more easily attacked than others, simply because of their power position in the system" (1963: 171). Once again, this suggests that, in its pursuit of organizational fit, the acquirer is likely to primarily implement changes within the narrow confines of the acquired firm because of its relatively weak power position in the overall organization (e.g., Jemison & Sitkin, 1986).

The performance effects of acquisitive growth. Since an acquisition is usually not an isolated event, but part of an overarching sequence of acquisitions collectively aimed at implementing a corporate strategy (Kusewitt, 1985; Salter & Weinhold, 1979), the acquirer tends to be faced with a sequence of integration decisions over time. Because, due to bounded rationality, "little attempt is made to integrate consciously the individual decisions that could possibly affect one another" (Fredrickson & Mitchell, 1984: 402), they are typically handled individually, rather than constituting a preconceived, integrated strategy resulting from some formal planning system (Fredrickson, 1984; Fredrickson & Mitchell, 1984; Mintzberg, 1978).

We argue that each consecutive acquisition adds "inefficiencies" (Lubatkin, 1983: 222) to the acquirer's organizational system. That is, given the sub-optimal organizational fit that results from local search in strategic decision making, each acquisition – with its own culture, structure, systems, and processes – represents a subunit that adds to the total complexity of coordinating the firm (Argyres, 1996; Campbell, 1988; Henderson & Fredrickson, 1996; Gary, 2005; Hill & Hoskisson, 1987; Thompson, 1967). This becomes all the more apparent upon realizing that the type of acquisitions at hand – related acquisitions – typically require strategic controls, which, unlike financial controls, demand a thorough understanding on the part of, as well as rich information exchange with, senior management (Hitt, Hoskisson, Johnson, & Moesel, 1996).[i]

Wolters Kluwer, a major multinational publishing and information services firm included in our sample, illustrates the point. After a steady decline in profits, the firm was recently losing money for the first time ever. Analysts said it showed signs of "burn-out" caused by a failure to integrate the hundred-plus acquisitions it had engaged in over the previous decade. They strongly advised the CEO to better integrate the firm's "archipelago" of subunits in order to counter the decreasing trend in its financial performance (NRC Handelsblad, 2003).

In light of the above, we argue that the extent to which anticipated synergies are realized from a given acquisition depends on its position within the overarching sequence of acquisitions.

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[i] In fact, information-processing requirements could increase as much as exponentially with the number of subunits (N): $N(N\text{-}1)/2$ (Hill & Hoskisson, 1987). Although lateral coordination mechanisms may partly alleviate these complications by dividing the coordination task over a larger number of individuals (e.g., Tsai, 2002), some vertical coordination through financial controls will remain necessary, thus still raising the burden on senior management with each acquisition to be integrated and coordinated.

Whereas early acquisitions in the sequence can draw on a relatively large pool of available managerial resources – thus, enabling comparatively high-quality integration – these resources will become increasingly tied up in coordination as more acquisitions are added (Kanfer & Ackerman, 1989). That is, "the services available from the existing managerial group limit the amount of expansion that can be planned [and implemented] at any time because all plans for expansion absorb some of the services available from this group" (Penrose, 1959: 49), as corroborated by more recent research (Hitt, Hoskisson, & Ireland, 1990; Yu et al., 2005).[i]

The more the acquirer's managerial resources become overstretched as a result of undertaking additional acquisitions, the more it will be forced to satisfice on their integration by engaging in ever more local search, leading it to consider an ever smaller subset of potential courses of action. That is, "the greater the job demands … the more remote strategic rationality becomes. Under high job demands, executives have so much performance pressure, so many decisions to make, in the face of so much information, they simply cannot afford – in terms of cognitive wherewithal, time, or other resources – to be comprehensive in their analyses or search for solutions" (Hambrick et al., 2005: 478). As a result, the odds of building the organizational fit required for synergies to be unlocked become ever smaller as the string of acquisitions grows.

Hence, we predict a vicious cycle as follows: the addition of a sub-optimally integrated acquisition will require more managerial resources for effective coordination of the firm as a whole (e.g., to resolve conflicts and ensure effective resource sharing between subunits), thus leaving fewer for the integration of the next acquisition. As a result, this next acquisition will be *even more* sub-optimally integrated, which, in turn, will increase the coordination demands *to an even greater extent*, and so on (see Ellis, Hollenbeck, Ilgen, Porter, West, & Moon, 2003). In light of bounded rationality, therefore, this pattern will increasingly result in missed synergistic opportunities in terms of, for example, joint R&D, exchanging best practices or people in the context of job rotation, or sharing knowledge and other resources required for concerted action throughout the firm (Ghoshal & Gratton, 2002). Based on the above, we hypothesize:

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[i] Hiring more managers is no solution, at least not in the short term, because their development and integration into the group requires the services of incumbent managers as well (Penrose, 1959).

Hypothesis 1: The impact of an additional related acquisition on firm performance becomes less positive (or more negative) as the acquisition sequence grows.[i]

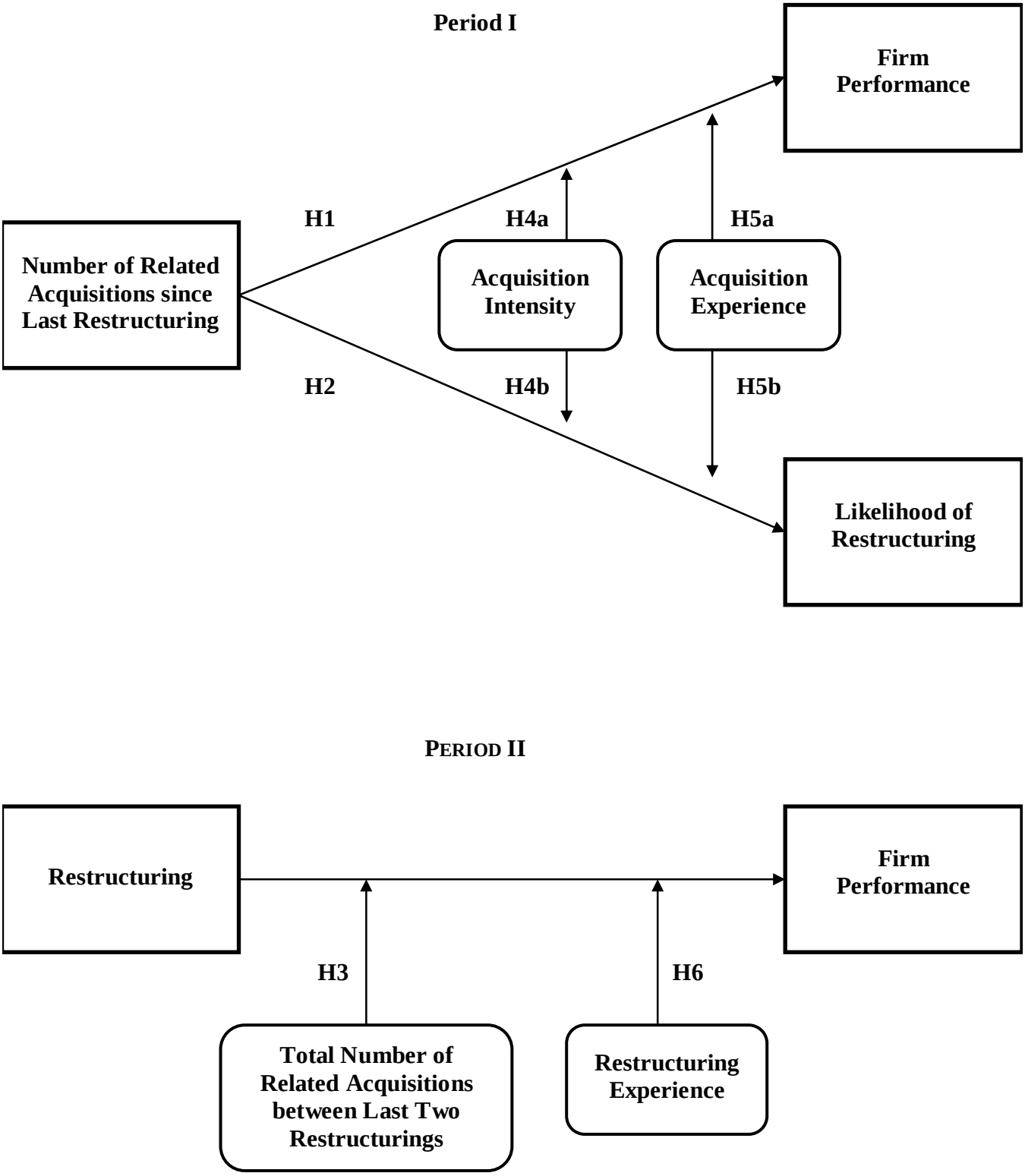
The corresponding effect of "Number of related acquisitions since last restructuring" on "Firm performance" is depicted in Figure 1, which provides a graphical representation of our theoretical framework.

Acquisitions as drivers of organizational restructuring: Distant search. As discussed earlier, behavioral scholars have argued and found that, in order to economize on information processing, firms engage in local search for an effective course of action. If this fails to generate a satisfactory outcome, they tend to shift to more distant search so as to consider a wider range of alternatives (Cyert & March, 1963; Mintzberg et al., 1976). Initially, therefore, the acquirer will mainly consider changes within the acquired firm itself, regarding its broader organizational structure as exogenous. Although such initial integration helps to realize synergies (Larsson & Finkelstein, 1999; Zollo & Singh, 2004), Hypothesis 1 suggests that these efforts gradually become blunted as the acquisition sequence grows, the firm increasingly suffers from integration and coordination problems, and its performance declines. Hence, in line with behavioral theory, we predict that at some point the firm will shift to more distant search for solutions.

We suggest that such distant search will lead to large-scale organizational restructuring, reflecting Miller and Friesen's argument that "major reorientations seem to take place because many excesses or deficiencies have developed during periods of pervasive momentum" (1980: 612). That is, the acquirer will at some point start to call into question its organizational structure and consider actions that go beyond incremental change within each individual acquisition. Again, Wolters Kluwer illustrates our theory. After a decade of highly acquisitive behavior, the

[i] The precise shape of this relationship between the number of related acquisitions undertaken and firm performance – whether it is a monotonically decreasing function or an inverted U-curve – is an empirical issue. Though, on average, acquisitions seem to fail in terms of synergy realization or, more generally, in terms of their contributions to the acquirer's performance, most studies report considerable variance in these findings (e.g., King et al., 2004), suggesting that not *all* acquisitions end up in failure. A priori, therefore, we would expect the inverted U-curve to materialize. We are grateful to our anonymous reviewers and action editor for pointing this out.

FIGURE 1
Theoretical Framework



firm's CEO, Nancy McKinstry, reported on the company website that "2003 was a year of transition for Wolters Kluwer, during which we began a … realignment of the organization."[i]

In general terms, organizational restructuring has been defined as change aimed at "increasing the efficiency and effectiveness of management teams through significant changes in organizational structure" (Bowman & Singh, 1993: 6). However, we need to be more specific because, for our purposes, it is essential to understand that organizational restructuring is fundamentally different from portfolio restructuring, which is what the term "restructuring" has usually referred to in the literature (e.g., Bergh & Lawless, 1998; Markides, 1995). Whereas portfolio restructuring refers to changes in the scope of the firm (through acquisitions, start-ups, or divestments), organizational restructuring refers to the recombination of existing subunits (see Karim, 2005), thus leaving the scope of the firm unchanged (Bowman & Singh, 1993).

Although failure of local search to yield effective courses of action has indeed been found to induce a shift to more distant search (Mintzberg et al., 1976), such a shift can take quite some time to set in, particularly when major organizational change is involved (Lant, Milliken, & Batra, 1992). Not only do firms have a tendency to escalate their commitment to key decisions made in the past (Staw, 1981), including in the context of acquisitions (Duhaime & Schwenk, 1985), but organizational change, in fact, tends to be impeded by interdependent routines in such organizational domains as structure, culture, and control systems, which have often become deeply ingrained over time (Cyert & March, 1963; Gersick, 1991; Greenwood & Hinings, 1993; Miller & Friesen, 1980; Romanelli & Tushman, 1994; Tushman & Romanelli, 1985).

As a result, the acquirer will tend to engage in major organizational restructuring only when a crisis has become sufficiently deep to break the strong grip of such inertia, triggering a period of sensemaking that allows it to change the prevailing beliefs underlying its existing organizational structure (Weick, 1995). Specifically, by redirecting its attention away from other activities (Bourgeois, 1985), such as additional acquisitions, this process will usually involve many more organizational members than the small groups of managers who initially integrated

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[i] Another illustration of how a sequence of acquisitions can drive major restructuring can be found in a press release entitled "Acquisitions trigger reorganization at Norwood," published on the homepage of Norwood Promotional Products, which states that the firm "is realigning itself to effectively integrate the new additions."

each of the acquisitions individually, thus allowing for a richer discussion and a broader range of alternative courses of action to be taken into consideration (March, Sproull, & Tamuz, 1991).

Hence, building on the argument underlying Hypothesis 1, we posit that acquisitive growth gradually increases the need for organizational restructuring, although it may take a substantial period of time before the acquirer's inertia is broken and such restructuring is actually undertaken. At this point, as Haspeslagh and Jemison suggested, "the firm has reached a stage where further acquisitions are ruled out … because the organizational challenges have caught up with them." Now, "a second, more profound set of demands arise from the competitive realities of the newly acquired position" (1991: 263), requiring major organizational change to combine all the pieces into "an integrated network of operations" (1991: 255).

Hypothesis 2: The probability of restructuring increases with the number of related acquisitions, controlling for firm performance.

Figure 1 depicts the corresponding effect of "Number of related acquisitions since last restructuring" on "Likelihood of restructuring." Since Hypothesis 1 predicts that mounting organizational inefficiencies will eventually cause firm performance to decrease, and since prior research has firmly established weakening performance as a key predictor of organizational change (Greve, 2003; Romanelli & Tushman, 1994), organizational restructuring may be a reaction to negative performance feedback. Our theory, however, suggests that acquisitive growth renders the firm more difficult to coordinate, thus possibly representing a driver of restructuring that operates independently of performance. In order to isolate the direct effect of acquisitions, therefore, we control for firm performance.

Unlocking synergistic potential through organizational restructuring. It is quite common for firms to use organizational restructuring as a means of experimenting with structure to find more promising configurations (Capron, Dussauge, & Mitchell, 1998; Capron, Mitchell, & Swaminathan, 2001; Eisenhardt & Brown, 1999; Karim, 2006). Due to bounded rationality, acquirers are typically unable to optimally integrate acquisitions the first time around. Therefore, acquisitions can be thought of as "pieces of clay that firms attempt to mold" (Karim, 2006: 804) repeatedly in order to unlock as much of their synergistic potential as possible over time.

For our purposes, recombination through organizational restructuring can take four forms, or any combination thereof: creation, elimination, merger, or split-up of divisions (Brickley & Van Drunen, 1990; see also Eisenhardt & Brown, 1999). Creation means that a new division is created into which multiple subunits are placed. Elimination implies that a division is cancelled and thus, its subunits are allocated to the remaining divisions.[i] Merger means that two or more separate divisions are combined and, finally, split-up implies that a division is broken up into one or more separate divisions. Thus, organizational restructuring has major implications for where subunits end up within the organization, representing a toolkit that the firm can use to integrate its acquisitions more effectively. By moving beyond organizational change at the level of the individual acquisition (Barki & Pinsonneault, 2005; Birkinshaw, Bresman, & Håkanson, 2000; Ghoshal & Bartlett, 1996; Ghoshal & Gratton, 2002), the acquirer can jump from a situation in which it can merely optimize its overall organizational fit "locally" – conditional on its existing organizational structure – to one in which it might reach the "global optimum" (Levinthal, 1997).

Hence, organizational restructuring enables the acquirer to more fully unlock the synergistic potential of its acquisitions.[ii] Not only does it allow the firm to identify, evaluate, and choose from among a wider range of alternative approaches to realize *anticipated* synergies, but with the benefit of hindsight, it also allows it to evaluate all of its acquisitions collectively, which may lead the firm to uncover *new* synergistic opportunities as well (Ciborra, 1996; Karim, 2006). The reason is that some of the synergistic potential of an acquisition may simply not be identifiable beforehand because it is conditional on others not yet undertaken at the time.[iii] For example, each of Cisco Systems' acquisitions tends to increase the synergistic potential of prior ones by enabling it to build more fully integrated networking solutions (Harbor Research, 2003).

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[i] To be sure, creation and elimination do not refer to acquisition and divestment of a division, respectively. Rather, they signify administrative modifications of the organizational chart, implying changes in reporting relationships.
[ii] Although organizational and portfolio restructuring are distinct in theory, they tend to correlate in practice (Bowman & Singh, 1993). Specifically, divestment activity tends to be relatively intensive during episodes of organizational restructuring (Hoskisson, Johnson, & Moesel, 1994; Miller & Friesen, 1980; Shimizu & Hitt, 2005; Tushman & Romanelli, 1985), as supported by the significant positive correlation coefficient in Table 1. In order to be able to factor out the effect of organizational restructuring in our models, therefore, we control for divestments.
[iii] As one of the anonymous reviewers pointed out, this latter argument, as opposed to the former, does not require the assumption of bounded rationality.

In the words of March et al. (1991: 8), "Great organizational histories, like great novels, are written, not by first constructing interpretations of events and then filling in the details, but by first identifying the details and allowing the interpretations to emerge from them. As a result, openness to a variety of … dimensions of experience and preference is often more valuable than a clear prior model and unambiguous objectives." Thus, it may only become clear after more recent acquisitions have been undertaken that, in the interest of organizational fit and synergy realization, some of the earlier ones in the sequence are best combined with others located in a different division, that it is best to create a new division in which multiple acquisitions are placed, or that a certain division is perhaps best split up into smaller, more homogeneous units (Brickley & Van Drunen, 1990; Galunic & Eisenhardt, 1996).[i] For instance, a study on Beatrice Company reports that following an extended period of acquisitive growth, it was restructured into six groups in order to "achieve synergies among the operations" (Baker, 1992: 1097).

Although organizational restructuring may often enable the acquirer to unlock more of the synergistic potential of its acquisitions – representing a second stage in the post-acquisition integration process – there are downsides to such radical change as well. Prior research has found that the disruption that it brings about subjects the firm to a "liability of newness" similar to that faced by newly founded firms, which leads to less efficient internal functioning and a significant short-term drop in performance as new routines are established (Amburgey, Kelly, & Barnett, 1993; Greve, 1999).[ii] Therefore, we expect the more fully unlocked synergistic potential of prior acquisitions to materialize some time after the restructuring, when its disruptive effect has subsided. Since, in light of our theory, this beneficial effect is likely to be greater if the restructuring involves a larger number of acquisitions, we hypothesize a performance increase following restructuring that is proportional to the number of acquisitions directly preceding it:

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[i] An additional benefit that organizational restructuring has to offer, in contrast to the initial, incremental efforts aimed at integrating each acquisition individually, is that it is considerably more likely to break the grip of inertia on the part of acquired firms that often complicates integration, since it jointly addresses several interdependent organizational domains over a short period of time (Allen, 1979; Romanelli & Tushman, 1994; Tushman & Romanelli, 1985). As such, it is usually able to achieve a momentum that individual subunits cannot undermine.

[ii] Empirically, therefore, we model this short-term disruptive effect explicitly, since its omission would paint an incomplete and misleading picture of the effect of organizational restructuring (Barnett & Carroll, 1995).

Hypothesis 3: Following restructuring, the increase in firm performance is amplified by the number of related acquisitions undertaken between the last two restructurings.

In Figure 1, this increase in firm performance in the period following the restructuring (i.e., "Period II") is represented by the effect of "Restructuring" on "Firm performance," amplified by "Total number of related acquisitions between last two restructurings."

The Evolution of Acquisition-Restructuring Cycles over Time

Having specified our basic model, we will now theorize how the acquisition-restructuring cycles described above evolve over time, as the firm gains experience with acquisitions and restructuring. To this end, we build on a theme within behavioral theory that naturally extends the insights into the search process gained so far: organizational learning. However, we will first briefly discuss another factor that, from a behavioral perspective, can be expected to impact the dynamics of these acquisition-restructuring cycles, namely the intensity of acquisitive growth.

Acquisition intensity. Due to bounded rationality, the post-acquisition integration process is subject to diseconomies of time compression (Dierickx & Cool, 1989). Thus, attempting to integrate a given number of acquisitions in a shorter period of time is likely to lower the degree and quality of integration and thus, the amount of synergy realized (Kusewitt, 1985; Vermeulen & Barkema, 2002).[i] The narrower the time interval in which a sequence of acquisitions is undertaken – that is, the higher the acquisition intensity – the less time the acquirer will have to search for and implement an effective course of action before the next acquisition is engaged in.

By extension, if acquisition intensity indeed hampers integration, then the need for more distant search through organizational restructuring should emerge sooner. In other words, we predict a difference in the propensity to restructure between a firm engaging in ten acquisitions within a period of, say, ten years and one undertaking ten acquisitions within a single year, as the accumulated organizational inefficiencies are likely to be greater in the latter case.

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[i] Penrose's theory of the receding managerial limit contains a compelling illustration of diseconomies of time compression: "If a firm deliberately or inadvertently expands its organization more rapidly than the individuals in the expanding organization can obtain the experience with each other and with the firm that is necessary for the effective operation of the group, the efficiency of the firm will suffer" (1959: 47).

Hypothesis 4a: Acquisition intensity moderates the relationship between the number of related acquisitions and firm performance, as predicted by Hypothesis 1. The higher the acquisition intensity, the higher the rate at which the impact of an additional acquisition becomes less positive (or more negative) as the acquisition sequence grows.

Hypothesis 4b: Acquisition intensity moderates the relationship between the number of related acquisitions and the probability of restructuring, as predicted by Hypothesis 2. The higher the acquisition intensity, the more positive this relationship.

Acquisition experience. As a task is repeated over time, the search process triggered by that task becomes increasingly routinized (Levitt & March, 1988), allowing the firm to decide on and implement a suitable course of action with less cognitive effort (March & Simon, 1958; Nelson & Winter, 1982; Shiffrin & Schneider, 1977). As the firm gains acquisition experience, therefore, detailed decision making about integration is partly replaced by routines (Zollo, 1998), thus alleviating the information-processing demands that are placed on its managerial resources.

Although the routinization that results from such experience accumulation may indeed allow the firm to acquire more *efficiently*, there is less consensus on whether it also enables it to acquire more *effectively*, thus enhancing synergy realization. Scholars have argued that it is difficult to learn from experience with heterogeneous and causally ambiguous tasks (Zollo & Winter, 2002) – a category that acquisitions clearly belong to in light of the many interdependent sub-activities that they encompass (Zollo & Singh, 2004), such as due-diligence, negotiation, financing, and integration. However, although acquisitions show considerable heterogeneity and causal ambiguity at the surface, many underlying sub-activities may be quite similar across deals (cf. Grant, 1996), such as identifying, screening, and deciding on acquisition targets, negotiating the purchase, and managing the integration process through integration teams (Haspeslagh & Jemison, 1991). Often, these sub-activities are performed by the same individuals or departments (Grant, 1996; Hébert et al., 2005), suggesting considerable scope for gaining valuable knowledge that is generalizable across acquisitions, through learning that is purely experiential or more deliberate, such as experience codification (Palter & Srinivasan, 2006; Zollo & Singh, 2004). In line with this, Eisenhardt and Brown (1999) offer anecdotal evidence of routines for mobilizing

integration teams, handling stock options, and tracking employee retention rates. General Electric, for instance, has managed to routinize its acquisition process to the point that it is now able to effectively integrate most of its acquisitions within 100 days (Ashkenas et al., 1998). More in general, most prior work has found that acquisition experience increases acquisition performance (Bruton, Oviatt, & White, 1994; Haleblian & Finkelstein, 1999; Hayward, 2002).

Extending this line of reasoning, if acquisition experience indeed increases the efficiency and effectiveness of integration, then the organizational inefficiencies described earlier should accrue less rapidly over a sequence of acquisitions. As a result, the need for more distant search through organizational restructuring should emerge less quickly as well.

Hypothesis 5a: Acquisition experience moderates the relationship between the number of related acquisitions and firm performance, as predicted by Hypothesis 1. The greater the acquisition experience, the lower the rate at which the impact of an additional acquisition becomes less positive (or more negative) as the acquisition sequence grows.

Hypothesis 5b: Acquisition experience moderates the relationship between the number of related acquisitions and the probability of restructuring, as predicted by Hypothesis 2. The greater the acquisition experience, the less positive this relationship.

Restructuring experience. If acquisition experience fosters integration at the level of the individual acquisition, experience with organizational restructuring may benefit integration at the level of the acquirer as a whole, enabling it to recombine subunits and thus, unlock previously untapped synergistic potential of its acquisitions more efficiently and effectively. Interestingly, such experience has received little attention in the literature so far (Amburgey et al., 1993; Delacroix & Swaminathan, 1991; Greve, 1998; Kelly & Amburgey, 1991; King & Tucci, 2002).

It could be argued, perhaps even more so than in the case of acquisition experience, that it is difficult to develop an experience-based restructuring capability, since restructurings occur infrequently and are highly heterogeneous and causally ambiguous (Zollo & Winter, 2002). However, the restructuring process consists of distinct sub-activities as well, such as aligning control systems and balancing power distributions (Allen, 1979; Bowman & Singh, 1993). Some of these sub-activities may be similar across restructurings, thus facilitating learning (Grant,

1996). Accordingly, Hitt et al. (2001) provide anecdotal evidence of the development of restructuring capability and McKinley and Scherer (2000) argue that top management learns through experience to choose among a variety of ways to restructure. As part of the sensemaking process surrounding complex events such as restructurings, individuals may sift back through their experience for a plausible explanation of what they now face and for a plausible course of action based on what has worked in similar circumstances in the past (Weick, 1995). Even in firms that restructure so infrequently that some of the experiential knowledge is washed away with the turnover of personnel, some of it may be retained in the form of routines, documents, culture, or other elements of organizational memory (Cyert & March, 1963).

Hence, "to routinize the process of change … an organization must gain experience in modifying operating routines … In short, organizations learn to change by changing" (Amburgey et al., 1993: 54). Although restructuring should be delayed until it is absolutely necessary and its benefits are likely to exceed its costs and disruptions, we expect that the success with which the firm is able to resolve organizational inefficiencies through restructuring – and thus, to unlock previously unrealized synergies from acquisitions – increases with restructuring experience:

Hypothesis 6: Following restructuring, the increase in firm performance is amplified by restructuring experience.

DATA AND METHODS

Sample

We collected panel data on 25 large Dutch multinational firms for the period 1966 to 2005. The year 1966 was chosen as our starting point because it represented a break in Dutch acquisition activity, with a sharp increase after 1966 (De Jong, 1988). The data were obtained directly from annual reports. The firms operated in a wide variety of industries, including brewing, publishing and printing, food products, chemicals, and so on. They represented all non-financial firms listed on the Amsterdam Stock Exchange in 1993, excluding the four largest ones (Royal Dutch/Shell Group, Unilever, Philips, and Akzo), which were outliers in terms of their

age and the time they started to acquire.[i] On average, our sample firms had 14,288 employees, 1.48 billion euros in sales, assets with a book value of 992.84 million euros, and a net profit of 43.25 million euros. Furthermore, they undertook an average of 1.87 related acquisitions per year, collectively engaging in 1585 acquisitions within our 40-year window of analysis.

Variables

Firm performance. In line with our theory and prior research on synergy realization from acquisitions (Kusewitt, 1985; Ramaswamy, 1997; Zollo & Singh, 2004), we operationalize firm performance through return on assets (ROA). Abnormal returns, although widely used in the acquisition literature, do not serve our purposes here, since we study when and how synergies are unlocked over time, rather than the total value that is created in terms of the net present value of all the cash flows that acquisitions give rise to, discounted to a single point in time. As compared to other accounting measures of profitability, ROA has been shown to be least sensitive to biases due to changes in leverage or bargaining power caused by acquisitions (Meeks & Meeks, 1981). In addition to using ROA as the dependent variable in our performance models, we include it as a control in the restructuring models, as performance tends to affect the firm's propensity to engage in radical organizational change (Greve, 2003; Romanelli & Tushman, 1994).

Organizational restructuring. This binary measure equals 1 if the annual report showed that a firm undertook organizational restructuring in a given year (Romanelli & Tushman, 1994). Sometimes restructuring took several years, but we found no cases where distinct restructuring programs overlapped in time. Organizational restructuring is fundamentally different from portfolio restructuring, which has typically been meant by the term "restructuring" in the literature (e.g., Bergh & Lawless, 1998; Markides, 1995) and which refers to changes in the scope of the firm through acquisitions, start-ups, or divestments (Bowman & Singh, 1993). Organizational restructuring, in contrast, implies the recombination of existing subunits, thus leaving the scope of the firm unchanged (Bowman & Singh, 1993; Karim, 2006). We first identified all firm-year observations in which restructuring activity took place at the divisional level, as indicated in the annual reports. Following Brickley and Van Drunen (1990), such

[i] The inclusion of these firms would have led to serious left-censoring problems for our experience variables.

divisional restructuring can take one of four forms: creation, elimination, merger, or split-up of divisions. Next, we created our restructuring dummy by assigning 1 to those cases (1) in which divisional restructuring spanned multiple divisions and/or (2) in which the firm transformed its formal structure, switching between functional, product-divisional, geographic area, or matrix structures. For triangulation purposes, we examined published business histories for the seven firms for which these were available and observed no discrepancies. This dummy serves as the dependent variable in the restructuring models and as an independent variable in the others.

Number of related acquisitions since last restructuring. This represents a count of the number of horizontal, vertical, and related diversified acquisitions since the year of the firm's most recent restructuring. Thus, in the case of organizational restructuring, the count variable is reset to zero. Following earlier research, an acquisition was coded as horizontal if it took place within the same three-digit SBI code[i] as the firm's core activities, as related diversified if it occurred within the same two-digit SBI code (but not the same three-digit category), and as vertical if it took place within the firm's value-added chain (see Pennings et al., 1994).[ii]

Number of related acquisitions between last two restructurings. This count variable is used to test H3 and, to this end, reports the total number of related acquisitions undertaken between the most recent restructuring and the one prior to that (i.e., between the last two restructurings). Hence, this variable is different from the previous one, which counts the number of acquisitions that the focal firm has so far engaged in since its most recent restructuring.

Elapsed time since last restructuring. This is a clock variable measuring the number of years elapsed since the firm's most recent restructuring. In the event of restructuring, the clock is reset to zero (e.g., Amburgey et al., 1993; Martin, Swaminathan, and Mitchell, 1998).

