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High-Technology Acquisitions: An Inquiry Toward the Microfoundations of a Grafting Capability

Amiryany Araghy, N.

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CHAPTER THREE

LEARNING TO GRAFT

ABSTRACT

Given the rapid change in high-technology industries, many firms in these industries undertake acquisitions to get access to new capabilities. Yet these acquisitions often fail. Post-acquisition capability transfer implications have been mentioned as the primary reasons for such high failure rates. Nonetheless, we still do not know how to enhance post-acquisition transfer of targets' capabilities. Prior post-acquisition research has focused broadly on two aspects: post-acquisition capability transfer and development of a general acquisition capability. This present study argues for a synthesis of these two prior post-acquisition literature streams. As a result, the importance of a grafting capability—that is, an acquisition capability specifically developed for transferring capabilities—is recognized. The findings of this study reveal that, in contrast with existing literature on capabilities that focuses on deliberate learning mechanisms, the microfoundations of such a grafting capability are search activities—that is, ad hoc problem solving. In addition, this study shows that the effect of such search activities can be stronger when firms involved have common knowledge.

INTRODUCTION

In an effort to understand performance variations across firms, many strategy scholars have focused on the concept of organizational capabilities during the past decades. In essence, an organizational capability is a firm's learned behavior that enables it to carry out certain activities successfully—or, preferably, more successfully than competitors (Nelson & Winter, 1982; Winter, 2003). Such behavior proceeds from two forms of learning: experiential learning and learning from others (e.g., Levitt & March, 1988). Experiential learning is learning by actually taking part in a task—that is, by doing (Argote & Greve, 2007; Dosi & Marengo, 2007; Huber, 1991; Levitt & March, 1988). Learning from others can take place, according to Huber (1991), through vicarious learning and grafting. Vicarious learning represents learning about the practices of other organizations—for example, by imitating them (Huber, 1991). Grafting, in contrast, is a form of learning whereby the focal firm acquires capabilities through access to new members, such as in an acquisition (Huber, 1991; Madhok, 1997; Puranam, Singh, & Zollo, 2006). In other words, in the case of vicarious learning, the focal firm learns from others by tapping into their experience more or less indirectly, whereas in the case of grafting, the focal firm makes those “others” part of its own organization and, thus, has the opportunity to tap into the desired capability directly (e.g., Argote & Miron-Spektor, 2011).

Given the rapid change in high-velocity environments such as high-technology industries, firms frequently choose to acquire new capabilities instead of developing them internally (hereafter, “capability-based acquisitions”), which points to the importance of grafting as a vehicle for gaining competitive advantage (e.g., Ahuja & Katila, 2001; Madhok, 1997; Makri, Hitt, & Lane, 2010; Puranam et al., 2006; Ranft & Lord, 2002). Clearly, simply acquiring a target firm by no means guarantees that its capabilities will be successfully grafted onto the acquirer's organization (e.g., Bresman, Birkinshaw, & Nobel, 2010; Ranft & Lord, 2002). Thus, capability-based acquisitions seem to be prone to failure (Barkema & Schijven, 2008b; Bresman et al., 2010; King, Dalton, Daily, & Covin, 2004). Post-acquisition integration problems appear to be the main reasons for acquisition failure (Puranam, Singh, & Zollo, 2003; Vermeulen & Barkema, 2001). Therefore, understanding how to enhance post-acquisition learning among employees of the acquired and acquiring firms and, thus, capability transfer of capability-based acquisitions, is a crucial step toward increasing acquisition success.

The roots of organizational learning can, by and large, be traced back to two foundational theories—that is, the behavioral theory of the firm (Cyert & March, 1963) and evolutionary economics (Nelson & Winter, 1982). Therefore, it is not surprising that these two theories play leading roles in the growing literature on learning in the context of acquisitions. Thus far, prior research has developed arguments along two lines. One stream of literature, while taking into account various important aspects of post-acquisition capability transfer—such as the importance of the size of the firms involved, of having common knowledge, and of retaining key employees—emphasizes the importance of social integration and, thus, the development of a new joint social community post-acquisition (Birkinshaw, Bresman, & Håkanson, 2000; Bresman, Birkinshaw, & Nobel, 1999; Bresman et al., 2010; Ranft, 2006; Ranft & Lord, 2002; Schweizer, 2005; Verbeke, 2010). This approach highlights the role of ad hoc problem solving, which ensures that employees collectively search for solutions while collaborating and building the necessary social relationships to enhance learning, which is in line with the behavioral theory of the firm. In contrast, strategy scholars, more in line with evolutionary economics, have argued for the importance of routinized activities in the form of deliberate learning mechanisms for experience accumulation, articulation, and codification—such as a mergers and acquisitions (M&A) department or an M&A repository or retrieval system—that could enhance learning from the acquisition process by developing an acquisition integration capability (hereafter, “acquisition capability”) (Amiryany, Huysman, De Man, & Cloodt, 2012; Barkema & Schijven, 2008a; Helfat et al., 2007; Zollo, Reuer, & Singh, 2002; Zollo & Singh, 2004; Zollo & Winter, 2002).

However, it is surprising that, with the exception of work addressing the importance of transferring capabilities (Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Ranft, 2006; Ranft & Lord, 2002; Schweizer, 2005; Verbeke, 2010) and a few studies emphasizing the importance of post-acquisition integration issues of such capability-based acquisitions (Puranam, Singh, & Chaudhuri, 2009; Puranam et al., 2003, 2006; Puranam & Srikanth, 2007), little research to date has pursued a deeper understanding of how firms can learn to graft and, thus, develop a grafting capability. In other words, a synthesis of the above-mentioned two streams of research—grafting itself and developing a capability to be able to graft successfully—is still lacking. Indeed, notwithstanding the contributions of prior research, we still neither know how the actual grafting process takes place nor how firms can learn to graft (e.g., Amiryany et al., 2012; Felin & Foss, 2005, 2009; Foss, 2007; Foss,

Husted, & Michailova, 2010; Helfat et al., 2007). This has some implications. On the one hand, research needs to reveal whether it is justifiable to recommend deliberate learning mechanisms for developing a grafting capability. On the other hand, if it is justifiable, we need to question what managers of these mechanisms should advise. An example of this is when an M&A department tries to enhance capability transfer or decide what such mechanisms should contain, such as for an M&A repository or retrieval system. However, if recommending a deliberate learning mechanism is not justifiable, what then should firms do to enhance grafting? Should firms, for example, rely more on ad hoc problem solving as proposed by the behavioral stream of research?

Acquirers that rely on capability-based acquisitions must not only learn the focal target's capability but also learn how to engage in this grafting process more effectively for future acquisitions—that is, to develop a grafting capability distinct from a general acquisition capability. This is because an acquisition capability could also be applicable to non-high-technology firms, focusing on integration issues regardless of the importance of getting access to new capabilities. An example of this is in acquisitions meant to gain access to new clients. In contrast, a grafting capability is a capability required when involved in capability-based acquisitions, meant to ensure that target capabilities are transferred successfully post-acquisition. However, developing such grafting capability focused on integrating acquisitions that serve to gain access to new capabilities has not been the focus of research so far. Therefore, gaining a better understanding of the microfoundations of a grafting capability and thus, how such capability can be built, is vital in order to extend existing theory. In addition, given the high failure rates of acquisitions (Barkema & Schijven, 2008b; Bresman et al., 2010; Hayward, 2002; King et al., 2004; Ranft, 2006)—in particular capability-based acquisitions—and the increasing importance of capability-based acquisitions in high-velocity environments, gaining deeper insight into the grafting process and how acquirers can develop a fruitful capability for this process also has practical value. This research aims to shed light on these issues, based on quantitative and qualitative data gathered in the context of high-technology acquisitions whose purpose is to access new capabilities. More specifically, this study attempts to explain how firms can learn to graft and what specific activities enhance learning through grafting, in an effort to discover what the microfoundations of a grafting capability are.

In the next sections, while building up to the hypotheses, we will first provide some background information on relevant acquisition literature and discuss how to enhance

grafting. Second, a description of the methodology of our study will be given. Third, after discussing our study's method, we will elaborate on the data and test our hypotheses. Finally, a discussion is provided.

BACKGROUND

Acquiring to Learn: Grafting

Firms in the high-technology industries increasingly acquire other, often smaller, firms to gain access to their capabilities (Bresman et al., 2010; Kapoor & Lim, 2007; Makri et al., 2010). These firms are interested in highly tacit capabilities of the acquired firms, which are often in the heads of their employees and embedded in their routines and social relationships (Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Ranft & Lord, 2002; Schweizer, 2005). Therefore, these firms acquire an entire company instead of just buying, for example, patents or hiring certain employees. These acquirers need to acquire the target firms to be able to learn what their employees know and how they conduct their activities. Acquiring to learn—that is, grafting—however, often does not live up to the desired objectives because such acquisitions are likely to fail (Finkelstein & Cooper, 2010; Graebner, Eisenhardt, & Roundy, 2010; Halebian, Devers, McNamara, Carpenter, & Davison, 2009). Post-acquisition integration issues are often the key reason for such high failure rates. In other words, firms usually struggle when trying to transfer target capabilities post-acquisition (Bresman et al., 2010; Puranam et al., 2003).

To address the complexity and importance of post-acquisition capability transfer, a growing body of literature in strategic management has focused on gaining insight into how to transfer capabilities post-acquisition (Graebner, 2004; Kapoor & Lim, 2007; Ranft, 2006; Ranft & Lord, 2002; Schweizer, 2005). Prior research has addressed this question by taking into account various issues. For example, prior studies reveal that the size of the firms involved matters, given that larger target firms tend to complicate the integration process. This is because firms need to retain more people, invest more in communication, and give the acquired firm more autonomy in such situations (Ernst & Vitt, 2002; Kapoor & Lim, 2007; Laamanen & Keil, 2008). In addition, the existence of common knowledge has been mentioned as an important ingredient for effective post-acquisition capability transfer because it enables employees to better understand one another's expertise (Ahuja & Katila, 2001; Cummings & Teng, 2003; Puranam et al., 2009).

Furthermore, the various dimensions of acquisition integration, such as speed, communication, autonomy, and retention of key employees, have been an issue of concern as well (Ranft, 2006; Ranft & Lord, 2002). In line with this, prior studies have revealed that post-acquisition capability transfer greatly depends on the degree of social integration achieved through a gradual process of employees getting to know each other and learning from one another. This process leads to the development of a new, joint, social community post-acquisition that is essential for creating value through capability-based acquisitions (e.g., Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Puranam et al., 2006; Schweizer, 2005; Verbeke, 2010).

Understanding how to socially integrate the companies post-acquisition while not disturbing existing relationships and giving the acquired firm the necessary autonomy seems vital for post-acquisition transfer of capabilities (Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Puranam et al., 2006; Puranam et al., 2009; Puranam & Srikanth, 2007; Verbeke, 2010). It is the effect of such social integration that creates value post-acquisition by enabling firms to access the capability of the acquired firm. To achieve such social integration, enhancing interaction among employees and having rich communication is critical because getting to know and trust one another is a prerequisite to start collaborating and, thus, transferring the desired highly tacit capabilities (Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Graebner, 2004; Graebner et al., 2010; Schweizer, 2005).

