



# The Pandora's box of social integration mechanisms

## Can they make it more difficult to realize absorptive capacity?

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### Abstract

**Purpose** – The purpose of this paper is to perform empirical tests to explore the influence of social integration mechanisms on organizations' absorptive capacities theorized by Zahra and George.

**Design/methodology/approach** – This study uses a cross-sectional design to test the relationships between potential absorptive capacity, three social integration mechanisms (cross-functional teams, participation in decision making, and self-managing teams), and realized absorptive capacity, in a sample of 92 organizations that bid competitively to provide products and services to a US university.

**Findings** – An organization's use of cross-functional teams is negatively related to its realized absorptive capacity and negatively moderates the relationship between potential and realized absorptive capacity. Self-managing teams negatively moderate the relationship between an organization's potential absorptive capacity and its realized absorptive capacity.

**Research limitations/implications** – The cross-sectional design allows tests of relatedness but does not support cause-and-effect inferences.

**Practical implications** – Managers who follow the prescriptive implications of using social integration mechanisms to enhance their organization's absorptive capacity may actually hinder it. The type of social integration mechanism is an important consideration for managers of firm strategies.

**Originality/value** – This study extends and challenges the literature on absorptive capacity through its empirical analysis of the role of social integration mechanisms on an organization's absorptive capacity. Social integration mechanisms can have mixed moderating effects on the absorptive capacity development process, and potential absorptive capacity is not easily transformed into realized absorptive capacity. This study expands the context of absorptive capacity beyond R&D settings and incorporates a task environment that allows a direct linking of inputs and outputs.

**Keywords** Self managing teams, Team working, Absorptive capacity, Social integration mechanisms, Competitive advantage, Cross-functional teams, Participate decision making

**Paper type** Research paper

A firm's ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends is called its absorptive capacity (Cohen and Levinthal, 1990, p. 128). Since its introduction into the strategic management literature in the early 1990s, research on absorptive capacity has been used to explain how intrafirm knowledge sharing can improve firm competitiveness (Lenox and King, 2004), power relationships within and between firms can influence the absorption of new knowledge



(Todorova and Durisin, 2007), corporate restructuring creates learning opportunities (Bergh and Lim, 2008), firm socialization capabilities promote knowledge management processes (Jansen *et al.*, 2005), structural holes within firms can be bridged effectively (Tsai, 2001; Zaheer and Bell, 2005), technologies can be sourced effectively (Nicholls-Nixon and Woo, 2003), and how trust between joint venture partners and their parents leads to greater knowledge exploitation (Lane *et al.*, 2001). As the breadth and diversity of these studies imply, the introduction of “absorptive capacity” to the management literature provided a multifaceted construct capturing the combined abilities that comprise an organization’s proficiency in creating commercially exploitable opportunities from new external information (Lane *et al.*, 2006).

One decade later, however, a new, reconceived framework for absorptive capacity appeared in the strategic management literature. Drawing from the dynamic capabilities view (Eisenhardt and Martin, 2000; Teece *et al.*, 1997), Zahra and George (2002) divided absorptive capacity into two subconstructs: potential absorptive capacity, which consists of knowledge acquisition and assimilation activities, and realized absorptive capacity, which represents knowledge transformation and exploitation activities. This reconceptualization is similar to the original model of absorptive capacity in its depiction of the concept as a multi-stage set of processes dedicated to converting new, external knowledge into a form resource that creates exploitable value for the firm. The models differ, however, in their descriptions of how knowledge that a firm has acquired and assimilated becomes transformed and exploitable. In the Zahra and George (2002) model, the gap between potential absorptive capacity and realized absorptive capacity is bridged by social integration mechanisms. Although they did not offer a formal definition, social integration mechanisms are described as factors that contribute to knowledge processing by providing various means for distributing information and gathering interpretations across an organization. The increased awareness of the types of knowledge that constitute an organization’s potential absorptive capacity leads, in turn, to enhanced knowledge transformation and exploitation (Chaudhuri and Tabrizi, 1999; Sheremata, 2000; Zahra and George, 2002).

In the ten years that have followed the 2002 introduction of this reconceived construct, scant progress has been made toward understanding what social integration mechanisms are and what roles they play in moderating the relationship between potential and realized absorptive capacities (Todorova and Durisin, 2007). Only a few studies (e.g. Jansen *et al.*, 2005; Easterby-Smith *et al.*, 2008; Jones, 2006; Vega-Jurado *et al.*, 2008) have focussed on the internal processes by which firms develop their absorptive capacities, despite the progress such a focus can provide to normative models for managing absorptive capacity more effectively (Lane *et al.*, 2006). As the means for “building connectedness and shared meanings” within firms (Zahra and George, 2002), social integration mechanisms certainly qualify as important knowledge management activities related to absorptive capacity. Despite their presumed usefulness, the literature has largely ignored efforts to elaborate on and understand the role of social integration mechanisms (Todorova and Durisin, 2007).

Therefore, the purpose of this study is to present empirical tests of the boundaries to the influence of social integration mechanisms on organizational efforts to realize their absorptive capacities. While other empirical studies have focussed on antecedents to the knowledge acquisition, assimilation, transformation, and exploitation processes (e.g. Jansen *et al.*, 2005; Vega-Jurado *et al.*, 2008), we are not aware of any empirical tests of the moderating role of social integration mechanisms on absorptive capacity.

