

## MANAGING POTENTIAL AND REALIZED ABSORPTIVE CAPACITY: HOW DO ORGANIZATIONAL ANTECEDENTS MATTER?

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**Exploring how organizational antecedents affect potential and realized absorptive capacity, this study identifies differing effects for both components of absorptive capacity. Results indicate that organizational mechanisms associated with coordination capabilities (cross-functional interfaces, participation in decision making, and job rotation) primarily enhance a unit's potential absorptive capacity. Organizational mechanisms associated with socialization capabilities (connectedness and socialization tactics) primarily increase a unit's realized absorptive capacity. Our findings reveal why units may have difficulty managing levels of potential and realized absorptive capacity and vary in their ability to create value from their absorptive capacity.**

The turbulence of the business environment has ensured focused attention on knowledge as a dominant source of competitive advantage. To survive selection pressures, firms need to recognize new external knowledge, assimilate it, and apply it to commercial ends. This ability, referred to as absorptive capacity (Cohen & Levinthal, 1990), has emerged as an underlying theme in strategy and organization research. Recent research has focused on the role of absorptive capacity in innovation (Tsai, 2001), business performance (Lane, Salk, & Lyles, 2001; Tsai, 2001), intraorganizational transfer of knowledge (Gupta & Govindarajan, 2000; Szulanski, 1996), and interorganizational learning (Lane & Lubatkin, 1998; Lane et al., 2001; Lyles & Salk, 1996).

Despite the growing interest in absorptive capacity, few have captured the richness and multidimensionality of the concept. Moreover, while most studies have focused on the competitive benefits of absorptive capacity, organizational antecedents have been largely ignored (Lane, Koka, & Pathak,

2002). The lack of research regarding this link is surprising, especially since Cohen and Levinthal (1990) emphasized the importance of organizational mechanisms and suggested considering what aspects of absorptive capacity are distinctly organizational. Even when organizational antecedents have been considered (e.g., Lane et al., 2001; Van Den Bosch, Volberda, & De Boer, 1999), their relationships with different dimensions of absorptive capacity have not been tested empirically. Although the ability to absorb new external knowledge can generate significant benefits (Cockburn, Henderson, & Stern, 2000; Zollo & Winter, 2002), organizational antecedents may have differing effects on dimensions of absorptive capacity and subsequently lead to different performance outcomes. Zahra and George (2002), for instance, distinguished among four dimensions of absorptive capacity that constitute potential and realized absorptive capacity. They argued that firms need to manage these dimensions of absorptive capacity successfully to obtain superior performance. Firms focusing on acquisition and assimilation of new external knowledge (i.e., potential absorptive capacity) are able to continually renew their knowledge stock, but they may suffer from the costs of acquisition without gaining benefits from exploitation. Conversely, firms focusing on transformation and exploitation (realized absorptive capacity) may achieve short-term profits through exploitation but fall into a competence trap (Ahuja & Lampert, 2001) and may not be able to respond to environmental changes. Examining differing effects of organiza-

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The authors thank Marshall Schminke and the three reviewers of *AMJ* for their constructive reviews. Comments from Alberto Aragón-Correa, Dania Dialdin, Gerry George, Arie Lewin, Marjorie Lyles, KC O'Shaughnessy, and Raymond van Wijk were very helpful for improving the overall quality of our manuscript. We thank Ad Drujts for enabling data collection at the financial services firm as well as Eric Tas and Susan de Grijp for research assistance. The Erasmus Research Institute of Management (ERIM) has supported this research.

tional antecedents on potential and realized absorptive capacity would not only clarify how absorptive capacity can be developed, but also reveal why firms have difficulties in managing dimensions of absorptive capacity successfully.

The objective of this study is to address this issue and to contribute to existing literatures in two ways. First, we advance research on absorptive capacity by extending and empirically validating the conceptual distinction between potential and realized absorptive capacity (Zahra & George, 2002). *Potential absorptive capacity*, which includes knowledge acquisition and assimilation, captures efforts expended in identifying and acquiring new external knowledge and in assimilating knowledge obtained from external sources (Zahra & George, 2002: 189). *Realized absorptive capacity*, which includes knowledge transformation and exploitation, encompasses deriving new insights and consequences from the combination of existing and newly acquired knowledge, and incorporating transformed knowledge into operations (Zahra & George, 2002: 190). To date, corresponding measures for dimensions that form potential and realized absorptive capacity are still lacking. This study differentiates among these dimensions and further clarifies the distinctness of potential and realized absorptive capacity.

Second, we contribute to research regarding the link between combinative capabilities and absorptive capacity (Kogut & Zander, 1992; Teece, Pisano, & Shuen, 1997; Van Den Bosch et al., 1999). We conceptually identify and empirically examine how common features of combinative capabilities affect dimensions of absorptive capacity. Previous research states that common features of combinative capabilities involve organizational mechanisms that each influence absorptive capacity in specific ways (e.g., Eisenhardt & Martin, 2000; Henderson & Cockburn, 1994; Van Den Bosch et al., 1999). No insights, however, have been gained into how organizational mechanisms differently affect the acquisition and assimilation (i.e., potential absorptive capacity), and the transformation and exploitation (i.e., realized absorptive capacity) of new external knowledge. Hence, this study reveals how organizational antecedents matter and examines links between specific organizational mechanisms as common features of combinative capabilities and dimensions of absorptive capacity.

## THEORETICAL OVERVIEW AND HYPOTHESES

As Cohen and Levinthal (1990: 131–132) argued, absorptive capacity not only resides in firms, but also in organizational units. In this article, we focus

on the unit level. The ability of units to absorb new external knowledge depends on their levels of prior related knowledge (Cohen & Levinthal, 1990). However, mere exposure to related external knowledge is not sufficient to ensure that a unit will internalize it successfully (Pennings & Harianto, 1992). In addition to prior knowledge resources (e.g., Verona, 1999), units need to develop organizational capabilities, defined as combinative capabilities (Kogut & Zander, 1992), that enable them to synthesize and apply current and newly acquired external knowledge (Eisenhardt & Martin, 2000; Kogut & Zander, 1992). Combinative capabilities are path-dependent in their emergence and idiosyncratic in detail; however they exhibit common features (Eisenhardt & Martin, 2000: 1116). These commonalities involve organizational mechanisms, such as cross-functional teams and participation in decision making, which each provide specific ways of dealing with dimensions of absorptive capacity. Matusik (2002: 458), for instance, related formal and informal structures to firm capabilities and specifically highlighted the importance of cross-functional coordination mechanisms in creating a conducive knowledge context. Henderson and Cockburn (1994: 66–67) argued that in addition to cross-functional boundary-spanning mechanisms, architectural or combinative capabilities include control systems and dominant values that influence the ability to access new external knowledge and to integrate knowledge flexibly. Similarly, Verona (1999) suggested that capabilities aimed at absorbing external knowledge are strictly linked to managerial structures, systems, and social relations. However, the relationships among these organizational mechanisms associated with combinative capabilities and dimensions of absorptive capacity are still unclear. We suggest specific organizational mechanisms as common features of combinative capabilities and examine how they influence potential and realized absorptive capacity. To structure our analysis, we discuss three types of combinative capabilities: (1) coordination capabilities, (2) systems capabilities, and (3) socialization capabilities (cf. Van Den Bosch et al., 1999: 556).

### Organizational Mechanisms Associated with Coordination Capabilities

Coordination capabilities enhance knowledge exchange across disciplinary and hierarchical boundaries (Henderson & Cockburn, 1994; Matusik, 2002; Teece et al., 1997). Common features of coordination capabilities are cross-functional interfaces, participation in decision making, and job rotation (Galbraith, 1973; Henderson & Cockburn,

1994; Van Den Bosch et al., 1999). These organizational mechanisms bring together different sources of expertise and increase lateral interaction between areas of functional, or component, knowledge. Units use *cross-functional interfaces* such as liaison personnel, task forces, and teams to enable knowledge exchange (Gupta & Govindarajan, 2000). Cross-functional interfaces result in lateral forms of communication that deepen knowledge flows across functional boundaries and lines of authority. They promote nonroutine and reciprocal information processing (Egelhoff, 1991) and contribute to a unit's ability to overcome differences, interpret issues, and build understanding about new external knowledge (Daft & Lengel, 1986). Thus, cross-functional interfaces enhance the knowledge acquisition and assimilation underlying a unit's potential absorptive capacity.