In other words, various aspects have been mentioned by prior research to play an important role for transferring the desired capabilities, but what is essential is for companies to become socially integrated and, thus, to form a new joint social community in which the employees of both firms are involved (Bresman et al., 2010; Verbeke, 2010). This new social community can grow from enhanced interaction and rich communication among employees. However, awareness of the important variables in post-acquisition capability transfer does not necessarily result in effective practice. Research on grafting through acquisitions has focused predominantly on the implications of transferring capabilities and not on how firms can develop a capability for being successful at undertaking acquisitions. Therefore, another stream of literature has focused on why certain firms are more successful in their post-acquisition endeavors than others and how they have learned to acquire. Having an acquisition capability is considered vital for engaging in acquisitions successfully. In the following section we will elaborate on the importance of such acquisition capability.

Learning to Acquire: Acquisition Capability

Managers of firms admire other firms in their industry that are successful at acquisitions, such as Cisco Systems and General Electric (e.g., Heimeriks, Schijven, & Gates, 2012). These successful firms are able to conduct their integration efforts in a way that most firms are unable to do (Heimeriks et al., 2012). Prior research attributes such firms' capabilities to having the required deliberate learning mechanisms in place to accumulate experiences and articulate and codify the knowledge gained from such experiences (Barkema & Schijven, 2008a; Heimeriks et al., 2012; Zollo & Singh, 2004). First, concerning their experience accumulation efforts, such firms have been conducting numerous acquisitions over the course of their lives, allowing them to have the requisite experience to know what is essential and what is not when involved in post-acquisition integration activities. Having done acquisitions in similar business areas could be of even greater value because this enables firms to draw conclusions directly from their experiences and apply them to future events (Hayward, 2002; Vermeulen & Barkema, 2001).

In addition to accumulating the necessary experience, successful acquirers tend to have certain organizational practices that, in combination with their experience, enhance their acquisition capability. First, these firms usually have dedicated functions in place at the corporate level, such as an M&A department, team, or manager, that are responsible for the acquisition process and for experience accumulation related to this process (Amiryany et al., 2012; Barkema & Schijven, 2008a; Helfat et al., 2007; Zollo & Singh, 2004). Second, these firms ensure that such dedicated functions articulate their experiences from previous acquisitions so they can learn from them, for example, by conducting post-acquisition evaluations (Amiryany et al., 2012; Barkema & Schijven, 2008a; Helfat et al., 2007; Zollo & Singh, 2004). Third, these firms document past experiences to create routines for subsequent events (Amiryany et al., 2012; Barkema & Schijven, 2008a; Helfat et al., 2007; Zollo & Singh, 2004). Furthermore, besides experience accumulation, articulation, and codification, recent research has shown that such firms also engage in "risk management" practices, which are meant to ensure that firms do not apply distributed knowledge across the firm, related to acquisition integration, to a particular deal without customizing it (Heimeriks et al., 2012). Therefore, firms successful at acquisition integration apply what they have learned over the course of their lives in a highly systematic manner, cautious not to make incorrect inferences.

Most literature focusing on the importance of such acquisition capabilities deals with all types of acquisitions in general and not capability-based acquisitions in particular. Given the

focus on transferring capabilities and the highly tacit nature of the capabilities to be transferred by means of capability-based acquisitions, it is important to realize that such acquisitions require an acquisition capability distinct from the one that addresses integration issues in general. The specific capability required for fruitfully conducting capability-based acquisitions is called a “grafting capability” throughout this study, which is discussed in the following section.

Learning to Acquire to Learn: Grafting Capability

The concept of grafting capability synthesizes the elements mentioned in the previous two sections, namely “acquiring to learn” (i.e., grafting) and “learning to acquire” (i.e., a generic acquisition capability). In other words, grafting capability is a specific type of acquisition capability focused on integrating acquisitions that serve to gain access to new capabilities of the acquired firm. Given the typically tacit nature of the capability a firm wants to acquire when involved in capability-based acquisitions, having a grafting capability is important because gaining access to the target firm’s unique capabilities requires different organizational practices than in other types of acquisitions, such as those focused on accessing new clients and markets. A grafting capability must deal with the transfer of highly tacit capabilities that are in the heads of employees and embedded in the organizational routines and practices of the target firm. More precisely, such a grafting capability ensures that the acquirer is able to transfer the capability of the acquired firm without disrupting the important routines and social relationships that underpin the acquired firm’s capability. Therefore, such grafting capability is meant to ensure that the acquisition process does not destroy the reason for making the acquisition in the first place. In the next section, we will elaborate on how firms can enhance grafting to make inferences about what the microfoundations of a grafting capability could be.

THEORY AND HYPOTHESES

Enhancing Grafting

To understand how to engage in successful grafting, one needs to know how such a complex organizational learning process takes place. As touched on in the introduction, the roots of the existing literature on organizational learning can largely be traced back to two foundational theories: the behavioral theory of the firm (Cyert & March, 1963) and evolutionary economics (Nelson & Winter, 1982). Behavioral theory of the firm focuses on

firms' decision making (Cyert & March, 1963; Gavetti, Levinthal, & Ocasio, 2007).

Organizational learning from this perspective assumes that firms invest time and resources to search for a set of alternative courses of action for a given task, compare them, choose the most appropriate option for the task, and learn from the resulting experiences to improve the odds of success of subsequent events. Thus, organizational learning from a behavioral theory of the firm's perspective aims to reveal how learning based on firms' decision making takes place. Understanding how the process of learning unfolds is a central theme in this research stream (Argote & Greve, 2007). Scholars from this tradition recognize the importance of both standard operating procedures (i.e., routines) and search activities for firms' decision making. This recognition has resulted in subsequent related acquisition literature embracing the importance of close collaboration and interaction—when involved in grafting activities (Puranam et al., 2006; Puranam & Srikanth, 2007). Frequent interaction and close collaboration that include searching together for solutions, called “search activities” throughout this study, have been argued to have a positive effect on capability transfer and, therefore, on the performance of capability-based acquisitions (Birkinshaw et al., 2000; Bresman et al., 2010; Ranft, 2006; Ranft & Lord, 2002; Verbeke, 2010).

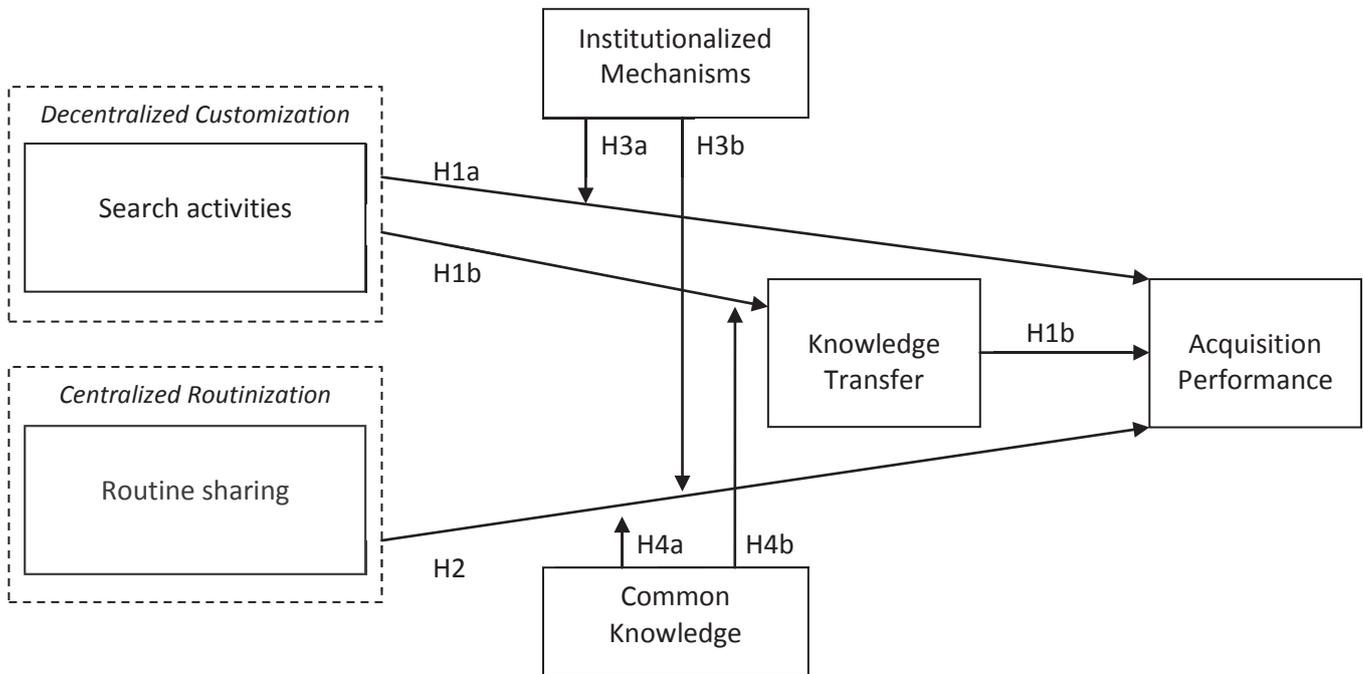
In contrast with behavioral theory of the firm, evolutionary economics focuses on routinization of activities, which ensures that firms can economize on the process of searching for solutions based on their past experiences, leading to these experiences becoming the routine way of doing things. This approach allows routines to rise and get refined over time as firms keep accumulating experiences. In time, by having created the needed routines on which they can depend, firms are able to develop certain organizational capabilities to outperform others, because they know what the best solutions are based on their experiences and can apply these solutions efficiently by means of their routines. In other words, the way that firms are able to carry out certain activities better than competitors can is assumed to be captured by their routines. Thus, evolutionary theory highlights routines as the focus of attention to understand how firms learn and develop certain capabilities (Nelson & Winter, 1982, 2002). Therefore, the aim of organizational learning from this perspective is to reveal how firms, given the stabilizing role of routines and the existence of search processes as generators of change in routines, learn to improve their performance by developing certain capabilities (Argote & Greve, 2007; Gavetti et al., 2007; Nelson & Winter, 1982, 2002). This important role of routines has led many firms involved in acquisitions to share routines, between the acquiring and acquired firms, in an attempt to gain access to the other firm's

capabilities and thus to learn from each other—an activity labeled “routine sharing” throughout this study (e.g., Zollo & Singh, 2004).

In addition to refining search activities and routine sharing, firms have been trying to develop an acquisition capability to enhance grafting by means of deliberate learning mechanisms such as M&A departments for experience accumulation, post-acquisition assessments for articulation, and M&A repositories and retrieval systems for codification, which we label “institutionalized mechanisms” (e.g., Barkema & Schijven, 2008a; Zollo & Singh, 2004; Zollo & Winter, 2002). Having such institutionalized mechanisms in place, as part of a firm’s grafting capability, is likely to have a positive effect on acquisition performance (Amiryany et al., 2012; Helfat et al., 2007; Hitt et al., 2009). This is because such institutionalized mechanisms are assumed to embody—on a corporate level—a firm’s past learning related to acquisition integration. The effect of such institutionalized mechanisms, however, should still be empirically tested, as is the case with search activities as well as routine sharing for developing a grafting capability (e.g., Amiryany et al., 2012; Helfat et al., 2007). Finally, regardless of the mechanisms used to enhance capability transfer, it is argued that having common knowledge—“knowledge that is shared and known to be shared” (Puranam et al., 2009, p. 314)—will be beneficial to this process. This is because the employees of the acquired and acquiring firms are more aware of what the other party knows and are better able to adjust their activities to one another. Therefore, this, in turn, means that when having common knowledge search activities and routines sharing will be more effective because the employees can better understand each other and the documents they are exchanging—while collaborating post-acquisition.