Acquisition experience. This variable is operationalized through the natural logarithm of the total number of acquisitions undertaken since 1966. The logarithm is used because this

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[i] The SBI coding system is the Dutch equivalent of the SIC system.

[ii] Although a more detailed operationalization of "sequences" or "strings" of acquisitions could be obtained by incorporating more properties of the underlying distribution (e.g., skewness and kurtosis in Vermeulen & Barkema, 2002), our theorizing in the present paper focuses simply on the number of acquisitions that firms undertake between episodes of organizational restructuring.

captures the decreasing marginal returns that experiential learning is subject to (e.g., Pablo, 1994; Pennings et al., 1994). Similar results were obtained using the non-transformed measure.

Restructuring experience. This variable was measured as the natural logarithm of the total number of restructurings since 1966, again with similar results when the log was not used.

Control Variables

Firm size. We use the natural logarithm of the number of employees. We include it in the performance models since it may influence both firm performance (Hitt, Hoskisson, & Kim, 1997) and acquisition behavior (Amburgey & Miner, 1992). Its inclusion may, therefore, account for spurious correlation. Firm size and its square are also included in the restructuring models, since the complexity of larger firms may require more frequent restructuring, although beyond a certain size this may be offset by structural inertia (Hannan & Freeman, 1984; Penrose, 1959).

Debt-to-equity ratio. Following prior research (Hitt et al., 1997; Vermeulen & Barkema, 2002), we control for capital structure using a debt-to-equity ratio, which may affect both acquisition behavior (as a proxy for free cash flow) and firm performance (Jensen, 1986). This variable is also included in the restructuring models as insolvency may signal a need for change.

Product scope. Product scope affects firm performance (Hoskisson & Hitt, 1990; Palich, Cardinal, & Miller, 2000). It is measured using the number of four-digit SBI codes in which the firm operated in a given year (Sharma, 1998). Using the number of three-digit SBI codes led to nearly identical results. Product scope is also included in the restructuring models, as diversified firms sometimes restructure in order to focus more on their core business (Allen, 1979).

Geographic scope. Similarly, geographic scope tends to affect firm performance (Hitt et al., 1997). We measure this variable through the number of different countries in which the firm operated in a particular year. Geographic scope is also included in the restructuring models for reasons similar to those supporting the inclusion of product scope.

Number of divestments. Although divestments are a form of portfolio restructuring rather than organizational restructuring, there does tend to be more divestment activity during periods of organizational restructuring (Bowman & Singh, 1993) (see the correlation coefficient in Table 1). In order to factor out their performance effect, therefore, the natural logarithm of the number

of divested acquisitions in a given year is included as a control in the performance models so that it is not confounded with the performance effect of organizational restructuring itself.

Number of divisions. The natural logarithm of the number of divisions of the firm is included as a control variable in the restructuring models because the modularity resulting from divisionalization may allow the firm to solve problems locally through organizational restructuring within divisions, rather than through the larger-scale restructuring that we study.

CEO change. CEO change has been found to trigger major organizational change (e.g., Lant, Milliken, & Batra, 1992; Romanelli & Tushman, 1994). In our restructuring models, therefore, we include a dummy that indicates whether a CEO change occurred in any given year.

Number of greenfields since last restructuring. This is a count of the number of greenfields undertaken since the last restructuring. It is reset to zero in case of restructuring. We include it in the restructuring models to compare the effect of greenfields to that of acquisitions. We do not expect greenfields to drive restructuring since they are naturally integrated to begin with. In fact, prior research found that greenfields make firms simple and inert (Vermeulen & Barkema, 2001), suggesting that they may have a negative effect on the propensity to restructure.

Firm dummies. We account for firm-specific unobserved heterogeneity using firm dummies. This controls for the dependence of observations nested within the same firm and alleviates concerns about potential endogeneity bias (Hamilton & Nickerson, 2003). It captures potential effects of stable firm-specific factors, such as organizational culture.

Year dummies. Year dummies are included to control for potential influences of trends, such as acquisition waves, the state of the economy, and the general aging of firms. Alternative specifications with a calendar time variable and several of its powers led to similar results.

Analyses

Given the panel structure of our data, we used Hausman tests to select between fixed- and random-effects models (Owusu-Gyapong, 1986). These tests showed that the random-effects estimator is inconsistent and thus, that fixed effects should be employed. We test H1, 3, 4a, 5a, and 6 using OLS fixed-effects regression models. To test H2, 4b, and 5b, we use conditional fixed-effects logit models, as is the standard approach with panel data and a binary dependent variable. Potential multicollinearity problems due to the use of squared and interaction terms are

mitigated by centering the continuous independent variables (Aiken & West, 1991; Jaccard, Turrisi, & Wan, 1990). Furthermore, robust Huber-White standard errors are used in all models. Finally, in order to be conservative, all significance tests in our models represent two-tailed tests, even though, in principle, one-tailed tests would have been statistically justified in light of the directionality of our hypotheses (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

RESULTS

Hypotheses Tests

Table 1 presents descriptive statistics and correlations. Overall, the magnitudes of the correlations suggest that multicollinearity is not a problem in our models, as confirmed by the variance inflation factors of our variables, which are all below 10 (Neter et al., 1996).[i]

Table 2 presents the OLS fixed-effects regression models testing H1, 3, 4a, 5a, and 6. All models are highly significant ($p < .001$) and have considerable explanatory power, with our full models (Models 8 and 9) explaining well over 40 percent of the variance in firm performance. To facilitate causal inference, we will primarily test our hypotheses using both Models 8 and 9, the latter of which is estimated with one-year lagged independent variables. Regarding H1, our models report the main effect of the number of related acquisitions since the last restructuring and its square. Note that, since we have centered our variables, it is only necessary that the coefficient of the squared term be significantly negative for there to be evidence of an inverted U-relationship (as long as the coefficient of the linear term is not too large and significantly negative). This coefficient is indeed strongly significant in almost all models ($p < .001$), including both full models. This corroborates H1 and, more specifically, reveals an inverted U-curve (see the figures below): following restructuring, acquisitions first tend to contribute to, but eventually hurt firm performance. Moreover, the partial derivatives indicate that the inflection points of the estimated inverted U-curves are all well within the range of our data.

[i] The strongest correlation is that between geographic scope and acquisition experience ($r = .675$). Since the somewhat inflated standard errors that could result bias against finding support for those hypotheses that pertain to acquisition experience, this merely renders our tests more conservative. Moreover, excluding geographic scope led to similar results for these hypotheses, implying the absence of serious multicollinearity. More in general, formal testing for spurious correlation by including the squares of the components of all our interaction terms revealed that any multicollinearity that may be present does not materially affect our hypothesized effects (Cortina, 1993).

TABLE 1
Descriptive Statistics and Correlations

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Return on assets	5.12	5.22														
2. Organizational restructuring	0.13	0.34	-0.063													
3. # Related acq. since last restruct.	12.88	16.06	0.217*	0.066												
4. # Greenfields since last restruct.	4.22	6.29	0.035	-0.001	0.590*											
5. Elapsed time since last restruct.	6.64	6.89	0.120*	-0.377*	0.601*	0.544*										
6. Acquisition experience (ln)	3.01	1.23	0.141*	0.194*	0.522*	0.268*	0.182*									
7. Restructuring experience (ln)	0.78	0.64	0.003	0.334*	0.142*	0.081*	-0.223*	0.658*								
8. Total # rel. acq. betw. last 2 restr.	12.63	14.71	-0.001	0.247*	0.091*	-0.090*	-0.283*	0.448*	0.185*							
9. # Employees (ln)	9.06	0.96	-0.095*	0.180*	0.347*	0.122*	-0.009	0.543*	0.531*	0.147*						
10. Debt-to-equity ratio	1.90	1.52	-0.245*	0.081*	0.069*	0.060	-0.054	0.126*	0.207*	-0.075	0.136*					
11. Product scope	16.07	10.65	-0.241*	0.064	-0.032	0.014	-0.110*	0.216*	0.074*	0.028	0.320*	0.117*				
12. Geographic scope	11.29	9.01	0.127*	0.169*	0.560*	0.465*	0.225*	0.675*	0.521*	0.231*	0.456*	0.072*	-0.027			
13. # Divisions (ln)	1.30	0.82	-0.018	0.092*	0.186*	0.161*	-0.049	0.537*	0.536*	0.056	0.210*	0.201*	0.154*	0.245*		
14. CEO change	0.12	0.33	-0.015	0.033	0.016	-0.038	-0.011	0.027	-0.008	0.089*	0.035	-0.032	0.001	0.020	0.014	
15. # Divestments	0.26	0.47	0.061	0.104*	0.139*	0.118*	0.048	0.326*	0.273*	0.146*	0.118*	0.017	0.127*	0.200*	0.250*	0.054*

* $p < .05$

TABLE 2
OLS Fixed-Effects Regression Models and Granger Causality Test Using LDV Model (Firm and Year Dummies Not Reported) [a]
Dependent Variable: Return on Assets

		ROA (*t*)								ROA (*t*+1)	LDV ROA (*t*+1)
	Hyp.	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept		7.243***	7.302***	6.367***	6.540***	6.599***	7.836***	6.717***	7.459***	7.646***	0.235*
Lagged dependent variable											0.463***
# Employees (ln)		-1.347***	-1.392***	-1.009**	-1.041***	-1.832***	-1.613***	-1.551**	-1.602**	-1.041*	2.124**
Debt-to-equity		-0.689*	-0.667*	-0.678*	-0.662*	-0.499*	-0.474†	-0.507*	-0.486*	-0.636***	-0.130
Product scope		-0.117**	-0.111*	-0.133**	-0.125**	-0.152**	-0.148**	-0.163**	-0.162**	-0.133*	0.093
Product scope ²		0.004	0.004	0.004	0.004	0.003	0.002	0.002	0.002	-0.001	-0.012***
Geographic scope		-0.012	-0.027	-0.016	-0.019	0.003	0.019	0.070	0.051	0.091	0.013
# Divestments (ln)		-0.056	0.009	-0.288	-0.228	-0.024	0.041	0.014	0.085	0.221	0.876***
# Rel. acq. since last restr.		0.206***	0.218***	0.043	0.053	0.033	0.086	-0.028	0.050	-0.058	-0.113
# Rel. acq. since last restr. ²	1	-0.002***	-0.003***	-0.003†	-0.005***	-0.005***	-0.004***	-0.004***	-0.004***	-0.004***	-0.002***
Restructuring		-2.902***	-2.960***	-2.239***	-2.303***	-2.091**	-1.619*	-1.285†	-1.395†	0.313	2.253***
Elapsed time since last restr.		-0.132**	-0.211***	-0.103*	-0.179***	-0.213*	-0.08	-0.257**	-0.136	-0.067	0.139
# Rel. acq. * Elapsed time	4a		0.003†		0.004***	0.004*	0.005**	0.004*	0.004*	0.006***	0.004***
# Rel. acq. ² * Elapsed time			0.000								
Acquisition experience (ln)		0.125	0.358	2.594***	2.732***	3.474***	2.946***	3.981***	3.025***	3.835***	-0.584
# Rel. acq. * Acq. exp.	5a			0.149***	0.155***	0.160**	0.102*	0.171**	0.113*	0.149**	0.077*
# Rel. acq. ² * Acq. exp.				-0.001							
Restructuring experience (ln)		1.634*	1.266	0.315	-0.037	1.437	1.020	1.485	1.418	1.203	-0.894
Total # rel. acq. betw. last 2 restr.						-0.027	0.105†	-0.028	0.069	0.135**	0.166***
Elapsed time * Total # rel. acq.	3						0.026**		0.019**	0.026***	0.023***
Elapsed time * Restr. experience	6							0.380**	0.293*	0.263*	0.222**
Adjusted R-squared		0.331	0.338	0.347	0.356	0.406	0.422	0.419	0.432	0.448	
Model F-test		8.65***	8.60***	8.91***	9.24***	7.59***	7.93***	7.85***	7.31***	7.41***	
Wald chi-squared											514.08
N		790	790	790	790	523	523	523	523	498	446

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$ (conservative two-tailed tests)
[a] The decrease in sample size from Model 5 to 6 is due to the inclusion of the "Total # of related acquisitions between last 2 restructurings" variable, which can only be computed for the years subsequent to the first observed restructuring of the focal firm. Additional models are available upon request.

With respect to testing H4a and H5a, it is important to note that our theory does not imply different *shapes* of the inverted U-curve at different values of the moderators, but only different *locations of the optimum*. Aiken and West (1991: 68-69) show that, in this case, correct testing requires that we interact the moderators only with the linear term of the independent variable. As a formal check, we estimated models that also included interactions with the squared term, but their coefficients are highly insignificant (see Models 2 and 3). H4a and H5a are supported in both full models: the coefficient of the interaction of related acquisitions with elapsed time is positive and significant (Model 8: $p < .05$; Model 9: $p < .001$), as is that of the interaction with acquisition experience (Model 8: $p < .05$; Model 9: $p < .01$). Thus, both acquisition intensity and acquisition experience moderate the inverted U-relationship between the number of related acquisitions undertaken since the last organizational restructuring and firm performance.

The graphs in Figures 2a and 2b, based on the estimates in Model 9, are neatly in line with H4a and H5a. We see, for instance, that an acquisition experience of one standard deviation below the mean (i.e., experience with about six acquisitions) does not imply any optimal number of related acquisitions at all, as even the first acquisition tends to hurt firm performance. In contrast, an acquisition experience of one standard deviation above the mean (i.e., experience with about 69 acquisitions) reveals an optimum of about 36 acquisitions, allowing ROA to rise up to 14 percent before additional acquisitions start to decrease firm performance.

In line with prior research (Amburgey et al., 1993; Greve, 1999), restructuring has a short-term disruptive effect, as can be inferred from the significantly negative coefficient of the restructuring dummy in all the models without one-year lagged independent variables (this effect indeed seems to be short-lived, since it is no longer significant one year after the restructuring, as can be seen in Model 9). In support of our theory, however, the performance increase *following* this short-term disruptive effect is greater (1) if a larger number of acquisitions preceded the restructuring and (2) if the firm had more restructuring experience, as the associated interaction terms have significantly positive effects in both full models (Model 8: $p < .01$ and $p < .05$, respectively; Model 9: $p < .001$ and $p < .05$, respectively). Hence, both H3 and H6 find support.

Briefly elaborating on H3, the results indeed suggest that organizational restructuring allows for more synergy to be unlocked, especially if such recombination activity follows a

FIGURE 2A
Estimated Relationship Hypothesis 4a: Acquisition Intensity

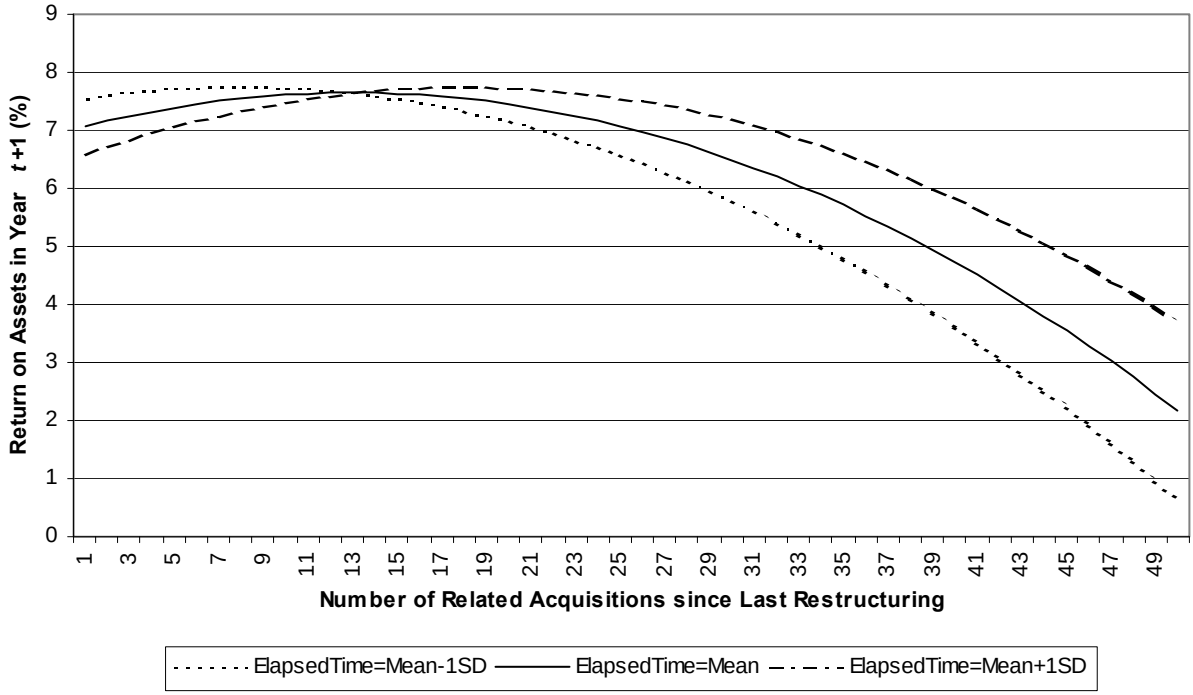
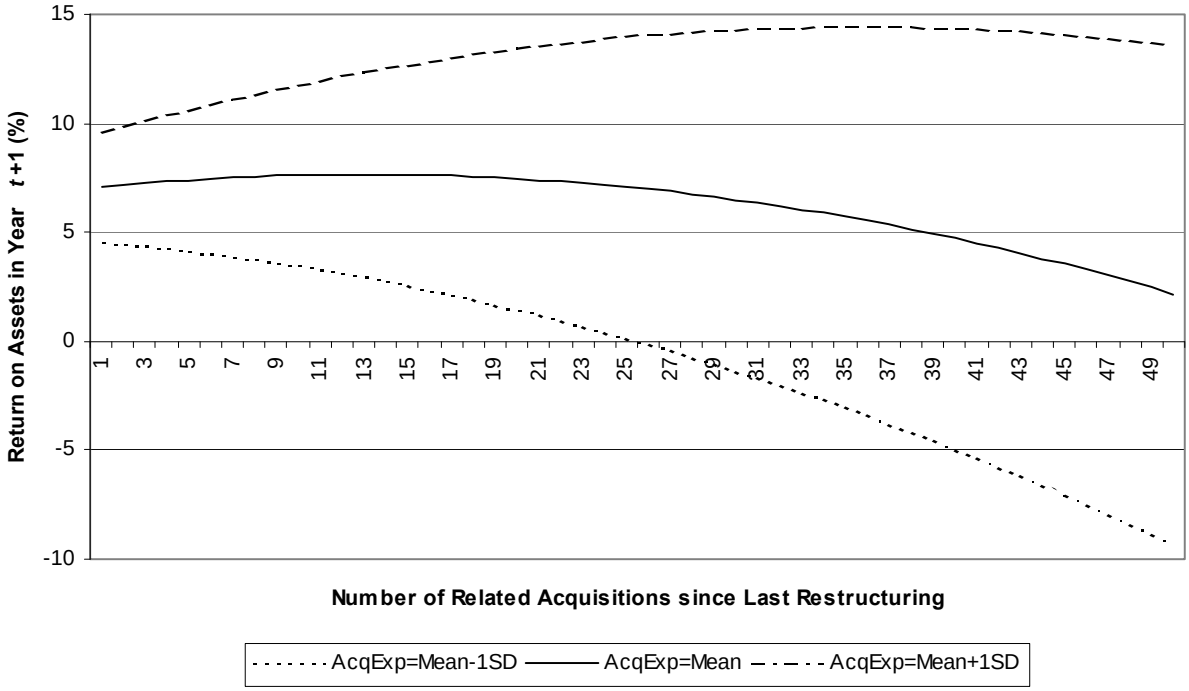


FIGURE 2B
Estimated Relationship Hypothesis 5a: Acquisition Experience



longer sequence of acquisitions. To illustrate its economic significance, the estimates of Model 9 suggest that the difference in additional gains within the first three years after the restructuring between scenarios where *five* acquisitions and *twenty-five* acquisitions preceded the restructuring amounts to no less than eight million euros. For the average sample firm with annual net profits of a little over 40 million euros, this is clearly a considerable amount of money.

Table 3 reports the logit models that test H2, 4b, and 5b. Like the OLS models, they are highly significant ($p < .001$) and have substantial explanatory power. Again, to facilitate causal inference, we lagged the independent variables by one year. Focusing on the full model (Model 5), H2 is strongly supported: the effect of related acquisitions on the likelihood of restructuring is positive and significant ($p < .01$), even after controlling for firm performance, which has a negative effect, as expected. Thus, acquisitions indeed seem to drive restructuring independently of performance. The associated odds ratio is 1.081, implying that, on average, each acquisition increases the odds of restructuring with about eight percent. Greenfields, in contrast, tend to decrease the propensity to restructure, in line with prior work (Vermeulen & Barkema, 2001).

Support is also found for H4b and H5b, as the coefficients of the interactions between related acquisitions and, respectively, elapsed time and acquisition experience are significantly negative in the full model (both $p < .05$). Thus, the wider the time interval in which acquisitions are undertaken (i.e., the lower the acquisition intensity) and the higher the firm's acquisition experience, the less each additional acquisition increases the probability of restructuring.

To improve our understanding of how our results play out over time as the acquirer gains acquisition and restructuring experience, we conducted a simulation based jointly on the full performance and restructuring models, in which performance feeds into the restructuring model and restructuring events, in turn, feed into the performance model (we used Model 8 to make sure that we also capture the short-term disruptive effect of organizational restructuring). Figures 3a and 3b present the outcomes. In line with our theory, these figures show that acquirers go through long-term cycles of acquisitions and restructuring, enabling them to become more profitable over time. What is more, the simulation adds an important insight into the dynamics of our theory: although we expected firms to learn to restructure closer to the optimal performance levels of each cycle as they gain acquisition and restructuring experience, it turns out that, with

TABLE 3
Conditional Fixed-Effects Logit Models (Firm and Year Dummies Not Reported)
Dependent Variable: Organizational Restructuring (*t*+1)

	Hyp.	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept		-3.145***	-2.765***	-2.751***	-2.625***	-2.676***
# Employees (ln)		0.517†	0.436	0.457	0.542†	0.583*
# Employees squared (ln)		-0.312**	-0.419**	-0.434**	-0.418**	-0.435**
Debt-to-equity		0.394***	0.409***	0.450***	0.419***	0.470***
Product scope		-0.012	-0.012	-0.014	-0.008	-0.009
Geographic scope		0.031	0.031	0.033	0.047	0.050
Elapsed time		-0.026	-0.085	0.078	-0.135	0.075
# Divisions (ln)		-0.527†	-0.566†	-0.529†	-0.571†	-0.553†
CEO change		0.613†	0.650*	0.623†	0.655*	0.618†
Restructuring experience (ln)		-1.329**	-1.205*	-1.146*	-1.149*	-1.076*
Acquisition experience (ln)		0.703	0.437	0.381	-0.174	-0.158
Return on assets		-0.101***	-0.097***	-0.092***	-0.107***	-0.105***
# Greenfields since last restructuring		-0.049†	-0.090*	-0.086*	-0.099*	-0.095*
# Related acquisitions since last restructuring	2		0.028*	0.027†	0.080**	0.078**
# Rel. acquisitions since last restruct. * Elapsed time	4b			-0.011*		-0.013*
# Rel. acquisitions since last restruct. * Acq. experience	5b				-0.032*	-0.032*
McFadden's pseudo R-squared		0.189	0.194	0.200	0.201	0.208
Model chi-squared		78.87***	80.50***	79.41***	83.70***	84.22***
Bayesian information criterion (BIC)		-4354.12	-4356.28	-4352.90	-4340.32	-4337.81
N		759	759	759	759	759

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$ (conservative two-tailed tests)

FIGURE 3A
Simulation Based on the Performance Model

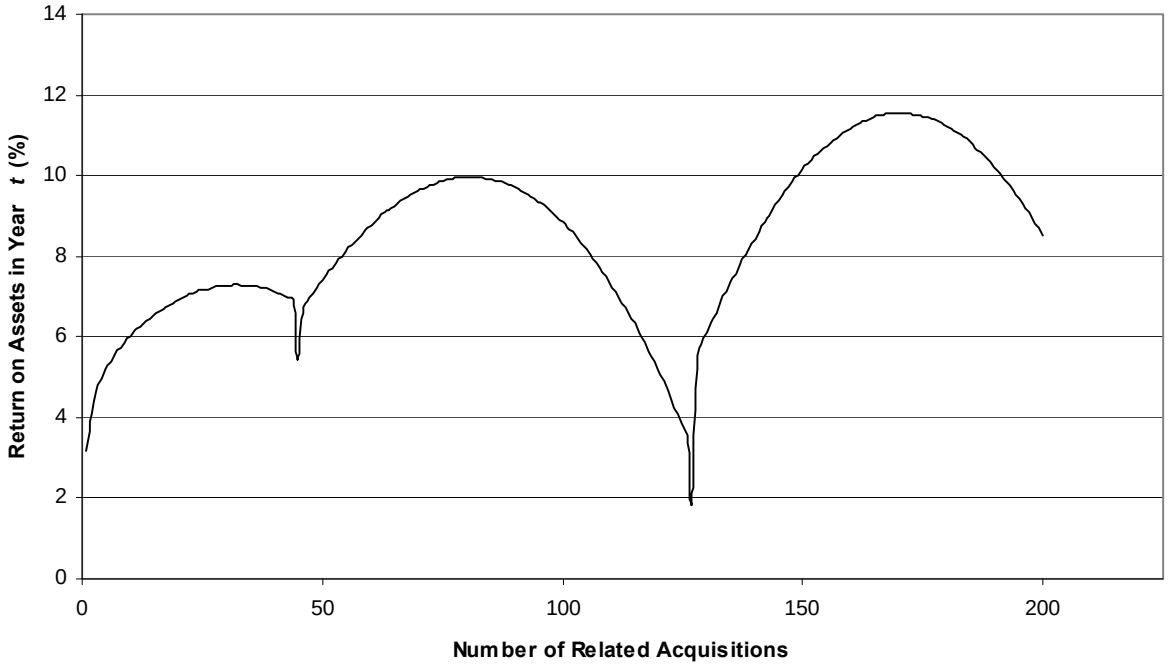
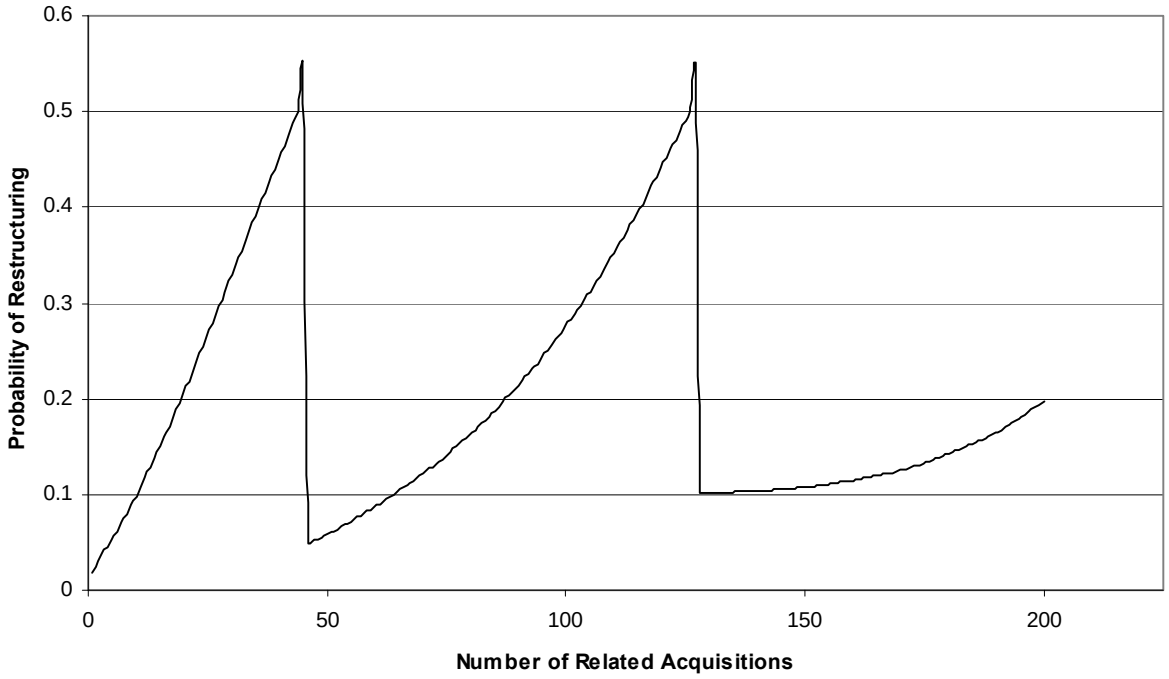


FIGURE 3B
Simulation Based on the Restructuring Model



each cycle, they tend to acquire further beyond this optimum before they restructure. Upon closer inspection, however, this makes sense, as performance levels above and beyond the optimal ones in their current cycles are more likely to be attained if firms first accumulate a larger number of acquisitions from which to unlock synergies through restructuring. Thus, experienced acquirers seem to sacrifice some of their profitability in the present to be more profitable in the future.

Causality

Do acquisitions and restructuring indeed affect performance, as hypothesized, or does performance, in fact, drive acquisition and restructuring? In non-experimental research, causal inference requires (1) correlation between cause and effect, (2) temporal precedence of the cause, and (3) exclusion of alternative explanations (Cook & Campbell, 1979). Although we have taken the conventional steps to establish causality (i.e., fixed effects and lagged independent variables), we sought to pursue this issue further through lagged dependent variable (LDV) models, which, in econometric terms, test for so-called "Granger causality" (Greene, 2003).

Using a lagged dependent variable implies conditioning on the history of all the independent variables, allowing past realizations of the dependent variable to affect its current level (Greene, 2003). Apart from explicitly modeling autocorrelation, this can greatly reduce the threat of spuriousness due to unobserved heterogeneity (Allison, 1990), thus alleviating concerns about reverse causality. The downside is that a lagged dependent variable usually absorbs a great deal of variance, leaving less for other variables to explain even though they may, in fact, be theoretically relevant. Furthermore, OLS estimation of a fixed-effects model with a lagged dependent variable leads to downward biased estimates of the coefficients of the other variables (Nickell, 1981), which can be resolved by using an estimator based on instrumental variables.

We drew on relatively recent developments in econometrics by using the Arellano-Bond estimator, which, after eliminating fixed effects using first differencing, applies instrumental variables estimation to the differenced equation (Arellano & Bond, 1991). Based on a generalized method of moments (GMM) approach, this estimator greatly improves the efficiency of the estimates by not only using lagged values of the dependent variable as instruments, but by considering all other potential instruments in the model as well. Model 10 of Table 2 presents the

results for an LDV model estimated by means of the Arellano-Bond estimator.[i] As can be seen, all our hypotheses remain supported – in some cases even more firmly than in our primary models – providing strong evidence that at least part of the causality indeed runs as specified by our hypotheses: from acquisitions and restructuring to firm performance.