*Hypothesis 1a. Cross-functional interfaces will be positively related to acquisition and assimilation of new external knowledge (that is, to potential absorptive capacity).*

In addition, cross-functional interfaces are beneficial to integrating diverse knowledge components and to creating a desirable amount of redundancy within units (Cohen & Levinthal, 1990: 134; Daft & Lengel, 1986). They support unit members in rethinking the systematic nature of existing products and services and revisit the ways in which components are integrated (Henderson & Cockburn, 1994). Accordingly, cross-functional interfaces enable employees to combine sets of existing and newly acquired knowledge. Moreover, cross-functional interfaces provide an effective way of generating commitment and facilitating the implementation of decisions (Bahrami & Evans, 1987). Thus, cross-functional interfaces increase transformation and exploitation, which underlie a unit's realized absorptive capacity.

*Hypothesis 1b. Cross-functional interfaces will be positively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

Participation in decision making indicates the extent to which subordinates take part in higher-level decision-making processes (Hage & Aiken, 1967). Participation increases the range of prospective "receptors" to the environment (Cohen & Levinthal, 1990). These receptors selectively act on new external knowledge and both filter and facilitate new external knowledge acquisition (Aldrich & Herker, 1977). In addition, participation allows for interplay among a variety of perspectives and leads to a rich internal network of diverse knowledge

(Hage & Aiken, 1967: 510) that supports assimilation of new external knowledge. Thus, exposure to external knowledge sources through receptors and the interplay between diverse knowledge structures enable knowledge acquisition and assimilation and increase a unit's potential absorptive capacity.

*Hypothesis 2a. Participation in decision making will be positively related to acquisition and assimilation of new external knowledge (that is, to potential absorptive capacity).*

Although conceptual research has suggested that participation in decision making increases the quantity and quality of ideas or proposals (e.g. Pierce & Delbecq, 1977; Sheremata, 2000), it may slow down transformation and exploitation of new external knowledge considerably. Zaltman, Duncan, and Holbek (1973), for instance, argued that participation facilitates the initiation of innovative behavior, but hinders its implementation. Research has indeed shown a negative effect of participation on new-product development speed that stems from the difficulty of gaining consensus (Atuahene-Gima, 2003). Moreover, Lin and Germain (2003) revealed that decentralization was inversely related to customer product knowledge utilization. These empirical results suggest that participation in decision making hampers information-processing efficiency (Cardinal, 2001) and may decrease a unit's realized absorptive capacity.

*Hypothesis 2b. Participation in decision making will be negatively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

*Job rotation* is the lateral transfer of employees between jobs (Campion, Cheraskin, & Stevens, 1994). Job rotation has been assumed to enhance redundancy as well as diversity of backgrounds, to increase problem-solving skills, and to develop organizational contacts (Cohen & Levinthal, 1990; Noe & Ford, 1992). Diverse knowledge structures support explorative learning (McGrath, 2001) and increase the prospect that new external knowledge is related to existing knowledge. Rotation of employees who each possess diverse and varied knowledge also augments a unit's capacity for making novel linkages and associations (Cohen & Levinthal, 1990). Job rotation therefore enables the acquisition and assimilation of new external knowledge that constitute potential absorptive capacity.

*Hypothesis 3a. Job rotation will be positively related to acquisition and assimilation of new*

*external knowledge (that is, to potential absorptive capacity).*

In addition, job rotation enhances the awareness of employees' knowledge and skills in other functional areas within a unit (Campion et al., 1994). Such awareness about where complementary expertise may reside increases employees' ability to identify opportunities for transformation and exploitation of new external knowledge (Cohen & Levinthal, 1990: 133; Matusik & Hill, 1998). Moreover, job rotation develops organizational contacts that promote the coalitions needed for successful exploitation of new external knowledge (Mumford, 2000). Job rotation thus also increases transformation and exploitation of the new external knowledge underlying a unit's realized absorptive capacity.

*Hypothesis 3b. Job rotation will be positively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

### **Organizational Mechanisms Associated with Systems Capabilities**

Systems capabilities program behaviors in advance of their execution and provide a memory for handling routine situations (Galbraith, 1973; March & Simon, 1958; Van Den Bosch et al., 1999). They typically exhibit common features, including formalization and routinization, that establish patterns of organizational action (Cohen & Bacdayan, 1994: 555; Galunic & Rodan, 1998).

*Formalization* is the degree to which rules, procedures, instructions, and communications are formalized or written down (Khandwalla, 1977). Reliance on rules and procedures reduces the likelihood that individuals will deviate from established behavior (Weick, 1979). Formalization acts as a frame of reference that constrains exploration efforts and directs attention toward restricted aspects of an external environment (Weick, 1979). In this sense, formalization tends to limit the intensity and scope of the efforts expended in knowledge acquisition. Moreover, formalization also inhibits rich, reciprocal knowledge interaction and hinders individuals' assimilation of new external knowledge. Accordingly, formalization negatively influences acquisition and assimilation of the new external knowledge underlying potential absorptive capacity.

*Hypothesis 4a. Formalization will be negatively related to acquisition and assimilation of*

*new external knowledge (that is, to potential absorptive capacity).*

Organizational units use formalization to respond to organizational phenomena in known ways (Daft & Lengel, 1986). Formalization supports the retrieval of knowledge that has already been internalized (Lyles & Schwenk, 1992) and enhances the causal understanding of sets of tasks within units. Accordingly, formalization increases the likelihood that unit members will identify opportunities for the transformation of new external knowledge (Galunic & Rodan, 1998; Zollo & Winter, 2002: 342). Through formalization, units also codify best practices so as to make knowledge more efficient to exploit, easier to apply, and faster to implement (Lin & Germain, 2003; Zander & Kogut, 1995). Formalization thus enhances transformation and exploitation of the new external knowledge underlying realized absorptive capacity.

*Hypothesis 4b. Formalization will be positively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

Units pursue *routinization* to develop sequences of tasks that require relatively little attention (Galunic & Rodan, 1998) and to ensure that inputs are transformed into outputs (Perrow, 1967). Routine tasks are invariable, repetitious, and seldom characterized by unexpected and novel events (Hage & Aiken, 1969; Perrow, 1967; Withey, Daft, & Cooper, 1983). Employees that execute routine tasks only deal with a few exceptions and a narrow range of problems (Perrow, 1967; Volberda, 1996). Routinization therefore limits the search for new external knowledge and narrows the scope of information processing. Moreover, it also restricts interaction among unit members (Daft & Macintosh, 1981; Galbraith, 1973) and decreases the range of unit members interpreting new external knowledge. Thus, routinization of organizational behavior decreases a unit's ability to acquire and assimilate the new external knowledge underlying potential absorptive capacity.

*Hypothesis 5a. Routinization will be negatively related to acquisition and assimilation of new external knowledge (that is, to potential absorptive capacity).*

Routine tasks establish automatic patterns of behavior and increase understanding of task relationships. As unit members plan the handling of their tasks (Daft & Macintosh, 1981), routinization provides efficient structures for collective action and decreases efforts spent on decision making and im-

plementation (Cohen & Bacdayan, 1994). In this sense, units that routinize organizational behavior are able to efficiently transform new external knowledge into existing sets of tasks (Cohen & Bacdayan, 1994). Additionally, as routine tasks are well-practiced and predictable, they permit closely coordinated exploitation of knowledge in pursuing collective objectives (Adler, Goldoftas, & Levine, 1999; Gersick & Hackman, 1990; Grant, 1996). Accordingly, routinization enables a unit's realized absorptive capacity.

*Hypothesis 5b. Routinization will be positively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

### **Organizational Mechanisms Associated with Socialization Capabilities**

Socialization capabilities create broad, tacitly understood rules for appropriate action (Camerer & Vepsalainen, 1988; Volberda, 1998). They contribute to common codes of communication and dominant values (Henderson & Cockburn, 1994; Teece et al., 1997; Verona, 1999) and exhibit two commonalities: connectedness and socialization tactics (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998). These organizational mechanisms refer to two aspects of social relations: the structural aspect, or density of linkages, and the cognitive aspect, or shared social experiences.

The density of linkages, or *connectedness*, serves as a governance mechanism and facilitates knowledge exchange (Jaworski & Kohli, 1993; Rowley, Behrens, & Krackhardt, 2000). Dense networks are advantageous for developing trust and cooperation but increase the redundancy of information and diminish access to divergent perspectives (Nahapiet & Ghoshal, 1998; Sethi, Smith, & Park, 2001). Accordingly, dense networks constrain unit members to perform broad searches for a variety of external knowledge sources. They "limit the openness to information and to alternative ways of doing things, producing collective blindness" (Nahapiet & Ghoshal, 1998: 245). Therefore, connectedness inhibits the acquisition and assimilation of new external knowledge (potential absorptive capacity).