This study begins to fill this gap by providing direct empirical tests of the way in which selected social integration mechanisms influence realized absorptive capacity. We contribute to the literature by finding conditions in which social integration mechanisms hinder, rather than support, an organization's absorptive capacity; testing the relation between potential absorptive capacity and realized absorptive capacity; and expanding the context in which absorptive capacity is studied beyond the R&D laboratory to a competitive bidding setting.

This paper is organized as follows. First, we provide an overview of the theoretical evolution of the absorptive capacity construct. Next, we develop and empirically test hypotheses that challenge conventional assumptions regarding the relations between social integration mechanisms and realized absorptive capacity. We conclude with a discussion of the results and implications for researchers and practitioners.

### **Theory and hypotheses**

#### *Potential absorptive capacity and realized absorptive capacity*

In their review of prior research on absorptive capacity, Zahra and George (2002) observe that most empirical studies have found significant relationships between absorptive capacity and innovative output, as well as other outcomes that generally serve as proxies for a firm's successful exploitation of knowledge (i.e. realized absorptive capacity). In contrast, potential absorptive capacity has received disproportionately less empirical attention. Potential absorptive capacity provides firms with the strategic flexibility needed to develop a repertoire of ideas and interpretations that may be exploitable (Zahra and George, 2002). While no competitive organization exists for long without a complementary repertoire for realizing the commercial value of those ideas and interpretations, more ideas and interpretations of knowledge (i.e. potential absorptive capacity) can increase the likelihood that exploitable knowledge (realized absorptive capacity) will be created. Further, as firms engage in the exploitation of some particular form of knowledge, the firm's members are likely to develop even more new insights and to seek out additional new knowledge that they recognize as relevant during the exploitation process. In this way, realized absorptive capacity can provide a pull for increasing the level of potential absorptive capacity.

Vega-Jurado *et al.* (2008) contend that the distinction between potential absorptive capacity and realized absorptive capacity highlights two important factors: first, the complex nature of absorptive capacity and the difficulty of dening a direct global measurement system; and second, the diverse nature, even though interrelated, of these two components and the possibility that an organizational characteristics can have a positive effect on the development of a one component while having a negative or null effect on the other. We assert, along with Todorova and Durisin (2007), that the organizational characteristics of social integration mechanisms will have diverse effects on potential absorptive capacity and realized absorptive capacity.

#### *Social integration mechanisms*

The relationship between potential absorptive capacity and realized absorptive capacity is moderated by an organization's social integration mechanisms (Zahra and George, 2002). Social integration mechanisms connect employees in ways that make them aware of the types of data that constitute their potential absorptive capacity and promote information processing activities that apply this knowledge (Sheremata, 2000). Social integration mechanisms facilitate the distribution of knowledge within an organization and, at the same time, make the process of combining this knowledge

with existing skills and experience much easier (Vega-Jurado *et al.*, 2008). These mechanisms promote a free flow of information that allows a firm to transform and exploit the information it has more efficiently.

Zahra and George's (2002) fourth proposition clearly predicts that social integration mechanisms positively moderate the relationship between potential absorptive capacity and realized absorptive capacity (p. 192). In reality, however, social integration mechanisms do much more. Social integration mechanisms play multifaceted roles that promote the acquisition, assimilation, transformation, and exploitation of knowledge within a firm (Todorova and Durisin, 2007; Vega-Jurado *et al.*, 2008). Social integration is particularly important in enabling individuals with diverse knowledge to participate in the transformation of organizational knowledge (Hotho *et al.*, 2012).

Social integration mechanisms can include cross-functional teams, self-managing teams, participation in decision making, job rotation, and quality circles, among others. Some organizations have structures, such as cross-functional teams, job rotation, and quality circles, which encourage participation among employees and allow them to improve how their job is performed (Huselid, 1995). Social integration mechanisms can be formal or informal mechanisms, but they are generally associated with practices such as job rotation, quality circles, problem-solving methodologies (Vega-Jurado *et al.*, 2008), forms of participation inducement (Huselid, 1995), and use of cross-functional and self-managing teams (Mohrman *et al.*, 1995).

Job rotations are lateral transfers of employees between jobs in an organization (Campion *et al.*, 1994). Job rotation was originally conceived as a means for reducing boredom and fatigue in production jobs (Miller *et al.*, 1973; Walker and Guest, 1952), but became popular as a way to orient and place new employees (Campion *et al.*, 1994; Wexley and Latham, 1981). Job rotation can increase the effectiveness of knowledge absorption as it promotes the complementarity of experience in the firm (Cohen and Levinthal, 1990; Vega-Jurado *et al.*, 2008). Job rotation can be a form of organizational learning because it is positively related to skill acquisition (Campion *et al.*, 1994) and provides employers with opportunities to evaluate employees' skills in different job-specific activities (Ortega, 2001).

Quality circles are "small groups of volunteers from the same work area who meet regularly to identify, analyze, and solve quality and related problems in their area of responsibility" (Munchus, 1983, p. 255). A quality circle is a group of employees that meets regularly to solve problems affecting its work area such as improved quality, enhanced productivity, increased employee involvement, and decreased intentions to quit (Griffin, 1988; Lawler and Mohrman, 1985). These attributes make quality circles useful for promoting and managing employee participation in operational areas (Marks *et al.*, 1986; Munchus, 1983), yet, for most organizations, quality circles turned out to be nothing more than a fad (Lawler and Mohrman, 1985).