Robustness Checks and Additional Analyses

First of all, responding to King et al. (2004), we used return on sales and return on equity as alternative performance measures, which led to very similar results. Second, we added a count of the total number of related acquisitions undertaken since 1966 and its square to check whether the inverted U-relationship that we pick up between restructurings is not simply part of a more general inverted U-curve (cf. Conn, Cosh, Guest, & Hughes, 2004). The original effects remained significant ($p < .001$), while those of the additional variable and its square, in fact, indicated the presence of a U-curve ($p < .001$) in line with Haleblian and Finkelstein's (1999) findings. We did the same for several randomly chosen acquisition sequences (i.e., not in between restructurings) and found no evidence of performance effects. Furthermore, adding the cubed term of our original variable led to insignificant results.

Third, we conducted four additional analyses to gain a better understanding of the inverted U-curve found for related acquisitions and to rule out potential alternative explanations. First, we re-ran the models to examine whether the relationship has a similar shape for *unrelated* diversified acquisitions. Consistent with our theory, we did not find an inverted U-effect. Second, we did the same for *international* related acquisitions: in addition to finding an inverted U-curve, we found, in line with the idea that cross-border acquisitions are particularly difficult to integrate (Brock, 2005), that that the inflection point corresponded to about two to four fewer acquisitions as compared to the one for related acquisitions in general. Third, we obtained data from the government that enabled us to operationalize industry-specific business cycles based on gross production and employment. We found that our restructuring measure is not correlated with such business cycles ($p > .50$), thus ruling out business-cycle effects as drivers of

[i] A Sargan test of over-identifying restrictions provided strong evidence of the validity of the available instruments ($p = 1.000$). Furthermore, an Arellano-Bond test provided evidence that autocorrelation of order 2 is absent ($p = .473$), implying that there is no need to add a two-year lagged dependent variable.

organizational restructuring. Furthermore, although we did find ($p < .01$) that acquisitions contribute more to firm performance when the overall industry production and/or employment is higher, suggesting that firms pick higher-quality acquisitions in times of economic prosperity within the industry (see Conn et al., 2004), these effects did not change the significance of our hypothesized results in either the performance or the restructuring models. Finally, we obtained data from SDC Platinum on the number of acquisitions undertaken in the focal firm's industry, enabling us to measure industry-specific merger waves from 1985 onwards. Our findings were similar to those on business cycles: merger waves were not correlated with our organizational restructuring measure ($p > .10$) and, although we found some evidence ($p < .05$) that firms are able to pick relatively high-quality targets during times of high acquisition intensity within the industry, this did not render our hypothesized effects in the performance and restructuring models statistically insignificant.

Fourth, upon having gathered acquisition-specific data from SDC Platinum, we found evidence ($p < .05$) that the greater the extent to which an acquisition sequence consists of multi-business targets (i.e., those active in multiple SIC codes), which are typically more difficult to integrate (e.g., Hitt et al., 2001), the faster the acquirer reaches the inflection point of the inverted U-curve that we find for H1, suggesting that it is indeed integration issues that drive our results.

Fifth, whereas the logarithmic specification of experience in our analyses is common, implying that the learning benefits of additional experience increase at a decreasing rate and thus, that recent experience is less important than earlier experience (see Yelle, 1979), some contend that recent experience may, in fact, be more decisive due to forgetting and antiquation of earlier experience (e.g., Argote, Beckman, & Epple, 1990). To explore this issue further, we incorporated three different discount factors, proposed by Baum and Ingram (1998), in our original (non-transformed) acquisition and restructuring experience variables: the square root of the age of the experience, the age of the experience, and the age of the experience squared (in increasing order of speed of experience depreciation). We found for both the restructuring and the performance models that none of these specifications fit the data as well as our initial logarithmic specifications, suggesting that acquisition and restructuring experience accumulated early on is crucial and not readily forgotten or antiquated.

Sixth, we gathered data on the top management teams (TMTs) of all our firms over our entire window of analysis from the chambers of commerce and the firms' annual reports to assess the extent to which the learning effects that we find are specific to TMT members rather than "organizational." For both acquisition and restructuring experience, we find that upon jointly including the organizational experience variable and a variable that measures the experience accumulated by the incumbent TMT member with the longest tenure, both are significant (at least $p < .10$), although the coefficient of the latter is about half the size of that of the former, thus providing some evidence of the existence of "organizational memory."

Seventh, inclusion of CEO change and the number of greenfields since the last restructuring in our performance models had little effect on the significance levels of the hypothesized effects, apart from having insignificant effects in their own right. Finally, inclusion of an interaction effect between the number of related acquisitions and the firm's debt-to-equity ratio (as a proxy for free cash flow; e.g., Gibbs, 1993), which should capture effects of free cash flow driving low-quality acquisitions (Harford, 1999), did not change our results either.[i]

DISCUSSION

Extant work has almost invariably treated acquisitions as isolated events, implicitly assuming that the acquirer can start with a clean slate every time it acquires. In reality, however, an acquisition usually represents merely one element in a broader sequence of acquisitions collectively aimed at implementing some corporate strategy (Kusewitt, 1985; Salter & Weinhold, 1979). Building on behavioral theory of search and organizational learning, we have developed a theoretical framework that adopts the acquirer, rather than the acquisition, as the unit of analysis and that seeks to explain when and how it unlocks synergy over extended periods of time.

Based on a sample of firms that engage in almost 1600 acquisitions over a period of four decades, our results reveal that acquirers tend to go through long-term cycles of acquisitive growth and organizational restructuring. Specifically, we find that the contribution of a given acquisition to the acquirer's performance depends on its position within the sequence, that such a sequence of acquisitions gradually increases the need for major organizational restructuring

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[i] We would like to thank our anonymous reviewers for suggesting several of these additional analyses.

(independently of performance feedback), and that such restructuring plays an important role in more fully realizing the potential of the firm's acquisitions. Moreover, we find that the balance that the firm needs to strike between acquisitive growth and organizational restructuring depends on its acquisition intensity as well as on its acquisition and restructuring experience.

Contributions to the Literature

First of all, our theory and results shed light on gains from acquisitions that so far seem to have remained largely overlooked. Whereas nearly all prior research has examined performance effects of acquisitions in the short to medium term (at most two or three years following the acquisition), we argue that major organizational restructuring, through the recombination of subunits that it entails, can reduce the organizational inefficiencies that inevitably accumulate over a string of acquisitions and thus, can enable the firm to more fully unlock their synergistic potential many years after they were undertaken. A key implication, therefore, is that post-acquisition integration, representing the single most important determinant of synergy realization (Larsson & Finkelstein, 1999), is often not a one-shot game, but a process that extends far beyond the integration efforts exerted for each acquisition individually.

Our study also helps to better understand the findings of prior work. By disregarding the role of organizational restructuring in establishing organizational fit, prior research has ignored important long-term benefits from acquisitions. Indeed, early acquisition research already showed that it can take up to 12 years before the full performance impact of a single acquisition can be reliably assessed (Biggadike, 1979) – an estimate that is surprisingly close to our sample average of the time lapse between organizational restructuring events. Although our study focuses squarely on acquisition performance in the long term, it may also have interesting implications for research on acquisition announcements using event studies. Under the assumption of (semi-)efficient capital markets, share prices are argued to capture the net present value of all the cash flows that a given acquisition gives rise to. However, if the focal acquisition is not the first in a sequence of related moves aimed at implementing a given strategy, then to what extent will shareholders have, in fact, anticipated the synergistic gains of this specific acquisition well ahead of its announcement (see Balakrishnan, 1988)? Even more intriguingly, are shareholders really able to foresee the gains unlocked through organizational restructuring

many years into the future, especially since our theory suggests that these gains are contingent on acquisitions that are undertaken *subsequent to* the focal one?

Third, we believe that our paper adds richness to the well-established, consistent finding that the average acquisition fails to realize anticipated synergies in the short to medium term (see King et al., 2004). The inverted U-curve regarding H1 shows that the optimum is typically reached relatively early on in the acquisition sequence and thus, that the downward-sloping part of the curve is more protracted than the upward-sloping part (see Figures 2a and 2b). Although this confirms that, on average, acquisitions decrease firm performance, it offers the additional insight that the *position* of an acquisition in the sequence is important for whether that specific acquisition will strengthen or weaken performance (prior to organizational restructuring).

Fourth, our study may shed light on the inconsistent findings on capability development in the context of acquisitions: whereas some authors find a positive relationship (e.g., Bruton, Oviatt, & White, 1994; Fowler & Schmidt, 1989), others uncover an insignificant one (e.g., Hayward, 2002; Lubatkin, 1987; Zollo & Singh, 2004), and still others find a U-shaped relationship (Haleblian & Finkelstein, 1999; Zollo & Reuer, 2003). In light of our finding that the performance of an acquisition (prior to restructuring) tends to be weaker if it occurs later on in the sequence, it may be the case that performance improvements due to learning cannot be accurately assessed by models that examine a firm's entire acquisition history at once without taking into account the counteracting force that we find between organizational restructurings. That is, although acquisitive growth enables firms to learn to become more successful acquirers, it also gives rise to other dynamics that need to be controlled for in order for the learning effects to be estimated correctly. Moreover, our study suggests that the benefits of acquisition experience are, in fact, greater than has been recognized so far, since, apart from enabling the acquirer to *increase* its acquisition performance, it also allows it to *decrease* the frequency with which it needs to engage in costly and disruptive bursts of organizational restructuring.

Fifth, our theory and results suggest that firms can develop a restructuring capability, although extant theory predicts that it would be difficult to do so, since restructurings occur infrequently and are highly heterogeneous and causally ambiguous (Zollo & Winter, 2002). Perhaps this is because organizational restructuring activity, like acquisition activity, is

partitioned into sub-activities that are similar across restructuring events and thus, may still offer considerable scope for learning (Grant, 1996). Hence, whereas acquisition experience allows the firm to learn to search locally for effective approaches toward integrating each acquisition individually, restructuring experience may enable it to learn to engage in distant search for effective ways of integrating the acquiring firm as a whole. Although organizational restructuring tends to be a traumatic event that leads to a substantial dip in firm performance in the short term (Amburgey et al., 1993; Greve, 1999), in the long term it enables the firm to more fully unlock the synergistic potential of its acquisitions and thus, to increase its performance to higher levels than before, especially, as our simulation shows, if it has restructuring experience.

More in general, we suggest that there may be benefits to placing acquisitions, as well as other types of strategic moves, within a larger framework of organizational change. In our case, by studying acquisitions at the level of the acquiring firm as a whole and demonstrating that the acquirer goes through long-term acquisition-restructuring cycles, our work establishes interesting links between the acquisition literature and the theory of punctuated equilibrium (Gersick, 1991; Tushman & Romanelli, 1985). As such, our theoretical framework draws together two forms of corporate development – acquisition and organizational restructuring – that operate at different levels of aggregation and that have rarely been studied in conjunction before.

Finally, apart from these theoretical contributions, our study may also offer an empirical contribution by formally checking the causality assumption underlying our performance models. The lagged dependent variable model that we use, in combination with the highly efficient Arellano-Bond estimator, allows us to establish Granger causality. Although this is common practice among econometricians, it is considerably more reliable than the techniques that prevail in our field today, such as fixed effects and lagged independent variables alone (Greene, 2003).

Managerial Implications

We believe that our theoretical framework and empirical results have important practical implications as well. Most notably, managers should not regard acquisition integration as a one-time, *ad-hoc* event, but rather as a more iterative process that is unable to yield optimal performance in the short to medium term. Integration requires additional, *post-hoc* efforts at the level of the acquiring firm as a whole in order to unlock a greater portion of the synergistic

potential of a past string of acquisitions than is possible through integration efforts at the level of each acquisition individually, because the synergistic potential of a given acquisition may become clearer in hindsight, especially since it often depends on those that are engaged in later on. Moreover, managers should be aware of the critical role that they play in striking a balance between acquiring and restructuring. Undertaking too many acquisitions without major restructuring will likely lead to increasingly sub-optimal integration. Restructuring too often, however, will also weaken performance due to the disruption and costs that it entails.

Limitations and Suggestions for Further Research

Our study suggests that it is important for future research to move beyond the notion of acquisitions as isolated events toward recognizing their embeddedness in sequences aimed at implementing a corporate strategy, which allows for a long-term and dynamic approach to studying their performance effects. One suggestion would be to refine our theory by studying acquisition sequences in greater detail (e.g., year-by-year trajectories rather than mere counts). Another approach would be to complement the strengths of archival data with those of survey data. Although extensive time series of archival data were necessary to test our theory, since acquisition-restructuring cycles span long periods of time, we inevitably missed out on the distinctive advantages that survey data offer. For instance, survey data, unlike our archival data, would allow one to study acquisition integration more directly, create finer-grained operationalizations of organizational restructuring, and measure acquisition size more accurately.

It also seems interesting to examine the boundary conditions of our theory. On the one hand, firms that acquire only occasionally might not have to undertake major restructuring at all, as they can largely avoid the accumulation of organizational inefficiencies. On the other hand, however, there are the highly acquisitive Cisco's and General Electric's that, somehow, also seem to be able to avoid the discrete bursts of restructuring that we have found to be necessary for our sample firms to thrive. An intriguing possibility is that, based on their vast experience, these firms have learned to effectively absorb each of their acquisitions from the start, making restructuring largely superfluous. Another interesting possibility that future research might examine is that such firms have adopted modular organizational designs (Karim, 2006; Schilling

& Steensma, 2001) that enable them to recombine their subunits more or less continuously without having to concentrate such activity in occasional bursts of radical organizational change.

Furthermore, although weak performance is well established as a key driver of organizational change (Greve, 2003; Romanelli & Tushman, 1994), we find that acquisitive growth, in and of itself, tends to trigger such change as well. This seems to contest the somewhat simplistic notion in the organizational change literature that top management is so removed from the inner workings of the firm that it relies exclusively on performance feedback to get a sense of how the firm is doing. Instead, there may often be more real-time signals, such as the organizational inefficiencies that accumulate over an acquisition sequence and that gradually render the firm more difficult to coordinate. Future research could make important contributions by providing a better understanding of what it is exactly that drives major organizational change.

Finally, as already touched upon, future research may offer valuable insights into the efficiency of capital markets by exploring the extent to which investors can really foresee gains from acquisitions that are realized far into the future, such as the ones we find, especially since some of these may be contingent upon acquisitions undertaken subsequent to the focal one.

CHAPTER 4 [i]

A STEPWISE APPROACH TO ACQUISITION CAPABILITY DEVELOPMENT: THE JOINT IMPORTANCE OF EXPERIENCE HOMOGENEITY AND HETEROGENEITY

ABSTRACT

Although organizational learning theorists have traditionally argued that experience homogeneity facilitates learning, research has recently started to uncover important learning benefits of experience heterogeneity instead. Focusing on the context of acquisitions and building on theory from cognitive psychology, we argue that their distinctive strengths are complementary and that both are crucial in developing acquisition capability, although at different stages of the learning process. We posit that, by first building a strong, though narrow, acquisition capability in its core business, the firm can subsequently use this experience homogeneity as a springboard toward developing a more widely applicable acquisition capability that capitalizes on the experience heterogeneity resulting from acquisitions outside this core business. Apart from reconciling the inconsistent views and findings in the literature today, this approach enables us to formulate and test a dynamic framework of hypotheses that provides insight into the actual process through which firms can develop acquisition capability. We test our theory using a multi-industry sample of acquirers over a period of four decades and find strong support for it.

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[i] This chapter is the result of joint work with Harry Barkema. Earlier versions of this project received a Distinguished Paper Award from the Business Policy and Strategy Division of the Academy of Management, a Best Paper Prize Honorable Mention from the Strategic Management Society, and a finalist status from the Annual Conference on Corporate Strategy. It also appeared in the Academy of Management's Best Paper Proceedings.

INTRODUCTION

The dismal track record of acquisitions, documented in a large multidisciplinary body of research including two meta-analyses (Datta, Pinches, & Narayanan, 1992; King, Dalton, Daily, & Covin, 2004), has induced many scholars to pursue a better understanding of what makes the difference between acquisition failure and acquisition success. We have learned a lot over the years. As it stands, it is commonly accepted that the success of acquisitions hinges on synergy realization (e.g., Haspeslagh & Jemison, 1991; Hitt, Harrison, & Ireland, 2001; Larsson & Finkelstein, 1999), which in turn depends on prudent target selection (e.g., Ramaswamy, 1997; Shelton, 1988; Singh & Montgomery, 1987) and, most importantly, on effective post-acquisition integration (e.g., Chatterjee, Lubatkin, Schweiger, & Weber, 1992; Datta, 1991; Haspeslagh & Jemison, 1991; Jemison & Sitkin, 1986; Larsson & Finkelstein, 1999; Pablo, 1994).

Despite the wealth of knowledge gained so far, however, most firms seem unable to put it to good use, since the majority of acquisitions continue to fail (King et al., 2004). Evidently, things are easier said than done. The business press duly recognizes, therefore, that learning from prior experience is crucial in attempting to enhance acquisition performance (e.g., Ashkenas, DeMonaco, & Francis, 1998; Paulson, 2001). Although firms may be well aware of what it takes for acquisitions to be successful in theory, effective implementation of these insights in practice is likely to require some capability that can only be developed through experience.

However, the academic literature is littered with inconsistent findings regarding the relationship between acquisition experience and acquisition performance, with some authors finding a positive relationship (Bruton, Oviatt, & White, 1994; Fowler & Schmidt, 1989), others uncovering an insignificant one (Baum & Ginsberg, 1997; Hayward, 2002; Lubatkin, 1987; Zollo & Leshchinskii, 2004; Zollo & Singh, 2004), and still others finding a U-shaped relationship (Haleblian & Finkelstein, 1999; Zollo & Reuer, 2008). These inconsistent results have sprouted a rich literature on the contingencies that might be at play. Whereas early research in the 1980s and 1990s contributed valuable insights by distinguishing between and examining different types of experience, the focus of more recent work has increasingly converged on the role that the heterogeneity of experience plays in shaping the process of organizational learning and its performance implications (for a review, see Barkema & Schijven, 2008a).

EXPERIENCE HETEROGENEITY, ACQUISITION PERFORMANCE, AND COGNITIVE PSYCHOLOGY

Organizational learning theorists have traditionally regarded experience heterogeneity as an impediment to learning – an insight that can be traced all the way back to Adam Smith's finding of productivity benefits through specialization. That is, since organizational learning is routine-based (e.g., Levitt & March, 1988; Nelson & Winter, 1982), the firm's experiences should be as homogeneous as possible to allow for effective refinement of its routines. To the extent that there is heterogeneity in experience, learning is complicated, as knowledge derived from one experience may not be generalizable to subsequent events (Zollo & Winter, 2002).

However, as elemental and taken-for-granted as this issue may have been in the past, scholars today have become increasingly divided on whether experience heterogeneity is indeed harmful or whether it is, in fact, beneficial to learning, with a number of researchers proposing that heterogeneity may actually foster the development of a deeper cognitive understanding of the task at hand (Beckman & Haunschild, 2002; Bingham & Eisenhardt, 2005; Haunschild & Sullivan, 2002; Reuer, Park, & Zollo, 2002; Schilling, Vidal, Ployhart, & Marangoni, 2003). After all, as in statistical analysis, one can only uncover causal relationships through variance.

This dichotomy of perspectives has also started to emerge, more specifically, within the literature on acquisitions. Although there is compelling evidence that experience heterogeneity complicates learning (Finkelstein & Haleblian, 2002; Haleblian & Finkelstein, 1999; Zollo & Singh, 2004), it has recently been uncovered that limited amounts of it can actually foster the development of acquisition capability (Hayward, 2002). Hence, there is a sizable gap in our understanding of what type of acquisition experience – homogeneous or heterogeneous – lends itself best to the challenge of improving the performance of present and future acquisitions. From a theoretical standpoint, this question begs an answer if our field is to push beyond the inconsistent findings that currently mark this area of study. From a practical standpoint, moreover, deeper insight seems crucial if firms are to systematically improve their acquisition track records and guard against the destruction of value that has become all too common.

We set out to answer this research question by drawing on theory that, we believe, enables us to address the above-mentioned inconsistent views and findings head-on: transfer

theory (see Cormier & Hagman, 1987; Ellis, 1965). Transfer theory originated in cognitive psychology to help explain individual-level learning but is increasingly applied in organizational settings in pursuit of valuable refinements of organizational learning theory. Having matured into a well-developed theoretical framework and having spawned a large number of empirically supported findings, it offers insights that may be of great value in attempting to enhance the explanatory power of the considerably younger organizational learning framework.

Transfer theory studies the performance effects of transferring prior experience with a given task to subsequent tasks (Cormier & Hagman, 1987; Ellis, 1965; Singley & Anderson, 1989). Research in this area typically consists of experiments that are designed to assess how experience accumulated with one or more tasks in the first part of the experiment subsequently influences the performance of the focal task in the second part. An early, but key, contribution of this literature is the argument that transfer effects can be positive as well as negative, depending on the extent to which the tasks performed during the two parts of the experiment are similar. This insight has recently been successfully applied to the acquisition context, deepening our understanding of the learning process in important ways by showing that dissimilarities between acquisitions can lead firms to inappropriately generalize their experience, hurting acquisition performance as a result (Finkelstein & Haleblian, 2002; Haleblian & Finkelstein, 1999).

Notwithstanding these seminal contributions, we have so far only scratched the surface of the richness that this area of cognitive psychology has to offer. Central to our paper are more recent developments that, we propose, can help us push the envelope considerably further by suggesting a more nuanced perspective. This perspective helps to reconcile and synthesize today's inconsistent views and findings on the effects of experience homogeneity and heterogeneity in an integrated theoretical framework that captures the dynamics of the process through which capabilities can be built. Specifically, we argue that experience homogeneity and heterogeneity each have their own distinctive strengths and can both be beneficial to the development of acquisition capability, but at different stages of the learning process. They are argued to play complementary roles because the strengths of one can compensate for the weaknesses of the other, thus making it possible to get "the best of both worlds." However, whether or not the firm ultimately succeeds in doing so, we argue, critically depends on the path

taken toward developing the capability. We test our theoretical framework using a multi-industry sample of acquirers that covers the four-decade period from 1966 through 2005.

THEORY AND HYPOTHESES

A Transfer-Theoretic Approach to Capability Development

The basics of transfer theory hold that for positive experience transfer to occur from one instance to the next – that is, for experience accumulation to be conducive to productive learning – there needs to be sufficient structural similarity between these instances (Ellis, 1965; Gick & Holyoak, 1987; Singley & Anderson, 1989), meaning the presence of shared components that are causally related with performance outcomes. The larger the number of such shared components, the greater the structural similarity and the higher the probability of positive transfer effects (see Tversky, 1977). In case of insufficient structural similarity, in contrast, experience may be generalized from one instance to a subsequent one to which the experience is not applicable, causing negative transfer effects. Such negative transfer results from the nature of human procedural memory, the resilience of which leads to the application of established routines to activities with fundamentally different execution requirements (Cohen & Bacdayan, 1994). Of course, beyond a threshold level of dissimilarity, no transfer will be attempted at all, since the inapplicability of prior experience to the focal event will be evident (see Barnett & Ceci, 2002).

After establishing these essentials, scholars developed the theory further by looking more closely at the effects of the composition of the first part of the experiment on the performance of experience transfer. Apart from uncovering that the learning process tends to benefit from having encountered a larger number of instances of a particular task (Ellis, 1965), they found the heterogeneity among these instances to play a crucial, albeit initially elusive, role. Resembling the competing arguments and findings in the organizational learning literature outlined earlier, transfer theory generated seemingly contradictory arguments and findings on the performance effects of experience homogeneity and heterogeneity during transfer. This indicates that, in the past, this field has had to come to terms with an inconsistency similar to the one we are currently facing in our own field: Is it experience homogeneity or heterogeneity that is most conducive to learning? Whereas some found experience heterogeneity to hinder learning (e.g., Nitsch, 1977;

Peterson, Meagher, Chait, & Gillie, 1973), others found it to be beneficial (e.g., Anderson, Kline, & Beasley, 1979; Fried & Holyoak, 1984; Homa & Vosburgh, 1976).

As summarized in Figure 1, experience homogeneity and heterogeneity each have their own distinctive strengths and weaknesses. Experience homogeneity makes underlying causal relationships relatively easy to identify but can only give rise to a narrow capability. In contrast, experience heterogeneity could result in a capability that is more broadly applicable but at the cost of introducing high levels of causal ambiguity. As such, they appear to be complementary in that the strengths of one might be able to compensate for the weaknesses of the other.

FIGURE 1
Experience Homogeneity versus Experience Heterogeneity

	Experience Homogeneity	**Experience Heterogeneity**
Strength	Facilitates the identification of underlying causal relationships (i.e., low causal ambiguity)	Enhances the generalizability of identified causal relationships, since they are representative of a wide variety of events
Weakness	Limits the generalizability of identified causal relationships, since they are representative of only a narrow set of events	Complicates the identification of underlying causal relationships (i.e., high causal ambiguity)

Given this complementarity, scholars eventually realized that a dynamic approach might hold the key to explaining the inconsistent findings on the effect of experience heterogeneity, leading them to investigate the effect of the *order* in which experiences are accumulated on the performance of subsequent experience transfer. For instance, in a learning experiment involving the acquisition of novel words, Nitsch (1977) found that, although highly variable instances clearly impaired learning, when high-variability instances were preceded by a sequence of low-variability ones, the subjects experienced considerably less confusion. Along the same lines, Elio and Anderson (1981, 1984) found, in experiments involving the classification of people described by verbal attributes, that experience transfer was most effective when low-variability

instances were introduced first.[i] This suggests that both experience homogeneity and heterogeneity may play important roles in the learning process, but that one will only be able to capitalize on their complementary strengths if they are encountered in the appropriate order.

Hence, there seems to be a specific algorithm that optimizes learning – one that has become considerably better understood as subsequent research built on the above. The first stage consists in exclusive exposure to relatively similar instances – that is, a period of focused training or "deliberate practice" (Ericsson & Charness, 1994: 726) – which avoids the complications that arise from being exposed to the full variability from the start (Elio & Anderson, 1981, 1984; Nitsch, 1977; Reber, Kassin, Lewis, & Cantor, 1980). As such, it enables the "novice" to develop into an "expert," thus gaining a deep understanding of the causal relationships underlying the particular task at hand. Whereas novices tend to transfer experience across tasks based on so-called "surface similarities" – that is, similarities not causally related with performance outcomes and thus, not conducive to positive experience transfer (Gick & Holyoak, 1987) – experts have developed the ability to accurately identify the underlying structural similarities, thereby enabling them to transfer experience based mainly on these (Chi, Feltovich, Glaser, 1981; Day & Lord, 1992; Novick, 1986, 1988).

By implication, only after attaining a sufficient level of expertise with the task at hand, should it be possible to effectively transfer experience beyond this specific setting (Elio & Anderson, 1984; Gick & Holyoak, 1987). This represents the second stage of the proposed learning process and allows the learner to gradually grow the initial, narrow capability into a more widely applicable one. Hence, the learning process is strongly path-dependent: rather than developing distinct capabilities for each task that is performed, the learner builds a capability for the first task encountered and then gradually attempts to extend this initial capability in an attempt to make it applicable to a wider variety of (seemingly) related tasks.

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[i] Specifically, this was found to be the case for tasks requiring an implicit learning approach. In cognitive psychology, an "explicit" learning approach refers to situations in which one can uncover a single deterministic rule on the basis of which experience is transferred. In contrast, an "implicit" learning approach implies that multiple partially predictive rules are derived more or less subconsciously (Gick & Holyoak, 1987), which is usually the only option in the case of relatively complex tasks (Woltz, Gardner, & Bell, 2000), such as acquisitions.

In sum, the crucial point here is that in order to optimize learning by minimizing negative experience transfer, it is imperative that exposure to heterogeneous experiences be postponed as much as possible until sufficient expertise has been developed through repeated encounters with homogeneous ones. It is this insight in particular that, we believe, has the potential to help deepen our understanding of how firms can successfully build acquisition capability.

Transfer Theory in the Context of Acquisitions

Although caution is warranted when applying individual-level theory at the organizational level (Klein, Tosi, & Cannella, 1999), there is strong evidence that individual and organizational learning overlap considerably, since organizational routines are stored as procedural memory at the individual level. "The properties of organizational routines arise from the way individuals store and enact their parts in those routines … [They] can be viewed as the concatenation of … procedurally stored actions, each primed by and priming the actions of others" (Cohen & Bacdayan, 1994: 557). This is in accordance with research arguing and demonstrating that organizational capabilities largely consist in the integration of pieces of knowledge held by individuals scattered throughout the firm (e.g., Grant, 1996; Henderson & Clark, 1990; Kogut & Zander, 1992; Nickerson & Zenger, 2005).

Furthermore, to the extent that organizational cognition does not take place at the individual level, it often seems to behave analogously to individual cognition (Schilling et al., 2003). These insights, among others, have led scholars to believe that transfer theory from cognitive psychology may have considerable explanatory power at higher levels of aggregation, such as the group and the organization (e.g., Crossan, Lane, & White, 1999; Larson & Christensen, 1993), as has been confirmed by recent empirical research (Finkelstein & Haleblian, 2002; Haleblian & Finkelstein, 1999; Schilling et al., 2003; Zollo & Reuer, 2008).

Structural similarity. In order to apply transfer theory to our acquisition context, we need a criterion on the basis of which structural similarity between acquisitions can be assessed. Prior research found similarity in terms of product business to be of central importance for experience to be generalizable across acquisitions, since "the demands of a particular industrial environment induce firms to submit to standard procedures" (Finkelstein & Haleblian, 2002: 38; see also Haleblian & Finkelstein, 1999; Hayward, 2002). More specifically, the industrial environment in

which acquirers are embedded leads them to pursue the same type of synergistic benefits, such as scale economies, scope economies, and market power (Gross & Lindstädt, 2005; Haspeslagh & Jemison, 1991), which, moreover, tend to vary over time with regulatory changes, technological advances, changes in industry concentration, and the like (Gugler, Mueller, Yurtoglu, 2006).