In the following sections, which describe the concepts depicted in our research model in Figure 1 and build up to our hypotheses, in line with the behavioral theory of the firm and evolutionary economics, we start off by discussing two distinct activities that firms use when trying to enhance grafting: search activities and routine sharing. Subsequently, we describe how the process of grafting could be affected by using institutionalized mechanisms proposed by strategy scholars and by having firms involved that have common knowledge.

Figure 1. Research model



Search activities

From a behavioral theory perspective, the importance of understanding which activities can enhance learning, how to avoid myopic search given bounded rationality, and, thus, how the process of learning unfolds have been central (Argote & Greve, 2007). Scholars from this tradition have recognized the importance of problemistic search (i.e., ad hoc problem solving) for enhancing learning, which could help avoid myopic search when working according to standard operating procedures. When it comes to grafting, it is about capabilities based on highly tacit knowledge and skills of employees who are able to carry out certain activities according to certain procedures. For transferring such highly tacit knowledge and skills, many scholars, whose learning roots might have originated in the behavioral theory stream of thought, have recognized the importance of close collaboration during post-acquisition to gain access to the capabilities of the acquired firm (Bresman et al., 2010; Ranft, 1997, 2006; Ranft & Lord, 2002). Transferring highly tacit knowledge requires personal interactions

(Haas & Hansen, 2007; Hislop, 2009). Many scholars have advocated enhancing learning by actually doing (Cook & Brown, 1999; Gherardi, 2000; Orlikowski, 2002; Tsoukas, 1996). Even the founders of evolutionary economics have recognized the importance of observing or being actively trained for transferring such highly tacit knowledge and skills (Nelson & Winter, 1982). Surprisingly, strategy scholars, using the evolutionary economics lens, have not paid much attention to the importance of such activities for transferring highly tacit capabilities. Thus, they have not explored the actual activities that constitute such observation and active training efforts and the possible impact of such activities on post-acquisition capability transfer and acquisition performance. This is remarkable, especially because such activities could be important components of the grafting capability we are attempting to understand.

Instead, strategy scholars have been advocating the importance of the routinization of the activities that enhance the transfer of capabilities in the form of deliberate learning mechanisms, as mentioned earlier (e.g., Zollo & Winter, 2002). However, when it comes to grafting, firms search for solutions from each other to enhance, for example, their product development efforts, and, thus, learning from each other. Given the rapid change in such high-technology environments, in which grafting usually takes place, and the post-acquisition integration issues that come along with such grafting activities, there is usually no time or need for routinization of such activities. Furthermore, routines could create inertia and path-dependency, making such problemistic search activities even more necessary (Heimeriks et al., 2012; Teece, 2007). Therefore, ad hoc problem solving usually seems to be a better solution for post-acquisition integration issues. This claim does not mean that there is no routine involved at all. As the director of a company that carries out multiple acquisitions per year mentioned during an interview, “I think more according to a plan [instead of ad hoc] while being aware of what is happening in the world around us.”

Thus, firms can have a set of search practices they use to deal with post-acquisition integration issues, such as having meetings or mentoring certain employees, but they can deal with the content of these activities—and everything else such activities actually entail—on an ad hoc basis in response to the current situation and changes in the environment (e.g., Winter, 2003). In other words, firms decide ad hoc what they need to deal with immediately during the meetings or what they need to teach certain employees by means of mentoring practices. Therefore, the ad hoc aspect concerns the content instead of the activity because firms have an arsenal of best practices they know are beneficial.

Such search practices could be, for example, project teams, job rotation, mentoring, briefing sessions, and interviewing experts. These search activities entail a more decentralized customization approach toward acquisition integration because firms ensure that employees collectively decide what to do next to enhance mutual collaboration and, thus, capability transfer (Bresman et al., 2010; Ranft & Lord, 2002). In addition, such search activities enhance the overall acquisition performance because the employees get to know each other and start developing social relationships that are beneficial to overall firm performance (Heimeriks et al., 2012). It is by means of such social relationships—enabled by search activities—that employees start developing a new joint social community post-acquisition, which helps ensure that they are willing to collaborate with each other to transfer the desired capability. The investment costs for such search activities are higher than those of routine sharing because search activities require intensive involvement of employees (e.g., Haas & Hansen, 2007). This involvement demands more time than routine sharing, which we will elaborate on in the next section. Winter (2003) argues though that the costs of such activities would be lower if the employees involved carried out these activities on top of their normal routine tasks. In other words, the costs of such search activities would be lower if the employees are expected not only to carry out acquisition-specific tasks but also to conduct the firm's normal operational activities. In this case, when there are no problems concerning capability transfer to deal with on an ad hoc basis, such employees would carry out their own tasks as usual. Regardless of the costs, one could expect that for transferring highly tacit capabilities, search activities are more effective than routine sharing because such capabilities are embedded in firms' practices and require interaction among employees and, thus, learning by doing (e.g., Bresman et al., 2010).

Furthermore, by enhancing interaction among employees while stimulating them to learn from each other about how the target's capability works, search activities ensure that knowledge is being transferred post-acquisition. This knowledge transfer, in turn, is of interest for the acquisition to transfer the capability in question and thereby also affects overall acquisition performance. Therefore, given the importance of knowledge transfer for capability-based acquisitions, one could expect that the positive effect of search activities on overall acquisition performance is a result of such activities' effect on knowledge transfer. Search activities probably enhance overall acquisition performance directly as well as indirectly through enhancing knowledge transfer. These arguments lead to the following hypotheses:

Hypothesis 1a: Search activities have a positive effect on overall acquisition performance.

Hypothesis 1b: The positive effect of search activities on overall acquisition performance is mediated by knowledge transfer.

Routine sharing

As mentioned above, an evolutionary economics perspective highlights the importance of routines for the analysis of firm behavior. Scholars in this tradition have focused on intra-firm replication of routines (Szulanski, 1996; Szulanski & Jensen, 2006; Szulanski & Winter, 2002; Winter & Szulanski, 2001), inter-firm replication of routines (e.g., Becker, 2004; Madhok, 1997), or the importance of routinized activities such as deliberate learning mechanisms for enhancing inter and intra-firm capability transfer (Zollo, 2009; Zollo & Singh, 2004). When it comes to grafting, the focus is on intra-firm transfer of capabilities because firms involved in such activities aim to access capabilities of the target firm that have become a part of their own organization. Therefore, one could argue that it is possible to use coordination mechanisms available for intra-firm activities in such contexts. Given the context-dependent nature of routines, which makes their replication difficult—indeed, often exceedingly difficult (e.g., Becker, 2004; Madhok, 1997)—firms involved in capability-based acquisitions try to find ways to transfer such routines. One such way is through routine sharing.

Firms oftentimes codify their understanding of internal operational routines in written tools such as manuals, blueprints, decision support systems, repository and retrieval systems, project management software, or even Web 2.0 software, which is consistent with thought on deliberate learning mechanisms, or knowledge codification (e.g., Haas & Hansen, 2007; Zollo & Winter, 2002). To gain access to capabilities of the acquired firm, an activity that requires minimal costs is to exchange codified versions of the firms' knowledge, an activity that we label "routine sharing" (Enberg, Lindkvist, & Tell, 2006). Given the relatively low investment efforts, firms involved in such capability-based acquisitions oftentimes opt for these routine sharing activities. By doing this, firms involved share their past codification efforts regarding their operational activities with each other. This approach originates in the economics of reuse (Enberg et al., 2006) and is in line with what Grant (1996) calls "giving directions" or what Haas and Hansen (2007) call "exchanging documents." The focus here instead is primarily on the idea that such an exchange of documents is meant to share the routines because firms involved in capability-based acquisition are interested in the way the other firm carries out its activities and the capabilities embedded in its routines. This

approach by definition entails some form of centralized routinization because firms try to steer the routines according to which activities should be carried out from the top. The importance of such routine sharing and its impact on acquisition performance has not attracted much attention though.

Given that the capabilities of firms are embedded in their routines (e.g., Allatta & Singh, 2011; Sirmon, Hitt, & Ireland, 2007) and are usually of a highly tacit and causally ambiguous nature (Ranft & Lord, 2002), routine sharing by means of giving directions entails a loss of tacit knowledge (Grant, 1996). Thus, it is expected that the knowledge the acquirer attempts to gain access to through grafting is not likely to be fully shared through routine sharing. As a corporate business development director of a company that carries out multiple acquisitions per year stated in an interview:

Interviewee: No, let me say it this way: sending reports [and documents] is just not going to be it.

Interviewer: No? So ... you really need that interaction [that you mentioned]?

Interviewee: No, you really need “talking” for that.

In other words, firms might have difficulties finding relevant knowledge or acting on it (Haas & Hansen, 2005, 2007). Therefore, routine sharing seems not to be an appropriate approach for enhancing grafting. In contrast, such routine sharing activities do enhance the “dating-process”—that is, they help firms get to know each other’s activities faster and, thus, enhance the process of getting acquainted with each other’s way of working. They also enable firms to coordinate their activities while not transferring knowledge. As the previously mentioned interviewee shared:

That [interaction among employees] goes actually based on the results. Like what have you achieved and how can we subsequently embed that in a new [airplane] engine program, but the knowledge that still remains with us [and does not get transferred].

For example, in the case of the above-mentioned interviewee, routine sharing helps firms know how certain activities (e.g., developing a component for a new airplane engine) are being carried out in generic terms (e.g., based on the results) and how such activities fit within their own operations (e.g., a new airplane engine program). This aid then helps the firms conduct their operations as efficiently as possible by not spending much time on transferring the actual knowledge (i.e., what the exact micro-level activities are that lead to developing a certain component for a new airplane engine) but by focusing on carrying out their own expertise—while coordinating the interdependencies among all these activities optimally. Therefore, routine sharing entails a coordination and efficiency aspect (e.g.,

Enberg et al., 2006; Grant, 1996; Haas & Hansen, 2007; Zack, 1999). Therefore, one could argue that routine sharing could have a positive effect on the overall acquisition performance. These arguments lead to the following hypothesis:

Hypothesis 2: Routine sharing has a positive effect on overall acquisition performance.

Institutionalized mechanisms

Institutionalized mechanisms such as an M&A department for experience accumulation, a post-acquisition assessment for knowledge articulation, and an M&A repository and retrieval system for knowledge codification most likely have a positive effect on acquisition performance, as mentioned earlier (Amiryany et al., 2012; Barkema & Schijven, 2008a; Helfat et al., 2007; Zollo & Winter, 2002). Such institutionalized mechanisms affect the choice and use of search activities and routine sharing based on firms' past learning, which has been captured and accumulated at the corporate level (Amiryany et al., 2012). In other words, institutionalized mechanisms, such as an M&A department structured according to the firm's past experiences, might use other existing institutionalized mechanisms, such as an M&A repository or knowledge articulation during evaluation sessions, to determine which type of search activities and routine sharing to carry out to enhance grafting within a specific acquisition. As a vice president of an active acquirer mentioned during an interview:

Two functions I think sit at corporate level in our company [related to acquisition integration]. So, that is integration leadership and the integration project management office. They go through plans, tasks, milestones, processes and tools, definitions, standards, all that stuff that creates a homogenous integrated [acquisition] project plan.