While job rotation and quality circles likely have the potential to contribute to an organization's absorptive capacity, their application in organizations typically is directed toward improving human resource-related outcomes such as organizational commitment and reduced turnover. Social integration mechanisms such as cross-functional teams, participation in decision making, and self-managing teams, in contrast, are frequently used for the specific purpose of problem solving. Cross-functional teams are groups of individuals who represent multiple organizational functions and are brought together for the purpose of integrating expertise from those functions to complete a project (Denison *et al.*, 1996). Participation in decision making involves joint decision making in which employees help to solve

organizational problems (Tjosvold, 1987). Self-managing teams are autonomous groups of interdependent individuals whose projects typically involve solving problems related to quality and productivity (Cohen and Ledford, 1994).

Problem solving is a central attribute of Cohen and Levinthal's (1990) conceptualization of absorptive capacity. Therefore, an integration of Cohen and Levinthal's (1990) conceptualization of absorptive capacity and Zahra and George's (2002) demands attention on social integration mechanisms that are oriented toward problem solving. While we do not regard the selection of these three particular mechanisms as all inclusive, we assert that they are sufficiently well established in the management literature as effective means for "building connectedness and shared meanings" within an organization and are therefore valid examples of Zahra and George's "social integration mechanisms" construct.

#### *Cross-functional teams*

Cross-functional teams are defined as groups of individuals who represent multiple organizational functions and are brought together for the purpose of integrating expertise from those functions to complete a project (Denison *et al.*, 1996). The goals of most cross-functional teams are usually related to reducing cycle times, creating knowledge, and disseminating organizational learning (Denison *et al.*, 1996; Nonaka and Takeuchi, 1995; Pinto and Slevin, 1988a,b). The logic behind the use of cross-functional teams is that team members will bring a sufficient diversity of viewpoints, disciplines, and functional specialties needed to make complex, non-routine decisions (Denison *et al.*, 1996; Fruin, 1996). Because of this functional diversity, members of cross-functional teams typically have different perspectives on important project attributes and on strategies for achieving the team's goals. Cross-functional teams differ from conventional teams in at least three important ways. First, each member of the team usually represents a separate subunit and therefore has a competing social identity and obligation to his or her "home" subunit of the organization (Alderfer, 1987; Denison *et al.*, 1996). Second, most cross-functional teams are temporary task teams that operate under conditions of high pressure and conflict (Denison *et al.*, 1996; Dougherty, 2001; Edmondson and Nembhard, 2009; Hackman, 2002). Third, cross-functional teams usually differ from conventional work teams in terms of performance expectations because they are typically tasked with non-routine, organization-level activities (Dougherty and Tolboom, 2008; Pinto *et al.*, 1993; Skilton and Dooley, 2010) rather than routine, function-specific responsibilities.

Recent studies of groups indicate that there is a persistent negative relationship between process conflicts (i.e. how teams accomplish their tasks) and group outcomes (de Wit *et al.*, 2012). In the context of cross-functional teams, process, and knowledge conflicts can make it more difficult for them to achieve their stated goals (Bechky, 2003). Further, the knowledge differences between members that make knowledge integration more difficult can be overcome only through the use of "deep dialog" and "significant resources and time" (Majchrzak *et al.*, 2012, p. 951). These mechanisms can facilitate the development of shared languages, interpretations, and understandings of cross-functional team members as they work together to make them more effective (Carlile, 2002; Slotegraaf and Atuahene-Gima, 2011). Few cross-functional teams, however, have these mechanisms or the time and resources to overcome their knowledge differences (Bechky, 2003; Edmondson and Nembhard, 2009). As a result, the inability to communicate effectively will have a negative effect on knowledge integration in most cross-functional teams (Bechky, 2003; Brown and Eisenhardt, 1997).

These attributes of cross-functional teams exacerbate the already difficult process of transferring knowledge between experts from different functional areas (Carlile, 2004; Carlile and Reberich, 2003; Dougherty, 2001; Lovelace *et al.*, 2001). The absence of a strong group identity with the cross-functional team and absence of routines for working together suggest that while a variety of information and perspectives may be introduced, there are few processes for shaping these diverse ideas into a cohesive solution that triggers action. In other words, divergent thinking may be strong, but convergent thinking is more problematic to accomplish. Cross-functional teams may be helpful in promoting potential absorptive capacity, but may be less effective in facilitating the transformation and exploitation of new information. Further, attempts by some firms to introduce knowledge sharing initiatives such as cross-functional teams have actually been counterproductive to expertise development (Oshri *et al.*, 2006). Therefore, an organization's use of cross-functional teams likely undermines an organization's realized absorptive capacity and the relationship between potential absorptive capacity and realized absorptive capacity. This leads to the following hypotheses:

*H1a.* An organization's use of cross-functional teams will be negatively related to its realized absorptive capacity.

*H1b.* An organization's use of cross-functional teams negatively moderates the relationship between potential and realized absorptive capacity.