In short, firms within the same product business "are subject to similar technological requirements and market dynamics" and thus, face "common problems and situations" (Yin & Shanley, 2008: 475). In support of this, product business similarity has been found to be a crucial factor through which managers perceive similarity across firms (Stimpert & Duhaime, 1997). Following earlier work, therefore, we focus on the acquisition's product business – capturing a plethora of shared practices and procedures – as the central criterion of structural similarity.[i]

We distinguish between two key categories of acquisitions. The first contains those acquisitions undertaken within the firm's initial core business.[ii] Since all these acquisitions are embedded in one and the same business – the firm's core business – they are by definition characterized by high levels of structural similarity. In contrast, the second category includes acquisitions in all related businesses the firm enters, broadening its scope beyond that of the core business alone. As elaborated upon below, these acquisitions, to the extent that they do not belong to the same business, reflect intermediate levels of structural similarity, both when compared to the core business and to one another. Since low structural similarity, as mentioned earlier, usually precludes experience transfer to begin with, all other – that is, unrelated – acquisitions are relatively uninteresting for our theoretical purposes, although we do control for them in our statistical analyses and explore them in greater depth in additional analyses later on in the paper. In sum, therefore, our key focus is on the first two acquisition categories, with the first corresponding to low levels and the second to intermediate levels of structural similarity.

Experience heterogeneity. Although most prior research on experience transfer – both in cognitive psychology (e.g., Ellis, 1965; Gick & Holyoak, 1987; Barnett & Ceci, 2002) and in our own field (e.g., Dokko, Wilk, & Rothbard, 2008; Haleblian & Finkelstein, 1999; Zollo & Reuer,

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[i] To explore this issue further, however, we examine the national culture in which the acquisition is embedded as an alternative criterion for structural similarity later on in the paper.

[ii] This represents the industry that the firm started off in. We refer to it as the *initial* core business because, as the firm expands and diversifies over time, its core business may sometimes change.

2008) – has conceptualized structural similarity at the dyadic level, our pursuit of a dynamic approach aimed at reconciling and synthesizing the inconsistent views and findings in the literature requires that we incorporate it into an overarching concept of experience heterogeneity. Hence, we are not only interested in the extent to which each of the firm's prior acquisition experiences is structurally similar to the focal acquisition, but also in the degree of structural similarity among the prior experiences themselves, which can accommodate the theoretical importance of the order in which these experiences are accumulated.

As discussed in the previous section, cognitive psychologists have found consistent evidence that the performance effects of experience transfer are optimized when the learning process is divided into two stages, which we label the "training stage" and the "generalization stage." More specifically, learning tends to be optimized if experience heterogeneity is postponed until a strong, albeit narrow, capability has been developed through a training period of relative experience homogeneity. Thus, the strength of the capability that the firm ultimately ends up with is highly path-dependent, being contingent on the extent to which "similar instances occur close together" in the training stage (Elio & Anderson, 1984: 28). Structurally dissimilar "interference" (Woltz et al., 2000: 602) between the focal acquisition and prior experiences that are structurally similar to this acquisition should, therefore, be avoided, at least until sufficient expertise has been developed to better cope with such experience heterogeneity.

In what follows, we approach the firm's acquisition behavior over an extended period of time as a natural or quasi-experiment that can be mapped onto the pure experimental design used by transfer theorists in cognitive psychology. Although there is considerable variance across firms, they initially tend to focus on acquisitions aimed at expanding and strengthening their core business (e.g., Chandler, 1962; Zook, 2004). As such, this relatively early phase in the firm's life can be likened to the training stage of "deliberate practice," which transfer theorists have found to be the crucial first step in effective learning. In contrast, subsequent diversification moves into new, related product businesses represent the generalization stage.

The Training Stage

Given our criterion of structural similarity, two acquisitions are structurally similar to the extent that they are in the same product business. In principle, therefore, prior experience with an

acquisition in the firm's core business should be generalizable to a subsequent acquisition in this business such that the probability of its failure decreases (Gick & Holyoak, 1987). As additional experience is accumulated with these acquisitions, the focal one is increasingly likely to succeed due to these compounding positive transfer effects (Ellis, 1965; Elio & Anderson, 1981).

In other words, the high degree of structural similarity involved should enable the firm to refine the associated routines with every additional acquisition undertaken. The more acquisitions the firm engages in within its core business, the more clearly it will be able to discern the underlying cause-and-effect relationships and the more successfully it can undertake the next acquisition in this business. Thus, we hypothesize:

Hypothesis 1: As the firm's acquisition experience in its initial core business increases, the failure probability of the focal acquisition in this core business decreases.

Above and beyond that stated in Hypothesis 1, however, the insights discussed earlier suggest that the effectiveness of capability development depends not only on the structural similarity between prior experiences and the focal acquisition, but also on the structural similarity between prior experiences themselves, which reflects the degree of experience heterogeneity that the firm faces when undertaking the focal acquisition. Specifically, capability building should be optimized if the firm avoids experience heterogeneity in the early stages of its development, since it creates causal ambiguity that complicates the learning process.

In principle, high degrees of experience heterogeneity are unlikely to be encountered early on in the firm's life because firms almost invariably lack the excess resources required to make diversification economically justifiable given the high risk involved (e.g., Chandler, 1962; Penrose, 1959; Zook, 2004). As a result, adoption of a diversification strategy – representing a break with mere horizontal expansion within the core business – usually occurs later on. In a way, therefore, most firms do indeed go through an initial "training stage" of relative experience homogeneity to one degree or another, albeit usually out of necessity rather than anything else.

Nevertheless, since there is only a limited supply of potentially interesting targets at any given point in time, the firm's acquisition behavior is typically shaped by those opportunities that happen to present themselves on an ad hoc basis (Conn, Cosh, Guest, & Hughes, 2004; Fuller,

Netter, & Stegemoller, 2002), rather than by a deliberate pursuit of acquisition candidates that are structurally similar to its previous deals. Hence, there is likely to be considerable variation across firms in terms of when they eventually do start to encounter experience heterogeneity by engaging in acquisitions that are structurally dissimilar to those in their core business.

We argue that the positive experience transfer effects predicted in Hypothesis 1 will be contingent on the degree of experience heterogeneity faced by the firm. Specifically, they might be mitigated if structurally dissimilar acquisitions "interfere" (cf. Woltz et al., 2000) between the focal acquisition in the core business and those previously undertaken in this business (Elio & Anderson, 1984). Most importantly, the specific nature of their structural dissimilarity to those in the core business can be expected to determine how much of an interference they actually turn out to be in the event of experience transfer. Since each business presents its own problems and situations (Yin & Shanley, 2008), as touched upon earlier, acquisitions in different businesses often require different courses of action in terms of, for instance, due diligence, valuation, financing, and integration (Finkelstein & Haleblian, 2002; Haspeslagh & Jemison, 1991).

Hence, an acquisition outside the core business, even if its business is related, is less structurally similar to the focal acquisition in the core business than one within this same core business. As a result, prior experience with an acquisition in some related business is unlikely to be readily and fully applicable to the focal one in the core business. Nevertheless, these acquisitions are not completely structurally dissimilar either, since, by definition, their businesses are to some extent related – that is, similar (Zaheer, Castañer, & Souder, 2004) – to one another. They are, therefore, characterized by intermediate levels of structural similarity.

Although perhaps counterintuitive at first, research has shown that it is precisely at such intermediate levels of structural similarity that negative transfer is most likely to occur (Zollo & Reuer, 2008). After all, at high levels of structural similarity, positive transfer will result, but at low levels there will be no experience transfer to begin with. Thus, on the one hand, acquisitions in related, but different, businesses will often be sufficiently structurally dissimilar to require different courses of action for them to perform well. On the other hand, however, they are likely to be sufficiently structurally similar to actually be perceived as such and induce the firm to transfer experience across them. In short, intermediate levels of structural similarity make it

difficult for the firm to "correctly identify the lessons from past experiences that are applicable to the context at hand" (Zollo & Reuer, 2008: 11), thus often giving rise to negative transfer effects.

In light of the above, "interfering acquisitions," which we define as those in related businesses that take place between the focal acquisition in the core business and the most recent one in this core business, capture a dimension of experience heterogeneity that is critical for our purposes. In effect, these acquisitions cut short the training stage of experience homogeneity, thus weakening the firm's ability to effectively learn from its prior acquisition experience in the core business.[i] That is, by engaging in such acquisitions characterized by different execution requirements, the firm inadvertently modifies the routines thus far developed in ways that make them less applicable to subsequent acquisitions in the core business. More formally:

> *Hypothesis 2: The negative relationship between the firm's acquisition experience in its initial core business and the failure probability of the focal acquisition in this core business is moderated by interfering acquisitions.*

The Generalization Stage

Our first two hypotheses were intended to shed light on the importance of experience homogeneity for the firm in establishing a strong, albeit narrow, acquisition capability within its core business through what we have labeled the training stage. In what follows, we will build on these initial insights by theorizing about how the firm should proceed from here in an attempt to grow its capability into one that is more widely applicable. That is, we will now focus on the generalization stage, which the firm enters once it starts to acquire outside its core business.

Experience homogeneity as a springboard. In essence, negative experience transfer is attributable to a discrepancy between perceived and structural similarity. Some perceived similarities represent surface, rather than structural, similarities, meaning that they are not causally related with performance outcomes and thus, not conducive to positive experience transfer (Gick & Holyoak, 1987). Negative experience transfer is, therefore, most likely to occur

[i] An alternative explanation may be that it is not such interfering acquisitions but simply the time lapse between structurally similar ones that complicates learning. Indeed, some organizational scholars have studied such processes of forgetting (Benkard, 2000; Hedberg, 1981). To account for this, we control for this time lapse in our analyses.

where this gap between perceived and structural similarity is greatest, which, as discussed in the previous section, is at intermediate levels of structural similarity (Zollo & Reuer, 2008). Since acquisitions in related businesses are characterized by such levels of structural similarity relative to the firm's core business, it may seem that the narrow acquisition capability developed in the core business during the training stage would be of little use in related businesses.

Here, however, the dynamic perspective that cognitive psychology provides is invaluable. Initial exposure to a relatively homogeneous set of experiences has consistently been shown to build expertise over time that tends to close the above-mentioned gap between perceived and structural similarity (e.g., Elio & Anderson, 1981, 1984; Ericsson & Charness, 1994; Nitsch, 1977; Reber et al., 1980). As such, it enables one to identify structural similarities ever more accurately, thereby allowing experience transfer to occur primarily based on these, rather than surface similarities (Chi et al., 1981; Day & Lord, 1992; Novick, 1986, 1988; see also Haleblian & Finkelstein, 1999). Thus, the firm that manages to build a strong initial acquisition capability within its core business by postponing acquisitions in related businesses until it has developed the expertise needed to cope with this experience heterogeneity (see Hypotheses 1 and 2), should, in fact, be in the best position to ultimately engage in these acquisitions successfully.

After developing a sufficient amount of such expertise, the firm has a deep understanding of the critical success factors that govern acquisitions in its core business. For example, it may have become keenly aware of the performance implications of post-acquisition integration and obtained a firm grasp of how to implement this process within its core business, where synergies are based on, say, cost subadditivities (e.g., Gimeno & Woo, 1999). As such, the firm now has specific knowledge based on which it can identify those pieces of its acquisition experience in the core business that should not be transferable to the focal acquisition in a related business, where synergies may, instead, be based on revenue superadditivities and thus, require a fundamentally different integration approach. In contrast, without such expertise, it cannot identify structural similarities, thus mainly transferring inapplicable elements of prior experience based on surface similarities (e.g., "The target is about the same size as our previous deals").

We expect, therefore, that once the firm has accumulated a sufficient amount of acquisition experience in its core business, the resulting capability can serve as a springboard

toward undertaking acquisitions in related businesses more effectively. Prior to attaining this requisite level of expertise, however, negative experience transfer is still likely to occur (cf. Haleblian & Finkelstein, 1999). Based on the above, we hypothesize:

> *Hypothesis 3: As the firm's acquisition experience in its initial core business increases, the failure probability of the focal acquisition in a related business first increases but later on decreases (i.e., an inverted U-relationship).*

Capitalizing on experience heterogeneity. Thus far, our hypotheses have focused almost exclusively on the benefits of experience homogeneity, much like the literature on organizational learning has traditionally done (see Levitt & March, 1988). In light of more recent work in this field, however, our theorizing would be seriously incomplete if it failed to recognize the distinctive advantages that experience heterogeneity has to offer (Beckman & Haunschild, 2002; Bingham & Eisenhardt, 2005; Haunschild & Sullivan, 2002; Reuer et al., 2002; Schilling et al., 2003). Although experience homogeneity indeed facilitates the identification of underlying cause-and-effect relationships, the limited variance that it entails implies that it will inevitably give rise to relatively simplistic routines customized to specialized settings (Bassok & Holyoak, 1987; Rosch, 1978). As Figure 1 suggested, it is this inherent weakness that may often make heterogeneous experiences as indispensable to the learning process as homogeneous ones. Hence, if the firm hopes to build a capability that is strong as well as widely applicable, it seems to have no choice but to somehow integrate the complementary strengths of both.

As discussed earlier, however, experience heterogeneity can create serious challenges if intermediate levels of structural similarity are involved and the firm lacks the expertise to deal with them, in which case negative experience transfer is likely to result (Zollo & Reuer, 2008). When confronted with a highly heterogeneous set of experiences, the variance often turns out to be confusing and detrimental to the ability to identify the causal relationships underlying their performance outcomes (Elio & Anderson, 1981, 1984; Nitsch, 1977). To be sure, this does not hold only at maximum levels of such heterogeneity, where each and every experience would be dissimilar to all others (see Harrison & Klein, 2007). In fact, even relatively few dissimilar

interferences in an otherwise homogeneous sequence of experiences can seriously impair the chances of any productive learning taking place (Elio & Anderson, 1984; Woltz et al., 2000).

We argue that the above often closely resembles the reality that acquirers face once they move outside their core business. Although firms, over time, tend to acquire repeatedly within the same related business, these structurally similar acquisitions are hardly ever clustered in neat sequences conducive to learning. Instead, as argued earlier, the business in which the next acquisition will take place is usually driven mainly by whatever interesting opportunity happens to present itself at that particular point in time (e.g., Conn et al., 2004). Thus, after adopting a diversification strategy, most firms acquire in a number of different businesses, possibly multiple times, in a more or less chaotic or jumbled order over time (see Chandler, 1962). For instance, the firm may engage in a few acquisitions in one related business, then several in another, perhaps one or two more in the first, and so on. Given the above research, therefore, the typical acquisition pattern resulting from a diversification strategy is likely to make it problematic for the firm to discern the cause-and-effect relationships underlying these acquisitions.

In support of this scenario, organizational learning scholars have shown that under conditions of high causal ambiguity, experience is indeed often unlikely to allow for the underlying causal mechanism to be identified (Lomi, Larsen, & Ginsberg, 1997; March & Olsen, 1975). Hence, we hypothesize that, in and of itself, the relatively heterogeneous acquisition experience accumulated through diversification will result in negative experience transfer:

Hypothesis 4: As the firm's acquisition experience in non-focal related businesses increases, the failure probability of the focal acquisition in a related business increases.

Nevertheless, we expect that this main effect of negative experience transfer is crucially contingent on the initial acquisition capability that the firm develops within its core business during the training stage. Leading up to Hypothesis 3, we argued that the firm needs sufficient expertise with these acquisitions to be able to accurately assess which elements of this initial capability are and which ones are not transferable to the focal acquisition in a related business. Extending this reasoning, we now argue that it requires this same expertise in order to evaluate

which of the elements of the heterogeneous experience with acquisitions in related businesses accumulated so far can be drawn upon to fill in the gaps that its initial capability cannot.

Specifically, by sharpening the firm's understanding of what its initial capability can and cannot do, this expertise enables it to improvise effectively in those areas where this narrow capability cannot help. In other words, it enables the firm to substitute active, mindful search for semi-automatic, less mindful transfer of established routines that are not generalizable to the task currently at hand (Cyert & March, 1963; Levinthal & Rerup, 2006). Indeed, research has shown that successful improvisation is not a spontaneous process but, instead, requires the development of a great deal of expertise beforehand (Moorman & Miner, 1998; Weick, 1998), since it "relies on rules and routines that are pre-established and rehearsed" (Vera & Crossan, 2005: 203).

Upon having attained sufficient expertise in its core business, therefore, we expect the firm to be able to avoid the negative transfer effects in Hypothesis 4 and, in fact, capitalize on its heterogeneous experience in related businesses. Since diverse experiences represent the building blocks for creative improvisation (Vera & Crossan, 2005), they allow the firm to greatly increase the number and variety of potential courses of action that it can consider in addressing the gaps that its initial capability cannot fill in the event of a related acquisition (Beckman & Haunschild, 2002; Bingham & Eisenhardt, 2005). In essence, then, experience heterogeneity allows the firm to grow its initial capability into one that is more widely applicable. In sum, we hypothesize that the firm can benefit from its acquisition experience in related businesses, but only after it has accumulated sufficient acquisition experience within its core business:

Hypothesis 5: The positive relationship between the firm's acquisition experience in non-focal related businesses and the failure probability of the focal acquisition in a related business is moderated by the firm's acquisition experience in its initial core business.

DATA AND METHODS

Data

To test our hypotheses, we collected panel data on 25 large Dutch multinational firms spanning the time interval from 1966 through 2005. To ensure reliability, the data were obtained directly from annual reports. The year 1966 was chosen as our starting point because it

represented a break in Dutch acquisition activity, with a sharp increase afterwards (De Jong, 1988). Unlike the bulk of extant research, which has frequently sampled less than a decade's worth of acquisition experience, our four-decade sampling window ensures that we capture practically all acquisitions in a firm's history, alleviating potential concerns about left-censoring.

The sample consists of all non-financial firms that were listed on the Amsterdam Stock Exchange in 1993, excluding the four largest ones (Royal Dutch/Shell Group, Unilever, Philips, and Akzo), since they represented clear outliers in terms of their age and the year in which they started to acquire, among other factors. They were active in a wide variety of industries – including brewing, publishing and printing, food products, pharmaceutical and chemical products, and others – thus increasing the generalizability of our findings. On average, our sample firms had 1.48 billion euros in sales, assets with a book value of 992.84 million euros, and a net profit of 43.25 million euros. Furthermore, they undertook an average of about two acquisitions per year, collectively engaging in 1585 acquisitions within our sampling window.

Variables

Acquisition longevity. This represents our dependent variable and is measured as the number of years that the focal acquisition persisted. An acquisition was deemed viable if it did not disappear from the list of ventures provided in the annual report. If it was divested or liquidated, it was coded as a failure. In many cases, problems with acquisitions were explicitly mentioned in the annual reports to justify their divestment. In case of any doubt, *Het Financieele Dagblad* was consulted, which is the Dutch equivalent of *The Wall Street Journal*. Furthermore, firm representatives were contacted on several occasions to verify information.

Numerous prior studies have used longevity as a measure of venture success (e.g., Agarwal, Echambadi, Franco, & Sarkar, 2004; Barkema, Bell, & Pennings, 1996; Carroll & Swaminathan, 1991; Delios & Beamish, 2001; Geringer & Hébert, 1991; Hennart & Zeng, 2002; Ingram & Baum, 1997; Kim & Miner, 2007; Lu & Ma, 2008; Mitchell, Shaver, & Yeung, 1994; Park & Russo, 1996; Pennings, Barkema, & Douma, 1994; Sharma, 1998; Shaver, Mitchell, & Yeung, 1997). It has long been argued that divestment usually indicates failure to reach management's original goals for the venture, since "it is rarely if ever that healthy units are sold" (Bane & Neubauer, 1981: 221). Likewise, Porter (1987) views divestment as a competitive

setback. Conversely, although survival is not necessarily an indication of strong performance, neither are positive abnormal stock returns or measures of profitability (Mitchell et al., 1994). In fact, Geringer and Hébert (1991) found that, among various objective and subjective measures of venture performance, longevity provides the best estimate of venture success *as experienced by managers.* In light of the learning approach that we adopt and the cognitive and perceptual processes underlying learning, this measure seems particularly appropriate for our purposes.

Acquisition experience in core business. This was operationalized through the number of acquisitions the firm has engaged in within its core business since 1966 (the start of our sampling window). Following prior research (e.g., Pennings et al., 1994), an acquisition was coded as such if it took place within the same three-digit SBI code[i] as the firm's core activities in 1966.

Acquisition experience in related businesses. This variable was operationalized through the number of acquisitions the firm has undertaken in related businesses since 1966. An acquisition was coded as such if it occurred in the same two-digit but not the same three-digit code as the firm's core activities in 1966 (e.g., Pennings et al., 1994). In the models in which the longevity of acquisitions in related businesses represents the dependent variable, we factor out the cumulative number of acquisitions in the focal acquisition's business itself, which is included as a separate control variable ("Acquisition experience in focal business"), as described below.

Interfering acquisitions. This variable was measured by the number of acquisitions in related businesses undertaken since the firm's most recent acquisition in its initial core business.

Control Variables

Firm size. We use the number of employees to measure firm size. This control was included because it may be correlated both with the firm's acquisition behavior (Amburgey & Miner, 1992) and the survival probability of its acquisitions (Hitt, Hoskisson, & Kim, 1997), in which case its inclusion should account for spurious correlation.

Firm profitability. Return on sales (ROS) was used to operationalize firm profitability. Its inclusion accounts for the possibility that high profitability may allow the firm to longer sustain underperforming acquisitions, thus buffering against divestment (Jensen, 1986).

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[i] The SBI coding system is the Dutch equivalent of the SIC system.

Product scope. Product scope was operationalized through the number of three-digit SBI codes in which the firm was active in any given year (Lubatkin, Merchant, & Srinivasan, 1993). It may affect the longevity of the focal acquisition since there may be more potential for synergy in diversified than in undiversified firms (Palich, Cardinal, & Miller, 2000). Conversely, the organizational complexity of diversified firms may make it more difficult to add an acquisition successfully. Using four-digit SBI codes led to nearly identical results.

Geographic scope. This variable was measured through the number of different countries in which the firm operated in any given year (Vermeulen & Barkema, 2002). It is included as a control because the integration and application of acquisition experience may be more difficult if the firm's activities are scattered out over a wide geographic area (see Martin & Salomon, 2003).

Non-focal divestments. This variable represents the total number of divestments in a given year minus the potential divestment of the focal acquisition. It accounts for the possibility that the divestment of the focal acquisition is part of a broader divestment strategy that the firm may be pursuing. Large diversified firms, such as those in our sample, have often been observed to follow such strategies to move back to their core business (Hoskisson & Johnson, 1992).

Organizational restructuring. This is a dummy variable that takes on the value of one if the annual report discloses that a firm has undertaken organizational restructuring in a specific year. We include it because divestment intensity has been shown to be particularly intensive during episodes of restructuring (Hoskisson, Johnson, & Moesel, 1994). Following prior research (Barkema & Schijven, 2008b; Brickley & Van Drunen, 1990), we started by identifying all cases in which restructuring activity took place at the divisional level, which could take one of four forms: addition, divestment, merger, and split-up of divisions. Subsequently, we created our organizational restructuring dummy by assigning a one to those cases (1) in which divisional restructuring spanned multiple divisions, and/or (2) in which the firm transformed its formal structure, switching between functional, product-divisional, geographic area, or matrix structures. Sometimes restructuring took several years. For triangulation purposes, we consulted published business histories for the seven sample firms for which these were available.

Elapsed time since last restructuring. This is a clock variable, measuring the number of years elapsed since the firm's last restructuring. Following Amburgey, Kelly, and Barnett (1993),

we add this as a control, since the disruptive effect of restructuring – and, therefore, the increased probability of divestment – tends to wear off as time elapses following the restructuring.

Focal acquisition in home cultural block. We measured this through a dummy variable that takes on the value of one in case the focal acquisition was located within the acquirer's home cultural block, that is, the Nordic block (Ronen & Shenkar, 1985). It was included as a control because acquisitions embedded in cultures dissimilar to the acquirer's home culture may be less likely to succeed (e.g., Barkema et al., 1996). Using a dummy for the home country instead of the home cultural block led to highly similar results.

Acquisition experience in unrelated businesses. This was measured through the number of acquisitions undertaken in businesses unrelated to the acquirer's core business since 1966. Relatedness refers here to similarity, not complementarity (Harrison, Hitt, Hoskisson, & Ireland, 1991; Zaheer et al., 2004), which is why vertical acquisitions are included in this category. Acquisitions were coded as such if they did not satisfy any of the criteria for being classified as acquisitions within the firm's core business or related businesses (e.g., Pennings et al., 1994).

Acquisition experience in focal business. We operationalized this control variable through the number of acquisitions that had been undertaken in the focal acquisition's business since 1966, based on its three-digit SBI code.

Interfering time lapse. This was measured through a clock variable capturing the number of years that have elapsed since the firm's most recent acquisition in its initial core business.

Firm fixed effects. We include firm dummies to capture unobserved heterogeneity, thus alleviating potential endogeneity concerns (Hamilton & Nickerson, 2003). Furthermore, their inclusion accounts for part of the hierarchical structure of our data (i.e., observations nested within firms), ensuring that standard errors are not underestimated (Certo & Semadeni, 2006).

Year fixed effects. Although one of the strengths of event-history methodology is that it formally models the time lapse leading up to the event under study, there may well be time effects separate from this specific time axis, such as acquisition waves or economic shocks. We include year dummies to account for such potential sources of unobserved heterogeneity. Alternative specifications based on a calendar year variable yielded robust results.

Analysis

We test our hypotheses using event-history methodology. Specifically, since we lack sufficiently strong theoretical insight into the shape of the baseline hazard – that is, the relationship between time and the hazard rate, or probability of failure, of acquisitions – we opted for a semi-parametric Cox proportional hazards model, which does not require one to specify an underlying distribution for the baseline hazard (Box-Steffensmeier & Jones, 2004). Since this model, unlike parametric models (e.g., the Weibull model), does not specify a baseline hazard, biased coefficient estimates due to misspecification are avoided (Pennings et al., 1994). The model is semi-parametric because it ranks the different durations so that the rank order of all acquisitions represents our dependent variable (Allison, 1984). It can be formulated as

$$\ln h(t) = \frac{h_0(t)\exp(\beta_k' x_i)}{h_0(t)\left[\Sigma_{Rt}\exp(\beta_k' x_i)\right]},$$

where $h_0(t)$ is the baseline hazard rate at time t, R_t is the risk set of acquisitions at time t, x_i are covariates, and β_k are the coefficients associated with these covariates. We use the Efron formula to handle tied failure times in our data, since research has shown this to be far more accurate than either the default Breslow approximation or the discrete-time Cox and Kalbfleisch-Prentice approximations (Hertz-Picciotto & Rockhill, 1997).

Unlike what is typically done in learning studies that employ models with OLS or other linear estimators, we do not compute logarithmic transformations of the experience variables (nor of the clock variables) prior to estimating our models, because "as in learning curve estimation, the fact that the marginal value of experience decreases as knowledge grows … is accounted for by the exponential form of the models we estimate" (Baum & Ingram, 1998: 999). Nevertheless, using logarithmic transformations led to qualitatively similar results.

In addition to using firm dummies, year dummies, and other control variables, we further mitigate the potential effects of unobserved heterogeneity by specifying our model such that it controls for the dependence of those observations nested within acquisitions. Such clustering renders the standard errors robust to this dependence (Box-Steffensmeier & De Boef, 2002; Box-Steffensmeier & Jones, 2004; Kelly & Lim, 2000). Also, we lagged our independent variables by one year to further facilitate causal inference. Moreover, to facilitate the interpretation of our

results, as well as to avoid inflated standard errors due to multicollinearity, we mean-centered our continuous independent variables (Aiken & West, 1991; Jaccard, Turrisi, & Wan, 1990). Finally, in order to be conservative, all significance tests in our models represent two-tailed tests.

RESULTS

Hypotheses Tests

Table 1 presents descriptive statistics and bivariate correlations. Overall, the magnitudes of the correlations suggest that multicollinearity should not be a problem in our models, as confirmed by the variance inflation factors of our variables, which are all below 10 (Neter, Kutner, Nachtsheim, & Wasserman, 1996).[i]

Table 2 presents the results for H1 and H2. Model 1 includes only control variables. Models 2, 3, and 4 introduce acquisition experience in the core business, in related businesses, and in unrelated businesses, respectively, and Model 5 includes all three. Model 7 represents the full model, which also includes the interaction terms associated with H2. Focusing on Model 7, H1 is strongly supported: the effect of acquisition experience in the core business is highly significant and in the hypothesized direction ($p < .001$). If we express the coefficient in terms of a hazard ratio, that is, $e^{-0.063}$, we can conclude that, on average, each prior acquisition in the core business decreases the failure probability of the focal acquisition in the core business by about ($1 - e^{-0.063} =$) 6.1 percent. Hence, the accumulation of experience with, say, 10 acquisitions in the core business decreases the failure probability of the next one by more than 60 percent.

In contrast, acquisition experience in unrelated businesses does not seem to influence the failure probability of the focal acquisition in the core business. This is in line with expectations, given the low levels of structural similarity involved. Also, the firm's overall acquisition experience in related businesses does not appear to affect this hazard rate either, possibly because most firms only start to diversify after they have sufficiently strengthened their core

[i] The strongest correlation is that between acquisition experience in the core business and geographic scope ($r = .673$). Since the somewhat inflated standard errors that might result bias against finding support for the hypotheses involved, this merely renders our tests more conservative. Moreover, omitting geographic scope led to similar results for these hypotheses, implying the absence of serious multicollinearity. More in general, formal testing for spurious correlation by including the squares of the components of all our interaction terms revealed that any multicollinearity that may be present does not materially affect our hypothesized effects (Cortina, 1993).

TABLE 1
Descriptive Statistics and Bivariate Correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Firm size [1]	23.25	39.65													
2. Firm profitability	1.94	10.31	-0.082*												
3. Product scope	40.33	19.06	0.213*	-0.073*											
4. Geographic scope	14.45	8.05	0.169*	-0.171*	-0.195*										
5. Organizational restructuring	0.29	0.45	0.126*	-0.093*	-0.013	0.060*									
6. Time lapse since last restructuring	4.66	5.77	-0.084*	0.039*	-0.057*	0.129*	-0.442*								
7. Non-focal divestments	0.89	1.71	-0.119*	0.022*	0.005	0.126*	-0.088*	0.139*							
8. Focal acquisition in home cultural block	0.38	0.49	-0.069*	0.147*	0.039*	-0.307*	-0.106*	0.136*	0.057*						
9. Interfering acquisitions	2.15	5.60	0.029*	-0.025*	0.059*	0.029*	0.040*	-0.058*	0.054*	0.018*					
10. Interfering time lapse	3.78	5.82	-0.011	-0.038*	0.058*	-0.039*	0.029*	-0.089*	0.019*	0.037*	0.222*				
11. Acquisition experience in focal business [2]	5.28	4.10	0.067*	-0.044*	0.105*	0.138*	0.160*	-0.106*	-0.059*	-0.157*	-0.013	-0.266*			
12. Acquisition experience in core business	32.10	23.11	0.230*	-0.113*	-0.123*	0.673*	0.351*	-0.154*	-0.103*	-0.238*	0.020*	-0.113*	0.407*		
13. Acquisition experience in related businesses	7.28	6.83	0.303*	-0.074*	0.146*	0.072*	0.142*	-0.150*	0.060*	0.059*	0.214*	0.076*	0.100*	0.079*	
14. Acquisition experience in unrelated businesses	14.52	16.24	0.223*	-0.075*	-0.116*	0.200*	0.340*	-0.217*	0.001	-0.081*	0.053*	-0.041*	0.289*	0.439*	0.101*

* $p < .05$

[1] In thousands

[2] This variable's correlations are based exclusively on acquisitions in related businesses, since it is only used in these models. It is of no use for the models in which the hazard rate of acquisitions in the core business represents the dependent variable, since all these acquisitions are by definition in the same business.