By helping decide on search activities and routine sharing, institutionalized mechanisms moderate the effect that such search activities and routine sharing have on overall acquisition performance in a positive way. Institutionalized mechanisms do this by guiding throughout the post-acquisition integration process. These arguments lead to the following hypotheses:

Hypothesis 3a: Institutionalized mechanisms amplify the effect that search activities have on overall acquisition performance.

Hypothesis 3b: Institutionalized mechanisms amplify the effect that routine sharing has on overall acquisition performance.

Common knowledge

As argued earlier, it is likely that for sharing highly tacit capabilities as in the case of grafting, search activities are more appropriate than routine sharing. In addition, it is reasonable to expect that the effect of search activities and routine sharing will be stronger

when common knowledge exists (e.g., Ahuja & Katila, 2001; Allatta & Singh, 2011; Argote & Greve, 2007; Hitt et al., 2009; Puranam et al., 2009). First, concerning search activities, having similar knowledge helps firms involved better understand each other such as by using the same jargon, leading to more effective usage of search activities. For example, when involved in brainstorming sessions or mentoring practices, having such common knowledge could help employees better understand the point of view of the other party and, thus, undertake more effective search activities. In addition, having common knowledge will enhance collaboration among employees, because experts will likely be more willing to collaborate with their peers, leading to an amplification of the effect of search activities and, thus, more effective search activities (Allatta & Singh, 2011). Second, the same holds for routine sharing, since when sharing the codified version of routines by means of, for example, manuals, having common knowledge could help employees to be better able to interpret the documents that are being exchanged. This is because, for example, certain codes that are being used in the documents would be obvious for the employees involved since they have some degree of common knowledge. In other words, the existence of common knowledge creates the needed absorptive capacity while decreasing the existing cognitive distance among employees and thus, amplifies the effect of routine sharing (Cummings & Teng, 2003; Lewin, Massini, & Peeters, 2011; Zahra & George, 2002). Therefore, firms can assimilate knowledge more easily when some degree of similarity exists (Allatta & Singh, 2011). As the director of a company that conducts multiple acquisitions per year mentioned during an interview:

They [experts of the acquired and acquiring firm] are complementary with each other. They can understand each other totally because they talk exactly in the same way and have exactly the same technique, but for totally different industries.

Thus, some homogeneous elements in the knowledge base of the firms involved in such grafting activities could help stimulate the grafting process and, thus, learning (e.g., Hitt et al., 2009). These arguments lead to the following hypotheses:

Hypothesis 4a: The positive effect of routine sharing on acquisition performance is amplified by the existence of common knowledge.

Hypothesis 4b: The positive effect of search activities on knowledge transfer is amplified by the existence of common knowledge.

DATA AND METHODS

Sample

This study is based on qualitative and quantitative data gathered by a three-phase research design aimed at gaining more understanding regarding the micro-practices that enhance post-acquisition knowledge transfer and, thus, the performance of capability-based acquisitions. First, we conducted a series of exploratory interviews with post-acquisition integration experts—that is, executives and front-line managers—in 2009, to understand their views of the post-acquisition implementation phase and the practices they use to enhance the transfer of knowledge. These experts had been involved in both successful and unsuccessful acquisitions, as well as small and large acquisitions. Second, the interviews were used as input for developing a survey in 2010. Subsequently, the survey was sent out to a large number of firms in 2011. Finally, in 2012, we conducted additional interviews to gain more understanding about the findings of our survey.

Interviews

In the first phase of our research, we conducted 17 interviews with executives and front-line managers responsible for and/or deeply involved in an acquisition implementation process. These executives and managers were part of a variety of large and small high-technology firms such as Cisco, Philips, Getronics, and Teva. These exploratory interviews provided the necessary stimulus for rethinking our perspective on acquisition implementation and, thus, gaining a deeper understanding of what such managers are concerned with and how they attempt to enhance the transfer of knowledge and capabilities of an acquired firm. The interviews lasted approximately 45 to 60 minutes and were semi-structured, containing questions about how the transfer of knowledge actually took place during the post-acquisition phase—that is, by means of which practices and the factors that affected this process. The interviews served as input for the development of our survey. In addition, we used a similar approach to conduct 10 additional interviews. These additional interviews were meant to gain a better understanding about the results of our survey.

Survey

Based on exploratory interviews, an extensive literature review, and advice from two academic experts, in the second phase of our research we developed a survey containing 17 practices aimed at enhancing grafting and an additional 7 institutionalized mechanisms meant

to develop a grafting capability. This approach enabled us to combine existing knowledge in acquisition implementation literature and the current practices of the high-technology industry to ensure that we could build on prior research and inform it through the latest practices in the industry. Subsequently, we pre-tested and adjusted the survey based on feedback from one acquisition specialist and three industry experts.

After refining the survey, it was sent out to 649 Cambridge Healthtech Institute (CHI) members with a senior R&D managing position. CHI is a network for leading researchers and business experts in the life sciences and provides conferences, event development and management, and industry reports for the industry. The life sciences industry—defined by the OECD as a high-technology industry (Hatzichronoglou, 1997)—has an active acquisition history in which technological learning has been key for gaining a competitive advantage (e.g., Cloudt, Hagedoorn, & Van Kranenburg, 2006; Schweizer, 2005). The senior R&D managers were selected as key respondents because the company that they were working at had been involved in an acquisition during the past five years, according to SDC Platinum, a worldwide M&A database. Using a five-year window allowed us to ask respondents to reflect on the acquisitions that were still fresh in their memories—while the acquisition effects that we are interested in were visible because the appropriate time had passed (e.g., Desyllas & Hughes, 2010). Furthermore, because capability-based acquisitions are meant to get access to the knowledge and capabilities of the acquired firm, senior R&D managers could function as the key respondents. Such senior R&D managers are involved in highly knowledge-intensive work and are prominent figures whom firms should and do involve in post-acquisition knowledge transfer activities. Thus, by choosing senior R&D managers as key respondents, we ensured that the survey was filled out by those who actually engage in the practices of interest for us (Heimeriks et al., 2012; Ray, Barney, & Muhanna, 2004). Therefore, having senior R&D managers—who have been actively involved in the knowledge transfer process of the acquisition—as respondents could be seen as a strength of our study. However, using this single-respondents method could create common method bias. Therefore, while developing our research design we considered a few aspects, to avoid such a pitfall. First, we assured respondents they would have total anonymity. Second, the independent and dependent variables were psychologically separated—that is, in terms of proximity and methodology (Heimeriks et al., 2012; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In other words, we measured the independent and dependent variables in different sections of the survey and used different types of scales. The former ensures that respondents do not

think the independent and dependent variables are part of the same scale and, thus, do not answer them accordingly. The latter, in contrast, ensures that respondents rethink their answers because the scales differ; thus, they cannot automatically fill in the answers. Therefore, respondents can avoid entering the same answers across the survey without thinking about whether they are appropriate. In addition, we used a marker variable, which is a theoretically unrelated variable, to test whether respondents also answered this question accordingly and, thus, were filling in the survey automatically, without thinking about the answers (Williams, Hartman, & Cavazotte, 2010).

After sending out the survey, a total of 126 were filled out, yielding a response rate of 19.4 percent. Such a response rate has been mentioned to be quite high for surveys that are targeted at senior managers (e.g., Capron & Shen, 2007; Heimeriks et al., 2012). Because of incomplete responses we had to drop 24 surveys, resulting in a total of 102 surveys to work with for the analysis. The resulting 102 responses contained “I don’t know answers” from less than 10 percent of respondents regarding some variables. For these missing values, we conducted an Expectation Maximization approach because they could be considered missing at random (Little & Rubin, 2002).

The respondents of our survey had a total of 181 experiences with acquisitions that had access to new knowledge and capabilities as their motive. The acquiring firms in these acquisitions were, in 65 percent of the cases, large and consisting of more than 1,000 employees, which was true for only 46 percent of the acquired firms. On average, 26 percent of the acquired firms had fewer than 100 employees, whereas this was the case for only 16 percent of the acquiring firms. In addition, approximately 63 percent of the acquiring firms were headquartered in North America and 25 percent in Europe. For acquired firms, approximately 75 percent were headquartered in North America and 12 percent in Europe. All acquisitions took place within the life sciences industry and aimed to get access to new capabilities.

Furthermore, by comparing early and late responses, we tested for non-response bias (Armstrong & Overton, 1977). The chi-square of two key variables, that is, acquisition performance ($\chi^2 = 4.817, p > 0.05$) and knowledge transfer ($\chi^2 = 12.516, p > 0.05$), did not show any non-response bias. In addition, for assessing whether common method bias existed within our data, we also carried out a formal procedure once we had the data. Using Harman’s one-factor test, we were able to find three distinct factors, all of them having an

eigenvalue greater than one, whereas none of them accounted for a covariance greater than 50 percent, namely: 29.7, 25.4, and 17.3 percent (Podsakoff & Organ, 1986).

Dependent and Independent Variables

Table A1 in the Appendix provides detailed information regarding our measurement approach to dependent and independent variables. In line with existing research in the strategy field, we used a perceptual measurement method for our dependent variable (Heimeriks et al., 2012; Kale & Singh, 2007; Zollo et al., 2002). More specifically, the dependent variable acquisition performance was measured by using a multi-item five-point Likert-type scale that focuses on different dimensions of performance—that is, overall performance, financial performance, and innovation performance. Such multi-item measures are generally preferable because they capture more information (Heimeriks et al., 2012).

First, for the independent variable “search activities,” we found 10 practices that firms used—an approach in line with existing literature (Heimeriks et al., 2012; Zollo & Singh, 2004). Second, for the independent variable “routine sharing,” we used the sum of 7 tools that were adopted by firms. Both of the independent variables measured how many of such practices the firms used during the acquisition to enhance grafting and, thus, the performance of such capability-based acquisitions. For ensuring construct validity, we used insights both from existing literature and our own fieldwork. Third, the mediating variable “knowledge transfer” was measured by using an adapted version of an existing multi-item Likert-type scale of Simonin (1999). In addition, the moderating variable “institutionalized mechanisms” was also measured by using existing practices that were mentioned in the literature and during our fieldwork and summing those practices up that were used by the firm during the focal acquisition (Barkema & Schijven, 2008a; Zollo & Singh, 2004; Zollo & Winter, 2002). Furthermore, we measured the moderating variable “common knowledge” by using a single-item Likert-type scale, an adapted version of a scale by Cummings and Teng (2003). Although multi-item scales are preferable, single-item scales have been mentioned to capture the needed information too, as long as the construct is specific enough (Heimeriks et al., 2012). Given that this scale only focuses on the similarity of the knowledge of both firms regarding the fact that employees of both firms are able to understand each other, it excludes any other factor that could have an overlap with the broader knowledge of the firm construct. Therefore, we believe it is specific enough to measure using a single-item scale (Heimeriks et al., 2012).