*Hypothesis 6a. Connectedness will be negatively related to acquisition and assimilation of new external knowledge (that is, to potential absorptive capacity).*

Connectedness develops trust and cooperation and fosters commonality of knowledge (Rowley et al., 2000). It encourages communication and im-

proves the efficiency of knowledge exchange throughout units (Galunic & Rodan, 1998). In this way, connectedness allows units to transform and exploit new external knowledge (Zahra & George, 2002: 194). Moreover, connectedness reduces the likelihood of conflict regarding goals and implementation (Rindfleisch & Moorman, 2001). Thus, connectedness facilitates the transformation and exploitation of newly acquired knowledge and develops a unit's realized absorptive capacity.

*Hypothesis 6b. Connectedness will be positively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

Organizational units use *socialization tactics* to structure shared socialization experiences (Ashforth & Saks, 1996). Socialization tactics offer newcomers specific information and encourage them to interpret and respond to situations in a predictable way (Jones, 1986). They lead to custodial role orientations and the acceptance of the status quo because organization members seek a high level of concurrence and conformance (Ashforth & Saks, 1996; Jones, 1986). Socialization tactics increase the commitment of unit members to past policies and procedures (Randall, 1987). They can create mental prisons and lead to poor information search as well as selective perception of information and alternatives (Janis, 1982). Thus, socialization tactics hamper the ability to tap into new external knowledge sources (Cohen & Levinthal, 1990) and impede a unit's ability to acquire and assimilate new external knowledge.

*Hypothesis 7a. Socialization tactics will be negatively related to acquisition and assimilation of new external knowledge (that is, to potential absorptive capacity).*

Socialization tactics affect the establishment of interpersonal relationships and lead to congruence of values, needs, and beliefs among individuals within units (Ashforth & Saks, 1996; Feldman, 1981; Van Maanen & Schein, 1979). They teach newcomers a unit-specific language that facilitates the comprehension of background knowledge and communication with others (Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994; Fisher, 1986). In this way, socialization tactics enhance the combination of newly acquired and existing knowledge through facilitating "bisociation" among unit members (Zahra & George, 2002). Moreover, socialization tactics lead to strong social norms and beliefs, which enhance commitment and compliance with exploitation processes of new external knowledge (Adler & Kwon, 2002). Thus, socialization tactics

enhance transformation and exploitation of new external knowledge.

*Hypothesis 7b. Socialization tactics will be positively related to transformation and exploitation of new external knowledge (that is, to realized absorptive capacity).*

## METHODS

### Setting and Data Collection

The empirical research was conducted at a large, European, multi-unit financial services firm. The firm has total assets of more than \$350 billion and ranks within the top 30 on the *Fortune* Global 500 in terms of total revenue in the banking industry. It is a broad-based financial service provider having branches in various countries; these branches are geographically distinct entities with their own clienteles. The products and services of the branches cover asset management, insurance, leasing, equity participation, corporate banking, and investment banking. In 2002, we administered a survey to the general managers of 769 organizational units in 220 branches in one country. To ensure confidentiality, we agreed not to reveal the managers' names and asked them to return the questionnaire directly to the research team. A total of 462 questionnaires were returned, corresponding with a response rate of 60.1 percent. The respondents had a mean company tenure of 7.7 years (s.d. = 8.14). The average size of the organizational units was 32.79 (s.d. = 21.09) full-time employees.

To test for nonresponse bias, we examined differences between respondents and nonrespondents. A *t*-test showed no significant differences ( $p < .05$ ) between the two groups based on the number of full-time employees of units and branches, total assets of branches, and units' prior performance. We also compared the early and late respondents in terms of demographic characteristics and model variables. These comparisons did not reveal any significant differences ( $p < .05$ ), indicating that differences between respondents were not related to nonresponse bias. To examine reliability issues associated with single-informant data, we surveyed two additional members of each responding unit. Both management team members and senior employees responsible for coordinating units were asked to participate. This follow-up survey resulted in 96 responses from 71 units that were comparable in size, age, and prior performance to our full sample. We calculated an interrater agreement score ( $r_{wg}$ ) for each study variable (James, Demaree, & Wolf, 1993). The median interrater agreement ranged from .68 to .93, suggesting ade-

quate agreement. In addition, examination of intraclass correlations revealed a strong level of interrater reliability: correlations were consistently significant at the .001 level (Jones, Johnson, Butler, & Main, 1983). We also performed Harman's one-factor test on items included in our regression model to examine whether common method bias augmented relationships. Because we found multiple factors, and the first factor did not account for the majority of the variance, we had little concern about potential problems associated with common method bias (Podsakoff & Organ, 1986).

### Measurement and Validation of Constructs

This study mainly used existing scales from previous research. However, appropriate scales for potential absorptive capacity, realized absorptive capacity, and job rotation were not available. The following steps were taken to develop new measures for these constructs: First of all, we reviewed relevant literature and generated a pool of items to tap the domain of each construct. From this pool of items, unique items were selected for inclusion in initial scales. Next, we conducted in-depth interviews with 15 unit managers at different branches. The managers were asked to complete the questionnaire and indicate any ambiguity regarding the phrasing of the items. During follow-up interviews, they were invited to suggest improvements to the questionnaire. Subsequently, the phrasing of items was further enhanced by the authors and peers, a process that resulted in a final version of the questionnaire.

**Potential and realized absorptive capacity.** To examine potential and realized absorptive capacity, we sought to measure the dimensions that have been defined (Zahra & George, 2002). Items were measured on a seven-point disagree/agree scale and were partially based on existing items regarding absorptive capacity (Szulanski, 1996) and market orientation (Jaworski & Kohli, 1993). The Appendix presents the items of potential and realized absorptive capacity we used in our study. Potential absorptive capacity consists of acquisition and assimilation of new external knowledge. Six items assessed the intensity and direction of efforts expended in knowledge *acquisition*. In addition, three items measured *assimilation* and gauged the extent to which units were able to analyze and understand new external knowledge. The scales for acquisition and assimilation were reliable (acquisition,  $\alpha = .79$ ; assimilation,  $\alpha = .76$ ). Realized absorptive capacity includes transformation and exploitation of new external knowledge. Six items measured *transformation* and assessed the extent

to which units were able to facilitate recognizing opportunities and consequences of new external knowledge for existing operations, structures, and strategies (Zahra & George, 2002). Six items tapped into the extent to which units were able to *exploit* new external knowledge. The scale gauged the ability of units to incorporate new external knowledge into their operations. Both scales were reliable (transformation,  $\alpha = .72$ ; exploitation,  $\alpha = .71$ ).

We conducted confirmatory factor analysis (CFA) of the items pertaining to dimensions of potential and realized absorptive capacity in order to check for construct independence. Each item was allowed to load only on the factor for which it was a proposed indicator. Results indicated that a four-factor model fitted the data moderately well ( $\chi^2/df = 2.76$ , goodness-of-fit index [GFI] = .91, comparative fit index [CFI] = .90, root-mean-square error of approximation [RMSEA] = .06). Item loadings were as proposed and were significant ( $p < .001$ ), providing evidence for convergent validity. The hypothesis that the four underlying dimensions of absorptive capacity converged on one common factor was unambiguously rejected ( $\Delta\chi^2_6 = 1,097.00$ ,  $p < .001$ ). Our four-factor model also provided a better fit to the data than its plausible rival two-factor model. All the fit indexes of the two-factor model were worse than those of our four-factor model. In addition, a chi-square difference test showed that the fit of the three-factor model was significantly worse than that of our four-factor model ( $\Delta\chi^2_5 = 840.03$ ,  $p < .001$ ). Accordingly, we judged the four dimensions underlying potential and realized absorptive capacity to be not only theoretically, but also empirically distinguishable.

To further assess the construct validity of the measures for potential and realized absorptive capacity, we compared the scores of the study variables with a separate overall measure of absorptive capacity (Szulanski, 1996). Using a nine-item scale ( $\alpha = .90$ ), respondents described their unit's ability to absorb new external knowledge regarding a new knowledge-intensive financial service, employee benefits, that had been released six months before the initial questionnaire. Correlations between the study variables and the overall measure of absorptive capacity regarding the new financial service were positive and significant (acquisition,  $r = .44$ ,  $p < .001$ ; assimilation,  $r = .37$ ,  $p < .001$ ; transformation,  $r = .34$ ,  $p < .001$ ; exploitation,  $r = .24$ ,  $p < .001$ ), suggesting evidence for convergent validity. In addition, we collected archival data through internal corporate records on the average number of services regarding employee benefits purchased by clients. Correlations between the study variables

and this service performance measure were also positive and significant (acquisition,  $r = .23$ ,  $p < .001$ ; assimilation,  $r = .13$ ,  $p < .01$ ; transformation,  $r = .22$ ,  $p < .001$ ; exploitation,  $r = .14$ ,  $p < .01$ ), suggesting that organizational units with higher levels of potential and realized absorptive capacities obtained higher levels of service performance regarding the new financial service.