TABLE 2
Semi-parametric Cox Proportional Hazards Models (Firm and Year Dummies Not Reported)
Dependent Variable: Hazard Rate of Failure for the Focal Acquisition in the Core Business

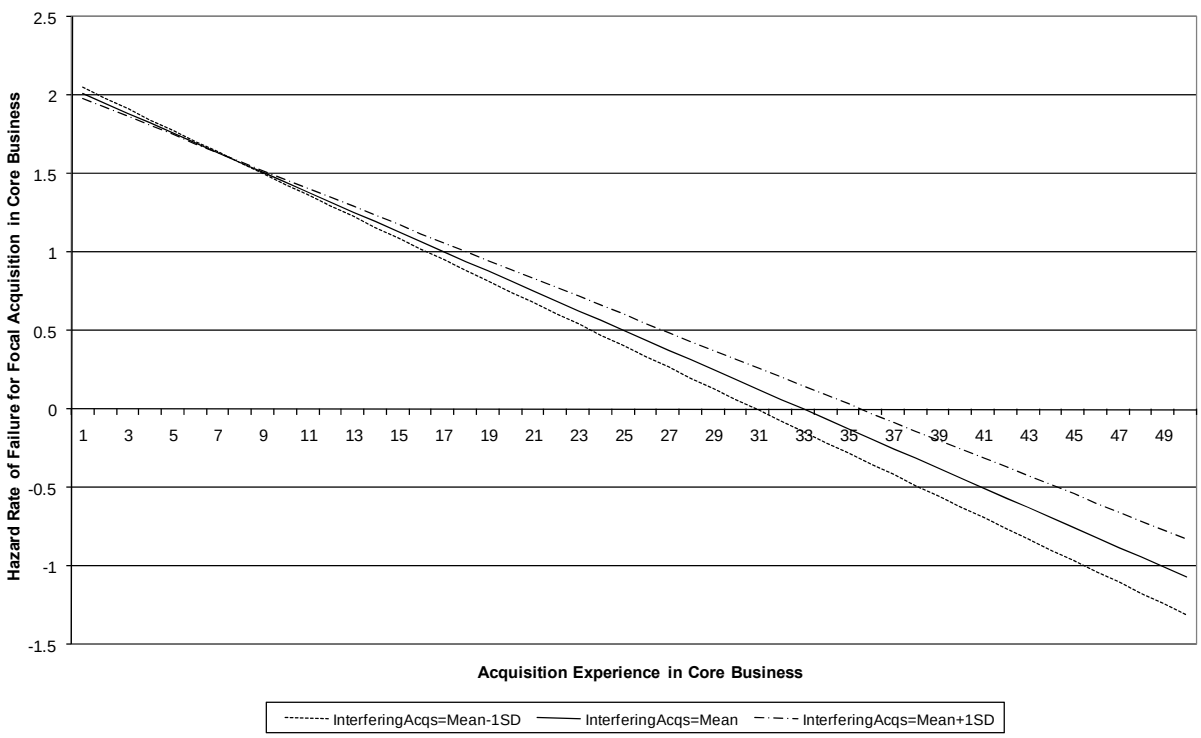
	Hyp.	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Controls								
Firm size		-0.033†	-0.034†	-0.034†	-0.035†	-0.034†	-0.033†	-0.033*
Firm profitability		-0.031**	-0.032**	-0.033**	-0.030**	-0.032**	-0.035***	-0.035***
Product scope		0.009	0.009	0.011	0.007	0.009	0.010	0.010
Product scope squared		-0.001	-0.001†	-0.001	-0.000	-0.001†	-0.001†	-0.001†
Geographic scope		-0.005	0.063*	-0.004	-0.009	0.063*	0.066**	0.066**
Organizational restructuring		-0.033	-0.085	-0.025	-0.029	-0.085	-0.096	-0.098
Time lapse since last restructuring		-0.009	0.006	-0.011	-0.005	0.006	0.010	0.010
Non-focal divestments		0.303***	0.356***	0.303***	0.319***	0.357***	0.358***	0.358***
Focal acquisition in home cultural block		0.041	0.068	0.038	0.052	0.069	0.078	0.078
Interfering acquisitions		0.022	0.025	0.025	0.024	0.025	0.026†	0.026†
Interfering time lapse		0.041*	0.032†	0.042*	0.039*	0.032†	0.031	0.033
Hypotheses Tests								
Acquisition experience in core business	1		**-0.057*** **			**-0.057*** **	**-0.063*** **	**-0.063*** **
Acquisition experience in related businesses				-0.021		0.001	0.008	0.008
Acquisition experience in unrelated businesses					-0.018	-0.001	0.002	0.002
Acq. exp. in core business × Interfering acquisitions	2						**0.001***	**0.001***
Acq. exp. in core business × Interfering time lapse								0.000
Log likelihood		-793.63	-783.46	-793.24	-792.17	-783.46	-781.99	-781.97
Wald chi-squared model test		357.03***	353.60***	359.86***	358.97***	353.89***	355.06***	355.90***
N		8031	8031	8031	8031	8031	8031	8031

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$ (all conservative two-tailed tests)

business. Nevertheless, in support of H2, Model 7 does show a significant effect for those related acquisitions that "interfere" between the focal acquisition in the core business and previous ones in this core business ($p < .05$). Hence, such interferences indeed seem to complicate the firm's efforts at developing an acquisition capability within its core business, as illustrated in Figure 2.

Specifically, at a relatively high level of over five interfering acquisitions (i.e., one standard deviation above the mean), each prior experience with an acquisition in the core business lowers the failure probability of the focal one in this core business by about 5.6 percent, compared to approximately 6.6 percent at a level of interfering acquisitions one standard deviation below the mean. Although this moderating effect may, at first sight, appear to be mild in Figure 2, note that the *y*-axis represents the hazard rate, which equals the logarithm of the hazard ratio. Indeed, when compounded over a string of acquisitions, the aforementioned hazard ratios imply that the impact of interfering acquisitions is far from trivial. For instance, after having undertaken nine acquisitions in the core business, the difference in the failure probability of the tenth one between the two situations described above amounts to over ten percent.

FIGURE 2
Estimated Relationship for Hypothesis 2



To account for the alternative explanation that it is not these interfering events that complicate learning but simply a process of forgetting as time elapses between structurally similar acquisitions (Benkard, 2000; Hedberg, 1981), we control for this in Model 7. The effect of this time lapse, however, turns out to be insignificant, offering additional support for H2.

Table 3 reports the models used to test the remainder of our hypotheses. Moving directly to the full model (Model 8), we find strong evidence that acquisition experience in the core business indeed enables the firm to decrease the failure probability of the focal acquisition in a related business. In fact, we find no evidence at all of an inverted U-shaped relationship as originally predicted in H3.[i] Instead, given the strongly significant negative coefficient of the linear term alone ($p < .001$), it appears that once firms start to diversify in related businesses, they can, on average, immediately draw successfully on their acquisition experience in the core business. Overall, therefore, our model estimates provide partial support for H3.

Nevertheless, despite the lack of evidence for a curvilinear relationship, the strong negative effect that we uncover, in fact, makes our theoretical argument all the more compelling, since it highlights the crucial importance of the initial capability that the firm builds within its core business. Specifically, each prior experience with an acquisition in the core business decreases the failure probability of the focal related acquisition by an average of over ($1 - e^{-0.075}$ =) 7.2 percent.[ii] Moreover, support for our theoretical framework is strengthened further by the insignificant effect of acquisition experience in the focal business ($p > .500$), which is one of our control variables. This finding suggests, in line with the core argument from cognitive psychology on which our theory is predicated, that learning often takes place through the development of an initial, narrow capability that is gradually extended over time to accommodate a wider range of contexts (e.g., Elio & Anderson, 1984; Gick & Holyoak, 1987).

More specifically, we have so far uncovered strong support for the contention that experience homogeneity plays a crucial role in the development of acquisition capability (H1,

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[i] The statistical insignificance of the quadratic term also seems to rule out the existence of a "competency trap" in the context of acquisitions, which would imply a U-shaped relationship (see Levinthal & March, 1993).

[ii] Although this hazard ratio is higher than that found in the context of H1, it does not imply that experience in the core business is more important for subsequent related acquisitions than it is for those in the core business, since the hazard ratio represents the estimated hazard relative to the baseline hazard. Since the baseline hazard of failure is greater for related acquisitions (Box-Steffensmeier & Jones, 2004), this higher hazard ratio is to be expected.

TABLE 3
Semi-parametric Cox Proportional Hazards Models (Firm and Year Dummies Not Reported)
Dependent Variable: Hazard Rate of Failure for the Focal Acquisition in a Related Business

	Hyp.	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Controls									
Firm size		-0.054***	-0.067***	-0.068***	-0.067***	-0.068***	-0.061***	-0.080***	-0.103***
Firm profitability		-0.009	-0.004	-0.004	-0.001	0.001	-0.010	0.006	0.007
Product scope		0.016	0.018	0.018	0.010	0.009	0.016	0.012	0.011
Product scope squared		-0.001	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001
Geographic scope		-0.008	0.108**	0.117**	0.005	0.008	-0.014	0.149**	0.145**
Organizational restructuring		-0.264	-0.179	-0.156	-0.364	-0.350	-0.249	-0.400	-0.380
Time lapse since last restructuring		-0.055	-0.032	-0.034	-0.023	-0.020	-0.045	-0.019	-0.029
Non-focal divestments		0.377***	0.476***	0.480***	0.376***	0.381***	0.378***	0.464***	0.464***
Focal acquisition in home cultural block		-0.078	0.178	0.166	-0.161	-0.175	-0.064	-0.078	-0.165
Interfering acquisitions		0.003	0.014	0.013	-0.006	-0.006	0.003	0.003	0.003
Interfering time lapse		0.029	0.037	0.038	0.039†	0.041†	0.028	0.043*	0.033
Acquisition experience in focal business		-0.008	-0.002	0.001	-0.044	-0.038	-0.012	-0.033	-0.047
Hypotheses Tests									
Acquisition experience in core business	3		**-0.076*** **	**-0.083*** **				**-0.084*** **	**-0.075*** **
Acquisition experience in core business squared	3			**0.000**					
Acquisition experience in related businesses (non-focal)	4				**0.108*** **	**0.095** **		**0.108*** **	**0.083** **
Acquisition experience in related businesses squared (non-focal)						0.002			
Acquisition experience in unrelated businesses							0.017	-0.018	0.001
Acq. exp. in related bus. (non-focal) × Acq. exp. in core bus.	5								**-0.004* **
Log likelihood		-308.11	-299.16	-299.00	-283.96	-295.19	-307.86	-288.17	-286.17
Wald chi-squared model test		250.09***	251.69***	260.61***	220.05***	285.78***	250.12***	292.66***	287.21***
N		2463	2463	2463	2463	2463	2463	2463	2463

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$ (all conservative two-tailed tests)

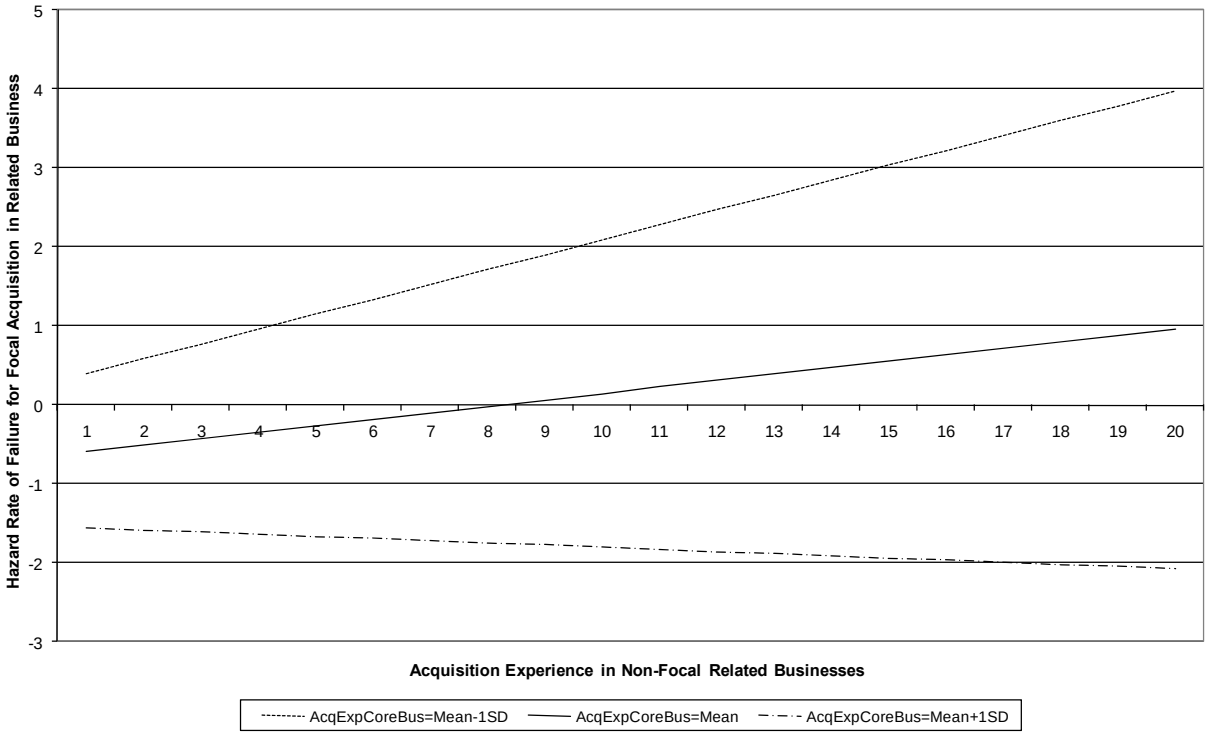
H2, and H3). We have also argued, however, that experience heterogeneity offers distinctive benefits of its own, which may enable the firm to extend its initial capability. First of all, in line with H4, we find that acquisition experience in non-focal related businesses, in itself, tends to increase the failure probability of the focal related acquisition ($p < .001$). Based on our estimates in the full model (Model 8), each experience with an acquisition in a non-focal related business tends to increase the failure probability of the focal related acquisition by no less than ($1 - e^{0.083}$ =) 8.7 percent. Thus, experience transfer across these acquisitions seems to have serious implications for performance due to the high levels of experience heterogeneity involved.

What is more, as can be seen in Model 5, we checked for a curvilinear effect to assess the extent to which this pattern of negative experience transfer may persist over time. Given the lack of evidence of such curvilinearity, the negative transfer resulting from this heterogeneity does not seem to "automatically" correct itself over time (cf. Haleblian & Finkelstein, 1999). On the contrary, these negative transfer effects can deepen considerably over time, suggesting that the confusion, in terms of the firm's inability to accurately identify the underlying cause-and-effect relationships, will exacerbate as more such heterogeneous experiences are accumulated.

Most importantly, however, we posited in H5 that the above scenario can be avoided and experience heterogeneity may, in fact, be turned to the firm's advantage by postponing diversification until the firm has undergone a training stage of relative experience homogeneity in which a strong, albeit narrow, acquisition capability is developed in the core business. As can be derived from Model 8, our estimates also corroborate this hypothesis ($p < .05$). To gain deeper insight, the associated interaction effect is illustrated in Figure 3.

As this figure shows, the firm's acquisition experience in its core business indeed has a dramatic impact on its ability to capitalize on the heterogeneity inherent in its acquisition experience in non-focal related businesses. Specifically, at a relatively low level of experience with about nine acquisitions in the core business (i.e., one standard deviation below the mean), each additional experience with an acquisition in a non-focal related business tends to raise the failure probability of the focal related acquisition immensely – by over 19 percent. In contrast, at one standard deviation above the mean, corresponding to experience with about 55 acquisitions in the core business, the failure probability of the focal related acquisition, in fact, *decreases*,

FIGURE 3
Estimated Relationship for Hypothesis 5



albeit only slightly in this case. Nevertheless, many large firms are considerably more acquisitive than this – indeed, several of our sample firms had engaged in close to a 100 acquisitions in their core business by the end of our sampling window – suggesting that there is considerable scope for firms to capitalize on their heterogeneous experiences in related businesses.

Robustness Checks and Additional Analyses

Apart from the robustness checks reported earlier – a calendar year variable instead of year dummies and log-transformed rather than non-transformed experience variables – we conducted several additional ones to increase the confidence that can be placed in our results. First of all, Cox models assume proportionality of hazards, implying that the shapes of the survival functions are the same for all firms studied. Although often overlooked, it is crucial to test whether this assumption holds, since its violation implies that the estimated coefficients may be severely biased (Box-Steffensmeier & Jones, 2004). Hence, based on so-called "Schoenfeld residuals," we conducted a formal test of this assumption and found it to be strongly supported in our models, implying that our coefficient estimates are unbiased.

Second, we re-ran the analyses with a parametric event-history model. Although the semiparametric Cox model is more robust (Allison, 1995), parametric models may be more efficient, since they use the full information on duration times rather than merely information on ordered failure time (Box-Steffensmeier & Jones, 2004). Since inferences on the basis of these models can only be justified if the distribution of the baseline hazard is specified correctly, we first used the Cox estimates to plot the survival function – the so-called Kaplan-Meier graph. We could readily discern a linearly increasing shape, suggesting that a Weibull distribution is most appropriate for our data. Upon estimation of the Weibull model, our results were typically of very similar magnitude and statistical significance. Furthermore, we re-estimated our models using a frailty specification, which, in effect, represents a random-effects specification for event-history models. This generally yielded robust results as well.

As an additional analysis to gain further insight into H2, we re-ran Models 6 and 7 of Table 2 using acquisitions in unrelated businesses as "interfering acquisitions," although, in theory, their low levels of structural similarity to the firm's core business suggest that they are unlikely to cause any serious interference in the learning process. Accordingly, we did not find any significant moderating effects for these unrelated acquisitions.

Finally, we re-ran the models for the three acquisition types (i.e., in the core business, in related businesses, and in unrelated businesses) after including a variable that captures the firm's total acquisition experience and that, therefore, disregards the different subcategories of acquisitions. In nearly all cases, the effect of this generic acquisition experience variable was highly insignificant, whereas the hypothesized effects of the experience variables for the specific acquisition types persisted. Its impact only turned significant if experience with specific types – particularly acquisitions in the core business – was omitted from the models. This offers additional evidence that the process of acquisition capability development is indeed far more complex than such a generic experience variable is able to capture.

DISCUSSION

Recent developments in the field of organizational learning point at potential benefits of experience heterogeneity (Beckman & Haunschild, 2002; Bingham & Eisenhardt, 2005; Haunschild & Sullivan, 2002; Reuer et al., 2002; Schilling et al., 2003), which is in stark contrast

with the traditional wisdom that it is experience homogeneity that fosters learning (see Levitt & March, 1988). Building on learning theory from cognitive psychology (see Cormier & Hagman, 1987; Ellis, 1965) and focusing on the context of acquisitions (e.g., Haleblian & Finkelstein, 1999; Hayward, 2002; Zollo & Singh, 2004), the theoretical framework developed in this paper aims to reconcile these two opposing views by placing them in a dynamic perspective and arguing that, in principle, both experience homogeneity and heterogeneity can be beneficial to acquisition capability development, although at different stages of the learning process.

Based on a multi-industry sample of acquirers over a period of four decades, we find that the relative experience homogeneity resulting from acquisitions in the core business typically allows the firm to develop a strong, though narrow, acquisition capability, although the effectiveness with which it is able to do so is contingent on the degree of experience heterogeneity it faces. The more the firm diversifies into related businesses early on in its life, the more challenging it will be for it to build a strong acquisition capability in its core business.

To the extent that it manages to develop such an initial acquisition capability, we find that the firm can use it as a springboard toward more successfully undertaking subsequent acquisitions in related businesses. In a way, acquisition activity in the core business represents a "training stage" that gradually leads to expertise enabling the firm to see through the fog of causal ambiguity surrounding these acquisitions. As such, it gains an ever clearer understanding of the critical success factors involved and how these are different from those governing acquisitions outside the core business, thus increasing its odds of diversifying successfully.

Perhaps most importantly, we find support for our argument that the experience homogeneity in the core business plays a critical role in unlocking the benefits of subsequent experience heterogeneity. Specifically, our findings suggest that, although prior experience in non-focal related businesses tends to hurt the performance of the focal acquisition in a related business, this heterogeneous experience can work to the firm's advantage if and only if it first develops a sufficiently strong acquisition capability in its core business. Under these conditions, such experience heterogeneity offers a wide variety of insights that can be drawn upon to fill in the gaps in its initial acquisition capability and, as a result, render it more widely applicable.

Contributions to the Literature

Apart from helping to explain the inconsistent findings in extant work on the effect of acquisition experience on performance, we believe that our paper makes valuable contributions to the acquisition literature by shedding light on the actual process through which capabilities in this setting can be developed over time. In particular, we think our theoretical framework offers an interesting complement to the growing stream of research on deliberate learning (e.g., Kale, Dyer, & Singh, 2002; Zollo & Singh, 2004). So far, this work has made invaluable contributions by arguing that the experience heterogeneity that strategic activities give rise to requires the firm to adopt tools and procedures that make the mechanism underlying organizational learning more deliberate and powerful than mere experience accumulation is.

Notwithstanding these compelling arguments, our paper suggests an alternative approach. Instead of changing the learning mechanism, the firm can change its behavior such that the experience heterogeneity encountered is directly reduced. In other words, we propose that the firm may not necessarily have to adopt more powerful and costly learning mechanisms to cope with experience heterogeneity if it limits this heterogeneity from the start by going through what we have described as a training stage and gradually increasing the heterogeneity afterwards. As such, we think our theory offers complementary insights to this research stream, painting a more complete picture of how firms can improve the effectiveness of their learning efforts.

Second, we feel that our theory and results have important implications for the organizational learning literature as a whole. By showing that experience homogeneity and heterogeneity are complementary and, therefore, both crucial to the learning process, we push beyond the debate that has been dividing this literature for close to a decade, with one camp emphasizing the merits of experience homogeneity and the other those of experience heterogeneity. As a result, research on experience heterogeneity and the more traditional work on experience homogeneity have largely developed as two separate strands of the literature so far. By building a bridge between the two camps, we believe our paper paves the way toward a more integrated and full-fledged theory of organizational learning in strategic settings.

Third, our theory and results seem to have interesting implications for the literature on diversification. In line with theory in cognitive psychology, we find that firms seem to learn not

by developing distinct capabilities for each of the activities they engage in, but by building a strong, initial capability in a specific context and subsequently growing it to make it applicable to a wider variety of related activities. This may partly explain why unrelated diversification has often been observed to underperform related diversification (e.g., Palich et al., 2000), since an entirely new capability would have to be developed from scratch. Related diversification, on the other hand, can benefit considerably from the initial capability that the firm often builds within its core business, although, as we have seen, problems of negative experience transfer may complicate such related moves. More in general, we feel that the diversification literature may greatly benefit from more dynamic theory that takes crucial path dependencies into account.

Finally, our paper may indirectly help to enhance our understanding of the "architecture" of capabilities in the larger domain of the knowledge-based view (e.g., Grant, 1996). Building on the above, if organizational learning indeed occurs through the development of a capability that is gradually expanded over time, then the decision on where in the firm the locus or loci of learning are to be organized initially would likely be a crucial one, since it may strongly affect the firm's ability to maximize positive transfer effects and avoid negative ones in the long term.

Managerial Implications

We believe our theory and findings have valuable implications for practitioners as well. By uncovering a theoretically informed, yet relatively straightforward, "formula" through which the process of capability development can be optimized over extended periods of time, our framework provides guidance on how firms should shape their acquisition behavior such that learning from the accumulated experience is facilitated. In essence, since the heterogeneity across acquisitions often complicates learning through the causal ambiguity that it introduces, we contend that a "training stage" of relative homogeneity – in which the firm largely limits itself to acquisitions within its core business – may go a long way toward mitigating these difficulties.

What is more, our study shows that the adoption of an ineffective approach early on could seriously undermine efforts at developing acquisition capability in the long term due to the strong path dependence that characterizes the process. Specifically, if the firm engages in highly heterogeneous acquisitions early on, this could lead to a state of increasing confusion that makes productive learning more and more unlikely. Hence, it seems crucial that the firm starts off with

modest levels of experience heterogeneity such that a strong capability can be built. Once established, this robust, specialized acquisition capability can serve as a springboard toward gradually developing a more widely applicable one. This path dependence may explain why some firms, such as Cisco, Oracle, and General Electric, seem to have learned a great deal from their acquisition experience, whereas others with equally impressive acquisition counts under their belts never seem to have developed a strong acquisition capability.

Limitations and Suggestions for Further Research

One of the limitations of our paper consists in the strictly archival nature of our data. Although these data enable us to study acquisition activity over extended periods of time, they usually do not allow for as much detail as primary data do. Some of the emerging work on deliberate learning (e.g., Kale et al., 2002; Zollo & Singh, 2004), for instance, has used primary data to capture phenomena that archival data alone cannot, such as experience articulation and codification. Studies that would be able to combine both a long longitudinal window of analysis and fine-grained measures, we believe, could offer major contributions to the field.

Moreover, the present paper follows a large body of prior research by using the survival of acquisitions as a performance measure. However, we feel that our understanding of how acquisition capabilities are developed may benefit a great deal from future work that employs other performance measures (e.g., accounting performance, abnormal stock returns, or perceptual measures of performance) in a dynamic theoretical framework similar to ours.

As for future research, it seems valuable to gain deeper insight into exactly how much experience heterogeneity the firm can handle in the early stages of its development and which organizational features this may be contingent on. Also, given that experience homogeneity early on seems to have a decisive impact on the firm's future fate, scholars may be able to enhance our understanding of the learning process by studying in more detail the specific conditions that such initial capabilities should satisfy in order to maximize the firm's ability to build on it as it grows.

Furthermore, it seems interesting to investigate other modes of corporate development, such as alliances, start-ups, foreign direct investments, and even divestments, to assess the degree to which the dynamic approach to capability building developed in this paper holds in other settings. Since all these strategic activities share certain characteristics with acquisitions –

most notably, their inherent complexity – it seems plausible that at least some of the insights from our paper can be of use in these related fields. In addition, some scholars have started to investigate experience spillovers across different modes of corporate development (e.g., Zollo & Reuer, 2008), which seems a particularly interesting avenue for future research.

CHAPTER 5 [i]

THE LOCUS OF ACQUISITION CAPABILITY DEVELOPMENT: BUSINESS-UNIT EXPERIENCE INTERPLAY ACROSS FIRM AND INDUSTRY BOUNDARIES

ABSTRACT

We argue that the widespread implicit assumption of the firm as a monolithic learning entity has constrained rigorous theorizing about where and how capabilities are developed. Building on insights from cognitive psychology, we theorize that the locus of learning in the context of acquisitions is primarily situated at the level of the business unit (BU) rather than that of corporate HQ and, as a result, that acquisition capability is developed through the interplay between BU-level pockets of experience located both within and across firms. Moreover, we hypothesize that the types of experience available to the focal BU – its own, that of "colleague BUs" within the firm, and that of "competitor BUs" outside the firm – have divergent effects on performance. We also investigate important moderators of these effects. We test our theory using panel data on all the acquisition activity engaged in by each of the 269 BUs of 52 U.S. software firms, as well as that of their competitors, over the 40 quarterly periods from 1998 through 2007.

[i] This chapter is the result of joint work with Xavier Martin.

INTRODUCTION

The last two decades have witnessed a growing research interest in issues of organizational learning in strategic contexts, such as acquisitions (e.g., Haleblian & Finkelstein, 1999; Zollo & Singh, 2004), alliances (e.g., Anand & Khanna, 2000; Kale, Dyer, & Singh, 2002), and foreign direct investment (e.g., Barkema, Bell, & Pennings, 1996; Shaver, Mitchell, & Yeung, 1997). Among these, acquisitions have served as the most prominent empirical setting to investigate such learning phenomena (for a review, see Barkema & Schijven, 2008a).

Taken together, however, the work in this area has produced largely inconsistent results. Whereas some authors find positive relationships between acquisition experience and performance (Bruton, Oviatt, & White, 1994; Fowler & Schmidt, 1989), many others uncover insignificant ones (e.g., Hayward, 2002; Kroll, Wright, Toombs, & Leavell, 1997; Lubatkin, 1982; Zollo & Singh, 2004). In light of these inconsistencies, scholars have increasingly realized that productive learning in strategic contexts presents challenges far greater than those typically encountered in operating settings, such as manufacturing, pricing, and distribution, for which highly consistent evidence of learning curves has emerged (see Yelle, 1979).

In particular, Haleblian and Finkelstein (1999) offered a theoretical explanation for this contrast that has since become commonly accepted and that various influential papers have built upon and refined (e.g., Zollo & Reuer, 2008; Zollo & Singh, 2004). Drawing on transfer theory (i.e., learning theory from cognitive psychology), they showed that the dissimilarities between acquisitions tend to lead firms to generalize their experience with one acquisition to the next, to which it is usually not fully applicable. In essence, therefore, the reason behind the difficulties of learning in strategic settings is that strategic activities are considerably more complex than operating activities. This is due primarily to the numerous interdependent sub-activities that they entail, such as due diligence, negotiation, financing, and integration in the case of acquisitions. Since the execution of each of these sub-activities often needs to be customized, at least to some extent, to the specific case at hand (Galpin & Herndon, 2007; Haspeslagh & Jemison, 1991), strategic activities tend to be heterogeneous across multiple dimensions (Cording, Christmann, & King, 2008). This imposes sharp constraints on the extent to which these activities can be routinized effectively (see also Finkelstein & Haleblian, 2002; Zollo & Winter, 2002).