Finally, an important aspect to note is that our measures of search activities, routine sharing, and institutionalized mechanisms are formative scales. In contrast to reflective scales, using formative scales entails measuring items that mutually affect and create the meaning of the construct being measured (Jarvis, Mackenzie, & Podsakoff, 2003). Using formative scales means that the items constituting such scales are not correlated, leading to the standard validity and reliability criteria for reflective scales not being appropriate to validate such formative ones (Jarvis et al., 2003). Therefore, to assess the validity and reliability of our formative scales, we considered a few aspects in line with requirements mentioned in literature (e.g., Heimeriks et al., 2012). First, we ensured that there would be appropriate overall scope (content specification) and appropriate scope for the specific items (indicator specification) by gaining detailed insights from our exploratory fieldwork and pre-testing the survey. Second, we ensured content and indicator specification by relying on existing literature. Last but not least, we conducted an inter-correlation test for each scale's items to determine indicator collinearity by using Variance Inflation Factors (VIF). There was no overlap among the items because all VIFs were far below the required threshold of 10 (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

Control Variables

In addition to the dependent and independent variables, we have added a few control variables to the research model. These include cross-border acquisitions, hostile acquisitions, acquisition experience, codifiability of knowledge, and the level and mode of the integration. First, cross-border acquisitions are acquisitions in which one of the firms is headquartered in a different country. Such cross-border acquisitions could face more difficulties because of cultural differences and the geographical dispersion of the firms involved. Therefore, controlling for cross-border acquisition could reveal interesting insights. Second, many times acquisitions have a hostile nature that can have consequences when transferring knowledge and capabilities of interest. Thus, hostile acquisitions can create a sense of resistance from the employees of the acquired firm, making it difficult to collaborate. Controlling for such hostile acquisitions might reveal interesting findings. Third, acquisition experience has to do with whether firms have been involved in an acquisition before. It could be that firms with acquisition experience are better at solving certain acquisition implementation issues than those without experience. Thus, controlling for acquisition experience seems to be an important aspect for understanding performance variations across acquisitions.

Furthermore, it could be that the knowledge the firms want to get access to is quite codifiable, which makes it easy to transfer such knowledge via documents and manuals and, thus, by means of routine sharing. In such cases, one could expect better acquisition performance because the knowledge meant to be transferred is less ambiguous and easier to transfer. Therefore, controlling for the degree of knowledge codifiability could reveal interesting insights also. By asking the respondents to what extent the knowledge in question that was being transferred could be explained in writing, we aimed to assess the codifiability of knowledge. Finally, the level of integration could have an effect on acquisition performance too. Firms using a high level of integration might disrupt the knowledge and capabilities of the acquired firm by not giving it the needed autonomy and, thus, negatively affecting acquisition performance. In contrast, it could also be that firms use different modes of integration, such as on distance and physical integration—that is, virtually integrating the operational activities versus co-locating employees in the same physical space to enhance acquisition performance. Therefore, it could be that firms use a high degree of integration but do not integrate the companies physically to make sure that the acquired firm has the needed autonomy. Controlling for the level and mode of integration could reveal interesting insights also.

On a related note, for cross-border acquisitions, hostile acquisitions, acquisition experience, and integration mode, a dummy variable is used to capture whether the acquisition had a cross-border or hostile nature, whether the firms had acquisition experience, and whether the acquiring firm used physical or on distance integration. For knowledge codifiability, however, a single-item Likert-type scale was used which is an adapted version of Levin and Cross's (2004) tacit knowledge scale. Finally, also a single-item Likert-type scale was used for assessing the integration level.

Analyses

For testing our hypotheses, we used Ordinary Least Square (OLS) regression analysis. By mean-centering the non-categorical independent variables, we reduced concerns about multicollinearity caused by using interaction terms (Aiken, West, & Reno, 1991). Furthermore, to be cautious, we used two-tailed tests for all significant results. Finally, we used a Sobel test to examine the mediation in our research model (MacKinnon, Warsi, & Dwyer, 1995).

RESULTS

Table 1 provides the descriptive statistics including the mean, standard deviation, and correlations of the variables of our research model. As the table shows, the variables are not highly correlated, indicating that multicollinearity should not be a problem. We attempted to confirm this observation by calculating the VIF factors of the explanatory variables and comparing them to a threshold of 10 (Neter et al., 1996). Given that all the VIFs were below the threshold of 10, multicollinearity issues do not seem to present a serious concern.

Table 1. Descriptive statistics and correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
Acquisition performance	3.161	0.950												
Knowledge transfer	3.615	0.788	0.476*											
Routine sharing	2.078	1.487	-0.133	0.042										
Search activities	4.118	2.186	0.320*	0.354*	0.497*									
Institutionalized mechanisms	2.157	1.584	0.101	-0.073	0.407*	0.441*								
Common knowledge	2.833	1.358	-0.127	-0.101	-0.121	-0.077	-0.080							
Cross-border acquisitions	0.422	0.496	0.064	0.079	0.035	-0.046	0.016	0.002						
Hostile acquisitions	1.137	0.346	-0.339*	-0.245*	0.248*	0.005	0.033	0.049	0.121					
Acquisition experience	2.755	0.432	0.214*	-0.068	-0.078	0.136	0.288*	0.014	-0.067	0.029				
Codifiability of knowledge	9.725	24.374	0.077	-0.063	0.062	-0.021	-0.003	-0.281*	0.001	-0.120	0.068			
Integration level	3.216	1.157	0.378*	0.512*	0.278*	0.393*	0.068	-0.071	0.116	-0.149	-0.131	0.098		
Integration mode physical	0.137	0.346	0.073	0.078	0.152	0.096	0.177	0.134	-0.167	0.007	-0.104	0.116	0.272*	
Integration mode distance	0.304	0.462	-0.061	0.115	0.023	-0.016	-0.160	-0.281*	-0.003	-0.016	-0.020	-0.094	-0.179	-0.264*

* $P < .05$

Table 2 displays the tests of our hypotheses. Model 1 is a baseline specification including only the control variables. Models 2 through 4 include both controls and main effects, whereas models 5 and 6 also include the interaction effects. Model 2 tests hypothesis 1a and 2, that is, the direct effect of search activities and routine sharing on acquisition performance, respectively. Models 2 through 4 test for the mediating role of knowledge transfer concerning the effect of search activities on overall acquisition performance and, thus, hypothesis 1b. Models 5 and 6 test for hypotheses 3a, 3b, 4a, and 4b, that is, the moderating role of institutionalized mechanisms and common knowledge, respectively. Concerning the results, first, model 2 shows that search activities have a significant positive effect on overall acquisition performance ($b = .142$; $p < .01$). Therefore, there is support for hypothesis 1a, suggesting that the more the employees engage in ad hoc problem solving activities post-acquisition, the better it is for acquisition performance. Model 2 also illustrates that routine sharing has a significant effect ($p < .01$) on acquisition performance, but this effect is negative ($b = -.208$). Therefore, our findings do not support hypothesis 2, which is that routine sharing has a positive effect on the overall acquisition performance. On the contrary,

our findings reveal that routine sharing actually has a negative effect on the overall acquisition performance, suggesting that routines could be interpreted wrongly when transferred in an explicit form by means of routine sharing.

Table 2. OLS regression analyses

	Hypothesis	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Controls		Acq.Perf.	Acq.Perf.	K. Transfer	Acq.Perf.	K. Transfer	Acq.Perf.
Intercept		2.332	2.509	3.815	2.444	3.734	2.409
Cross-border acquisitions		0.176	0.220	0.156	0.169	0.192	0.225
Hostile acquisitions		-0.764**	-0.599**	-0.216	-0.530*	-0.214	-0.533*
Acquisition experience		0.584**	0.445†	-0.432	0.459*	-0.021	0.479*
Codifiability of knowledge		0.109	0.048	0.205	-0.017	0.169†	-0.021
Integration level		0.257**	0.223*	0.228**	0.149	0.245**	0.151
Integration mode physical		0.091	0.200	0.151	0.151	0.108	0.180
Integration mode distance		0.002	-0.041	0.257*	-0.124	0.318*	-0.104
Hypothesized Variables							
Search activities	1a & 1b		0.142**	0.099**	0.110*	0.103**	0.117*
Knowledge transfer	1b				0.323*		0.324*
Routine sharing	2		-0.208**	-0.060	-0.188*	-0.075	-0.204**
Institutionalized mechanisms			-0.005	-0.074	0.019	-0.060	0.040
Common knowledge			-0.092	-0.030	-0.082	-0.006	-0.087
Search activities * Institutionalized mechanisms	3a						-0.022
Routine sharing * Institutionalized mechanisms	3b						-0.005
Routine sharing * Common knowledge	4a						0.043
Search activities * Common knowledge	4b					0.043†	
N		102	102	102	102	102	102
Model F-test		12.56**	10.56**	11.15**	12.41**	10.77**	13.26**
R-squared		0.314	0.413	0.462	0.452	0.483	0.464
Adjusted R-squared		0.263	0.342	0.396	0.378	0.413	0.371

† $P < .10$

* $P < .05$

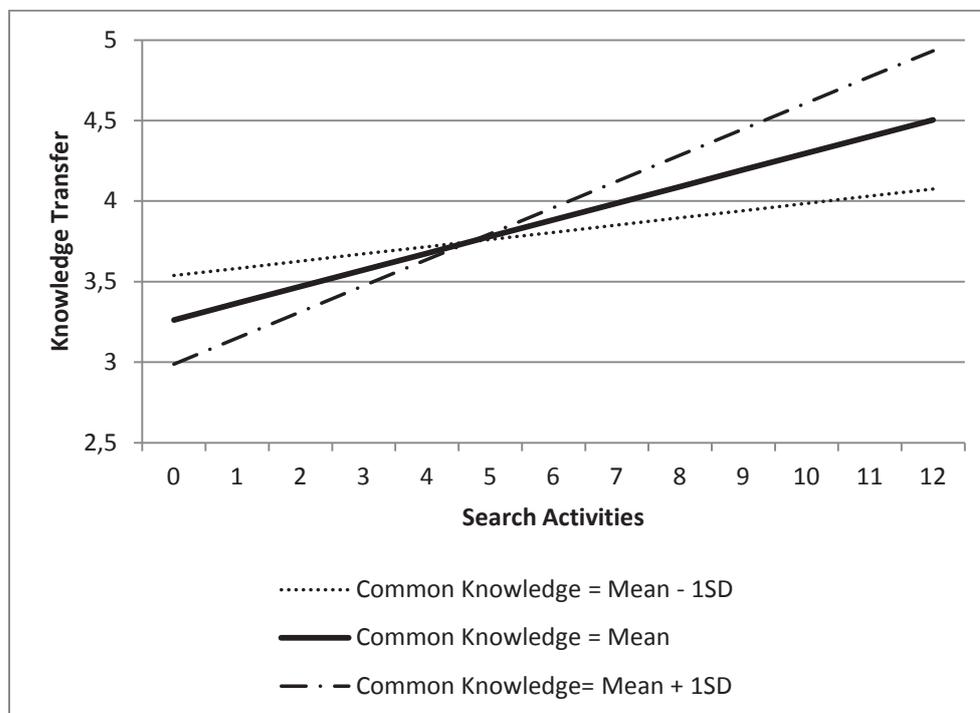
** $P < .01$

As mentioned earlier, model 2 demonstrates that search activities are positively related to acquisition performance. However, models 3 and 4 reveal that knowledge transfer partially mediates this effect. First, this is because search activities are positively related to knowledge transfer, as model 3 shows ($b = .099$; $p < .01$). In addition, model 4 shows that search activities remain having a significant effect on acquisition performance ($b = .110$; $p < .05$), but knowledge transfer has a significant effect too, when included in the model ($b = .323$; $p < .05$). Furthermore, the explanatory power of model 4 is quite a bit higher than that of model 2 (Baron & Kenny, 1986). Finally, a Sobel test for mediation confirmed this observation.