**Organizational mechanisms associated with combinative capabilities.** To measure *cross-functional interfaces*, we asked managers to indicate the extent to which their unit used liaison personnel, temporary task forces, and permanent teams to coordinate activities (Galbraith, 1973). The final measure was a weighted average of the three items (cf. Gupta & Govindarajan, 2000), ranging from 1 for liaison personnel to 3 for permanent teams ( $\bar{x} = 4.39$ ; s.d. = 1.18). We used the construct of participation in decision making (Dewar, Whetten, & Boje, 1980; Hage & Aiken, 1967) to measure *participation* ( $\alpha = .79$ ). *Job rotation* was measured with two items that tapped the extent to which employees were rotated between different functions within and between subunits ( $\alpha = .77$ ). The items were as follows: "Employees in our unit are regularly rotated between different functions" and "Employees are regularly rotated between different subunits." To measure *formalization*, we used a five-item scale ( $\alpha = .73$ ) from Desphandé and Zaltman (1982). *Routinization* tapped the extent to which tasks within units were invariable, uniform, or predictable (Withey, Daft, & Cooper, 1983). Withey et al.'s (1983) exceptions scale, which is based on Perrow's (1967) work on unit technology, was the measure of routinization ( $\alpha = .73$ ). *Connectedness* ( $\alpha = .74$ ) was measured with a four-item scale (Jaworski & Kohli, 1993). Connectedness measured the extent to which individuals in organizational units were networked to various levels of the hierarchy. We used two categorizations of Van Maanen and Schein's model (1979: 232) to measure *socialization tactics*: collective versus individual and serial versus disjunctive tactics (cf. Jones, 1986). Previous research has suggested that these two categorizations affect custodial role orientations, the congruence of values and beliefs, and newcomer adjustment to organizations (Ashforth & Saks, 1996; Grant & Bush, 1996). Since we were interested in the overall effect of socialization tactics, we constructed a measure for socialization tactics by averaging the scores of collective socialization tactics ( $\alpha = .74$ ) and serial socialization tactics ( $\alpha = .76$ ).

An integrated CFA on all items of potential and realized absorptive capacity and organizational mechanisms associated with combinative capabilities (with each item constrained to load only on the

factor for which it was the proposed indicator) yielded a model that fitted the data moderately well ( $\chi^2/df = 2.40$ , GFI = .90, CFI = .90, RMSEA = .06). Item loadings were as proposed and significant ( $p < .01$ ). The scale for cross-functional interfaces was not subjected to confirmatory factor analysis because of the weighted structure.

**Control variables.** As larger units may have more resources, yet may lack the flexibility to acquire and assimilate new external knowledge, we included the natural logarithm of the number of full-time employees within units to account for *unit size*. Following the same reasoning, we included *branch size* as well, calculating it as the natural logarithm of the number of full-time employees within a branch (average: 136.36 full-time employees). A *unit's age*, measured by the number of years from its founding, was included since age may influence knowledge acquisition and exploitation (Autio, Sapienza, & Almeida, 2000). To control for the effect of units' potential specialization in different markets and different ranges of products and services, we included *unit client focus*, which indicated whether a unit provided products and services for private clients (coded 0) or for business clients (coded 1). Units with a strong history of high performance are more likely to invest in absorptive capacity. Hence, we included a *unit's past performance*. Because units may have different strategic priorities, we adjusted performance data to evaluate each unit. Following Tsai (2001), we used a unit's profitability-achieved rate, calculated as profitability divided by target profitability. We also controlled for *branch's past performance* and included a branch's profitability-achieved rate, a branch's return on investment divided by its target return. The performance measures, as well as the achieved rates for the units and branches in this study, were collected for the period 1999–2001 through internal corporate records. Environmental aspects may trigger units to develop their potential or realized absorptive capacity. Accordingly, we included a dummy variable, *urban/rural unit location* (0 = "rural location"; 1 = "urban location") to account for different business dynamics such as market concentration and competitiveness (Dietz, Pugh, & Wiley, 2004). The urban/rural data were collected through internal corporate records. *Environmental dynamism* can trigger a unit to develop potential absorptive capacity (Zahra & George, 2002). We therefore included a three-item scale ( $\alpha = .75$ ) that captured environmental dynamism (Dill, 1958; Volberda & Van Bruggen, 1997). Sample items are, "Our clients regularly ask for complete new products and services" and "In our market, changes are taking place continuously."

## ANALYSIS AND RESULTS

Table 1 presents descriptive statistics and correlations for the study variables. To examine the issue of multicollinearity, we calculated variance inflation factors (VIFs) in each of the regression equations. The maximum VIF within the models was 1.44, which was well below the rule-of-thumb cut-off of 10 (Neter, Wasserman, & Kutner, 1990).

### Results of the Analyses

Table 2 presents the results of the hierarchical regression analyses for organizational mechanisms and both components of absorptive capacity. Unstandardized coefficients, with standard errors in parentheses, as well as standardized coefficients are reported. Models 1 and 2 relate to potential absorptive capacity. As expected, organizational mechanisms associated with coordination capabilities had positive and significant effects on potential absorptive capacity. In particular, coefficients indicated that cross-functional interfaces (acquisition,  $p < .01$ ; assimilation,  $p < .01$ ) and job rotation (acquisition,  $p < .01$ ; assimilation,  $p < .05$ ) enhanced a unit's potential absorptive capacity, consistently with Hypotheses 1a and 3a. Regarding Hypothesis 2a, we found mixed results. Participation in decision making was positively associated with acquisition ( $p < .001$ ), but not with assimilation ( $p > .10$ ). Thus, participation in decision making only triggers unit members to acquire new external knowledge. The coefficients for formalization (acquisition,  $p > .10$ ; assimilation,  $p > .10$ ) were not significant. Hypothesis 4a was not supported. Routinization of tasks (acquisition,  $p < .001$ ; assimilation,  $p < .05$ ) had significant and negative effects on acquisition and assimilation of new external knowledge, supporting Hypothesis 5a. Accordingly, the negative effect of organizational mechanisms associated with systems capabilities on potential absorptive capacity mainly originated from routinization of tasks. Hypothesis 6a, which posits a negative influence of connectedness on a unit's potential absorptive capacity, was not supported. Results showed that connectedness did not affect acquisition ( $p > .10$ ) and even positively influenced assimilation ( $p < .01$ ). Thus, contrary to our prediction, connectedness enhanced the assimilation of new external knowledge. Hypothesis 7a, which claims a negative relationship between socialization tactics and potential absorptive capacity, was also not supported. The coefficients (acquisition,  $p > .10$ ; assimilation,  $p > .10$ ) were not significant. Thus, connectedness and socialization



**TABLE 1**  
Means, Standard Deviations, and Correlations<sup>a</sup>

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Acquisition	3.58	1.24	(.79)																		
2. Assimilation	4.74	1.13	.28	(.76)																	
3. Transformation	4.61	0.83	.35	.50	(.72)																
4. Exploitation	5.26	0.72	.07	.40	.55	(.71)															
5. Cross-functional interfaces	4.39	1.18	.20	.17	.14	.07															
6. Participation	3.87	1.05	.31	.10	.17	.01	.17	(.79)													
7. Job rotation	2.18	1.08	.17	.11	.14	.05	.26	.11	(.77)												
8. Formalization	5.53	0.74	-.03	.11	.20	.38	.02	-.11	-.04	(.73)											
9. Routinization	3.26	0.97	-.31	-.20	-.23	-.08	-.06	-.16	.01	-.02	(.73)										
10. Connectedness	5.60	0.78	.16	.27	.32	.31	.09	.04	.02	.14	-.15	(.74)									
11. Socialization tactics	4.56	0.72	.02	.13	.28	.39	.14	.03	.20	.28	.06	.13	(.75)								
12. Unit size <sup>b</sup>	1.44	0.27	-.18	-.18	-.20	-.11	.20	-.12	.19	-.03	.16	-.13	.06								
13. Branch size <sup>b</sup>	2.10	0.18	.02	-.00	.06	-.03	.08	-.09	.10	.01	-.04	.03	.10	.34							
14. Unit age	3.23	2.35	-.12	-.01	.02	-.01	-.09	-.07	-.07	.02	.10	.09	-.01	.00	-.12						
15. Unit client focus	0.42	0.50	.06	-.01	-.08	-.09	.12	-.01	-.07	-.15	-.07	-.01	-.04	.11	-.02	.01					
16. Past performance unit	102.92	24.64	.11	.09	.05	.00	-.02	-.01	.01	-.02	-.05	.00	.03	-.01	-.07	-.05	-.01				
17. Past performance branch	103.20	30.31	-.01	-.02	.04	.04	-.14	-.05	-.07	-.03	-.03	.02	.06	.05	.01	.06	-.06	.19			
18. Urban/rural unit location	0.54	0.50	.02	.01	.00	-.02	.02	-.13	.11	-.03	-.03	.06	-.03	.15	.40	-.06	.03	-.15	-.06		
19. Environmental dynamism	4.29	1.19	.13	.17	.13	.06	.01	.04	.15	-.02	-.13	.11	.04	-.05	.21	-.02	-.11	.03	.05	.18	(.75)

<sup>a</sup>  $n = 462$ . Numbers in parentheses on the diagonal are the Cronbach's alpha coefficients of the composite scales. Correlations above |.09| are significant at  $p < .05$ .