#### *Participation in decision making*

Participation is defined as joint decision making in which employees are invited to help solve organizational problems (Tjosvold, 1987). Participation in decision making frequently is endorsed as a social integration mechanism that involves the vertical exchange of knowledge within an organization. Participation in decision making represents the extent to which subordinate employees take part in the decision-making processes that occur in higher levels of the organization's hierarchy (Hage and Aiken, 1967). This mechanism is different from the use of cross-functional teams, however, because participation in decision making emphasizes the vertical exchange of knowledge, while the interfaces within cross-functional teams stress lateral exchanges of knowledge.

Participation in decision making provides a mechanism through which managers and employees exchange ideas expressly in order to solve problems (Tjosvold, 1987, p. 739). An organization's use of participation in decision making is expected to increase the likelihood that decision-making participants will share their ideas, information, and knowledge. However, there are no guarantees that the decisions reached by group participants will lead to high-quality outcomes (Cotton *et al.*, 1988), and many studies of the relationship between participation in decision making and performance show that the effect is so small that it lacks *practical* significance (Wagner, 1994, p. 325, emphasis in original). The free exchange of information that occurs in participative decision making should contribute to an organization's potential absorptive capacity, but the absence of clear, productive ways to act upon this information may actually impede efforts to realize absorptive capacity. The pursuit of consensus or affective acceptance can reduce decision quality (Amason, 1996) and lead to groupthink (Janis, 1972). An organizational group may also decide to engage in ad hoc participation in decision making in situations where the use of existing routines would be more advantageous (Winter, 2003). In addition, an organization can extend participation in decision making to include individuals who

have low expertise, little competence in working with others to solve problems, or minimal commitment to organization goals which can lead to negative consequences from expanded participation (Vroom and Jago, 1988).

Recent studies support the claim that participative decision making can lead to the generation of more ideas, but that the relationship and process conflicts that occur in this mechanism are negatively related to decision quality and achievement of desired group outcomes (de Wit *et al.*, 2012). As is the case for cross-functional teams, effective use of the participative decision-making mechanism requires frequent and effective communication and cooperation (Bechky, 2003) among different constituencies in the organization. Further, because participative decision making typically involves the involvement of a group of individuals in decisions usually reserved for managers (Tjosvold, 1987), participative decision making is effective (or not) to the extent that managers are both willing and able to involve subordinates in the decision-making process (Somech, 2003; Thompson, 2007). These attributes suggest that participative decision making may indeed have positive influences on job satisfaction and task significance because it provides greater involvement by and insights to subordinates (Kim, 2002; Witt *et al.*, 2000; Wright and Kim, 2004), but that it may stand in the way of achieving important, time-sensitive organizational goals. Jansen *et al.* (2005), for example, cite research showing a negative effect of participation on new product development speed that stems from the difficulty of gaining consensus (Atuahene-Gima, 2003) and information processing efficiency (Cardinal, 2001). Consequently, organizations may fail to realize their absorptive capacity because they rely on participative processes that create poor-quality decisions or slow down processes directed toward knowledge exploitation. This leads to the following hypotheses:

*H2a.* An organization's use of participation in decision making will be negatively related to its realized absorptive capacity.

*H2b.* An organization's use of participative decision making negatively moderates the relationship between potential and realized absorptive capacity.

#### *Self-managing teams*

Self-managing teams are defined as groups of interdependent individuals that can self-regulate on relatively whole tasks (Cohen and Ledford, 1994; Cummings and Griggs, 1977; Goodman *et al.*, 1988). Such teams are frequently responsible for a complete product or service, or a major part of a production process (Cummings and Worley, 2005). The key characteristics of self-managing teams include employees with interdependent tasks who are responsible collectively for making a product or providing a service; employee discretion over decisions such as work assignments, work methods, and scheduling of activities (Goodman *et al.*, 1988); and an external leader who interacts with other parts of the organization to support the team's activities (Druskat and Wheeler, 2003). Members of self-managing teams have broad roles and are typically able to perform a variety of functions related to the team's output (Cummings and Worley, 2005; Wall *et al.*, 1986).

Self-managing teams can contribute new ideas, information, and knowledge to their organizations, yet too much flexibility and adaptability can get in the way of exploiting these ideas effectively. The very flexibility and adaptability that make self-managing teams effective can also be limiting and dysfunctional (Langfred, 2007). Instances of groupthink (Janis, 1972) or directive leadership can hurt team productivity

(Alper *et al.*, 1998; Barker, 1993; Kirkman and Shapiro, 2001; Moorhead *et al.*, 1998). Further, the high levels of autonomy that characterizes self-managing teams can hinder inter-group coordination, which in turn can hurt organizational performance (Ingvaldsen and Rolfsen, 2012). Even though self-managing teams frequently outperform more traditional forms of task completion (Cohen and Ledford, 1994), problems with inter-group coordination can actually counteract these performance gains at the level of the organization (Ingvaldsen and Rolfsen, 2012). Therefore, an organization's use of self-managing teams should be useful for its potential absorptive capacity but negatively affect its realized absorptive capacity. Further, the use of self-managing teams should negatively moderate the relationship between potential absorptive capacity and realized absorptive capacity:

*H3a.* An organization's use of self-managing teams is negatively related to realized absorptive capacity.

*H3b.* An organization's use of self-managing teams negatively moderates the relationship between potential and realized absorptive capacity.