Therefore, we find support for hypothesis 1b, indicating that the effect of search activities on acquisition performance is partially mediated by knowledge transfer.

Models 5 and 6 test the moderating effects of common knowledge and institutionalized mechanisms, respectively. Model 5 shows a weak but positive and significant effect ($b = .043$; $p < .10$) regarding the interaction between common knowledge and search activities. Thus, the existence of common knowledge moderates the relationship between search activities and knowledge transfer, suggesting that the more common knowledge, the stronger the effect search activities will have on knowledge transfer. Therefore, our findings support hypothesis 4b. To gain deeper insights into the moderating effect of common knowledge on search activities, Figure 2 provides an additional plot.

Figure 2. Moderating effect of common knowledge on search activities



Furthermore, model 6, which is the most complete model with acquisition performance as a dependent variable, demonstrates that the interaction effect of institutionalized mechanisms and search activities is not significant. The same holds for the interaction effect of institutionalized mechanisms and routine sharing. Thus, institutionalized mechanisms do not moderate the relationship between search activities and acquisition performance and between routine sharing and acquisition performance. Therefore, we do not find support for hypothesis 3a and 3b, suggesting that institutionalized mechanisms such as an M&A department do not

seem to affect the impact of search activities and routine sharing post-acquisition. Model 6 also illustrates that common knowledge does not moderate the relationship between routine sharing and acquisition performance. Therefore, there is no support for hypothesis 4a, indicating that the knowledge that is meant to be transferred by means of such acquisitions is probably of such a highly tacit nature that even having common knowledge does not enable firms to transfer it by means of routine sharing.

Furthermore, concerning the control variables, most results are in line with previous research. However, we believe the findings regarding the mode of integration are noteworthy. Specifically, model 5 shows that on distance integration mode, in which employees are not co-located but operational activities are virtually integrated, also has a positive effect ($b = .318$; $p < .05$) on knowledge transfer. This result could indicate that creating interdependency between the firms by virtually integrating their operational activities could also lead to a certain degree of interaction, which is beneficial for knowledge transfer.

Supplementary Analyses

To check the robustness of our findings, we conducted a few additional tests. As mentioned in the literature section, prior research has highlighted the importance of size for acquisition performance. However, because the sample is relatively small, we did not add size as a control variable in the models to avoid overfitting them. Nonetheless, as part of the robustness check, we reran the models while adding size as a control variable. The results of this analysis showed that size is not significant. The inclusion of size in the models also did not lead to any major changes of the earlier results and, thus, the results were qualitatively identical. This result confirms once again the validity of our findings. In addition, we also reran the models while excluding all control variables to directly address potential concerns about overfitting, which can occur when estimated models include too many variables relative to the number of observations on which they are based. The results of this additional analysis did not reveal any major changes in our findings either. Therefore, this analysis further confirms the robustness of our findings.

DISCUSSION

This study has built on existing literatures on learning, provided by strategy and organization theory scholars, to understand how firms can enhance organizational learning through grafting and how they can build a grafting capability. Based on existing literature, we conceptualized grafting capability as being constituted by institutionalized mechanisms which are meant to deliberately enhance learning (Barkema & Schijven, 2008a; Zollo & Singh, 2004; Zollo & Winter, 2002). We did, however, probe a few questions, that is, whether such institutionalized mechanisms have a positive effect on the post-acquisition process and, if so, what should such mechanisms advice and contain to enhance learning. Based on our fieldwork and an in-depth survey, our findings reveal that institutionalized mechanisms do not have a positive effect on the post-acquisition process. Therefore, the questions that remain are how firms, then, should enhance learning when involved in grafting and what the microfoundations of a grafting capability should be.

Our findings demonstrate that the most important aspects that enhance grafting are the existence of common knowledge and the use of search activities. On the one hand, knowing that the existence of common knowledge enhances capability transfer enables firms to identify which targets to acquire and, thus, to focus on ones with which they have some overlap in knowledge, increasing the odds of success (e.g., Ahuja & Katila, 2001; Allatta & Singh, 2011; Argote & Greve, 2007; Hitt et al., 2009; Puranam et al., 2009). On the other hand, knowing only which targets to acquire is not enough because firms still need to be able to adequately transfer targets' capabilities after the acquisition and, thus, build a grafting capability. In doing this, our findings show that search activities are vital (Bresman et al., 2010; Ranft, 1997, 2006; Ranft & Lord, 2002). In other words, the most important microfoundations of a grafting capability seem to be search activities.

Given the highly tacit nature of the capabilities firms wish to transfer by means of capability-based acquisitions, having search activities that enhance collaboration among employees while searching together for solutions is key for transferring capabilities post-acquisition. This is because such capabilities are often in the heads of employees and embedded in their routines and social relationships and, thus, embedded in practice (Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Ranft & Lord, 2002; Schweizer, 2005). Search activities, by enhancing collaboration and interaction, while being focused on the actual practices of the employees in question, enable employees to start solving problems together on an ad hoc basis, based on the situation at hand and the changes in the

environment (e.g., Winter, 2003). By doing this, employees start learning from each other about the complexity of the desired capability and the way the other firm carries out specific activities. In other words, it is learning-by-doing in the actual practice that enables these employees to learn from each other, leading to the transfer of the desired capability (Cohen, 2007; Cook & Brown, 1999; Gherardi, 2000; Orlikowski, 2002; Tsoukas, 1996).

In addition, this learning-by-doing by means of search activities takes place when employees start building relationships and trusting each other, which is necessary for collaboration. Search activities, by involving face-to-face interaction, enhance the development of social relationships among employees and, thus, social integration. Creating the necessary social relationships for collaboration is what leads to the development of a new joint social community post-acquisition that stimulates capability transfer. The development of such new joint social community is mentioned to be vital for value creation post-acquisition—when involved in capability-based acquisitions (e.g., Birkinshaw et al., 2000; Bresman et al., 1999, 2010; Puranam et al., 2006; Verbeke, 2010).

Finally, our findings show that even when acquiring firms choose not to physically integrate the acquired firm and give it the needed autonomy, virtually integrating the acquired firm's operational activities over distance enhances acquisition performance too. In other words, it appears that solely virtual integration, as long as the interdependencies among the firms and interactions among employees increase, is beneficial for acquisition performance. Therefore, it could be that virtual integration also enhances social integration to a certain degree and, therefore, also capability transfer.

Theoretical Contributions

By synthesizing two streams of research on post-acquisition integration—that is, grafting through acquisitions and acquisition capability development—we conceptualized a distinct type of acquisition capability for capability-based acquisitions, namely a grafting capability, in an attempt to understand how firms can enhance learning through grafting and, thus, what the microfoundations of a grafting capability are. By doing this, our research, we believe, offers a number of theoretical contributions.

First, this study addresses recent calls for more research on the microfoundations of capabilities in general (Felin, Foss, Heimeriks, & Madsen, 2012) and knowledge sharing processes in particular (Foss et al., 2010). More specifically, our research addresses recent calls for empirically testing the effect of deliberate learning mechanisms, such as an M&A

department, on post-acquisition performance (Amiryany et al., 2012; Barkema & Schijven, 2008a; Helfat et al., 2007), to find out whether such institutionalized mechanisms could function as the microfoundations of a grafting capability. In an attempt to contribute to existing research, we have tested the effect of such institutionalized mechanisms. This study so far, has shown that the existence of institutionalized mechanisms does not affect post-acquisition performance. Therefore, in line with recent research, our findings reveal that routinization on a corporate level is probably not the solution for developing a grafting capability (e.g., Barkema & Schijven, 2008a; Schijven & Martin, forthcoming). In other words, it could be that firms' learning regarding acquisition integration is not captured at the corporate level. Second, our research reveals that deliberate forms of organizational learning by means of routine sharing also do not enhance learning through grafting; on the contrary, they even harm performance (e.g., Enberg et al., 2006; Haas & Hansen, 2007; Zollo & Winter, 2002), suggesting that a centralized approach to using routines for enhancing learning through grafting does not work either. Third, the findings of this study suggest that the microfoundations of a grafting capability are search activities (Bresman et al., 2010; Ranft & Lord, 2002), which are more effective when firms involved have some degree of common knowledge (Ahuja & Katila, 2001; Allatta & Singh, 2011; Puranam et al., 2009). Search activities stimulate interaction among employees in their actual practice while enabling them to conduct problem-solving activities on an ad hoc basis, based on the situation at hand. By means of such interactions, search activities enhance the development of social relationships among employees and, thus, a new joint social community post-acquisition, which enables capability transfer (Birkinshaw et al., 2000; Bresman et al., 2010; Puranam et al., 2006; Verbeke, 2010). Building a new joint social community has been mentioned as being the single most important dimension of capability-based acquisitions' success (e.g., Birkinshaw et al., 2000; Bresman et al., 2010; Verbeke, 2010). Having such a new joint social community enables employees to have a mutual practice in which they all are involved, which is of utmost importance to understand how the target's capability functions and, thus, to be able to learn from one another (e.g., Levina & Vaast, 2005).

Indeed, our theory and results suggest that when learning through grafting, firms need to take into account the specific practices that have enabled the target to create its capability in the first place. This is because, firms involved in capability-based acquisitions want to know how the target carries out certain activities and why. They can accomplish this only by being involved in the actual practice and having face-to-face interaction. In other words, firms

involved in capability-based acquisitions are in search of the target firm's past learning and, thus, the trial-and-error process that it has navigated to build its capability. It is through practice—by means of search activities—that firms can do this (Cohen, 2007; Cook & Brown, 1999; Gherardi, 2000; Orlikowski, 2002; Tsoukas, 1996). Therefore, our findings demonstrate that strategy researchers should take into account the importance of actively training and being involved in practice to transfer highly tacit capabilities—as mentioned in the seminal work of Nelson and Winter (1982)—when they attempt to gain more understanding of the microfoundations of a grafting capability.

Finally, being involved in practice, while enhancing learning by using search activities, means that firms' knowledge related to acquisition integration is—for a great part—distributed within the firm among core knowledge-workers. This is because core knowledge-workers know how they can learn from each other optimally, given a certain situation, to transfer the capability in question. Therefore, this study partly reorients existing research on post-acquisition capability development by illustrating that the role of a firm's core knowledge-workers might extend far beyond that which was previously thought.

Managerial Implications

What do our findings mean for firms involved in capability-based acquisitions? What should managers responsible for such grafting events do to improve such an event's performance? Given that research on acquisitions has shown that acquiring a firm does not guarantee successful grafting (e.g., Bresman et al., 2010; Heimeriks et al., 2012; Ranft & Lord, 2002), knowing how to enhance grafting could help acquirers improve their odds of success. In line with this, first, we have shown in this study that to enhance grafting, firms should not rely on institutionalized mechanisms meant to deliberately enhance learning top-down. It seems that having, for example, an M&A department, does not mean that lessons learned from the past—at the corporate level—are applicable to current events, and having such a department does not increase the odds of success of future events. Therefore, post-acquisition integration managers should be aware that a firm's acquisition integration experience is, for a great part, captured elsewhere within the firm (e.g., Barkema & Schijven, 2008a; Schijven & Martin, forthcoming).