Notwithstanding these invaluable contributions, however, there is a widespread implicit assumption underlying virtually all extant work in this area that the firm represents a monolithic learning entity. This assumption suggests that the corporate level serves as the only or primary locus of learning. Hence, corporate HQ is assumed to accumulate and attempt to learn from one large, increasingly heterogeneous experience base over time, thus raising the likelihood that experience is inappropriately generalized across strategic events. If this assumption is relaxed, however, a rather different – though potentially complementary – perspective emerges. That is, if we acknowledge the possibility that a significant portion of what is learned in strategic settings is, in fact, learned at organizational levels below that of corporate HQ, as some research seems to confirm (Frankel, 2007; Haspeslagh & Jemison, 1991; Palter & Srinivasan, 2006), then we are left with a fundamentally different view of the mechanisms that govern capability development.

First of all, to the extent that subunits develop their own context-specific capabilities (cf. Gavetti, 2005), the degree of experience heterogeneity that is actually encountered and needs to be dealt with in order to learn productively will be considerably lower than it may appear to be at the level of the firm as a whole (see Grant, 1996). Thus, there may be less real substance to the construct of firm-wide acquisition experience than prior work has invariably assumed. In other words, the literature may have fallen victim to an ecological fallacy that has led to inaccurate, or even incorrect, inferences about organizational learning. Second, above and beyond shedding light on this "vertical" dimension of where the locus of learning is situated, this perspective, if in line with reality, should allow for deeper insight into the "horizontal" interplay between context-specific pockets of experience that are distributed among subunits, both within and across firms.

We seek to address these issues by breaking with the simplistic assumption of the firm as a monolithic learning entity and unpacking the phenomenon of organizational learning into some of the core intra- and inter-organizational processes of which it is composed. As such, we aim to push beyond the somewhat metaphorical use of the learning concept in the past toward a finer grained theory of how firms learn to be more effective at a key strategic activity: acquisitions.

Specifically, we develop the argument that acquisition capability is built more effectively at the level of the business unit (BU) than that of corporate HQ. Subsequently, we theorize about the different processes through which such capability development at the BU level may unfold.

The focal BU can learn from (1) its own experience, (2) the experience of other BUs within the same industry but different firms ("competitor BUs"), and (3) the experience of other BUs within the same firm but different industries ("colleague BUs"). We hypothesize that the effectiveness of capability building crucially depends on which of these experience bases the focal BU taps into and we explore important moderators of these effects. To test our theory, we use a unique dataset on all the acquisition activity engaged in by each of 269 BUs of 52 U.S. software firms, as well as that of their competitors, over the 40 quarterly periods from 1998 through 2007.

THEORY AND HYPOTHESES

Transfer Theory and Experience Heterogeneity

Research on transfer theory in cognitive psychology typically consists of two-stage experiments – a training stage and a transfer stage – with "the latter used to determine how the training provided during the first stage influenced performance at the second stage" (Finkelstein & Haleblian, 2002: 37). As such, it studies the performance effects of transferring prior experience with a given task to subsequent tasks (Cormier & Hagman, 1987; Ellis, 1965). Such transfer effects can be positive as well as negative, depending on the extent to which the tasks performed are similar. In order for positive transfer – that is, productive learning – to occur, there needs to be experience that is sufficiently structurally similar to the task at hand (e.g., Ellis, 1965). This implies the presence of shared components that are causally related to performance outcomes. The larger the number of such shared components, the greater the structural similarity and the higher the probability of positive transfer effects (see Tversky, 1977). In case of insufficient structural similarity, in contrast, experience may be generalized from one instance to a subsequent one to which the experience is not applicable, thus causing negative transfer effects.

More recent developments in this field have provided a large body of evidence showing that even in the presence of experience that is structurally similar to the task at hand, positive experience transfer is impeded if it is embedded in a broader experience base that makes it difficult to isolate the elements that are structurally similar from those that are not (e.g., Elio & Anderson, 1981, 1984; Gick & Holyoak, 1987; Nitsch, 1977; Peterson, Meagher, Chait, & Gillie, 1973; Reber, Kassin, Lewis, & Cantor, 1980). In other words, experience often turns out to be a

mixed blessing if it originates from prior events that *appear* to belong to the same overall category of activity but that are not all, *in fact*, structurally similar. In such cases, the resulting experience heterogeneity tends to confuse and, as a result, cause negative transfer effects.

Experience Heterogeneity and the Locus of Acquisition Capability Development

Prior research suggests that acquisitions represent a case in point of the above. As Haleblian and Finkelstein's work (1999, 2002) has shown, two consecutive acquisitions by a given firm usually tend to be structurally dissimilar in that execution requirements vary across the specific contexts in which they are embedded, thus giving rise to negative experience transfer. Hence, the acquisition experience base that the firm as a whole accumulates over time will often be highly heterogeneous. This implies that it may be difficult – even in the presence of experience that *is* structurally similar – to disentangle those individual experiences that are applicable to a subsequent acquisition from those that are not (Schijven & Barkema, 2008).

However, if acquisition experience is not all captured in a single corporate-level experience base, but instead there are multiple pockets of context-specific experience throughout the firm at a lower level, then these learning difficulties could be significantly alleviated. Such context-specific experience bases lower down in the firm are, almost by definition, likely to be considerably less heterogeneous than one all-encapsulating corporate body of experience. As such, we believe that the organizational level at which experience accumulation occurs may have profound implications for the effectiveness with which acquisition capability is developed.

In fact, there are numerous hints that acquisition capability may indeed, to an important extent, be built at the level of the business unit (BU) rather than that of corporate HQ. First and foremost, Haspeslagh and Jemison point out a key distinction between corporate- and business-level acquisitions, noting that the vast majority of acquisitions belong to the latter category. Since these seek to strengthen an existing domain, they are "the province of the managers in that business" (1991: 80-81). Thus, whereas the relative similarity among a single-business firm's acquisitions will often allow its corporate HQ to "develop a series of rules of thumb" in order to deal with them effectively, multi-business firms that undertake both corporate- and business-level acquisitions "need to develop a much more complex and sophisticated administrative repertoire, one in which a number of roles can be activated and adjusted" (1991: 81).

Moreover, the corporate M&A department, if present, is typically a key player in the rare event of a corporate-level acquisition. However, its role in business-level acquisitions "is not to make acquisition decisions but instead to facilitate and support the process" (1991: 85). It is "a conduit and a catalyst, rather than a substitute for line authority" (1991: 86). In fact, Haspeslagh and Jemison observe that the BU usually forms its own acquisition task force, which represents the vehicle through which it "can build up its own learning and expertise" (1991: 94).

Several more recent studies support these arguments (Ashkenas, DeMonaco, & Francis, 1998; Chaudhuri & Tabrizi, 2002; Frankel, 2007; Nolop, 2007; Palter & Srinivasan, 2006). For example, Palter and Srinivasan find that, in the case of business-level acquisitions, successful acquirers are "more than twice as likely to involve their business units … from start to finish" (2006: 10). They report that "according to the vast majority of acquirers we spoke with, the responsibility for integration falls to the business units" (2006: 10). Since prior work has shown that integration represents the single most important determinant of acquisition performance (Larsson & Finkelstein, 1999), effective capability development should mainly draw on the experience that resides within the BUs. In summary, it appears that BUs play a central role in the development of acquisition capability – one, however, that has yet to be investigated in detail.

In line with the above, we distinguish between two key, alternative loci of learning – the corporate level and the BU level – which provide a stylized basis for theorizing about how learning efforts differ when engaged in at different levels within the firm. We define the BU as a subunit of a given firm operating in a given industry, thus representing a unique industry-firm intersection.[i] Building on this, we can distinguish between five key categories of experience: (1) experience that is fully generalizable across firms and industries, (2) experience that is specific to the firm of which the focal BU is part, (3) experience that is specific to the industry in which the focal BU operates, (4) experience that is specific to the focal BU (i.e., specific to a unique industry-firm intersection), and (5) experience that is event-specific and thus, not generalizable across events. Since the latter is, by definition, not conducive to learning, Figure 1 uses the first

[i] That is, although a given firm may consist of multiple BUs, each one of them is, to a greater or lesser extent, active in an industry that is distinct from the ones in which the other BUs operate. Similarly, although a given industry consists of multiple BUs, each is part of a different firm.

FIGURE 1
Generalizable Experience Available to the Focal BU

	Industry = *j*	**Industry ≠ *j***
Firm = *i*	BU-Specific Experience	Firm-Specific Experience
Firm ≠ *i*	Industry-Specific Experience	[Fully Generalizable Experience]

four categories to gain an understanding of the different types of generalizable experience that are available to the focal BU, which represents the intersection of Firm=*i* and Industry=*j*.

In accordance with the implicit assumption that the literature has so far subscribed to, experience may be accumulated at the corporate level. Although, as mentioned earlier, empirical evidence on the relationship between firm-wide acquisition experience and performance has been mixed, some of these findings did indeed suggest a positive performance effect of such firm-wide experience (Bruton et al., 1994; Fowler & Schmidt, 1989). To set the stage for our theory development below, therefore, we submit the following baseline hypothesis:

Hypothesis 1a: Firm-wide experience with BU-level acquisitions positively impacts the performance of the focal acquisition undertaken by the focal BU.[i]

In contrast with the above, the focal BU could draw on its own experience, which is specific to both the firm and the industry in which it is embedded (i.e., BU-specific). Since this experience, unlike that accumulated at the corporate level, does not lump together all the

[i] In accordance with Haspeslagh and Jemison's (1991) above-mentioned statement, our data indeed bear out that corporate-level acquisitions are rare: only five percent of our sample firms' acquisitions represent corporate-level acquisitions (see "Methods"). More importantly, since they are, as pointed out earlier, fundamentally different from business-level acquisitions, we distinguish between the two in our paper, both conceptually and empirically. In line with our theorizing, we focus primarily on business-level acquisitions, which clearly represent the vast majority of acquisitions undertaken. Nevertheless, we do explore corporate-level acquisitions in additional analyses later on.

different categories of experience mentioned above, it will often exhibit considerably lower levels of heterogeneity. Of course, the extent to which this is the case critically depends on the nature of the task at hand. If the task is relatively simple and, as a result, the experience with it is highly generalizable, then capturing all this homogeneous experience at the corporate level may indeed be preferable, since it avoids individual BUs from having to "reinvent the wheel."

Needless to say, however, acquisitions are far from simple. Although some aspects, such as legal issues and negotiations, may be rather similar across deals, much of the experience accumulated will be context-specific, as with most complex events (Dearborn & Simon, 1958). In light of the above-mentioned transfer-theoretic evidence that a heterogeneous experience base impairs the ability to effectively isolate and draw on only those experiences that are applicable to a given task, this heterogeneity across deals suggests that acquisition experience may best be accumulated at an organizational level below that of corporate HQ. Although firm-specific and fully generalizable experience are, of course, applicable throughout the firm, the aggregation of industry-specific, BU-specific, and event-specific experience into one large, heterogeneous experience base at the corporate level may make negative experience transfer close to inevitable.

In contrast, if the learning efforts are undertaken by each of the firm's BUs, then the scope for such negative transfer should be greatly reduced, since the experience that is accumulated is far more specific. Apart from that which is event-specific (see Finkelstein & Haleblian, 2002; Haleblian & Finkelstein, 1999), all the experience that is accumulated under this scenario is by definition specific to the focal BU's context, such as its industry, its competitive strategy, and its culture. By extension, therefore, this experience should be applicable to all the acquisitions that this BU engages in. Hence, we hypothesize:

Hypothesis 1b: The focal BU's acquisition experience positively impacts the performance of its focal acquisition.

The BU-Level Mechanisms underlying Acquisition Capability Development

In the above, we have highlighted the possibility that the accumulation of acquisition experience primarily takes place within each individual BU, rather than at the corporate level. If this holds, acquisition capability development may, to a large degree, consist in the interplay

between BU-level pockets of experience. Specifically, Figure 1 suggests that as an alternative, or in addition, to drawing on its own experience, the focal BU could tap into two other types of experience bases: (1) those of other BUs within the same industry, which are embedded in firms different from its own – "competitor BUs" (the intersection of Firm≠*i* and Industry=*j*) and (2) those of other BUs within the same firm, which are, to a greater or lesser extent, embedded in industries different from its own – "colleague BUs" (the intersection of Firm=*i* and Industry≠*j*).[i]

From a transfer-theoretic perspective, both these scenarios of vicarious learning have drawbacks compared to the case in which the focal BU relies on its own experience. Specifically, neither competitor BUs nor colleague BUs can provide the focal BU with access to experience that is uniquely suited to its own context. Instead, as Figure 1 suggests, only the industry-specific elements of competitor BUs' experience and the firm-specific elements of colleague BUs' experience should be readily generalizable to the focal BU's setting. Since both these applicable elements are embedded in heterogeneous experience bases, many pieces of which may not be readily applicable (i.e., firm- and BU-specific experience of competitor BUs and industry- and BU-specific experience of colleague BUs), the probability of negative experience transfer in both cases should be higher compared to when the focal BU draws on its own experience.

Having said this, however, the focal BU may, of course, not have any acquisition experience of its own to draw on. Moreover, even if it does, this experience may not be sufficient for it to be comfortable undertaking acquisitions without relying on the lessons learned by other, more experienced acquirers. Indeed, prior research has produced a considerable body of evidence that vicarious learning processes are widely used to mitigate the high level of uncertainty and causal ambiguity that acquisitions and other strategic events entail (e.g., Baum, Li, & Usher, 2000; Haunschild & Miner, 1997; Peteraf & Shanley, 1997; Terlaak & Gong, 2008).

In comparing the performance implications for the focal BU of relying on the acquisition experience of competitor and colleague BUs, we first need to understand the central construct of transfer theory – structural similarity – within the context of our study. As touched upon earlier, two phenomena are structurally similar if they share components that are causally related to

[i] Finally, the focal BU could, in theory, attempt to tap into the experience of BUs that are both part of other firms and embedded in other industries (the intersection of Firm≠*i* and Industry≠*j*). Given the relative implausibility of this option, however, we do not study it in depth in this paper.

performance outcomes (Cormier & Hagman, 1987; Ellis, 1965). We argue that competitor and colleague BUs contrast sharply in terms of the degrees to which their experience is structurally similar to that of the focal BU and thus, that very different performance effects are likely to materialize as a result of the focal BU drawing on each of their acquisition experience bases.

Vicarious learning from competitor BUs. Competitor BUs offer acquisition experience that contains elements specific to the *industry* in which the focal BU operates. A great deal of prior research suggests that BUs within the same industry "are subject to similar technological requirements and market dynamics" and, therefore, face "common problems and situations" (Yin & Shanley, 2008: 475; see also Armour & Teece, 1978). First of all, the vast literature on industrial organization argues that the structure of an industry, most notably its degree of concentration, has a strong influence on how firms within that industry behave competitively (e.g., Bain, 1968; Porter, 1980; Scherer, 1980). Furthermore, institutional theorists argue that firms face pressures to abide by industry-specific norms that define the legitimate forms of behavior and the sanctions for their violation (e.g., Phillips, 1994; Scott, 2001; Spender, 1987).

The above has also been shown to apply, more specifically, to the context of acquisitions, where the industrial environment in which acquirers are embedded leads them to pursue the same type of synergistic benefits, such as economies of scale, economies of scope, market power, and capability transfer (e.g., Gross & Lindstädt, 2005; Haspeslagh & Jemison, 1991). Moreover, the type of synergy pursued within a given industry tends to vary over time with regulatory changes, technological advances, changes in industry concentration, and the like (Gugler, Mueller, Yurtoglu, 2006; McNamara, Haleblian, & Dykes, 2008). In sum, therefore, BUs active within the same industry face largely the same opportunities and threats.

How exactly each BU goes about competing with the others in its industry depends on firm- and BU-specific factors (i.e., its strengths and weaknesses). These internal factors result from the path-dependent idiosyncrasies of their individual histories (Levitt & March, 1988), which set them on a course toward different "local peaks" within the competitive landscape (Levinthal, 1997). However, since the external environments that these BUs face are highly structurally similar, they essentially pursue the same end: capitalizing on the opportunities and neutralizing the threats that this shared environment confronts them with in an attempt to

enhance their competitiveness.[i] As such, the means that competitor BUs adopt toward achieving this common end should, at least in part, be applicable to the focal BU as well. By sampling on the strategies, structures, and procedures of competitor BUs, the focal BU may be able to learn about different approaches toward resolving the same issues it faces. Thus, it allows the focal BU to tap into valuable experience while minimizing the likelihood of negative experience transfer.

Extant theory on vicarious learning lends support to our reasoning above. Miner and Haunschild (1995) argue that vicarious learning from competitors enables the firm to explore a variety of alternative solutions to the same opportunities and threats presented by their shared environment without incurring the costs and risks associated with such experimentation. That is, it enables the firm to engage in "exploratory learning," although its competitors may merely be "exploiting" their own experience (March, 1991). Moreover, empirical research on vicarious learning in strategic contexts, including that of acquisitions, has almost invariably shown that drawing on the experience of competitors leads to positive transfer effects (e.g., Baum et al., 2000; Beckman & Haunschild, 2002; Ingram & Baum, 1997; Sarkar, Echambadi, & Ford, 2003; Shaver, Mitchell, & Yeung, 1997). Hence, following prior work (Finkelstein & Haleblian, 2002; Haleblian & Finkelstein, 1999), we posit that industry-specific factors represent the key criterion of structural similarity, which allows us to formulate the following hypothesis:

> *Hypothesis 2: Competitor BUs' acquisition experience positively impacts the performance of the focal acquisition undertaken by the focal BU.*

Vicarious learning from colleague BUs. In contrast to the experience of competitor BUs, that of colleague BUs contains elements specific to the *firm* in which the focal BU is embedded. As touched on in the previous subsection, a large body of prior research has argued that firm-specific, along with BU-specific factors – that is, internal strengths and weaknesses as reflected in strategy, structure, culture, and the like – are strongly influenced by the opportunities and

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[i] An industry may, of course, consist of heterogeneous strategic groups (Dranove, Peteraf, & Shanley, 1998), in which case the environments faced (industry-specific factors) and/or the means employed by some competitor BUs to compete (firm- and BU-specific factors) may not be fully structurally similar to those of the focal BU.

threats (i.e., industry-specific factors) presented by the external environments in which BUs are embedded (e.g., Lawrence & Lorsch, 1967; Thompson, 1967; see also Shamsie, 2003).

Indeed, the strategy literature on variance decomposition of BU-level performance (e.g., McGahan & Porter, 1997; Rumelt, 1991; Schmalensee, 1985) has uncovered that industry-specific factors, apart from having a direct effect, have a strong and persistent indirect influence on BU-level performance through their impact on internal factors. Thus, as Yin and Shanley put it: "Industry conditions shape decision content ... The features of a firm's strategy often depend on industry/market characteristics, such as scale, scope, or differentiated demand" (2008: 474).

As a result, BUs "in one industry may have trouble learning from the experiences of [those] facing very different problems" in other industries (Yin & Shanley, 2008: 475). This is all the more so in light of the distinct evolutionary path that each industry follows, requiring the pursuit of different courses of action over time in order to remain competitive (Gugler et al., 2006; McNamara et al., 2008). Since colleague BUs are, to a greater or lesser extent, all active in industries different from that of the focal BU, drawing on their experience will likely confront the focal BU with considerable structural dissimilarity along the industry dimension, thus raising the likelihood of negative experience transfer.[i] Simply put, unlike in the case of relying on competitor BUs' experience, in which case the focal BU can learn about different approaches to dealing with the *same* issues it faces, tapping into the experience of colleague BUs informs it about a variety of approaches to dealing with issues fundamentally *different* from its own.

This argument is in line with evidence from the literature on product diversification. The general consensus here is that there is an inverted U-relationship between product diversity and firm performance (Palich, Cardinal, & Miller, 2000). Any synergies that diversification may provide are, at some point, outweighed by the bureaucratic costs that product diversity entails (e.g., Grant, Jammine, & Thomas, 1988; Jones & Hill, 1988; Tallman & Li, 1996). As the firm expands into multiple industries, effective coordination of all the interdependencies among its BUs becomes increasingly challenging, thus weakening performance. In light of Haleblian and

[i] On top of this structural dissimilarity, the focal BU will also face considerable experience heterogeneity along the industry dimension in case it has multiple colleague BUs. As discussed at the start of the current section, prior research on transfer theory has shown that this further compounds the likelihood of negative experience transfer.

Finkelstein's (1999) findings, these bureaucratic costs of product diversity are likely to partly represent negative transfer effects due to the transfer of industry-specific experience across BUs.

Applying the above argument to our context of acquisitions – and foreshadowing our empirical setting – consider a BU that offers IT consulting services and is about to engage in an acquisition within its industry. If it were to draw on the acquisition experience of a colleague BU that produces enterprise software, we argue that negative experience transfer would be likely to result. Unlike in enterprise software, where acquisitions are routinely undertaken to add to the acquirer's product pipeline or in pursuit of new technology platforms and product development capabilities, acquisitions in IT consulting tend to be aimed at increasing the scale of operations by broadening the geographic coverage (see Campbell-Kelly, 2003). The synergies underlying the pursuit of acquisitions in these industries are, therefore, usually fundamentally different and thus, demand different courses of action in order to be realized (Bower, 2001).[i] Based on the above discussion, we hypothesize in contrast with the previous hypothesis on competitor BUs:

> *Hypothesis 3: Colleague BUs' acquisition experience negatively impacts the performance of the focal acquisition undertaken by the focal BU.*

The moderating effects of geographic proximity and industry relatedness. It should be acknowledged that transfer theory provides insight into only part of the organizational learning phenomenon, albeit a critical part that has received surprisingly little research attention in the past. Unlike individual-level learning – the traditional domain of transfer theory, which revolves squarely around the *applicability* of experience – organizational learning, especially when conceptualized at the level of the BU, has an additional dimension: the *accessibility* of experience. Since experience is held by individuals scattered throughout the focal firm and other firms, its applicability in a given situation is merely a necessary, not a sufficient, condition for

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[i] Technology acquisitions, for example, often require granting the target considerable autonomy in the short term in order to avoid disrupting or undermining the very innovative capabilities that motivated the acquisition (Chaudhuri & Tabrizi, 1999; Puranam, Singh, & Zollo, 2006). The realization of scale economies, in contrast, often calls for efforts to integrate as soon as possible (Haspeslagh & Jemison, 1991; Hitt, Harrison, & Ireland, 2001). Moreover, even if the motivations behind acquisitions do overlap – for instance, when both BUs acquire in an attempt to reap scale economies – the differences across industries will require the integration of operations that may often be very different in nature, implying that experience is unlikely to be readily generalizable even under these circumstances.

organizational learning to occur. Clearly, if experience is inaccessible, no learning can take place based on it (Schulz, 2001; Szulanski, 1996), regardless of how applicable it is.

Hence, even though vicarious learning from competitor BUs' experience, as predicted in Hypothesis 2, is likely to present the focal BU with high degrees of structural similarity and thus, applicability, such vicarious learning may be impeded by the relative inaccessibility of this experience. That is, tapping into the experience of parties external to the firm to which the focal BU belongs, especially that of competitors, can be a challenging task (Miner & Haunschild, 1995). A key reason for this is the sheer geographic distance involved, which may often preclude experience spillovers from taking place (Almeida, 1996; Zaheer, 1995).

The focal BU can more easily and accurately observe the behavior of competitors located nearby (Edling & Liljeros, 2003; Hedström, Sandell, & Stern, 2000). Also, media coverage of acquisition activity and personal contact, to the extent that this occurs among competitors, will usually be less extensive over long geographic distances (Haunschild & Beckman, 1998). Given that many of the most valuable pieces of knowledge regarding strategic events are often tacit in nature (Haleblian, Kim, & Rajagopalan, 2006; Ranft & Lord, 2002), we expect that the focal BU will be better able to tap into the acquisition experience of competitor BUs that are relatively proximate geographically (Argote, 1999; Martin & Salomon, 2003). This geographic proximity to competitor BUs should, in turn, result in stronger positive experience transfer:

> *Hypothesis 4: The positive impact of competitor BUs' acquisition experience on the performance of the focal acquisition undertaken by the focal BU is amplified by the geographic proximity between the focal BU and its competitor BUs.*

Vicarious learning from colleague BUs, in contrast, will often provide far fewer problems of experience accessibility. Indeed, the growing body of knowledge-based research is largely predicated on the argument that the very reason for the existence of firms is their efficiency at knowledge transfer relative to the market (Kogut & Zander, 1993). However, as predicted in Hypothesis 3, the experience that colleague BUs can provide, insofar as it pertains to complex strategic events such as acquisitions, may cause negative experience transfer due to its inapplicability to the focal BU's context. If this is indeed the case, it follows that the focal BU

may, at least in part, be able to avoid these negative transfer effects by being more selective of its sources of experience within the firm. Specifically, if it were to draw exclusively on the experience of colleague BUs whose industry settings are sufficiently similar to its own, if available, then our earlier reasoning suggests that the focal BU should be able to avoid negative experience transfer and, in fact, even benefit from positive experience transfer:

> *Hypothesis 5: The negative impact of colleague BUs' acquisition experience on the performance of the focal acquisition undertaken by the focal BU is moderated by the industry relatedness between the focal BU and its colleague BUs.*

DATA AND METHODS

Data

Empirical setting. Since our primary objective is to shed light on the causal mechanisms underlying acquisition capability development, we deemed it critical to limit the extent to which unobserved heterogeneity can muddy the picture and thus, decrease the internal validity of our study. To test our hypotheses, therefore, we opted for an industry-specific research design (e.g., Becker & Gerhart, 1996; Slater & Atuahene-Gima, 2004). We built a unique longitudinal dataset based on a sample of firms that operate in the U.S. software industry. Although industry-specific designs inevitably imply trading in some external validity for higher internal validity, the concession that we make is limited by the fact that the U.S. software industry has been the single most acquisitive industry over the last two decades (e.g., Chang, Shekhar, Tam, & Zhu, 2007). Another key reason for us to use the U.S. software industry was that it is relatively young, enabling us to largely avoid issues of left-censoring in our experience variables. Software emerged as an industry distinct from computer hardware shortly after 1980, prior to which all computer-related business activity was dominated by vertically integrated firms (Campbell-Kelly, 2001, 2003; Sherman, 1993; Young, Smith, & Grimm, 1996). Furthermore, a specific focus on the U.S. portion of this industry seems appropriate, since U.S. players have been argued to set the direction for the global computer industry as a whole (e.g., Manasian, 1993).

The first step in building our dataset consisted in identifying all listed U.S. firms in the software industry in the Security and Exchange Commission's (SEC) EDGAR database. We

looked up all firms reported under primary SIC codes 7370 through 7374. SIC 7372 represents the core software industry ("prepackaged software"), which includes the majority of our sample firms (see Table 1). The SEC defines the other four SIC codes as "computer programming, data processing, etcetera" (7370)[i], "computer programming services" (7371), "computer integrated systems design" (7373), and "computer processing and data preparation" (7374).

Although most prior research using data on the software industry focused either exclusively on SIC 7372 (e.g., Tanriverdi & Lee, 2008) or on SICs 7371-7373 (e.g., Young et al., 1996)[ii], we defined the industry more broadly by also including SICs 7370 and 7374 because we are not merely interested in the primary industry in which a firm operates but in all of those in which its BUs are active. Since, upon investigation, we found that a number of firms in the closely related SICs 7370 and 7374 also have BUs involved in software, these additional codes allowed us to study a larger and more representative portion of the software industry. At the time of collecting the data, the EDGAR database reported a total of 1613 U.S. firms for primary SICs 7370-7374 (153 for 7370, 194 for 7371, 811 for 7372, 312 for 7373, and 143 for 7374).

Business-unit data. The second step was to identify the BUs of which the firms consist. It has been notoriously difficult to obtain reliable and consistent BU data in the past, since the accounting standard governing the segment disclosures of listed firms – Statement of Financial Accounting Standards (SFAS) 14 – offered a great deal of discretion in defining their industries. Indeed, it often allowed multi-business firms to report all their operations "as being in a single, very broadly defined industry segment" (FASB, 1997: 22). This, in effect, enabled them to avoid the disclosure of disaggregated information that the majority of analysts and investors consider the single most valuable type of data for their investment decisions (Epstein & Palepu, 1999).

In 1997, however, the Financial Accounting Standards Board (FASB) issued SFAS 131, entitled "Disclosures about segments of an enterprise and related information," with the express goal of greatly lessening subjectivity in how firms define their operating activities. More

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[i] Contrary to the official governmental SIC code list of 1987, which does not report SIC 7370 as a distinct code but rather uses SIC 737 as an overarching code in which the corresponding four-digit ones are nested, the SEC's EDGAR database does use it as a distinct primary SIC code.

[ii] As Young et al. (1996) point out, software firms were reported under SIC 7372 ("computer programming") prior to 1987. In 1987, however, software firms were reallocated to one of three new SIC codes: 7371, 7372, and 7373.

specifically, it has drastically altered the firm's reporting requirements by switching from the so-called "industry approach," which characterized the old accounting standard (SFAS 14) that was issued as far back as 1976, to the so-called "management approach," which prescribes a single, objective method for disclosing disaggregated information (FASB, 1997). Rather than requiring the firm to report *industry segments*, which were inevitably loosely defined under the old accounting standard, SFAS 131 requires it to report *operating segments* "based on how management organizes divisions within the enterprise for making decisions and assessing performance" (Berger & Hann, 2002: 3).[i] In short, this new accounting standard is meant to force firms to disclose disaggregated information that is in line with their internal organizational structure, thus providing insight into the actual BUs residing directly below corporate HQ that typically remained hidden to the public under the old standard (Pahler, 2002).

Several recent studies have provided evidence of the effectiveness of SFAS 131. First, it has resulted in a significant increase in the number of reported segments (Berger & Hann, 2003; Street, Nichols, & Gray, 2000). For example, whereas IBM historically reported only one industry segment, it started to report seven operating segments after the implementation of SFAS 131 (Reason, 2001). Second, by pushing firms to provide more disaggregated information, the new standard has enhanced the ability of analysts to predict firms' future earnings (Berger & Hann, 2003; Ettredge, Kwon, Smith, & Zarowin, 2005). In sum, there is widespread agreement that SFAS 131 has successfully circumvented the firm's incentive to underreport disaggregated information and has better aligned segment reporting with internal organizational structure. This suggests that these data lend themselves well to the longitudinal study of BUs within firms.