### Setting and sample

Our sample population consists of the vendors who provide a large public US university in with products and services through a competitive bid process. The sample population is derived from the archived records of the focal university's purchasing documents for an entire fiscal year. This sample population was selected for several reasons. First, the population of vendors who provide products and services to the focal university ranges in size from single-individual, sole-proprietor organizations to multidivisional public companies. These differences in size make the sample representative of the overall population of commercial enterprises, which supports the generalizability of the study's findings. Second, archival data about the vendor organizations is readily available from the purchasing department of the focal university, providing details about contact information, organization location, and names of individuals who prepared bid documents. Third, the competitive bid process through which organizations compete for contracts allows a direct comparison of organizations that won bids and those that did not. Finally, the competitive bid process occurs under the conditions of deadlines that must be met in order to be considered as a prospective vendor and emphasizes the importance of managing external knowledge flows to enhance an organization's absorptive capacity and competitive advantage (Escribano *et al.*, 2009). The condition of deadlines helps to emphasize the aspect of temporal pacing that must be adopted by organizations that participate in bid competitions.

Under these conditions we argue that organizations that are awarded a purchase order by the university are considered to have realized their absorptive capacity (i.e. they were able to effectively transform new information acquired from the university and to exploit it in the form of an accepted bid), while those that are not awarded a purchase order are considered not to have adequately created exploitable knowledge from their potential absorptive capacity. In other words, our study captures instances in which firms acquired specific forms of external knowledge and combined them with their own unique stores of firm-specific knowledge and knowledge processes (i.e. absorptive capacity) to propose value-creating products or services in a competitive setting. Accordingly, the primary dependent variable of this study (realized absorptive capacity) is measured in terms of whether or not an organization



won a project through a competitive bid. The use of a “win” or “no-win” outcome is a relatively coarse measure for realized absorptive capacity, but it does capture instances of the relationship between social integration mechanisms and absorptive capacity.

## Method

### *Survey*

The target sample population for this study consists of the organizations that competitively bid to provide products or services worth \$25,000 or more to the focal university. The majority of these organizations consist of electronics, computing, scientific, and laboratory service vendors. These organizations rely on the outsourcing of specific services from their clients through competitive-bid contracts. These customers outsource certain services, such as information technology, laboratory, and other technical services that do not comprise the customers’ core activities, in order to reduce their own operating costs.

A search of bid documents made available by the focal university led to the identification of 136 organizations that competitively bid on work during the university’s most recently completed fiscal year. Individuals who were involved in the bid preparation process were identified by names and contact information listed on the archived procurement records. A listing of company names, addresses, phone numbers, individual contact information, status as a historically underutilized business (HUB), and contract size was created in a spreadsheet. A request to take the online survey containing measures for social integration mechanisms and potential absorptive capacity was e-mailed to one contact person from each organization. Of the 136 individuals who were initially contacted by e-mail, 92 completed the full survey. A separate request to take an online survey containing only the measures for potential absorptive capacity and control variables was sent to the contact individuals with instructions to forward the message to a manager in their organization. Responses from bid preparers and managers were matched by company and combined to reflect a single case for each responding organization. The final sample population of 92 complete responses from the initial pool of 136 organizations represents a 68 percent response rate.

### *Constructs and measures*

*Dependent variable:* the dependent variable in this study is realized absorptive capacity.

R&D plays a central role in Cohen and Levinthal’s (1990) conceptualization of absorptive capacity. Following their lead, most measures of a firm’s absorptive capacity have been based on proxies such as R&D intensity (Cohen and Levinthal, 1990; de Jong and Freel, 2010; Stock *et al.*, 2001), patenting productivity (Nicholls-Nixon, 1993), or other composite measures related to R&D activities (Escribano *et al.*, 2009).

In contrast to R&D intensity, which represents an input measure, patenting productivity represents an outcome measure that more accurately represents an organization’s transformation and exploitation of knowledge, both of which are outcomes of absorptive capacity. In other words, a patent represents a specific outcome in which an organization has transformed and exploited knowledge. This measure, however, does not translate to studies of organizations in non-R&D settings. Since patents are accepted indicators of instances in which organizations realize their absorptive capacities, and there is no widely accepted measure of realized absorptive capacity (Vega-Jurado *et al.*, 2008), particularly in non-R&D settings,

winning a contract through a competitive bid process is a suitable analog for measuring this outcome. Therefore, realized absorptive capacity is operationalized as a dummy variable of “1” for organizations who won a bid competition and “0” for those organizations that competed but did not win. Archives of university procurement records served as the source for this measure.

*Independent and moderator variables:* potential absorptive capacity was measured using the average of survey items adapted from Jansen *et al.* (2005) for knowledge acquisition and knowledge assimilation. Use of cross-functional teams was measured using three survey items (Denison *et al.*, 1996; Fruin, 1996; Holland *et al.*, 2000). Participation in decision making was measured using five survey items used previously by Black and Gregersen (1997). Self-managing teams was measured using a derivation of Goodman *et al.*'s (1988) definition of self-managing teams. Operationalizations for these constructs and Cronbach's  $\alpha$ 's for the measures are provided in the Appendix.