<sup>b</sup> Logarithm of the number of full-time employees.

tactics do not disrupt acquisition and assimilation of new external knowledge.

Models 3 and 4 in Table 2 present the results of the hierarchical regression analysis for organizational antecedents and realized absorptive capacity. The coefficients for cross-functional interfaces (transformation,  $p < .05$ ; exploitation,  $p > .10$ ) and job rotation (transformation,  $p < .05$ ; exploitation,  $p > .10$ ) were positive and significant for transformation; however, they were not significant for exploitation. Hypotheses 1b and 3b receive support only in model 3: that is, they are supported for transformation of new external knowledge. Cross-functional interfaces and job rotation did not increase exploitation of knowledge underlying realized absorptive capacity. Participation in decision making (transformation,  $p < .05$ ; exploitation,  $p > .10$ ) had no significant, negative effect on realized absorptive capacity. Contrary to our prediction, participation in decision making even increased transformation of new external knowledge. Hypothesis 2b was not supported. As hypothesized, formalization (transformation,  $p < .05$ ; exploitation,  $p < .001$ ) positively influenced a unit's realized absorptive capacity. Hypothesis 4b was supported. The coefficients for routinization (transformation,  $p < .01$ ; exploitation,  $p > .10$ ) were both negative and only significant for transformation.

Hypothesis 5b, positing a positive relationship between routinization and realized absorptive capacity, was not supported. Coefficients for connectedness (transformation  $p < .001$ ; exploitation,  $p < .001$ ) and socialization tactics (transformation,  $p < .001$ ; exploitation,  $p < .001$ ) were positive and highly significant. In accordance with Hypotheses 6b and 7b, connectedness and socialization tactics increased a unit's realized absorptive capacity.<sup>1</sup>

### Comparison of Relative Effects

To gain further insights into the relative effects of organizational antecedents on potential and realized absorptive capacity, we determined the relative importance of each set of organizational mechanisms (that is, associated with each type of combinative capability) over another, by performing  $F$ -tests involving both the full and re-

<sup>1</sup> We ran additional regression analyses to examine curvilinear relationships. Results revealed an inverted U-shaped relationship between cross-functional interfaces and transformation. Thus, although cross-functional interfaces contribute to transformation, using many liaison persons, task forces, and cross-functional teams may eventually hurt transformation by creating too much redundancy among unit members.

**TABLE 2**  
**Results of Hierarchical Regression Analyses: Effects of Organizational Antecedents**  
**on Potential and Realized Absorptive Capacity<sup>a</sup>**

Variables	Potential Absorptive Capacity				Realized Absorptive Capacity			
	Acquisition, Model 1		Assimilation, Model 2		Transformation, Model 3		Exploitation, Model 4	
	<i>b</i> (s.e.)	$\beta$	<i>b</i> (s.e.)	$\beta$	<i>b</i> (s.e.)	$\beta$	<i>b</i> (s.e.)	$\beta$
Coordination capabilities								
Cross-functional interfaces	0.15 (0.05)	0.15**	0.14 (0.05)	0.15**	0.08 (0.03)	0.12*	0.03 (0.03)	0.05
Participation	0.25 (0.05)	0.21***	0.01 (0.05)	0.01	0.08 (0.04)	0.11*	-0.00 (0.03)	-0.01
Job rotation	0.15 (0.05)	0.13**	0.11 (0.05)	0.10*	0.07 (0.04)	0.09*	-0.00 (0.03)	-0.00
Systems capabilities								
Formalization	-0.05 (0.08)	-0.03	0.09 (0.07)	0.06	0.11 (0.05)	0.10*	0.29 (0.04)	0.29***
Routinization	-0.26 (0.06)	-0.20***	-0.13 (0.06)	-0.11*	-0.12 (0.04)	-0.14**	-0.04 (0.03)	-0.06
Socialization capabilities								
Connectedness	0.11 (0.07)	0.07	0.23 (0.07)	0.16**	0.21 (0.05)	0.20***	0.19 (0.04)	0.20***
Socialization tactics	-0.03 (0.08)	-0.02	0.12 (0.08)	0.07	0.24 (0.05)	0.20***	0.31 (0.05)	0.30***
Control variables								
Unit size	-0.41 (0.10)	-0.20***	-0.38 (0.10)	-0.20***	-0.33 (0.07)	-0.24***	-0.08 (0.06)	-0.07
Branch size	0.12 (0.15)	0.04	0.04 (0.15)	0.01	0.16 (0.10)	0.08	-0.13 (0.09)	-0.08
Unit age	-0.03 (0.02)	-0.06	0.01 (0.02)	0.02	0.01 (0.02)	0.04	-0.01 (0.01)	-0.04
Unit client focus	0.18 (0.11)	0.07	0.02 (0.11)	0.01	-0.08 (0.07)	-0.05	-0.05 (0.06)	-0.04
Past performance, unit	0.01 (0.00)	0.10*	0.00 (0.00)	0.10*	0.00 (0.00)	0.04	-0.00 (0.00)	-0.01
Past performance, branch	-0.00 (0.00)	-0.02	-0.00 (0.00)	-0.02	0.00 (0.00)	0.03	0.00 (0.00)	0.03
Urban/rural unit location	0.04 (0.12)	0.02	0.01 (0.12)	0.00	-0.03 (0.08)	-0.02	0.03 (0.07)	0.02
Environmental dynamism	0.05 (0.05)	0.05	0.09 (0.05)	0.10*	0.04 (0.03)	0.06	0.01 (0.03)	0.01
Adjusted <i>R</i> <sup>2</sup>	.23***		.15***		.26***		.29***	

<sup>a</sup> Unstandardized coefficients are reported, with standard errors in parentheses, as well as standardized coefficients.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

stricted models (cf. Hansen & Wernerfelt, 1989; Kotha & Nair, 1995). Results suggested several important issues. First, acquisition of new external knowledge was most strongly affected by organizational mechanisms associated with coordination capabilities; organizational mechanisms associated with socialization capabilities had little or no impact. Second, organizational mechanisms associated with coordination and socialization capabilities primarily explained assimilation of new external knowledge. Interestingly, organizational mechanisms associated with socialization capabilities had the strongest effect. Third, the effects of organizational mechanisms associated with socialization capabilities on transformation and exploitation (i.e. realized absorptive capacity) were stronger than organizational mechanisms associated with either coordination capabilities or systems capabilities. Connectedness and socialization tactics, for instance, accounted for more than three times as much

variance of transformation as cross-functional interfaces, participation in decision making, and job rotation.

## DISCUSSION AND CONCLUSION

The objective of this study was to explore the differing effects of organizational antecedents on a unit's potential and realized absorptive capacity. Although research has been devoted to outcomes of absorptive capacity, organizational antecedents of absorptive capacity have been largely ignored. In addition, research into absorptive capacity has only begun to explore components and dimensions. This empirical study assessed potential and realized absorptive capacity and examined the links between specific organizational mechanisms as common features of combinative capabilities and dimensions of absorptive capacity.