Second, routine sharing, which seems to be an efficient way of sharing existing knowledge, does not improve acquisition performance either. Therefore, managers involved in such acquisitions should be aware that there is more important knowledge than just that

which written tools capture (Cook & Brown, 1999; Haas & Hansen, 2007). More important, practitioners involved in such settings should be aware that routine sharing could even harm acquisition performance, because complex routines can be interpreted wrongly when transferred by means of documents, leading to harming performance instead of benefitting it.

More specifically, this study shows that to enhance grafting, firms need to invest in search activities such as project teams, job rotation, mentoring, briefing sessions, and interviewing experts. These search activities stimulate interaction among employees and enhance the development of social relationships and, thus, a new joint social community post-acquisition (Birkinshaw et al., 2000; Bresman et al., 2010; Ranft & Lord, 2002). For developing a new joint social community, involvement in the actual practice of experts seems to be vital (Levina & Vaast, 2005). Therefore, managers responsible for acquisition integration should not underestimate the effect of such search activities for developing a grafting capability. Search activities, on average, require more investment because they demand more effort and involvement from employees. However, such investments do not go unrewarded because they improve acquisition performance and, therefore, lead to higher returns.

Furthermore, managers involved in capability-based acquisitions should take into account the importance of having common knowledge when searching for new targets. Acquiring firms that have a common knowledge base can increase the beneficial effect of search activities and improve the resulting acquisition performance. Finally, this study has shown that virtual integration enhances knowledge transfer also. Given that acquirers should usually retain a target's autonomy, post-acquisition managers should consider at least virtually integrating the companies to stimulate capability transfer. Such virtual integration increases the interdependencies among the firms, leading to more interaction between the employees, and, therefore, enhances capability transfer.

Limitations and Suggestions for Future Research

Regardless of our efforts and careful considerations, this study has several limitations. First, our data consist of a small sample size. Despite extensive qualitative fieldwork that we have done in order to elaborate on the findings, it could be that a larger sample size reveals other findings. Therefore, a task for future research is to test these findings with a larger sample size to generalize the findings, perhaps even in a different context—for example, other types of acquisitions and other industries. Second, our data include single respondents in each firm and, therefore, also the possibility of common method bias, even though we have

tried to avoid this as much as possible. Further research, including multiple respondents per firm, could offer more robust evidence to these findings.

Furthermore, throughout this study we have argued for the importance of search activities and a decentralized approach toward acquisition integration and, thus, for developing a grafting capability. As mentioned earlier, the division of routines versus search activities for enhancing organizational learning has been shown to be evident from organizational learning's early inception—that is, the roots of organizational learning that go back to a behavioral theory of the firm and evolutionary economics theory. Our findings have shown that search activities, advocated by behavioral theory scholars, are more effective for enhancing learning when involved in grafting and, thus, for developing a grafting capability. The importance of such search activities for transferring highly tacit knowledge and skill, has been mentioned by the founders of evolutionary economics also (Nelson & Winter, 1982). Nevertheless, strategy scholars with a strong link to evolutionary economics theory have not paid much attention to the importance of such search activities and of being involved in practice for transferring highly tacit capabilities. However, focusing on search activities for developing capabilities such as grafting would be a good step forward. Strategy scholars could study this area further to enhance our understanding of organizational learning through capability-based acquisitions.

More specifically, when using search activities, employees are dealing with the content of the activity itself on an ad hoc basis and, thus, in a non-routinized way. Strategy scholars conducting future research could ask themselves how much nonroutinization is enough nonroutinization. Therefore, how flexible should such search activities be? Addressing these questions could reveal interesting insights. Furthermore, in general, revealing answers to these questions is fundamental because organizations, by definition, try to formalize and standardize and, thus, routinize their activities to control them and achieve greater efficiency. Future research on strategy and organization theory should reveal, given organizational goals, the best ways to develop a grafting capability to enhance learning through acquisitions and, thus, acquisition performance.

On a related note, it is surprising that institutionalized mechanisms do not affect acquisition performance. Throughout this study we have argued that a firm's acquisition experience is probably captured by the experts involved in practice and, thus, not by the corporate entity. This argument has implications for future research, because researchers should focus on a different level of analysis when trying to understand where firms' learning

through acquisitions takes place. Our findings demonstrate that this level of analysis is the practice of the actual employees who have created the target's capability in the first place (Cohen, 2007; Cook & Brown, 1999; Gherardi, 2000; Orlikowski, 2002; Tsoukas, 1996). Further research should reveal how capability development in practice takes place and, thus, what micro-level activities actually enable such experts to develop a grafting capability.

CONCLUSION

Regardless of the increasing number of capability-based acquisitions in high-velocity environments and the high failure rates of such acquisitions, we still do not know how to enhance the process of learning through grafting and, thus, how to improve these acquisitions' performance. One thing strategy scholars would agree on is the importance of having a grafting capability that ensures that the acquirer is able to carry out acquisitions successfully. However, what the microfoundations of such grafting capability should be has been unclear to date. In this study, our attempt has been to unravel the microfoundations of such a grafting capability. Surprisingly, in contrast with existing literature on capabilities that focuses more on deliberate learning mechanisms, our findings have shown that to enhance learning through grafting, firms should engage in search activities and, thus, ad hoc problem solving. In addition, to improve the odds of success, having firms involved in such capability-based acquisitions that have common knowledge could increase the effect of such search activities. By conducting this study, we hope to have contributed to the strategy field and, more specifically, to the organizational learning field, by revealing that learning highly tacit capabilities requires intensive collaboration and ad hoc problem solving—aspects that firms cannot address through routine sharing and institutionalized mechanisms only.

REFERENCES

- Ahuja, G., & Katila, R. 2001. Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal*, 22: 197–220.
- Aiken, L. S., West, S. G., & Reno, R. R. 1991. *Multiple regression: Testing and interpreting interactions*. London: Sage Publications.
- Allatta, J. T., & Singh, H. 2011. Evolving communication patterns in response to an acquisition event. *Strategic Management Journal*, 32(10): 1099–1118.
- Amiryany, N., Huysman, M., De Man, A. P., & Cloodt, M. 2012. Acquisition reconfiguration capability *European Journal of Innovation Management*, 15(2): 177–191.
- Argote, L., & Greve, H. R. 2007. A behavioral theory of the firm—40 years and counting: Introduction and impact. *Organization Science*, 18(3): 337–349.

- Argote, L., & Miron-Spektor, E. 2011. Organizational learning: From experience to knowledge. *Organization Science*, 22(5): 1123–1137.
- Armstrong, J. S., & Overton, T. S. 1977. Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14: 396–402.
- Barkema, H. G., & Schijven, M. 2008a. How do firms learn to make acquisitions? A review of past research and an agenda for the future. *Journal of Management*, 34(3): 594–634.
- Barkema, H. G., & Schijven, M. 2008b. Toward unlocking the full potential of acquisitions: The role of organizational restructuring. *The Academy of Management Journal*, 51(4): 696–722.
- Baron, R. M., & Kenny, D. A. 1986. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Becker, M. C. 2004. Organizational routines: A review of the literature. *Industrial and Corporate Change*, 13(4): 643–678.
- Birkinshaw, J., Bresman, H., & Håkanson, L. 2000. Managing The post-acquisition integration process: How the human integration and task integration processes interact to foster value creation. *Journal of Management Studies*, 37(3): 395–425.
- Bresman, H., Birkinshaw, J., & Nobel, R. 1999. Knowledge transfer in international acquisitions. *Journal of International Business Studies*, 30(3): 439–462.
- Bresman, H., Birkinshaw, J., & Nobel, R. 2010. Knowledge transfer in international acquisitions. *Journal of International Business Studies*, 41(1): 5–20.
- Capron, L., & Shen, J.-C. 2007. Acquisitions of private vs. public firms: Private information, target selection, and acquirer returns. *Strategic Management Journal*, 28(9): 891–911.
- Cloodt, M., Hagedoorn, J., & Van Kranenburg, H. 2006. Mergers and acquisitions: Their effect on the innovative performance of companies in high-tech industries. *Research Policy*, 35(5): 642–654.
- Cohen, M. D. 2007. Reading Dewey: Reflections on the study of routine. *Organization Studies*, 28: 773–786.
- Cook, S. D. N., & Brown, J. S. 1999. Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science*, 10(4): 381–400.
- Cummings, J. L., & Teng, B.-S. 2003. Transferring R&D knowledge: The key factors affecting knowledge transfer success. *Journal of Engineering and Technology Management*, 20(1–2): 39–68.
- Cyert, R. M., & March, J. G. 1963. *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice Hall.
- Desyllas, P., & Hughes, A. 2010. Do high technology acquirers become more innovative? *Research Policy*, 39(8): 1105–1121.
- Dosi, G., & Marengo, L. 2007. On the evolutionary and behavioral theories of organizations: A tentative roadmap. *Organization Science*, 18(3): 491–502.
- Enberg, C., Lindkvist, L., & Tell, F. 2006. Exploring the dynamics of knowledge integration. *Management Learning*, 37(2): 143–165.
- Ernst, H., & Vitt, J. 2002. The influence of corporate acquisitions on the behaviour of key inventors. *R&D Management*, 30(2): 105–120.
- Felin, T., & Foss, N. J. 2005. Strategic organization: A field in search of micro-foundations. *Strategic Organization*, 3(4): 441–455.

- Felin, T., & Foss, N. J. 2009. Organizational routines and capabilities: Historical drift and a course-correction toward microfoundations. *Scandinavian Journal of Management*, 25(2): 157–167.
- Felin, T., Foss, N. J., Heimeriks, K. H., & Madsen, T. L. 2012. Microfoundations of routines and capabilities: Individuals, processes, and structure. *Journal of Management Studies*, 49(8): 1351-1374.
- Finkelstein, S., & Cooper, C. L. 2010. *Advances in Mergers and Acquisitions*. Bingley, UK: Emerald.
- Foss, N. J. 2007. The emerging knowledge governance approach: Challenges and characteristics. *Organization*, 14(1): 29–52.
- Foss, N. J., Husted, K., & Michailova, S. 2010. Governing knowledge sharing in organizations: Levels of analysis, governance mechanisms, and research directions. *Journal of Management Studies*, 47(3): 455–482.
- Gavetti, G., Levinthal, D., & Ocasio, W. 2007. Neo-Carnegie: The Carnegie School's past, present, and reconstructing for the future. *Organization Science*, 18(3): 523–536.
- Gherardi, S. 2000. Practice-based theorizing on learning and knowing in organizations. *Organization*, 7(2): 211–223.
- Graebner, M. E. 2004. Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strategic Management Journal*, 25(8–9): 751–777.
- Graebner, M. E., Eisenhardt, K. M., & Roundy, P. T. 2010. Success and failure in technology acquisitions: Lessons for buyers and sellers. *Academy of Management Perspectives*, 24(3): 73–92.
- Grant, R. M. 1996. Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science*, 7(4): 375–387.
- Haas, M. R., & Hansen, M. T. 2005. When using knowledge can hurt performance: The value of organizational capabilities in a management consulting company. *Strategic Management Journal*, 26(1): 1–24.
- Haas, M. R., & Hansen, M. T. 2007. Different knowledge, different benefits: Toward a productivity perspective on knowledge sharing in organizations. *Strategic Management Journal*, 28(11): 1133–1153.
- Haleblian, J., Devers, C. E., McNamara, G., Carpenter, M. A., & Davison, R. B. 2009. Taking stock of what we know about mergers and acquisitions: A review and research agenda. *Journal of Management*, 35(3): 469–502.
- Hatzichronoglou, T. 1997. Revision of high-technology sector and product classification. *OECD Science, Technology and Industry Working Papers*.
- Hayward, M. L. A. 2002. When do firms learn from their acquisition experience? Evidence from 1990–1995. *Strategic Management Journal*, 23(1): 21–39.
- Heimeriks, K. H., Schijven, M., & Gates, S. 2012. Manifestations of higher-order routines: The underlying mechanisms of deliberate learning in the context of postacquisition integration. *Academy of Management Journal*, 55(3): 703–726.
- Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M. A., Singh, H., Teece, D. J., & Winter S. (Eds.). 2007. *Dynamic capabilities: Understanding strategic change in organizations*. Malden, MA: Blackwell Publishing.
- Hislop, D. 2009. *Knowledge management in organizations: A critical introduction*. New York: Oxford University Press.
- Hitt, M. A., King, D. R., Krishnan, H., Makri, M., Schijven, M., Shimizu, K., & Zhu, H. 2009. Mergers and acquisitions: Overcoming pitfalls, building synergy, and creating value. *Business Horizons*, 52(6): 523–529.
- Huber, G. 1991. Organizational learning: the contributing processes and literatures. *Organization Science*, 2(1): 88–115.