*Control variables:* consistent with empirical studies of absorptive capacity at the level of the organization (Chen, 2004; de Jong and Freel, 2010; Fernhaber and Patel, 2012; Minbaeva *et al.*, 2003; Lane and Lubatkin, 1998; Tsai, 2001), this study includes control variables for firm size. We also control for the number of competitors (e.g. Ucbasaran *et al.*, 2010; Un, 2011) and HUB status. Firm size is operationalized as the natural log of the number of employees. The number of competing firms was operationalized as the number of firms that competed in a particular bid competition,  $-1$ . The number of competing firms as a control variable mitigates potential biases that may be caused in instances where firms were awarded contracts with few or no competitors. Low values of competing firms may also indicate instances in which participating firms had unique insights such that no or few other firms would compete.

A HUB is “an entity with its principal place of business in Texas, and is at least 51% owned by an Asian Pacific American, Black American, Hispanic American, Native American and/or American woman who reside in Texas and have a proportionate interest and demonstrate active participation in the control, operations and management of the entity's affairs” (Texas Procurement and Support Services, 2005). We control for HUB because the “HUB” certification is assigned to minority and women-owned businesses that have historically been underrepresented in bidding opportunities provided by state organizations. Organizations were coded as “1” if they were HUB and “0” otherwise.

### Analysis

We performed binomial regression for tests of hypotheses. This is the appropriate method for regression analyses in which the dependent variable is binomial (Neter *et al.*, 1996). The first model introduces the effects of the control variables on the dependent variable. The second model adds the effects of potential absorptive capacity to the control variables. The remaining models step-wise add the direct and moderating effects of potential absorptive capacity and social integration mechanisms.

### Results

Table I presents the descriptive statistics and correlations of the measures used in this study. Table II presents the results of binomial regression of realized absorptive capacity on potential absorptive capacity and social integration mechanisms.

*H1-H3* in Table II test the main and moderating effects of social integration mechanisms on realized absorptive capacity. *H1a* predicted a negative main effect of

**Table I.**  
Descriptive statistics  
and correlations

	Mean	SD	1	2	3	4	5	6	7	
1	0.63	0.49	1							
2	5.51	0.83	0.01	1						
3	5.14	1.15	-0.08	0.24*	1					
4	5.93	0.73	-0.25*	0.15	0.13	1				
5	5.53	1.31	0.02	-0.03	0.39**	0.05	1			
6	0.32	0.47	-0.40**	-0.05	-0.04	0.05	0.03	1		
7	5.61	2.92	0.29**	0.12	0.08	-0.08	0.10	-0.23*	1	
8	4.52	4.91	-0.52**	0.02	-0.22*	0.22*	-0.30**	0.24*	-0.20***	1

Notes:  $n = 92$ . \* $p < 0.05$ , \*\* $p < 0.01$

	Model							
	0	1	2a	2b	3a	3b	4a	4b
Constant	1.60*	1.37	4.95****	-24.16*	4.60	27.50	4.06	23.20
HUB status	-1.71**	-0.17**	-1.79**	-2.22**	-1.69**	-1.63**	-1.58**	-1.49*
Firm size	0.19****	0.19****	0.22****	0.23****	0.18	0.17	0.21	0.16
No. of competitors	-0.33**	-0.33**	-0.42**	-0.55**	-0.32**	-0.33**	-0.40**	-0.40**
PCAP		0.04	0.20	5.72**	0.10	-3.71	0.00	-3.16
CFT			-0.81*	4.90*				
PCAP × CFT				-1.05**				
PDM					-0.59	-4.42		
PCAP × PDM						0.64		
SMT							-0.42	
PCAP × SMT								
-2Log likelihood	78.16	78.15	71.75	64.17	76.21	75.42	75.06	71.93
Cox and Snell $R^2$	0.37	0.37	0.42	0.46	0.39	0.39	0.39	0.42
Nagelkerke $R^2$	0.51	0.51	0.57	0.63	0.53	0.54	0.54	0.57
$n = 92$								

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; \*\*\*\* $p < 0.10$

cross-functional teams on realized absorptive capacity. In support of *H1a*, the main effect of cross-functional teams on realized absorptive capacity is negative and significant ( $p < 0.05$ ) in Model 1a. Model 1b shows that the main effects of both potential absorptive capacity and cross-functional teams are positive and significant ( $p < 0.01$  and  $p < 0.05$ , respectively), but that the moderating effect is negative and significant ( $p < 0.01$ ). *H1b* is supported.

*H2a* and *H2b* predicted negative main and moderating effects of participation in decision making on realized absorptive capacity. Model 2a shows that the main effect of participation in decision making is negative but not significant. Further, the moderating effect predicted in *H2b* was positive, rather than negative, though this effect was not significant either. *H2a* and *H2b* are not supported.

Model 3a shows that the effect of self-managing teams on realized absorptive capacity is negative, but not significant. In Model 3b, that negative effect becomes weakly significant ( $p < 0.10$ ), while the moderating effect of self-managing teams is positive and not significant. *H3a* is weakly supported, while *H3b* is not.