Given that the new standard has been effective for fiscal years starting after December 15, 1997 (FASB, 1997) and disaggregated data disclosed prior to this date do not offer valid and reliable measures at the level of the BU, we limit the longitudinal dimension of our study for which BU data is collected to the ten-year period from 1998 through 2007. Nevertheless, we go

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[i] Formally, an operating segment is a semi-independent unit within the firm "(a) that engages in business activities from which it may earn revenues and incur expenses [i.e., a profit center], (b) whose operating results are regularly reviewed by the enterprise's chief operating decision maker [which could be one individual or a group of executives] to make decisions about resources to be allocated to the segment and assess its performance, and (c) for which discrete financial information is available" (FASB, 1997: 7).

back as far as 1985 – roughly the time period when the software industry emerged as a distinct industry – in constructing all our experience variables. Using the SEC's EDGAR database, we collected and studied all annual (10-K) and quarterly (10-Q) reports of the aforementioned 1613 firms from 1998 onwards to assess which of them (1) are, or were at some point, composed of multiple BUs[i] as well as (2) have engaged in multiple acquisitions over our window of analysis.

The software industry is a fragmented one that, although fraught with acquisition activity by large players, includes a competitive fringe of countless small firms (e.g., Campbell-Kelly, 2003). As a result, the majority of firms have been active in a single business over our entire window of analysis, focusing exclusively on the development of a few closely related software products. In light of our theory, this large category of small, single-business, and relatively non-acquisitive firms is not of primary interest to us here. Instead, our objective was to identify as many as possible of the other, smaller category of firms: the large, multi-business firms that have made the U.S. software industry the single most acquisitive industry over the last two decades.

After investigating all the SEC filings mentioned above, we ended up with a sample of 52 firms that satisfied the eligibility criteria for our study (see Table 1).[ii] Collectively, they report on 269 BUs over our ten-year window of analysis, for an overall average of about 5.2 per firm. Moreover, unlike prior research in this literature (e.g., Haleblian & Finkelstein, 1999; Zollo & Singh, 2004) – and the management literature more in general, for that matter – which has almost invariably used annual data, our unit of analysis is the BU-quarter. Hence, whereas the vast majority of prior longitudinal work has tended to theorize and analyze at the level of the firm-year, our data allow us to drill down to a considerably finer-grained level.[iii]

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[i] Although SFAS 131 accommodates the possibility of reporting geographic (rather than industry-based) segments if the firm's internal organizational structure is based on such geographic subunits, we decided to exclude these cases from our sample (1) for the sake of consistency and (2) because relatively few U.S. software firms turned out to be structured (consistently) along such geographic lines over our entire window of analysis.

[ii] Although testing our theory required us to study multi-business firms, selection bias should not be a serious issue, since we did not systematically exclude single-business firms. In fact, more than half of our sample firms (28 of them) were, at some point within our sampled time frame, composed of only a single BU.

[iii] To our knowledge, this level of detail cannot be obtained through existing databases. Although S&P's Compustat databases offer quarterly data at the firm level as well as annual data at the BU level, one needs to revert directly to the firm's 10-Q filings for quarterly data at the BU level. Nevertheless, for cross-validation purposes, we did consult the Compustat North America Segments database and found no BUs that are not also in our hand-collected data.

TABLE 1
Sample Firms

Firm	Primary SIC	Firm	Primary SIC
Analex	7370	Oracle	7372
PC Tel	7370	Parametric Technology	7372
S1	7370	Progress Software	7372
SRA International	7370	Quest Software	7372
TechTeam Global	7370	Quovadx	7372
Advent Software	7371	Renaissance Learning	7372
Ciber	7371	Smith Micro Software	7372
Data Systems & Software	7371	Sybase	7372
iGate	7371	Telecommunication Systems	7372
JDA Software Group	7371	Transaction Systems Architects	7372
Level 8 Systems	7371	Caci International	7373
Loudeye	7371	Filenet	7373
OpenTV	7371	Henry Jack & Associates	7373
Accelrys	7372	Identix	7373
Activision	7372	Macrovision	7373
Autodesk	7372	MTM Technologies	7373
BMC Software	7372	Scientific Games	7373
Cadence Design Systems	7372	Talx	7373
Compuware	7372	Verso Technologies	7373
Doubleclick	7372	Viisage Technology	7373
Electronic Arts	7372	Acxiom	7374
Epicor Software	7372	Cybersource	7374
GSE Systems	7372	Emdeon	7374
I many	7372	Netsmart Technologies	7374
Intuit	7372	Proxymed	7374
MRO Software	7372	Sabre Holdings	7374

Allocation of acquisitions to BUs. After collecting our BU data, the third step was to obtain data on our sample firms' acquisitions and to assess exactly which of the firms' BUs had undertaken a given acquisition, if it had not been undertaken by corporate HQ. We used both the M&A module of Thomson Financial's SDC Platinum database and the firms' 10-K and 10-Q SEC filings to identify the acquisitions. Cross-validation among the two proved helpful. First of all, SDC seemed to have missed quite a few deals that were disclosed in the SEC filings. Second, for some particularly acquisitive firms, SDC reported a number of relatively small acquisitions that the SEC filings paid only cursory attention to or omitted altogether. After excluding minority investments and stock repurchases, we ended up with a total of 680 acquisitions.

We used a three-step procedure to match acquisitions with BUs.[i] First, after searching the text of the focal firm's SEC filings using the data obtained earlier, we looked for information on where each of its acquisitions was integrated or supposed to be integrated in the near future. Second, if we failed to find such integration information, we looked for goodwill information, which was provided for the majority of acquisitions. Firms need to allocate goodwill associated with a given acquisition to the BU or BUs in which the anticipated synergies are expected to be realized (e.g., Morris, 2004; PricewaterhouseCoopers, 2006), unless it represents a corporate-level acquisition. These are not integrated into existing BUs but represent new BUs altogether and are, therefore, undertaken by corporate HQ (Haspeslagh & Jemison, 1991). Such corporate-level acquisitions could be easily identified due to the wide exposure that they received in the SEC filings. In line with Haspeslagh and Jemison's (1991) argument that they are relatively rare, only 34 of the 680 acquisitions in our sample (i.e., five percent) were corporate-level deals. Finally, for those cases where these first two steps did not allow us to reliably allocate acquisitions, we managed to obtain the information on where they were integrated directly from the firm through personal communication. Overall, the first two steps proved to be quite effective, as we have had to take this latter approach for only four of our sample firms.

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[i] In our efforts to allocate acquisitions to the firm's BUs, the new accounting standard, again, turned out to play an important role. Unlike under the old standard, when reported segments revealed little, if anything, about the firm's actual internal organizational structure, SFAS 131 has greatly helped ensure that the reported BUs are used consistently throughout the firm's SEC filings, including in the sections that cover its acquisitions. As a result, the SEC filings enabled us to determine which BU, if any, was responsible for a given acquisition.

As a fourth step, we needed to identify the deals that the competitors of our sample firms' BUs had engaged in. We first consulted S&P's Compustat North America Segments database to obtain North American Industry Classification (NAIC) codes[i] for all the business activities of each of the BUs in our sample. For each quarterly period, S&P assigns a primary NAIC code to each of a firm's reported BUs corresponding to the activity that provides it with all or most of its revenue. If a given BU is active in more than one activity, it also assigns a secondary NAIC code, which corresponds to this secondary activity. Using SDC Platinum, we relied on these NAIC codes to identify all the acquisitions undertaken by the focal BU's direct competitors.

Firm-level data. The fifth and final step in our research design was to add relevant firm-level variables. We used the Compustat North America Industrial Quarterly database, allowing us to get quarterly information that maps directly onto our hand-collected quarterly BU data.

Variables

BU's operating margin. We measure BU performance through its operating margin: the ratio of operating income and sales. Unlike net income, operating income is relatively immune to "the mechanical effects [of] the method of accounting for the merger (purchase or pooling) and the method of financing (cash or equity)" (Heron & Lie, 2002: 145; Barber & Lyon, 1996). Prior work on acquisitions has, therefore, often favored the use of operating income (e.g., Hotchkiss & Mooradian, 1998; Kaplan, 1989). Regarding the denominator, Barber and Lyon (1996) argue that scaling operating income by sales yields the most appropriate measure of operating performance for acquirers, since sales, unlike assets and equity, are not directly affected by the acquisition charges incorporated in the balance sheet (see also Lopez, Regier, Holder-Webb, 2001).

Moreover, Cording, Christmann, and Weigelt argue that accounting-based measures are recommended when studying the performance effects of experience in the context of acquisitions and other strategic events. Since capability development is largely invisible to investors, "effects from experience are only visible with realized performance" (2007: 25). Hence, unlike market-based measures, which reflect only public information – and in the case of short-term abnormal

[i] The NAIC system replaced the 1987 U.S. SIC system in 1997 and was updated in 2002. It was jointly developed by the U.S., Canada, and Mexico and offers finer-grained industry classifications than the SIC system does. As a result, it better reflects today's industry boundaries, particularly in the information sector, which includes software.

stock returns, only that which is available upon the announcement of the deal (e.g., disregarding information about integration) – accounting-based measures capture *realized* performance effects based on both public *and private* information (Barkema & Schijven, 2008b; Oler, Harrison, & Allen, 2008; Zollo & Singh, 2004). Also, unlike prior research, which has almost invariably used annual performance data, we measure BU operating margin at the quarterly level. As a result, our dependent variable should benefit from the above-mentioned advantages of accounting-based data, while substantially alleviating one of its key weaknesses compared to market-based data – that is, its failure to isolate the performance effects associated with a given acquisition.

The SEC filings showed that most firms measure operating income as earnings before interest, taxes, depreciation, amortization, and extraordinary items (EBITDA) (cf. Mikkelson & Partch, 2003). However, since we did notice considerable variance in the exact definitions used across firms, we employ firm fixed effects to capture these firm-level differences (see Analysis).

BU's number of acquisitions. This is a count of the number of acquisitions undertaken by the focal BU in a given quarter. Apart from measuring the main effect of the acquisitions engaged in by the focal BU, it is used to create the interaction terms that test our hypotheses. These interactions allow us to isolate the influence of the experience variables on the performance implications of the focal BU's acquisitions (e.g., Barkema & Schijven, 2008b).

BU's acquisition experience. This represents a count of the total number of acquisitions engaged in by the focal BU since the date on which it emerged within the firm. Importantly, it takes into account all the BU reconfigurations that take place within the firm (Karim, 2006) (see our controls). Hence, the counter starts on the date on which it was created (BU creation) and stops if it is eliminated (BU elimination). Moreover, the experience of multiple BUs is combined in case they are merged (BU merger) and each new BU that results from the split-up of an earlier one (BU split-up) is assumed to walk away with the full experience base on the date of split-up.

Colleague BUs' acquisition experience. This variable counts the total number of acquisitions undertaken by the focal BU's colleague BUs since their creation. Again, this variable takes into account all the BU reconfigurations that take place within the firm.

Firm's total BU-level acquisition experience. This variable represents a count of the total number of BU-level acquisitions engaged in since the firm's founding or since 1985 in case

the firm existed prior to 1985, when the software industry approximately emerged (Campbell-Kelly, 2001, 2003). Deeper inquiry into the history of those sample firms that already existed in 1985, however, did not provide any evidence of acquisitions prior to this year. Thus, we are confident that any left-censoring in our data is minimal in magnitude and impact.

This variable is used to test our baseline hypothesis (H1a). It assumes, in line with all prior work, that acquisition capability is developed at the corporate level rather than that of the BU. As such, it includes all BU-level acquisitions that were integrated into any of the firm's current BUs as well as into those BUs that were part of the firm in the past but no longer exist. Moreover, it does not take into account the BU reconfiguration activity because, if acquisition capability is indeed built at the corporate level, such reconfigurations should have no effect on it.

Competitor BUs' acquisition experience. This counts the total number of acquisitions by all the focal BU's competitors since 1985. As discussed earlier, S&P assigns primary as well as secondary NAIC codes to BUs that are active in some peripheral industry alongside their core industry. Since, we are primarily interested in the industrial environment in which the focal BU is most deeply embedded, we computed this variable based on the BU's primary NAIC code.

Control Variables

Firm's total assets. We use the firm's total assets to control for firm size, since it may influence both performance (Hitt, Hoskisson, & Kim, 1997) and acquisition behavior (Amburgey & Miner, 1992). We have logarithmically transformed it to render its distribution more normal.

Firm's age. Similarly, we include the firm's age, measured since its founding, as it may affect performance (Zahra, Ireland, & Hitt, 2000) and is also likely to affect acquisition behavior.

Firm's product diversity. We operationalize the firm's product diversity based on an entropy measure (e.g., Hitt et al., 1997; Jacquemin & Berry, 1979), for which construct validity has been established in prior work (Hoskisson, Hitt, Johnson, & Moesel, 1993). The measure is defined as $\sum_{i=1}^{N} P_i \ln(1/P_i)$, where P_i indicates the percentage of the firm's total sales in the i-th BU and N is the number of BUs.

Firm's total value acquired. This represents a proxy for acquisition size and captures the value of the target(s) acquired by the firm in a given quarter in terms of the total amount paid.

We include it because the size of an acquisition may affect how long it takes for it to be integrated and thus, start contributing to performance (Cording et al., 2008; Datta, 1991).

Firm's debt-to-equity ratio. Following prior research (Hitt et al., 1997; Vermeulen & Barkema, 2002), we control for capital structure using a debt-to-equity ratio, which may affect both acquisition behavior (as a proxy for free cash flow) and firm performance (Jensen, 1986). However, given that our dependent variable is based on operating income, rather than net income, we do not expect this variable to have a significant effect in our models.

Firm's corporate-level acquisition experience. Similar to Firm's total BU-level acquisition experience discussed above, this variable counts the total number of corporate-level acquisitions undertaken by the firm since its founding or since 1985.

BU reconfiguration. We include four dummies that collectively offer a comprehensive picture of the firm's BU-level reconfiguration activity and that may affect BU performance (Karim, 2006). *BU creation* indicates that a new BU being added to the firm, either as the result of a corporate-level acquisition or of a start-up. *BU elimination* captures those instances in which a BU is eliminated, either as the result of divestiture or of being closed down. *BU merger* implies that a BU is merged with one or more existing BUs. Finally, *BU split-up* refers to those instances in which a BU is split up into two or more new BUs.

Firm fixed effects. We include firm dummies to capture unobserved heterogeneity, which alleviates endogeneity concerns (Hamilton & Nickerson, 2003). Furthermore, their inclusion accounts for the hierarchical structure of our data (Certo & Semadeni, 2006).[i]

Year and quarter fixed effects. Similarly, we include dummies for each year and each quarter to account for unobserved heterogeneity along the time dimension, such as the general state of the economy and seasonal effects (Certo & Semadeni, 2006).

Analysis

The very fact that disaggregated information under the new accounting standard closely reflects the organizational structure as implemented and reported upon *within* the firm inevitably implies a decrease in their comparability *across* firms (Berger & Hann, 2003). Most notably, we

[i] We explored models that also included fixed effects for BUs, but these turned out to be collectively insignificant.

found that firms often differed in terms of the exact definitions used for their BUs' operating income. Therefore, we deliberately opted for a fixed-effects estimator, which strictly estimates coefficients based on the variance within the panels and thus, disregards the variance between them (Greene, 2003). This decision, moreover, was formally supported by Hausman tests.

Potential multicollinearity problems due to the use of higher-order terms are mitigated by centering the continuous independent variables (Aiken & West, 1991; Jaccard, Turrisi, & Wan, 1990). Furthermore, robust Huber-White standard errors are used in all models. In order to be conservative, moreover, all significance tests in our models represent two-tailed tests, even though, in principle, one-tailed tests would have been statistically justified in light of the directionality of our hypotheses (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

Finally, we lag our independent variables, not only to facilitate causal inference but also because acquisition integration, which is usually a prerequisite for synergy realization (Larsson & Finkelstein, 1999), takes time. Prior research with accounting-based performance measures used somewhat arbitrary time lags ranging from one up to four years (see Cording et al., 2007). Our quarterly data, however, allow us to be a bit more precise. To this end, we ran initial regressions with lags ranging up to four years in quarterly increments and found significant performance effects of our sample acquisitions to be concentrated within the time interval from four to eight quarters following the deal. Accordingly, therefore, our reported models use the moving average of BU operating margin over quarters t+4 through t+8 as the dependent variable.

RESULTS

Hypotheses Tests

Table 2 reports descriptive statistics and correlations. Overall, the correlations suggest that multicollinearity should not be a problem in our models. This is confirmed by the variance inflation factors of our independent variables, which are all below 10 (Neter et al., 1996).

Table 3 presents the OLS fixed-effects regression models used to test our hypotheses. All models are highly significant ($p < .000$) and have strong explanatory power. Our results for the BU's number of acquisitions variable are in line with the consistent finding in the literature that acquisitions tend to either negatively affect the acquirer's performance or leave it unaffected

TABLE 2
Descriptive Statistics and Correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. BU's operating margin [1]	-8.11	166.37															
2. Firm's total assets [2]	1.13	2.56	0.086*														
3. Firm's age	19.76	10.72	0.073*	0.076*													
4. Firm's product diversity	0.79	0.38	0.114*	0.273*	-0.078*												
5. Firm's total value acquired [3]	10.36	188.58	0.011	0.221*	0.012	0.017											
6. Firm's debt-to-equity ratio	0.40	13.35	-0.023	0.014	0.039*	-0.019	0.002										
7. Firm's corporate-level acq experience	0.43	0.81	0.050*	-0.109*	-0.035*	-0.032	-0.011	0.029									
8. BU creation	0.01	0.08	0.005	-0.015	0.008	0.021	-0.002	0.005	0.100*								
9. BU elimination	0.01	0.08	0.007	-0.019	-0.018	-0.046*	-0.004	0.002	0.012	-0.006							
10. BU merger	0.02	0.12	0.012	-0.002	-0.003	-0.023	0.008	0.003	0.053*	-0.010	0.012						
11. BU split-up	0.02	0.13	-0.050*	-0.005	-0.008	0.021	-0.000	-0.068*	-0.019	-0.011	-0.010	0.024					
12. BU's number of acquisitions	0.14	0.41	0.040	0.076*	0.000	-0.053*	0.208*	0.006	-0.044*	-0.007	-0.026	0.008	-0.024				
13. Firm's total BU-level acq experience	13.34	11.32	0.084*	0.434*	0.256*	0.233*	0.063*	0.018	-0.157*	-0.032*	0.000	0.016	0.022	0.101*			
14. BU's acq experience	3.78	6.39	-0.015	0.092*	0.036*	-0.059*	0.112*	0.008	-0.081*	-0.046*	-0.017	0.068*	0.009	0.219*	0.379*		
15. Competitor BUs' acq experience	177.98	145.65	0.034	0.259*	0.085*	-0.005	0.047*	-0.016	-0.158*	-0.010	-0.027	0.003	0.011	0.025	0.205*	0.036*	
16. Colleague BUs' acq experience	5.50	9.65	0.038	0.360*	0.082*	0.171*	-0.018	0.017	-0.135*	-0.045*	0.013	0.099*	-0.030*	-0.021	0.573*	0.580*	0.128*

* $p < .05$

[1] As discussed in the Data section, the new accounting standard that governs the disclosure of segment information (SFAS 131) requires firms to report the performance measures that are used internally. Hence, there is some variance across firms in the exact definitions of operating income (the numerator of BU's operating margin) that they report in their SEC filings. Although these discrepancies are captured by our firm fixed effects, note that the mean and standard deviation are, therefore, not as informative for BU's operating margin as they are for the other variables.

[2] In billions of US$

[3] In millions of US$

TABLE 3
OLS Fixed-Effects Regression Models (Firm, Year, and Quarter Dummies Not Reported)
Dependent Variable: BU Operating Margin (Moving Average over Quarters *t*+4 through *t*+8 in %)

	Hyp.	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Controls													
Intercept		-68.407	-74.630†	-55.914	-44.269	-63.265	-42.207	-38.399	-12.199	-31.297	-96.030*	-48.546	-75.188*
Firm's total assets (ln)		-24.273	-23.429	-25.867	-26.800	-24.567	-27.209	-28.969	-24.247	-29.013	-21.855	-20.053	-23.321
Firm's age		-0.210	-0.164	-0.355	-0.369	-0.247	-0.401	-0.587	-0.367	-0.580	-0.186	-0.151	-0.298
Firm's product diversity		-38.054*	-36.767†	-40.282*	-38.722*	-34.617†	-39.230*	-44.820*	-44.701*	-45.865*	-33.697†	-38.563*	-37.394†
Firm's total value acquired		0.002	0.002	0.002	-0.000	-0.001	-0.000	0.004	0.002	0.004	0.003	0.002	0.004
Firm's debt-to-equity ratio		-0.110	-0.108	-0.106	-0.110	-0.116	-0.111	-0.089	-0.079	-0.124	-0.093	-0.087	-0.132
Firm's corporate-level acquisition experience		7.654	6.609	6.809	9.028	5.757	8.806	14.742*	12.727*	18.270**	6.005	7.774	11.728†
BU creation		-4.662	-5.095	-4.001	-0.094	-0.270	0.152	-2.617	1.832	2.403	-3.447	1.096	1.486
BU elimination		11.311	10.984	11.990	16.495†	15.871†	16.384†	15.621	22.096†	22.454*	14.048	22.366†	22.078†
BU merger		29.126	29.065	29.488	23.907	23.387	24.103	-8.287	-3.859	-4.942	-20.503	-10.405	-13.244
BU split-up		-12.734	-12.079	-11.273	-11.224	-11.247	-11.133	-2.806	-0.931	-7.688	-0.860	-0.359	-6.892
Hypothesized Variables													
BU's number of acquisitions		-1.615	-3.383	-5.774	-22.417***	-23.491***	-22.474***	-17.139***	-15.462**	-16.310***	-19.040***	-16.537***	-17.881***
Firm's total BU-level acquisition experience			-0.598			-1.683†					-5.488***	-3.329**	-4.288***
BU's number of acq × Firm's total BU-level acq exp	1a		**0.567***			**-0.259**					**0.412**	**0.288**	**0.361**
Firm's total BU-level acquisition experience (ln)				9.861			2.137						
BU's number of acq × Firm's total BU-level acq exp (ln)	1a			**9.994***			**-2.648**						
BU's acquisition experience (ln)					14.743***	15.843***	14.676***	15.147***	4.537†	18.498***	18.779***	7.896**	21.803***
BU's number of acq × BU's acq exp (ln)	1b				**17.400*** **	**19.871*** **	**18.599*** **	**14.976*** **	**10.954** **	**11.243*** **	**16.551*** **	**11.253* **	**11.888** **
Competitor BUs' acquisition experience								0.064*			0.057†		
BU's number of acq × Competitor BUs' acq exp	2							**0.028**			**0.032**		
Competitor BUs' acq exp: within U.S.									0.011***			0.010***	
BU's number of acq × Competitor BUs' acq exp: within U.S.	4								**-0.001**			**-0.001**	
Competitor BUs' acq exp: within state										-0.010			-0.011
BU's number of acq × Competitor BUs' acq exp: within state	4									**0.016*** **			**0.017*** **
Colleague BUs' acquisition experience								3.295***			4.115***		
BU's number of acq × Colleague BUs' acq exp	3							**-0.423* **			**-0.721*** **		
Colleague BUs' acq exp: same 2 digits									-0.015			0.802	
BU's number of acq × Colleague BUs' acq exp: same 2 digits	5								**0.217**			**0.101**	
Colleague BU's acq exp: same 6 digits										4.384***			5.119***
BU's number of acq × Colleague BUs' acq exp: same 6 digits	5									**-0.195**			**-0.452**
R-squared		0.654	0.654	0.654	0.657	0.658	0.657	0.668	0.668	0.665	0.672	0.669	0.667
Adjusted R-squared		0.640	0.640	0.640	0.644	0.644	0.643	0.655	0.654	0.652	0.658	0.655	0.653
Model F		48.39***	47.00***	47.03***	47.68***	46.37***	46.30***	49.36***	49.28***	48.68***	48.65***	48.12***	47.73***
N		1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811

† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$ (all conservative two-tailed tests)

(King, Dalton, Daily, & Covin, 2004). As for the controls, a noteworthy finding is the negative impact of product diversity. Although we do not replicate the commonly accepted inverted U-shaped effect (Palich et al., 2000), our results pertain to BU- rather than firm-level performance, thus making direct comparison problematic. In any case, the negative effect seems to support our argument that negative experience transfer becomes more likely as product diversity increases.

Model 2 tests H1a, our baseline hypothesis, which follows received wisdom by predicting that acquisition experience is accumulated at the corporate level. We find a significant positive effect of the firm's total BU-level acquisition experience on the relationship between the focal BU's acquisitions and its performance ($p < .05$), thus indeed suggesting that learning takes place at corporate HQ. Moreover, this effect remains qualitatively unchanged in Model 3, where potential decreasing marginal returns to experience are accounted for by using the natural logarithmic transformation of the firm's total BU-level acquisition experience. Nevertheless, given the slightly higher significance level of its coefficient, we use the non-transformed version of the firm's total BU-level acquisition experience in our subsequent models.

Whereas some prior work has subscribed to an assumption of decreasing marginal returns to experience (e.g., Barkema & Schijven, 2008b; Ingram & Baum, 1997), other work has not (e.g., Haleblian & Finkelstein, 1999; Hayward, 2002). As such, there seems to be little consensus as to the most appropriate specification of experience effects. In an attempt to offer more clarity regarding this issue, we argue that decreasing marginal returns are most likely manifested if learning is based on a relatively homogeneous set of experiences. In contrast, in the presence of considerable experience heterogeneity, we expect that the novelty that is encountered with each experience will tend to preclude, or at least postpone, such decreasing marginal returns.

Hence, our argument that firm-wide acquisition experience is highly heterogeneous may explain why the non-transformed measure fits our data slightly better than the transformed one. The same applies to colleague BUs' and, especially, competitor BUs' acquisition experience, which we will discuss later on. We also estimated models with log-transformed versions of these variables, but their effects were weaker. In contrast, the focal BU's acquisition experience had a far stronger effect when it was log-transformed, as expected given its relative homogeneity.

Model 4 tests H1b, in which we argue that the development of acquisition capability primarily takes place at the level of the BU. We find that the focal BU's acquisition experience has a strongly significant positive effect on the relationship between its acquisitions and its performance ($p < .001$). More importantly, Models 5 and 6 show that the effect of the firm's total BU-level acquisition experience, which was significant in Models 2 and 3, disappears completely upon inclusion of the focal BU's acquisition experience. The effect of the focal BU's acquisition experience, in contrast, becomes even stronger in these models. Hence, we find strong support for H1b – not for H1a. This implies, in accordance with our theory, that acquisition capability is primarily developed at the level of the BU rather than that of corporate HQ.

Model 7 tests H2 and H3, which deal with competitor and colleague BUs' experience, respectively. In this model, we exclude the firm's total BU-level acquisition experience to avoid potentially confounding its effect with that of colleague BUs' experience, since these variables overlap somewhat (see Table 2). Model 10, however, does include the firm's total BU-level experience and the results are highly similar, suggesting the absence of such confounding effects.[i] Colleague BUs' acquisition experience has a significant negative effect on the performance of the focal BU's current acquisitions ($p < .05$ in Model 7 and $p < .001$ in Model 10), which strongly supports our prediction in H3. However, H2 is not corroborated, suggesting that competitor BUs' experience – at least when the experience of all competitors worldwide is lumped together – does not affect the performance of the focal BU's current acquisitions.

Models 8, 9, 11, and 12 test H4 and H5. As for H4, these models reveal why we did not find support for H2: in line with our theorizing, the focal BU seems to learn only from the acquisition experience of competitor BUs that are relatively close by. More specifically, only the experience of competitors located within the same state significantly impact the performance of the focal BU's current acquisitions. Since this effect is positive ($p < .001$ in both Models 9 and 12), implying positive experience transfer, we find strong support for H4. In short, therefore, whereas colleague BUs' experience tends to hurt the performance of the focal BU's acquisitions, that of within-state competitor BUs seems to benefit their performance.

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[i] We also estimated models using a version of the firm's total BU-level acquisition experience variable that excludes the focal BU's acquisition experience. This specification yielded very similar findings as well, thus further alleviating potential concerns about such conflating effects.

Finally, we predicted in H5 that the negative effect of drawing on colleague BUs' acquisition experience is moderated by the industry relatedness between the focal BU and its colleague BUs. Models 8 and 11 show that the negative effect found in Models 7 and 10 turns insignificant when we focus exclusively on the experience of colleague BUs that are active in the same two-digit NAIC industry category as the focal BU. Moreover, Models 9 and 12 show that it remains insignificant when we use an experience variable based on colleague BUs that operate in the same six-digit category as the focal BU. Thus, at least in our sample, not even BUs within the same firm that are active in highly related industries seem able to learn effectively from each other's acquisition experience. Nevertheless, such industry relatedness does allow the focal BU to avoid negative experience transfer, which supports H5. In short, there seems little to be gained for the focal BU from attempting to learn from the acquisition experience of colleague BUs.

Figures 2a, b, and c illustrate the estimated performance effects of the BU's own experience, that of within-state competitor BUs, and that of colleague BUs, respectively (i.e., H1b, H4, and H3). Figure 2a shows that, with an average amount of experience, each acquisition by the focal BU tends to decrease its operating margin by almost 20 percentage points within two years following the deal. Only if it has a large amount of experience – for example, 1.5 standard deviations above the mean, corresponding to about 12 acquisitions – is the focal BU able to strengthen its performance through its acquisitions. Figure 2c also offers interesting insights. The slopes of the curves show, in line with H3, that drawing on colleague BUs' experience tends to hurt the focal BU's acquisition performance. If colleague BUs have no acquisition experience (i.e., the bottom curve), then an acquisition by the focal BU (with an average level of own acquisition experience) tends to decrease its operating margin by about ten percentage points. In contrast, if colleague BUs collectively have experience with about 20 acquisitions (i.e., the top curve), such an acquisition would decrease its operating margin by almost 23 percentage points. Interestingly, however, the figure reveals that it nevertheless seems desirable for the focal BU to have experienced colleague BUs. Perhaps the stronger performance of experienced colleague BUs allows for more cross-subsidization, thus strengthening the focal BU's performance.