## Implications

Our study contributes to research on absorptive capacity and combinative capabilities in several ways. Most importantly, our results reveal that organizational mechanisms associated with combinative capabilities drive a unit's potential and realized absorptive capacity in different ways. The present study contributes to scholars' understanding as to why certain units are able to acquire and assimilate new external knowledge, but are not able to transform and exploit it successfully. Overall, our research indicates that organizational mechanisms associated with coordination capabilities (cross-functional interfaces, participation, and job rotation) primarily enhance potential absorptive capacity, while organizational mechanisms associated with socialization capabilities (connectedness and socialization tactics) primarily strengthen realized absorptive capacity. These results reveal that organizational units may differ in their ability to manage levels of potential and realized absorptive capacity; follow different developmental paths; and differ in their ability to create value from their absorptive capacity.

Our findings indicate that organizational mechanisms associated with coordination capabilities enhance a unit's potential absorptive capacity. Participation in decision making, however, only increases acquisition of new external knowledge; it does not enhance assimilation of newly acquired knowledge. A possible explanation for this result is that participation in decision making does not necessarily result in collective assimilation efforts, but rather, leads to lower-level assimilation of new external knowledge by narrowly focused unit members. Future studies may incorporate different levels of analyses to investigate the unanticipated effect of participation in decision making on assimilation of new external knowledge. Although cross-functional interfaces, participation in decision making, and job rotation have relatively little impact, they also enhance a unit's realized absorptive capacity. However, these organizational mechanisms only increase transformation of new external knowledge; they are not related to exploitation. These results suggest that exploitation requires more stable and densely connected knowledge structures than does transformation. The temporal nature of cross-functional interfaces and job rotation indeed fosters acquisition, assimilation, and transformation of new external knowledge, but this augmentation may be insufficient to embed new external knowledge into systems and structures (Matusik & Hill, 1998). Moreover, results indicate that participation does not negatively influence

transformation as predicted, but rather, it positively influences transformation through initiating new ideas, insights, and opportunities.

The organizational mechanisms associated with systems capabilities provide somewhat surprising results. Firstly, although formalization contributes to a unit's realized absorptive capacity as we predicted, it does not decrease a unit's potential absorptive capacity. One main reason could be that acquisition and assimilation may be formalized to some extent. Well-designed rules and procedures capture prior experiences that may enable employees to search for, and assimilate, new external knowledge (Adler & Borys, 1996). Secondly, our study confirms that routinization negatively influences a unit's potential absorptive capacity. However, contrary to our prediction, it also shows that routinization negatively influences transformation underlying a unit's realized absorptive capacity. Although it has been suggested that routinization enhances efficient integration of existing knowledge (cf. Gersick & Hackman, 1990; Grant, 1996), our study reveals that it impedes the flexible incorporation of newly acquired *and* existing knowledge (Volberda, 1996). These two contradicting results regarding systems capabilities highlight the benefits of codifying established behavior over holding it tacit (Zollo & Winter, 2002). In contrast to making established behavior tacit through routinization, codification efforts through formalization enhance a unit's ability to transform and exploit new external knowledge, and to initiate the recombinations necessary for developing new competences and capabilities (Galunic & Rodan, 1998; Zollo & Winter, 2002). Routinization seems to separate knowledge, to constrain joint learning, and to restrict the creation of new knowledge by imposing existing knowledge (Dougherty, 1992).

Our findings reveal the relative importance of organizational mechanisms associated with socialization capabilities in enhancing realized absorptive capacity. Interestingly, we found a strong and positive effect of connectedness on potential absorptive capacity or, in particular, the assimilation of new external knowledge. To some degree this pattern bears similarities to findings of other recent studies suggesting that low connectedness increases overall access to diverse knowledge sources, yet may not be sufficient to support a regular and reliable flow of knowledge (e.g., Hansen, 1999). A dense network *within units* may motivate employees to be of assistance to each other and may allow two-way interaction that helps the interpretation and understanding of new external knowledge (Cohen & Levinthal, 1990; Morrison, 2002). Our study suggests that in addition to estab-

lishing ties with external sources of new knowledge (Hansen, 1999; Tsai, 2001), establishing dense networks of ties *within units* is needed for units to assimilate, transform, and exploit new external knowledge. Moreover, findings indicate that socialization tactics do not disrupt acquisition and assimilation of new external knowledge. Although previous studies have suggested that socialization tactics result in custodial role orientations and well-established norms and beliefs, future research may explore the intent of these tactics and investigate to what extent certain socialization tactics contribute to an orientation toward openness.

The present study advances understanding of combinative capabilities through conceptually identifying and empirically examining common features of coordination, systems, and socialization capabilities. The idea that effective combinative capabilities for absorbing new external knowledge exhibit common features does not imply that a particular type of combinative capability is identical across units (Eisenhardt & Martin, 2000). Our findings reveal, for instance, that cross-functional interfaces, such as liaison devices and cross-functional teams, positively influence acquisition and assimilation of new external knowledge. However, the composition of cross-functional teams or location of liaison devices may be idiosyncratic to units. Moreover, formalization strongly increases the level of a unit's realized absorptive capacity. However, units may use various rules and procedures that differ in design and content, thereby executing formalization differently and developing idiosyncratic systems capabilities. Thus, effective coordination, systems, and socialization capabilities may differ in details as long as important commonalities like those identified and examined in our study are present (Eisenhardt & Martin, 2000: 1110).

From a strategic management perspective, we assume that performance differences may arise when units vary in developing effective combinative capabilities and pursue different developmental paths of potential and realized absorptive capacity. Previous research has suggested that market dynamism moderates the effectiveness of both components of absorptive capacity (Eisenhardt & Martin, 2000; Zahra & George, 2002). To gain preliminary insights into these strategic implications, we collected performance data through internal corporate records and included four interaction terms: acquisition and dynamism, assimilation and dynamism, transformation and dynamism, and exploitation and dynamism. Using a unit's financial performance as dependent variable, with all control variables included, we found that units with well-developed potential absorptive capacity ( $\beta_{\text{acquisition}*\text{dynamism}} = .10, p < .01$ ;

$\beta_{\text{assimilation}*\text{dynamism}} = .11, p < .01$ ) improved their performance in dynamic environments. Interestingly, coefficients for realized absorptive capacity and environmental dynamism were mixed ( $\beta_{\text{transformation}*\text{dynamism}} = .08, p < .10$ ;  $\beta_{\text{exploitation}*\text{dynamism}} = -.12, p < .01$ ). Organizational units with well-developed realized absorptive capacity do not necessarily increase their performance in dynamic environments. Rather, exploitation even decreases performance in dynamic environments. Overall, these preliminary findings have two interesting implications. First, organizational units operating in dynamic markets improve their performance by increasing their potential absorptive capacity. Potential absorptive capacity provides organizational units with strategic advantages, such as greater flexibility in reconfiguring resources and effective timing of knowledge deployment at lower costs, which are necessary to sustain a competitive advantage (Zahra & George, 2002: 195–196). Second, organizational units may not always be better off by fully realizing their potential absorptive capacity in dynamic environments. Although realized absorptive capacity promotes innovation, the resultant products and services may rapidly converge to industry standards (Eisenhardt & Martin, 2000; Zahra & George, 2002) and become obsolete relative to current environmental demands (Sorensen & Stuart, 2000). Accordingly, units operating in dynamic markets need to selectively act upon their potential absorptive capacity and only exploit certain aspects of newly acquired knowledge. These findings suggest managing levels of potential and realized absorptive capacity in a timely fashion is the logic for competitive advantage (Eisenhardt & Martin, 2000).

### Limitations

Several limitations of this study merit discussion. First, our data were self-reported assessments of unit managers. Although we took several steps in both the design and testing phases to limit concerns regarding single-informant data, the issues of key informant bias and common method bias cannot be totally ruled out. However, strong interrater agreement and interrater reliability, together with the confidentiality that was assured for respondents, reduced our concern that respondents artificially inflated or disguised their responses. Additionally, Harman's one-factor analysis provided evidence against the presence of one common factor. Common method bias would also have produced consistent effects of the same variables on both components of absorptive capacity, yet we found different effects of several variables on potential and realized absorptive capacity. Second, although the results presented here confirm the majority of

the hypotheses, the study is to some degree exploratory. New scales were developed for inherently difficult-to-measure constructs such as the dimensions of absorptive capacity. Although we conducted additional analyses to assess the validity of our measures, it would be useful to further enhance these measurements and develop more elaborate scales. In future studies, researchers may also try to measure dimensions of absorptive capacity using objective measures and relate these to our measures. Third, our survey research was conducted at multiple organizational units within branches of a large financial services firm. Such a focus helped to account for corporate-, industry- and country-specific differences that might have otherwise masked significant effects. Empirical studies in a wider variety of organizations within different industries are necessary to further generalize the findings. Fourth, the data employed in this study were cross-sectional. Although our results are consistent with the theoretical predictions, further longitudinal research should empirically establish the causal claim of our model.