## Discussion

### *Contributions and implications*

This study extends the literature on absorptive capacity through its empirical analysis of the influence of social integration mechanisms on an organization's ability to realize its absorptive capacity and makes three major contributions to our understanding of this construct. First, we examine the conventional wisdom associated with the specific role of three common social integration mechanisms relative to the final stage in the absorptive capacity development process. Second, we demonstrate that potential absorptive capacity is not easily transformed into realized absorptive capacity. Third, we follow other scholars (e.g. Vega-Jurado *et al.*, 2008) who expand the context in which absorptive capacity is studied beyond a focus on R&D activities. We discuss these contributions in greater detail in the following paragraphs.

The reconceptualization of absorptive capacity championed by Zahra and George (2002) emphasizes the role of social integration mechanisms in moderating the transition of knowledge comprising an organization's potential absorptive capacity to its realized absorptive capacity. However, an untested assumption embedded in this expectation is that social integration mechanisms will have a uniformly positive influence on this relationship. We provide some evidence that challenges this assumption. We show, for example, that an organization's use of cross-functional teams relates positively to its realized absorptive capacity but negatively moderates the relationship between potential and realized absorptive capacity.

This study used measures for potential absorptive capacity that were reliable (Cronbach's  $\alpha = 0.80$ ) and used previously in empirical study of knowledge acquisition and assimilation (Jansen *et al.*, 2005). The main effects of potential absorptive capacity on realized absorptive capacity in this study, however, are mostly insignificant and are positive or negative depending on the inclusion of different social integration mechanisms. The effects of potential absorptive capacity on realized absorptive capacity appear to be magnified by the inclusion of social integration mechanisms by one to two orders of magnitude. These mixed results suggest that the roles of social integration mechanisms in absorptive capacity are more varied and complicated (e.g. Easterby-Smith *et al.*, 2008; Todorova and Durisin, 2007) than that proposed by the Zahra and George model. Consequently, these findings suggest that a more nuanced

understanding of social integration benefits and liabilities is needed to effectively shape a firm's potential for managing its absorptive capacity.

This study also responds to criticisms that absorptive capacity literature has tended to examine the construct solely in an R&D context and that few studies have examined the role of absorptive capacity in other types of business-related knowledge (Lane *et al.*, 2001, 2006; Vega-Jurado *et al.*, 2008). The variety of the types of firms in this study and the focus on managerial issues rather than research and development issues extends the generalizability of this construct beyond the boundaries of empirical studies that are limited to an R&D context. Thus, this study highlights the importance of knowledge flow mechanisms and alternative sources of knowledge for firm innovation (e.g. Santamaria *et al.*, 2009). This study thereby tests the more generalizable conceptualization of absorptive capacity prescribed by Zahra and George (2002).

A further contribution of this study is its incorporation of the exploratory measures Jansen *et al.* (2005) created in their study of antecedents of absorptive capacity. They assert that "(i)n future studies, researchers may also try to measure dimensions of absorptive capacity using objective measures and relate these to our measures" (2005, p. 1011). Our objective measure of a bid win is more precise than aggregated financial or research productivity measures used in previous empirical studies of absorptive capacity (e.g. Bergh and Lim, 2008; George *et al.*, 2001; Kostopoulos *et al.*, 2011; Lane *et al.*, 2001; Zahra and Hayton, 2008). While these studies make important contributions to our understanding of absorptive capacity, the present study provides a closer examination of the relationship between potential absorptive capacity, social integration mechanism, and the incremental "wins" that provide evidence of firms' abilities to exploit knowledge.

Finally, we were intrigued by the relationships between HUB status, number of competitors, and realized absorptive capacity. HUB status was positively and significantly correlated with the number of competitors in a given bid competition, indicating that HUB-designated firms tended to pursue projects that many other firms also chose to pursue. The negative, significant relationships between HUB status and firm age and realized absorptive capacity may also suggest that HUB-designated firms lack an appropriate level of absorptive capacity necessary for winning in bidding competitions, though this finding might be attributable to the smaller size of most HUB-designated firms. This finding contradicts previous studies that suggest public procurement processes benefit smaller firms (e.g. Aschhoff and Sofka, 2009). From a policy standpoint, organizations that have an HUB designation may benefit from training programs that help them develop their absorptive capacities. From a research standpoint, future studies might investigate the microfoundational antecedents of absorptive capacity (e.g. Volberda *et al.*, 2010) by addressing measures related to the human capital of such firms.

### *Limitations*

This study has some limitations that should be acknowledged along with its contributions. Tests of the roles of the participation in decision making and self-managing teams suggested negative effects on realized absorptive capacity, but these tests were not conclusive. In addition, while the method used in this study attempted to make direct links between potential and realized absorptive capacity by focussing on specific competitive bids, this study does not capture the temporal precedence needed to declare cause-and-effect relations.

This study uses a binomial, win/loss dependent variable to measure realized absorptive capacity. Using such a measure allows the linkage between a firm's

potential absorptive capacity, social integration mechanisms, and the outcome in discrete events in terms of exploitation; the organization either won or lost the competitive bid. At the same time, binomial variables tend to be coarse measures. Future studies wishing to focus on the competitive bidding process might aggregate the win-loss records of a population of firms.

The sample population used in this study consists primarily of electronics, computing, scientific, and laboratory service vendors. Because this sample population is focussed on the provision of technical services, rather than non-technical products or services, the results of this study may not be generalizable beyond this grouping of firms. Further, the results may not be generalizable in more traditional empirical settings such as R&D-intensive organizations.