- Jarvis, C. B., Mackenzie, S. B., & Podsakoff, P. M. 2003. A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30: 199–218.
- Kale, P., & Singh, H. 2007. Building firm capabilities through learning: The role of the alliance learning process in alliance capability and firm-level alliance success. *Strategic Management Journal*, 28(10): 981–1000.
- Kapoor, R., & Lim, K. 2007. The impact of acquisitions on the productivity of inventors at semiconductor firms: A synthesis of knowledge-based and incentive-based perspectives. *Academy of Management Journal*, 50(5): 1133–1155.
- King, D. R., Dalton, D. R., Daily, C. M., & Covin, J. G. 2004. Meta-analyses of post-acquisition performance: Indications of unidentified moderators. *Strategic Management Journal*, 25(2): 187–200.
- Laamanen, T., & Keil, T. 2008. Performance of serial acquirers: Toward an acquisition program perspective. *Strategic Management Journal*, 29(6): 663–672.
- Levin, D. Z., & Cross, R. 2004. The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science*, 50: 1477–1490.
- Levina, N. & Vaast, E. 2005. The emergence of boundary spanning competence in practice: Implications for implementation and use of information systems. *MIS Quarterly*, 29(2): 335–363.
- Levitt, B., & March, J. G. 1988. Organizational learning. *Annual Review of Sociology*, 14: 319–340.
- Lewin, A. Y., Massini, S., & Peeters, C. 2011. Microfoundations of internal and external absorptive capacity routines. *Organization Science*, 22(1): 81–98.
- Little, R. J. A., & Rubin, D. B. 2002. *Statistical analysis with missing data*. Hoboken, NJ: Wiley.
- MacKinnon, D. P., Warsi, G., & Dwyer, J. H. 1995. A simulation study of mediated effect measures. *Multivariate Behavioral Research*, 30: 41–62.
- Madhok, A. 1997. Cost, value and foreign market entry mode: The transaction and the firm. *Strategic Management Journal*, 18: 39–61.
- Makri, M., Hitt, M. A., & Lane, P. J. 2010. Complementary technologies, knowledge relatedness, and invention outcomes in high technology mergers and acquisitions. *Strategic Management Journal*, 31(6): 602–628.
- Nelson, R. R., & Winter, S. G. 1982. *An evolutionary theory of economic change*. Cambridge, MA: Harvard University Press.
- Nelson, R. R., & Winter, S. G. 2002. Evolutionary theorizing in economics. *The Journal of Economic Perspectives*, 16(2): 23–46.
- Neter, J., Kutner, M. H., Nachtsheim, C. J., & Wasserman, W. 1996. *Applied linear statistical models*. New York: McGraw-Hill.
- Orlikowski, W. J. 2002. Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science*, 13(3): 249–273.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5): 879–879–903.
- Podsakoff, P. M., & Organ, D. W. 1986. Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4): 531.
- Puranam, P., Singh, H., & Chaudhuri, S. 2009. Integrating acquired capabilities: When structural integration is (un)necessary. *Organization Science*, 20(2): 313–328.
- Puranam, P., Singh, H., & Zollo, M. 2003. A Bird in the hand or two in the bush? Integration trade-offs in technology-grafting acquisitions. *European Management Journal*, 21(2): 179–184.

- Puranam, P., Singh, H., & Zollo, M. 2006. Organizing for innovation: Managing the Coordination-autonomy dilemma in technology acquisitions. *Academy of Management Journal*, 49(2): 263–280.
- Puranam, P., & Srikanth, K. 2007. What they know vs. what they do: How acquirers leverage technology acquisitions. *Strategic Management Journal*, 28(8): 805–825.
- Ranft, A. 1997. Preserving and transferring knowledge-based resources during post-acquisition implementation.
- Ranft, A. 2006. Knowledge preservation and transfer during post-acquisition integration. *Advances in Mergers and Acquisitions*, 5: 51–67.
- Ranft, A., & Lord, M. D. 2002. Acquiring new technologies and capabilities: A grounded model of acquisition implementation. *Organization Science*, 13(4): 420–441.
- Ray, G., Barney, J. B., & Muhanna, W. A. 2004. Capabilities, business processes, and competitive advantage: Choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal*, 25(1): 23–23.
- Schijven, M., & Martin, X. 2010. *Sources of acquisition capabilities and performance*. Working paper, Mays Business School, Texas A&M University.
- Schweizer, L. 2005. Organizational integration of acquired biotechnology companies into pharmaceutical companies: The need for a hybrid approach. *The Academy of Management Journal*, 48(6): 1051–1074.
- Simonin, B., L. 1999. Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20(7): 595–623.
- Sirmon, D. G., Hitt, M. A., & Ireland, R. D. 2007. Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Journal*, 32(1): 273–292.
- Szulanski, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17: 27–43.
- Szulanski, G., & Jensen, R. J. 2006. Presumptive adaptation and the effectiveness of knowledge transfer. *Strategic Management Journal*, 27(10): 937–957.
- Szulanski, G., & Winter, S. G. 2002. Getting it right the second time. *Harvard Business Review*, 80(1): 62–69.
- Teece, D. J. 2007. Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13): 1319–1350.
- Tsoukas, H. 1996. The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal*, 17: 11–25.
- Verbeke, A. 2010. International acquisition success: Social community and dominant logic dimensions. *Journal of International Business Studies*, 41(1): 38–46.
- Vermeulen, F., & Barkema, H. 2001. Learning through acquisitions. *The Academy of Management Journal*, 44(3): 457–476.
- Williams, L. J., Hartman, N., & Cavazotte, F. 2010. Method variance and marker variables: A review and comprehensive CFA marker technique. *Organizational Research Methods*, 13(3): 477–514.
- Winter, S. G. 2003. Understanding dynamic capabilities. *Strategic Management Journal*, 24(10): 991–995.
- Winter, S. G., & Szulanski, G. 2001. Replication as strategy. *Organization Science*, 12(6): 730–743.
- Zack, M. H. 1999. Managing codified knowledge. *Sloan Management Review*, 40(4): 45–58.
- Zahra, S. A., & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2): 185–203.

- Zollo, M. 2009. Superstitious learning with rare strategic decisions: Theory and evidence from corporate acquisitions. *Organization Science*, 20(5): 894–908.
- Zollo, M., Reuer, J. J., & Singh, H. 2002. Interorganizational routines and performance in strategic alliances. *Organization Science*, 13(6): 701–713.
- Zollo, M., & Singh, H. 2004. Deliberate learning in corporate acquisitions: Post-acquisition strategies and integration capability in U.S. bank mergers. *Strategic Management Journal*, 25: 1233–1256.
- Zollo, M., & Winter, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3): 339–351.

APPENDIX

Table A1. Measurement of the variables†

Construct	Measurement
Acquisition performance	“(1) To what extent was (is) your company satisfied with the overall performance of this acquisition (so far), (2) to what extent did this acquisition have a positive effect on the overall innovation performance of the combined entity (so far), (3) to what extent could this acquisition be seen as a success from a financial point of view (so far)?” The variables are measured on a five-point scale: (1) not at all, (2) a little, (3) somewhat, (4) to a great extent, and (5) to a very great extent.
Search activities	“Please indicate if any of the following were used to enhance sharing of knowledge among the employees of the acquiring/acquired company and your company? (Please note: it is possible to give more than one answer): (1) site visits or tours of the partner company, (2) interviews with experts of the partner company, (3) job rotation (employees get a position in the partner company), (4) mentoring, (5) brainstorming sessions, (6) team-based work design (project teams), (7) briefing sessions, (8) workshops and seminars, (9) training courses or skill development practices, (10) best practice exchange (companies exchange the best processes they have)?” The variables are measured as a sum ranging from 0 = none of the items to 10 = all items in place (e.g., Zollo & Singh, 2004).
Routine sharing	“Please indicate if any of the following were used to enhance sharing of knowledge among the employees of the acquiring/acquired company and your company? (Please note: it is possible to give more than one answer): (1) electronic forums, (2) exchange of documents, (3) repository and retrieval systems containing information regarding partner company’s knowledge, (4) intranet, (5) groupware technology (e.g., Lotus Notes), (6) blogs, (7) Web 2.0 (e.g., wiki)?” The variables are measured as a sum ranging from 0 = none of the items to 7 = all items in place (e.g., Zollo & Singh, 2004).
Knowledge transfer	“To what extent are the following statements correct: (1) your company has learned a great deal about the knowledge held by the acquiring/acquired company, (2) the acquiring/acquired company has learned a great deal about the knowledge held by your company, (3) the knowledge held by your company has been assimilated by the acquiring/acquired company, (4) the knowledge held by the acquiring/acquired company has been assimilated by your company.” The variables are measured on a five-point scale: (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, (5) strongly agree (adapted from Simonin, 1999).
Institutionalized mechanisms	“Please indicate if any of the following were used for this acquisition (Please note: it is possible to give more than one answer): (1) acquisition (M&A) department, (2) acquisition (M&A) team, (3) acquisition (M&A) manager (a person responsible for the specific acquisition who watches over the whole process), (4) knowledge integration manager (a person responsible for enhancing the sharing of knowledge among the employees of companies involved), (5) M&A collaboration site (a website accessible for managers from relevant business functions in order to enhance collaboration and guide the acquisition process), (6) acquisition repositories (a database storing knowledge, tools, and processes about acquisitions, which can be used for each new acquisition), (7) post-acquisition assessment (to discuss the lessons learned from this acquisition)?” The variable is measured as a sum ranging from 0 = none of the items to 7 = all items in place (e.g., Zollo & Singh, 2004).
Common knowledge	“Given the overlap of the knowledge of the two companies, the acquiring/acquired company could independently develop the same outputs as your company.” The variables are measured on a five-point scale: (1) strongly disagree, (2) disagree, (3) neither agree nor disagree, (4) agree, (5) strongly agree (adapted from Cummings and Teng, 2003).

†A complete overview of the survey is available from the author.