### Directions for Future Research

The present study provides several issues for future research. Future research may incorporate additional antecedents of potential and realized absorptive capacity such as organizational form (Van Den Bosch et al., 1999), incentive systems, and dimensions of external linkages of organizational units. Future studies may also incorporate multiple levels of analysis and examine individual-level as well as organization-level variables (Van Den Bosch, Van Wijk, & Volberda, 2003). Furthermore, investigating combined or moderating effects of organizational antecedents (Siggelkow, 2002) would further enhance understanding of how organizational units manage levels of potential and realized absorptive capacity. Particular combinations of organizational mechanisms, for instance, may even enhance all dimensions of absorptive capacity. Accordingly, future research may investigate how such contextual ambidextrous units combine contradictory elements (cf. Gibson & Birkinshaw, 2004) and increase their levels of both potential and realized absorptive capacities simultaneously.

To better explain the effectiveness of potential and realized absorptive capacity, future studies might investigate what kind of balance between potential and realized absorptive capacity leads to superior performance. With the moderating effects of environmental dynamism in mind, we would expect that units with baseline levels of realized absorptive capacity and high levels of potential

absorptive capacity obtain above-normal performance in dynamic markets. It would be useful to include various consequences such as strategic flexibility, innovativeness, and first-mover advantages (Volberda, 1998; Zahra & George, 2002) as well as environmental moderators such as competitiveness and market growth. Examining various consequences and moderating effects would enhance understanding of how certain (relative) levels of potential and realized absorptive capacities may contribute to achieving and sustaining competitive advantages.

Future studies might also address the role of knowledge attributes. For instance, Subramaniam and Venkatraman (2001) found that a higher degree of tacitness of newly acquired knowledge requires richer information-processing mechanisms such as cross-functional teams, frequent communication, and experienced members.

In conclusion, studying potential and realized absorptive capacity offers intriguing insights for both researchers and practitioners. We acknowledge that absorptive capacity is a multifaceted construct and provide new insights regarding how units may develop important sources of sustainable competitive advantages.

### REFERENCES

- Adler, P. S., & Borys, B. 1996. Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly*, 41: 61–89.
- Adler, P. S., Goldoftas, B., & Levine, D. I. 1999. Flexibility versus efficiency? A case study of model changeovers in the Toyota Production System. *Organization Science*, 10: 43–68.
- Adler, P. S., & Kwon, S. 2002. Social capital: Prospects for a new concept. *Academy of Management Review*, 27: 17–40.
- Ahuja, G., & Lampert, C. M. 2001. Entrepreneurship in the large corporation: A longitudinal study of how established firms create breakthrough inventions. *Strategic Management Journal*, 22: 521–543.
- Aldrich, H., & Herker, D. 1977. Boundary spanning roles and organization structure. *Academy of Management Review*, 2: 217–230.
- Ashforth, B. E., & Saks, A. M. 1996. Socialization tactics: Longitudinal effects on newcomer adjustments. *Academy of Management Journal*, 39: 149–178.
- Atuahene-Gima, K. 2003. The effects of centrifugal and centripetal forces on products' development speed and quality: How does problem solving matter? *Academy of Management Journal*, 46: 359–373.
- Autio, E., Sapienza, H. J., & Almeida, J. G. 2000. Effects of age at entry, knowledge intensity, and imitability on

- international growth. *Academy of Management Journal*, 43: 909–924.
- Bahrami, H., & Evans, S. 1987. Stratocracy in high technology firms. *California Management Review*, 30(1): 51–66.
- Camerer, C., & Vepsäläinen, A. 1988. The economic efficiency of corporate culture. *Strategic Management Journal*, 9: 115–126.
- Campion, M. A., Cheraskin, L., & Stevens, M. J. 1994. Career-related antecedents and outcomes of job rotation. *Academy of Management Journal*, 37: 1518–1542.
- Cardinal, L. B. 2001. Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organization Science*, 12: 19–36.
- Chao, G. T., O'Leary-Kelly, A. M., Wolf, S., Klein, H. J., & Gardner, P. D. 1994. Organizational socialization: Its content and consequences. *Journal of Applied Psychology*, 79: 730–743.
- Cockburn, I., Henderson, R., & Stern, S. 2000. Untangling the origins of competitive advantage. *Strategic Management Journal*, 21: 1123–1146.
- Cohen, M. D., & Bacdayan, P. 1994. Organizational routines are stored as procedural memory. *Organization Science*, 5: 554–568.
- Cohen, W., & Levinthal, D. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128–152.
- Daft, R. L., & Lengel, R. H. 1986. Organizational information requirements, media richness and structural design. *Management Science*, 32: 554–571.
- Daft, R. L., & Macintosh, N. B. 1981. A tentative exploration into the amount and equivocality of information processing in organizational work units. *Administrative Science Quarterly*, 26: 207–224.
- Desphandé, R., & Zaltman, G. 1982. Factors affecting the use of market research information: A path analysis. *Journal of Marketing Research*, 19: 14–31.
- Dewar, R. D., Whetten, D. A., & Boje, D. 1980. An examination of the reliability and validity of the Aiken and Hage scales of centralization, formalization, and task routineness. *Administrative Science Quarterly*, 25: 120–128.
- Dietz, J., Pugh, S. D., & Wiley, J. W. 2004. Service climate effects on customer attitudes: An examination of boundary conditions. *Academy of Management Journal*, 47: 81–92.
- Dill, W. R. 1958. Environments as an influence on managerial autonomy. *Administrative Science Quarterly*, 2: 409–443.
- Dougherty, D. 1992. Interpretive barriers to successful product innovation in large firms. *Organization Science*, 3: 179–202.
- Egelhoff, W. G. 1991. Information-processing theory and the multinational enterprise. *Journal of International Business Studies*, 22: 341–368.
- Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic capabilities: What are they? *Strategic Management Journal*, 21: 1105–1121.
- Feldman, D. C. 1981. The multiple socialization of organization members. *Academy of Management Review*, 6: 309–318.
- Fisher, C. D. 1986. Organizational socialization: An integrative review. *Research in Personnel and Human Resource Management*, 4: 101–145.
- Galbraith, J. R., 1973. *Designing complex organizations*. Reading, MA: Addison-Wesley.
- Galunic, D. C., & Rodan, S. 1998. Resource recombinations in the firm: Knowledge structures and the potential for Schumpeterian innovation. *Strategic Management Journal*, 19: 1193–1201.
- Gersick, C. J. G., & Hackman, J. R. 1990. Habitual routines in task-performing groups. *Organizational Behavior and Human Decision Processes*, 47: 65–97.
- Gibson, C. B., & Birkinshaw, J. 2004. The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47: 209–226.
- Grant, E. S., & Bush, A. J. 1996. Salesforce socialization tactics: Building organizational value congruence. *Journal of Personal Selling & Sales Management*, 3: 17–32.
- Grant, R. M. 1996. Prospering in dynamically-competitive environments: Organizational capability as knowledge creation. *Organization Science*, 7: 375–387.
- Gupta, A. K., & Govindarajan, V. 2000. Knowledge flows within multinational corporations. *Strategic Management Journal*, 21: 473–496.
- Hage, J., & Aiken, M. 1967. Program change and organizational properties: A comparative analysis. *American Journal of Sociology*, 72: 503–519.
- Hage, J., & Aiken, M. 1969. Routine technology, social structure, and organization goals. *Administrative Science Quarterly*, 14: 366–376.
- Hansen, G. S., & Wernerfelt, B. 1989. Determinants of firm performance: The relative importance of economic and organizational factors. *Strategic Management Journal*, 10: 399–411.
- Hansen, M. T. 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44: 82–111.
- Henderson, R., & Cockburn, I. 1994. Measuring competence? Exploring firm effects in pharmaceutical research. *Strategic Management Journal*, 15: 63–84.
- James, L. R., Demaree, R. G., & Wolf, G. 1993.  $r_{wg}$ : An assessment of within-group interrater agreement. *Journal of Applied Psychology*, 78: 306–309.