#### *Future research*

Three specific social integration mechanisms that are commonly used in most organizations had differing effects on realized absorptive capacity. While this study provides a useful first step toward unraveling the complex relationships between social integration mechanisms and absorptive capacity, the literature in organizational learning (Cepeda-Carrion *et al.*, 2012, Lane and Lubatkin, 1998; Levin, 2000; Mowery *et al.*, 1996; Szulanski, 1996; Tyre and von Hippel, 1997; von Hippel, 1994; Zollo and Winter, 2002) and new product development (Atuahene-Gima, 2003; Nord and Tucker, 1987; Sheremata, 2000) suggests that there are perhaps hundreds of different processes that qualify as “social integration mechanisms.” Future research should address other commonly used social integration mechanisms.

This study applied a cross-sectional design to the relationship between potential absorptive capacity, realized absorptive capacity, and social integration mechanisms. Future studies should explore longitudinal designs that provide insights into the feedback loops within an organization’s absorptive capacity building processes (Lane *et al.*, 2006; Todorova and Durisin, 2007). An organization learns from the success or failure of its exploitation efforts, and this feedback from the external environment surely influences an organization’s knowledge acquisition and assimilation processes (aka potential absorptive capacity).

Recent studies have found factors other than social integration mechanisms that affect the relationship between potential absorptive capacity and realized absorptive capacity. Cepeda-Carrion *et al.* (2012), for example, find that this relationship is mediated by information systems and an “unlearning” capability (e.g. McGill and Slocum, 1993; Nystrom and Starbuck, 1984). Information systems can provide a means for “building connectedness and shared meanings” within an organization (Zahra and George, 2002), but an “unlearning” context seemingly implies a means for destroying connectedness and shared meanings because it involves eliminating organizational memory (Akgün *et al.*, 2007). An organization’s absorptive capacity may require an unlearning dimension to help it avoid competency traps (Leonard-Barton, 1992; Levinthal and March, 1993).

The concept of absorptive capacity has many similarities to the literature on organizational learning, suggesting that they share a “conceptual affinity” (Sun and Anderson, 2010, p. 130). Indeed, Volberda and colleagues assert that the origins of absorptive capacity arose from the organizational learning literature of the 1980s emphasizing the role of research and development in organizational learning (Fiol and Lyles, 1985; Levitt and March, 1988). The concepts of organizational memory and unlearning (Akgün *et al.*, 2007; McGill and Slocum, 1993; Nystrom and Starbuck, 1984)

and a potential, yet unexplored, link between absorptive capacity and competency traps (Leonard-Barton, 1992; Levinthal and March, 1993) offer intriguing paths for future research and a richer understanding of both concepts. Future studies could explore whether absorptive capacity and organizational learning (Crossan and Berdrow, 2003; Crossan *et al.*, 1999) might be further integrated (e.g. Sun and Anderson, 2010) or better delineate borders between the two constructs (e.g. Bacharach, 1989).

### Conclusion

This study tested the relationship between social integration mechanisms and realized absorptive capacity in an attempt to find boundary conditions for the reconceptualization of absorptive capacity (Zahra and George, 2002). We find that there are indeed social integration mechanisms that can impede an organization's ability to realize its absorptive capacity. These findings call into question common assumptions regarding the uniformly positive consequences of increasing a firm's social integration mechanisms and provide empirical support for Todorova and Durisin's (2007) assertion that social integration mechanisms can introduce a "Pandora's Box" of liabilities as well as benefits.

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### Appendix. Survey measures used for this research

All of the survey items employ seven-point Likert scales, ranging from "1" ("strongly disagree") to "7" ("strongly agree").

#### *Potential absorptive capacity*

- (1) our organization has frequent interactions with corporate headquarters to acquire new knowledge;
- (2) we collect industry information through informal means (e.g. lunch with industry friends, talks with trade partners);
- (3) our organization periodically organizes special meetings with customers or third parties to acquire new knowledge;
- (4) we are slow to recognize shifts in our market (e.g. competition, regulation, demography) (reverse coded);
- (5) we are quick to understand new opportunities to serve our customers; and
- (6) we quickly analyze and interpret changing market demands.

Cronbach's  $\alpha$ : 0.800.

#### *Cross-functional teams*

When engaged in the process of preparing bid documents for universities I ...:

- (1) frequently work on a team composed of individuals who represent different areas of specialization;
- (2) frequently work as part of a group of people who apply different skills to reach a common goal; and
- (3) frequently work as part of a team whose members bring a variety of different viewpoints, disciplines, and functional specialties.

Cronbach's  $\alpha$ : 0.945.

*Participation in decision making*

During the preparation of bid documents for universities, I am responsible for...:

- (1) identifying significant issues or problems to work on;
- (2) generating possible solutions to a specific problem;
- (3) selecting specific solutions;
- (4) planning the implementation; and
- (5) monitoring the results and success.

Cronbach's  $\alpha$ : 0.952.

*Self-managing teams*

During the preparation of bid documents for universities...:

- (1) ...I act as part of a team that has a collective responsibility for work outcomes;
- (2) ...I act as part of a team that has a collective responsibility for monitoring its own performance; and
- (3) ...I act as part of a team that has a collective responsibility for managing its own performance.

Cronbach's  $\alpha$ : 0.956.

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