FIGURE 2A
Estimated Effect of BU Acquisition Experience (H1b)

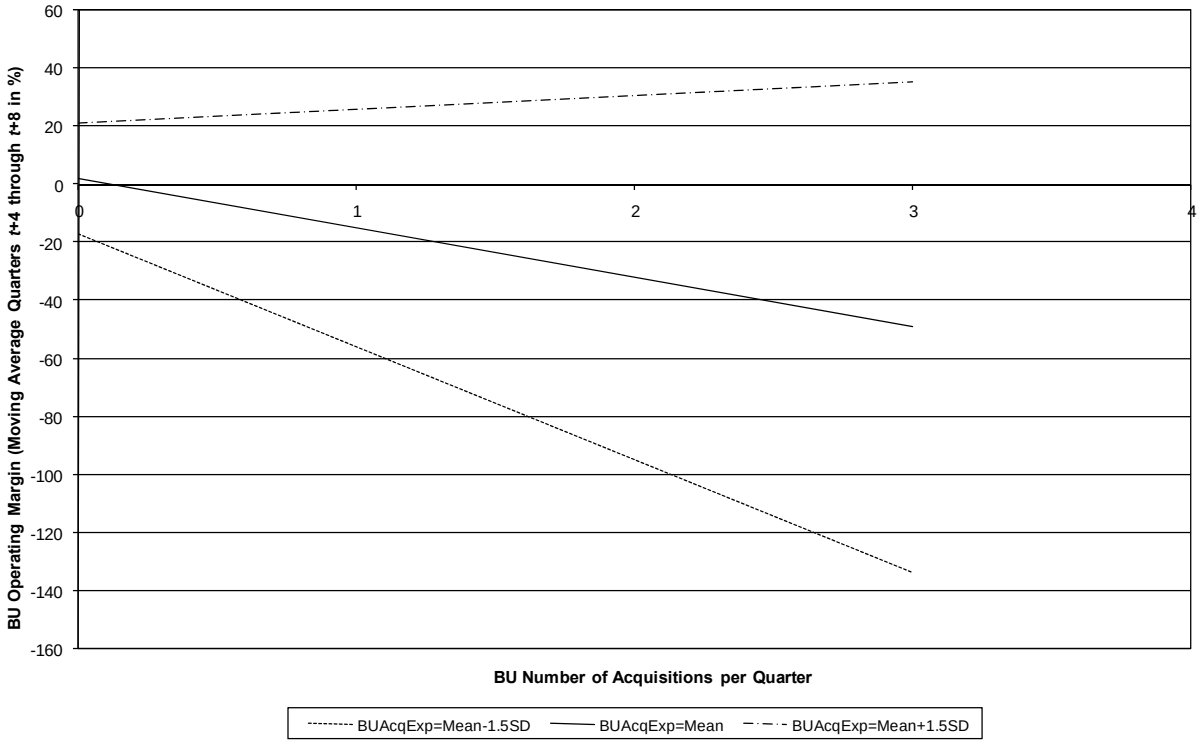


FIGURE 2B
Estimated Effect of Within-State Competitor BU Acquisition Experience (H4)

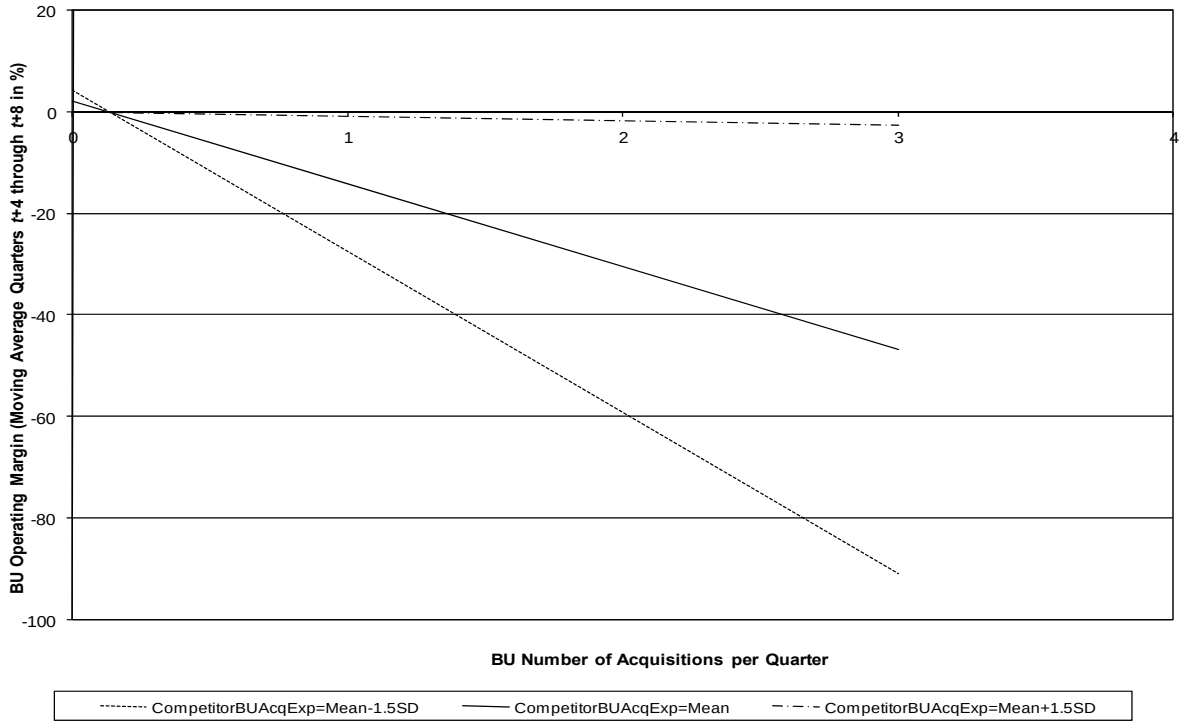
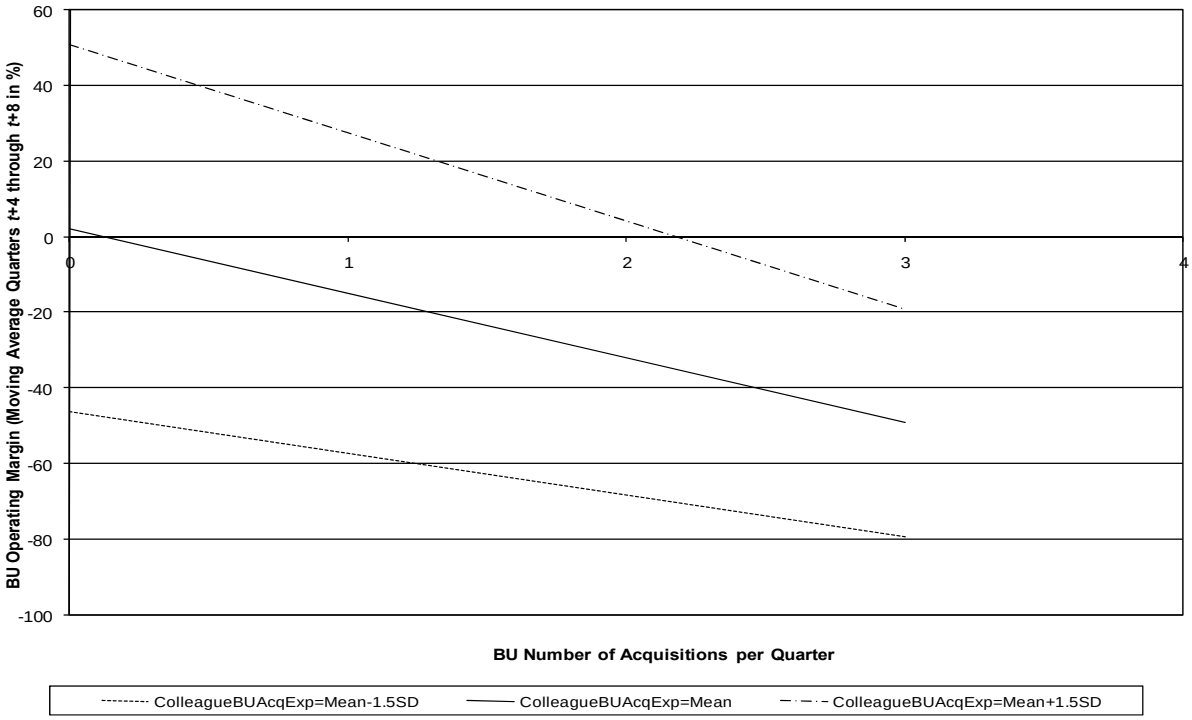


FIGURE 2C
Estimated Effect of Colleague BU Acquisition Experience (H3)



Robustness Checks and Additional Analyses

As a first robustness check, we re-ran our models with a calendar quarter-period polynomial variable and several of its higher-order terms instead of year and quarter dummies and found highly similar results. Second, we ran models with BU fixed effects (both with and without firm fixed effects) and found them to be collectively insignificant. Third, we checked for curvilinearity in the experience effects by including interactions with squared experience variables (see Barkema & Schijven, 2008b), but found no such effects. Fourth, we ran models with variables for the focal BU's and colleague BUs' experience that did not incorporate information on internal recombination through BU merger and split-up and found much smaller, often insignificant, effects, implying that this is crucial information to be taken into account.

In addition, we wanted to gain deeper insight into the positive main effect of firm-wide corporate-level acquisition experience that we found in some of our models, suggesting that capability development for these types of acquisitions may be occurring at the corporate level. Using a measure of operating margin at the firm level, therefore, we estimated models that

included an interaction between the count of the focal firm's corporate-level acquisitions in a given quarter and its corporate-level acquisition experience. However, we found no evidence of any capability development at the corporate level for these corporate-level acquisitions. In principle, this is not surprising: since corporate-level acquisitions occur rather infrequently, there may simply be too little opportunity for any learning to take place (Zollo & Winter, 2002).

DISCUSSION

Extant work on capability development in the context of acquisitions as well as other strategic activities has almost invariably assumed, albeit implicitly, that the firm represents a monolithic learning entity in which corporate HQ serves as the only or primary locus of learning (e.g., Haleblian & Finkelstein, 1999; Hayward, 2002; Zollo & Singh, 2004). Building on transfer theory from cognitive psychology (see Cormier & Hagman, 1987; Ellis, 1965), we develop a theoretical framework that breaks with this assumption. We argue that acquisition capability is primarily built within BUs, since high levels of experience heterogeneity at the corporate level would make it exceedingly difficult to isolate generalizable elements from those that are not, thus making negative experience transfer close to unavoidable. Extending this line of reasoning, we contend that individual BUs may, in fact, learn to effectively undertake acquisitions not just as a result of their own experience, but through rich interplay among pockets of acquisition experience at the BU level that are located both within and across firms. Using panel data on the acquisition activity of all the BUs of 52 U.S. software firms, and that of their competitors, over the forty quarterly periods from 1998 through 2007, we find strong support for our theory.

Contributions to the Literature

First and foremost, we believe our paper offers a new perspective on capability development that fleshes out some of the key mechanisms underlying organizational learning in strategic settings. As such, our theory and results shed light on the inconsistent findings regarding the relationship between acquisition experience and performance in prior work (e.g., Bruton et al., 1994; Fowler & Schmidt, 1989; Haleblian & Finkelstein, 1999; Hayward, 2002; Lubatkin, 1987; Zollo & Reuer, 2008; Zollo & Singh, 2004). Specifically, researchers may have been trying to measure acquisition capability where there is none or very little to be found. If the

learning indeed occurs mainly within BUs, the inconsistencies may, at least in part, be due to differences across samples. For instance, if one draws on a sample that predominantly consists of single-business firms, one is likely to find a learning effect with a simple, firm-wide count of acquisitions. In contrast, a sample composed of diversified firms may show no such evidence.

Second, to the best of our knowledge, our paper is the first to distinguish – both theoretically and empirically – between BU-level and corporate-level acquisitions. Although Haspeslagh and Jemison (1991) already pointed out the fundamental difference between these two types of acquisitions, the literature has so far lumped them together, often using "corporate acquisitions" as a universal term to suggest that all acquisition activity falls within the domain of corporate HQ. Our theoretical framework and empirical findings, however, show that it is crucial to differentiate between these two types. BU-level acquisitions – by far the most prevalent type – require capability development on the part of BUs, rather than corporate HQ, in order for them to be undertaken effectively. Corporate-level acquisitions, on the other hand, are often so rare that capability development based on these experiences may be close to impossible. On a related note, to the extent that prior studies have restricted their samples to large, corporate-level acquisitions and thus, have undersampled on BU-level ones, this distinction suggests another potential explanation for the inconsistent results in the literature.

Third, our paper complements recent work arguing that firms may only be able to develop acquisition capability if they move beyond mere routine-based experience accumulation toward more deliberate forms of learning, including the use of knowledge codification tools (Zollo & Singh, 2004) and dedicated corporate development departments (Kale et al., 2002). Indeed, these mechanisms may work in tandem with the ones that we uncover. That is, whereas most capability development may be taking place within BUs, many acquisitive firms may be attempting to speed up the learning process by implementing these tools within their corporate HQs. This would imply, as confirmed by some recent research (Palter & Srinivasan, 2006), that the corporate level primarily plays a coordinating role in the capability development process.

Fourth, the transfer-theoretic perspective that we adopt contributes to extant work on vicarious learning, which has taken a rather one-sided approach to studying the phenomenon. In general, this work has argued that the high degrees of experience heterogeneity that vicarious

learning allows the focal firm or BU to tap into is beneficial, enabling it to engage in exploratory learning (e.g., Ingram & Baum, 1997). However, although such exploration may indeed be valuable in some situations, it often carries a real danger: the experience that is being tapped into may simply not be applicable to the context at hand, as we show for the case of colleague BUs.

Fifth, our paper offers interesting implications for the growing stream of knowledge-based research (e.g., Grant, 1996; Kogut & Zander, 1993). Whereas this work argues that the primary reason for the existence of firms is that they are more efficient at knowledge transfer than markets are, our theory and results raise the question as to whether such knowledge transfer should be fostered in the first place. If much of the knowledge within the firm is highly context-specific, as we find to be the case for knowledge about acquisitions, then firms may, in fact, be better off restricting knowledge flows among their subunits. Thus, while it seems indisputable that knowledge is more easily *accessible* within rather than across firms, our results show that at least some knowledge is not *applicable* across different subunits of the same firm. We believe, therefore, that knowledge-based research should move beyond focusing merely on the accessibility of experience. By incorporating insights from transfer theory, which focuses on the applicability of experience, we feel that more valuable insights can be gained, since accessibility and applicability are both necessary conditions for productive learning to take place.

Empirical Contribution

We believe our research design represents a promising avenue for future work. Our paper suggests that the field has only scratched the surface of the mechanisms underlying capability development, pointing at a vast intra-organizational domain that has largely escaped the radar so far. The 1997 adoption of a new accounting standard for the disclosure of segment information using the so-called “management approach” (SFAS 131) has offered access to an unprecedented level of archival detail about the firm’s internal organizational structure. Unfortunately, our field so far seems to have been largely unaware of the existence of these data. The upside of this is that, by now, there is over a decade’s worth of public, longitudinal information that offers fine-grained insight into some of the most salient aspects of the firm’s “anatomy.” These data are far more reliable than what was available under the old standard, as evidenced by a number of

studies. By being among the first to capitalize on this wealth of information, we hope to help set the stage for future work that could benefit greatly from research designs similar to ours.

Managerial Implications

Our theory and results also carry important implications for practitioners. By unpacking some of the key mechanisms underlying acquisition capability development and providing evidence that effective learning occurs within BUs, our paper may help managers gain deeper insight into what the role of the corporate level should be. Specifically, our theory and results suggest that this role should perhaps primarily be a coordinating one. In other words, our study suggests that there may be considerable scope for meaningful management intervention by pointing out that corporate HQ's role is not so much that of accumulating acquisition experience, as has been assumed so far, but of coordinating the processes through which the BUs do so. By carefully analyzing the extent to which experience is applicable across the firm's BUs and selectively establishing links among them based on this insight (e.g., through liaison roles, management rotation, or strategic controls), corporate HQ could be invaluable in ensuring that experience transfer across BUs occurs only when it is likely to lead to positive transfer effects.

Limitations and Suggestions for Further Research

Future research could attempt to address several limitations of our paper. First of all, by combining our archival research design with a survey design, great strides may be made toward further deepening our understanding of the process of acquisition capability development. For instance, our approach did not allow us to measure the deliberate learning mechanisms that some recent work has found to be important. If these insights could be combined with the ones that we offer on the locus of learning, we feel that more novel contributions could be made.

Second, although we follow existing theory and evidence by conceptualizing and operationalizing the structural similarity across events using the industry dimension, there may certainly be other dimensions along which such structural similarity varies in important ways. One particularly salient example seems to be the national cultural dimension. The industries in which firms are embedded have a major impact on the way these firms behave but one might expect this to be the case for their cultural contexts as well. By identifying a wider variety of

dimensions that shape structural similarity, future research could considerably enhance our understanding of the mechanisms underlying organizational learning.

Furthermore, we have argued that it is crucial to distinguish between the applicability and the accessibility of experience. Our focus in this study has primarily been on the former because the majority of extant work on learning and knowledge-based theory has concentrated on the latter. However, although accessibility does play a role in our study, it is a relatively minor one and we feel that future work could contribute by theorizing more explicitly on how these two key factors interact in shaping the effectiveness with which firms learn.

Finally, future work could apply our theoretical framework in different strategic contexts, such as those of alliances or FDI. Perhaps even more interestingly, scholars could try to capture multiple such strategic activities in a single theory. Moreover, we believe that the field could benefit greatly from work that shows how longitudinal research can be conducted at organizational levels located even lower down in the firm than that of the BU. We hope that our study and others can help spark such innovative research in the future.

CHAPTER 6

GENERAL CONCLUSION

It seems to be beyond question that the insights thus far produced by the vast body of academic work on acquisitions contain substantial descriptive value. Indeed, when comparing today's literature with that of, say, three decades ago, it is difficult to ignore the progress that has been made. However, given that the majority of acquisitions still seem to fail (King et al., 2004), a growing number of researchers have, either implicitly or explicitly, started to cast doubt on the *prescriptive* value of these scholarly insights. In light of the complexity and heterogeneity that characterize acquisitions – and strategic activities more in general, for that matter – the guidelines and heuristics offered by researchers studying these phenomena may often be insufficient to be of immediate use in practice (Polanyi, 1958). Instead, some capability that is developed through experience may be necessary for firms to perform well at these activities.

As discussed in the general introduction, therefore, the guiding principle throughout this dissertation has been that, although research may not be able to teach firms how to do acquisitions, it may well be able to teach them how to *learn* to do them. Following recent work (e.g., Beckman & Haunschild, 2002; Haleblian, Kim, & Rajagopalan, 2006; Hayward, 2002; Kale, Dyer, & Singh, 2002; Zollo & Reuer, 2008; Zollo & Singh, 2004), I have conceptualized learning as an inherent part of strategy, thus being amenable to managerial action. More specifically, I have argued that the high degree of complexity involved places constraints on the extent to which the acquisition process can be routinized. Hence, in order to reap the fruits of its acquisitions, the firm will likely have to engage in both active cognitive search and routinization.

Major Contributions

Taken together, I believe that Chapters 3, 4, and 5 of this dissertation carry important implications both for the literature on acquisitions and that on organizational learning. First of all, Chapter 3 incorporates insights on both cognitive search and routinization in pursuit of a behavioral theory of acquisition performance that is more comprehensive than what existing

research has offered so far. A first contribution of this chapter consists in the observation that acquirers go through long-term cycles of acquisitive growth and organizational restructuring, thereby showing that the latter is an integral part of the acquisition process as a crucial second stage of post-acquisition integration. Furthermore, this chapter shows that the routinization of prior experience alleviates the demands that active cognitive search places on the firm's bounded rationality, thus allowing the firm to acquire more efficiently and effectively.

Perhaps most importantly, however, the theory and results of this chapter suggest that, by overlooking the critical role of organizational restructuring, prior research may have systematically underestimated the extent to which firms benefit from their acquisitions, since such restructuring often unlocks gains from acquisitions a decade or more after they were initially undertaken. Hence, acquisition failure may not be as ubiquitous as most prior work has led us to believe, which may account for the fact that – even when controlling for the wave-like temporal pattern in acquisition activity – the popularity of acquisitions has skyrocketed over time. Indeed, with a staggering total value of $4.5 trillion, "the volume of worldwide mergers and acquisitions surpassed an all-time record during 2007 … a 24 percent increase over the previous record set in 2006" (Thomson Financial, 2008: 1).

Building on the general framework established in Chapter 3, Chapters 4 and 5 both draw on theory from cognitive psychology in pursuit of a deeper understanding of how the firm can successfully learn from its acquisition experience, given the heterogeneity involved. Whereas Chapter 3 provided evidence that routinization leads to more efficient and effective acquisitive growth by alleviating the demands that are placed on the firm's bounded rationality, Chapters 4 and 5, instead, focus on the problems that such routinization tends to cause. Specifically, Chapter 4 addresses a debate that currently divides the organizational learning literature into two camps, with one emphasizing the merits of experience homogeneity and the other those of experience heterogeneity. I attempt to resolve this debate, representing the first contribution of this chapter, by reconciling the competing arguments on the roles of experience homogeneity and heterogeneity, arguing and showing that both are critical to the development of acquisition capability, although at different stages of the learning process.

A second key contribution of this chapter consists in the development of a dynamic approach that shapes the firm's acquisition behavior such that experience heterogeneity is initially attenuated, but can ultimately be capitalized on, thus optimizing the learning process. Finally, a third contribution lies in the light that this framework sheds on the actual process through which capabilities are built. That is, it shows that the firm starts off by building a strong acquisition capability that is only narrowly applicable within a specialized domain and then, through the introduction of experience heterogeneity, gradually grows this initial capability in an attempt to make it more widely applicable.

Chapter 5 studies the same basic problem of experience heterogeneity in the context of acquisitions, but proposes a different, albeit complementary, approach toward solving it. The first contribution of this chapter lies in showing that the literature on learning in strategic contexts may have fallen victim to an ecological fallacy that has constrained rigorous theorizing by implicitly assuming that the locus of learning is situated at the corporate level. By breaking with this assumption, I argue and provide evidence that acquisition capability is, instead, largely built at the level of the business unit (BU). The second contribution consists in the novel insights that this perspective offers in terms of how such capability is developed over time through the interplay of BU-specific pockets of experience within and across firms and how this sheds light on whether this capability is ultimately developed successfully or not.

Finally, Chapters 4 and 5 jointly contribute to the growing literature on deliberate learning by arguing and showing that it may not always be necessary for the firm to switch from mere experience accumulation to more powerful and costly learning mechanisms, such as experience codification, in order to cope with the heterogeneity involved. That is, if the firm shapes it acquisition behavior (Chapter 4) or structures its organization (Chapter 5) such that this heterogeneity is alleviated, the effectiveness with which it can develop acquisition capability is greatly enhanced. Hence, I argue that these two chapters offer approaches to learning that may be strongly complementary to the ones so far proposed by the literature on deliberate learning.

Limitations and Suggestions for Further Research

One limitation of the research presented in this dissertation is that it is exclusively based on archival data. Although these data allow me to study acquirers over extended periods of time,

it inevitably limits the level of detail of the measures that are used. As such, one suggestion for further research in the area of organizational learning in strategic contexts would be to attempt to combine the strengths of both archival and primary data, such that firms can be studied over long time spans as well as in great detail. Such an approach, I argue, could lead to contributions that greatly enhance our understanding of these learning phenomena.

A second limitation lies in the fact that my theory has primarily, though certainly not exclusively, built on two of the most established and widely studied forms of learning – most notably, learning from experience through routinization and more cognitive or deliberate forms of learning. There are, however, certainly other dimensions to the overall learning phenomenon that could greatly enrich our theorizing. Most notably, such insightful perspectives as those offered by existing research on learning from failure (e.g., Kim & Miner, 2007; Miner, Kim, Holzinger, & Haunschild, 1999), learning from counterfactuals (e.g., Morris & Moore, 2000), learning through improvisation (e.g., Moorman & Miner, 1998; Vera & Crossan, 2005), and "fact-free learning" (e.g., Aragones, Gilboa, Postlewaite, & Schmeidler, 2005; Yayavaram & Ahuja, 2008) could take us in directions that have so far remained virtually unexplored.

Finally, my research in this dissertation focuses exclusively on acquisitions. It is quite possible that the theory developed here is also applicable to other modes of corporate development, such as alliances, start-ups, foreign direct investments, and divestments. What may be even more interesting for future research, however, is to examine the potential for learning across different strategic activities, in line with what some recent work has started to do (e.g., Zollo & Reuer, 2008). Research endeavors along these lines could ultimately result in an integrated theoretical framework of organizational learning that incorporates multiple alternative and complementary modes of corporate development, which may offer invaluable contributions.

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NEDERLANDSE SAMENVATTING

Bedrijven staan in toenemende mate onder druk om te groeien. Deze groei kan organisch plaatsvinden (door middel van zogenaamde "greenfield" ofwel "start-up" ventures) of aan de hand van acquisities. Acquisities – overnames van bestaande bedrijven of onderdelen daarvan door andere bedrijven – zijn over de jaren enorm in populariteit gestegen. Echter, acquisities zijn berucht om hun lage kans van slagen. Bestaand onderzoek heeft ondubbelzinnig uitgewezen dat niet minder dan 50 tot 75 procent van alle acquisities als "onsuccesvol" bestempeld kan worden.

Wat de omvangrijke literatuur omtrent acquisities ons tot dusver heeft geleerd is, onder andere, dat twee specifieke factoren van cruciaal belang zijn voor succesvol acquireren: (1) een voldoende mate aan synergetisch potentieel ("strategic fit") tussen de beide partijen en (2) effectieve integratie van de overgenomen partij in het overnemende bedrijf ("organizational fit"). Ondanks deze goed gedocumenteerde theoretische inzichten, blijkt het, zoals aangegeven in de voorgaande alinea, enorm moeilijk voor bedrijven om ze in de praktijk te implementeren. Mede als gevolg hiervan is er een groeiende subliteratuur ontstaan, gebaseerd op het idee dat bedrijven "acquisition capability" dienen te ontwikkelen aan de hand van hun ervaring en die van anderen.

Dit proefschrift bestaat uit zes hoofdstukken: een introductie, vier gerelateerde papers en een conclusie. Het eerste paper (Hoofdstuk 2) is een gedetailleerde review van de bestaande literatuur omtrent organizational learning in de context van acquisities. Onderzoek heeft aangetoond dat bedrijven operationele activiteiten, zoals productie en distributie, doorgaans effectief kunnen leren ("routinization"). Helaas zijn de bevindingen in het kader van acquisities en andere strategische activiteiten veel minder consistent. De complexiteit van acquisities leidt ertoe dat ze vaak significant van elkaar verschillen. Deze heterogeniteit betekent dat ervaringen met acquisities uit het verleden zelden volledig toepasbaar zijn op de huidige acquisitie.

Met andere woorden, de mate waarin bedrijven generaliseerbare routines kunnen ontwikkelen op basis van hun acquisitie ervaring is beperkt, met als gevolg dat er voor elke acquisitie actief moet worden gezocht naar gepaste strategische benaderingen en dat er diep moet worden nagedacht over welke hiervan de meest veelbelovende is ("cognitive search"). Een cruciale taak is dus het identificeren van lessen uit het verleden die toepasbaar zijn op de huidige acquisitie en elementen van de acquisitie die daarentegen cognitive search vereisen.

Hoofdstuk 3 bouwt voort op deze tweedeling tussen passieve routinization en actieve cognitive search. In dit paper bestudeer ik hoe synergie op de lange termijn gerealiseerd wordt. Op basis van behavioral theory stel ik dat de initiële integratie van een gegeven acquisitie noodzakelijkerwijs suboptimaal is omdat in dit stadium niet alle synergetische mogelijkheden ervan ontdekt kunnen worden. Naarmate acquisitieve groei de performance verlaagt door deze ontoereikende cognitive search ("local search"), zullen bedrijven op een gegeven moment echter radicaal herstructureren. Hieraan ten grondslag ligt een bredere evaluatie van het synergetisch potentieel van hun acquisities ("distant search"), waardoor een groter deel hiervan gerealiseerd wordt als gevolg van de herstructurering. Verder hypothetiseer ik dat routinization van acquisitie ervaring, in hoeverre dit mogelijk is, deze cycli van acquisities en herstructureringen beïnvloedt. In essentie stel ik dus dat herstructurering vaak een tweede stadium is in de integratie van acquisities en dat bestaand onderzoek derhalve de performance van acquisities systematisch heeft onderschat. Ik toets het theoretisch raamwerk aan de hand van kwantitatieve data die betrekking heeft op 25 grote Nederlandse bedrijven en een periode van 40 jaar (1966-2005) omvat.

In tegenstelling tot Hoofdstuk 3, waarin ik de alternatieve fenomenen van cognitive search en routinization tracht te combineren in een algemene theorie van acquisitie performance, concentreren Hoofdstuk 4 en 5 zich specifiek op routinization en dus op de vraag hoe bedrijven effectief kunnen leren van zowel hun eigen acquisitie ervaring als die van anderen. Hoofdstuk 4 tracht het hedendaagse debat in de literatuur omtrent de rollen van homogene en heterogene ervaring op te lossen. Hoewel de traditionele organizational learning literatuur heterogene ervaring als een obstakel beschouwd in het leerproces, suggereert recenter onderzoek dat dergelijke heterogene ervaring hiervoor juist een belangrijke voorwaarde is. Voortbouwend op theorie uit de cognitieve psychologie hypothetiseer ik dat homogene en heterogene ervaring complementair zijn en dus, dat ze beide van cruciaal belang zijn voor succesvolle ontwikkeling van acquisition capability, alhoewel in verschillende stadia van het leerproces. In wezen claim ik dat bedrijven hun acquisitie strategie dusdanig kunnen inrichten dat heterogene ervaring op de korte termijn kan worden vermeden maar er op de lange termijn wel van kan worden geprofiteerd. Deze theorie wordt getoetst met behulp van dezelfde dataset als die in Hoofdstuk 3.

Hoofdstuk 5 richt zich op hetzelfde fundamentele vraagstuk omtrent heterogene ervaring in het kader van acquisities. Echter, hier stel ik een alternatieve, hoewel complementaire, oplossing voor door me met name op organisatiestructuur, in plaats van strategie, te richten. Wederom voortbouwend op cognitieve theorie stel ik dat acquisition capability primair wordt ontwikkeld op het niveau van de business units (BUs) en niet, zoals tot dusver in de literatuur verondersteld, op het niveau van het hoofdkantoor. Aangezien de BU met minder heterogene ervaring te maken heeft dan het hoofdkantoor zou de ontwikkeling van acquisition capability hier effectiever plaats moeten kunnen vinden. In het bijzonder hypothetiseer ik dat acquisition capability wordt ontwikkeld door interactie tussen acquisitie ervaring die zich bevindt in BUs zowel binnen als buiten het bedrijf in kwestie en dat de effectiviteit waarmee dit gebeurt afhankelijk is van welke ervaring een gegeven BU aanwendt. Ik toets deze theorie aan de hand van data die betrekking heeft op alle acquisities die de 269 BUs van 52 Amerikaanse softwarebedrijven en hun concurrenten hebben ondernomen gedurende de veertig kwartalen tussen 1998 en 2007.