- Janis, I. L. 1982. *Groupthink*. Boston: Houghton Mifflin.
- Jaworski, B. J., & Kohli, A. K. 1993. Market orientation: Antecedents and consequences. *Journal of Marketing*, 57(3): 53–70.
- Jones, A. P., Johnson, L. A., Butler, M. C., & Main, D. S. 1983. Apples and oranges: An empirical comparison of commonly used indices of interrater agreement. *Academy of Management Journal*, 26: 507–519.
- Jones, G. R. 1986. Socialization tactics, self-efficacy, and newcomer adjustments to organizations. *Academy of Management Journal*, 29: 262–279.
- Khandwalla, P. N. 1977. *Design of organizations*. New York: Harcourt Brace Jovanovich.
- Kogut, B., & Zander, U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, 3: 383–397.
- Kotha, S., & Nair, A. 1995. Strategy and environment as determinants of performance: Evidence from the Japanese machine tool industry. *Strategic Management Journal*, 16: 497–518.
- Lane, P. J., Koka, B., & Pathak, S. 2002. *A thematic analysis and critical assessment of absorptive capacity research*. Paper presented at the annual meeting of the Academy of Management, Denver.
- Lane, P. J., & Lubatkin, M. 1998. Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 19: 461–477.
- Lane, P. J., Salk, J. E., & Lyles, A. 2001. IJV learning and performance. *Strategic Management Journal*, 22: 1139–1161.
- Lin, X., & Germain, R. 2003. Organizational structure, context, customer orientation, and performance: Lessons from Chinese state-owned enterprises. *Strategic Management Journal*, 24: 1131–1151.
- Lyles, M. A., & Salk, J. E. 1996. Knowledge acquisition from foreign parents in international joint-ventures. *Journal of International Business Studies*, 27: 905–927.
- Lyles, M. A., & Schwenk, C. R. 1992. Top management, strategy and organizational knowledge structures. *Journal of Management Studies*, 29:155–174.
- March, J. G., & Simon, H. A. 1958. *Organizations*. New York: Wiley.
- Matusik, S. F. 2002. An empirical investigation of firm public and private knowledge. *Strategic Management Journal*, 23: 457–467.
- Matusik, S. F., & Hill, C. W. L. 1998. The utilization of contingent work, knowledge creation, and competitive advantage. *Academy of Management Review*, 23: 680–697.
- McGrath, R. G. 2001. Exploratory learning, innovative capacity, and managerial oversight. *Academy of Management Journal*, 44: 118–131.
- Morrison, E. W. 2002. Newcomers' relationships: The role of social network ties during socialization. *Academy of Management Journal*, 45: 1149–1160.
- Mumford, M. D. 2000. Managing creative people: Strategies and tactics for innovation. *Human Resource Management Review*, 10: 313–351.
- Nahapiet, J., & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23: 242–266.
- Neter, J., Wasserman, W., & Kutner, M. H. 1990. *Applied linear statistical models*. Homewood, IL: Irwin.
- Noe, R. A., & Ford, J. K. 1992. Emerging issues and new directions for training research. In G. R. Ferris & K. M. Rowland (Eds.), *Research in personnel and human resources management*, vol. 10: 345–384. Greenwich, CT: JAI Press.
- Pennings, J. M., & Harianto, F. 1992. The diffusion of technological innovation in the commercial banking industry. *Strategic Management Journal*, 13: 29–46.
- Perrow, C. 1967. A framework for the comparative analysis of organizations. *American Sociological Review*, 32: 194–208.
- Pierce, J. L., & Delbecq, A. L. 1977. Organization structure, individual attitudes and innovation. *Academy of Management Review*, 2: 27–37.
- Podsakoff, P. M., & Organ, D. W. 1986. Self-reports in organization research: Problems and prospects. *Journal of Management*, 40: 308–338.
- Randall, D. M. 1987. Commitment and the organization: The organization man revisited. *Academy of Management Review*, 12: 460–471.
- Rindfleisch, A., & Moorman, C. 2001. The acquisition and utilization of information in new product alliances: A strength-of-ties perspective. *Journal of Marketing*, 65: 1–18.
- Rowley, T., Behrens, D., & Krackhardt, D. 2000. Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal*, 21: 369–386.
- Sethi, R., Smith, D. C., & Park, C. W. 2001. Cross-functional product development teams, creativity, and the innovativeness of new consumer products. *Journal of Marketing Research*, 38: 73–85.
- Sheremata, W. A. 2000. Centrifugal and centripetal forces in radical new product development under time pressure. *Academy of Management Review*, 25: 389–408.
- Siggelkow, N. 2002. Evolution toward fit. *Administrative Science Quarterly*, 47: 125–159.
- Sorensen, J. B., & Stuart, T. E. 2000. Aging, obsolescence, and organizational innovation. *Administrative Science Quarterly*, 45: 81–112.
- Subramaniam, M., & Venkatraman, N. 2001. Determinants of transnational new product development capability: Testing the influence of transferring and

- deploying tacit overseas knowledge. *Strategic Management Journal*, 22: 359–378.
- Szulanski, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practices within the firm. *Strategic Management Journal*, 17: 27–44.
- Teece, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal*, 18: 509–533.
- Tsai, W. 2001. Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business-unit innovation and performance. *Academy of Management Journal*, 44: 996–1004.
- Van Den Bosch, F. A. J., Van Wijk, R., & Volberda, H. W. 2003. Absorptive capacity: Antecedents, models, and outcomes. In M. Easterby-Smith & M. A. Lyles (Eds.), *Handbook of organizational learning and knowledge management*: 278–301. Oxford, UK: Blackwell
- Van Den Bosch, F. A. J., Volberda, H. W., & De Boer, M. 1999. Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization Science*, 10: 551–568.
- Van Maanen, J., & Schein, E. H. 1979. Toward a theory of organizational socialization. In B. M. Staw (Ed.), *Research in organizational behavior*, vol. 1: 209–264. Greenwich, CT: JAI Press.
- Verona, G. 1999. A resource-based view of product development. *Academy of Management Review*, 24: 132–142.
- Volberda, H. W. 1996. Toward the flexible firm: How to remain vital in hypercompetitive environments. *Organization Science*, 7: 359–374.
- Volberda, H. W. 1998. *Building the flexible firm: How to remain competitive*. Oxford, UK: Oxford University Press.
- Volberda, H. W., & Van Bruggen, G. H. 1997. Environmental turbulence: A look into its dimensionality. In M. T. A. Bemelmans (Ed.), *Dynamiek in organisatie en bedrijfsvoering*: 137–146. Enschede, the Netherlands: NOBO.
- Weick, K. E. 1979. *The social psychology of organizing*. Reading, MA: Addison-Wesley.
- Withey, M., Daft, R. L., & Cooper, W. H. 1983. Measures of Perrow's work unit technology: An empirical assessment and a new scale. *Academy of Management Journal*, 26: 45–63.
- Zahra, S. A., & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27: 185–203.
- Zaltman, G., Duncan, R., & Holbek, J. 1973. *Innovations and organizations*. New York: Wiley.
- Zander, U., & Kogut, B. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization Science*, 6: 76–92.
- Zollo, M. M., & Winter, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13: 339–351.

## APPENDIX

### Scales and Items of Potential and Realized Absorptive Capacity<sup>a</sup>

#### Potential Absorptive Capacity

##### Acquisition

Our unit has frequent interactions with corporate headquarters to acquire new knowledge.

Employees of our unit regularly visit other branches.

We collect industry information through informal means (e.g. lunch with industry friends, talks with trade partners).<sup>b</sup>

Other divisions of our company are hardly visited. (reverse-coded)

Our unit periodically organizes special meetings with customers or third parties to acquire new knowledge.

Employees regularly approach third parties such as accountants, consultants, or tax consultants.

##### Assimilation

We are slow to recognize shifts in our market (e.g. competition, regulation, demography). (reverse-coded)

New opportunities to serve our clients are quickly understood.

We quickly analyze and interpret changing market demands.

#### Realized Absorptive Capacity

##### Transformation

Our unit regularly considers the consequences of changing market demands in terms of new products and services.

Employees record and store newly acquired knowledge for future reference.

Our unit quickly recognizes the usefulness of new external knowledge to existing knowledge.

Employees hardly share practical experiences. (reverse-coded)

We laboriously grasp the opportunities for our unit from new external knowledge. (reverse-coded)

Our unit periodically meets to discuss consequences of market trends and new product development.

##### Exploitation

It is clearly known how activities within our unit should be performed.

Client complaints fall on deaf ears in our unit.<sup>b</sup> (reverse-coded)

Our unit has a clear division of roles and responsibilities.<sup>c</sup>

We constantly consider how to better exploit knowledge.

Our unit has difficulty implementing new products and services. (reverse-coded)

Employees have a common language regarding our products and services.<sup>c</sup>

<sup>a</sup> All items were measured on a seven-point scale on which 1 was "strongly disagree" and 7 was "strongly agree."

<sup>b</sup> Adapted from Jaworski and Kohli (1993).

<sup>c</sup> Adapted from Szulanski (1996).





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