THE ROLE OF BRICOLAGE IN TRIGGERING EXPLORATION AND EXPLOITATION IN SMALL AND MEDIUM-SIZED ENTERPRISES

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THE ROLE OF BRICOLAGE IN TRIGGERING EXPLORATION AND EXPLOITATION IN SMALL AND MEDIUM-SIZED ENTERPRISES

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Abstract

This study proposes that small and medium enterprises (SME) make use of entrepreneurial bricolage, to reconcile the tensions between exploration and exploitation and pursue ambidextrous strategies. Moreover, we examine how two top management team (TMT) attributes, namely networking ability and cognitive diversity, enhance firms’ ability to engage in bricolage successfully. Lastly, we test a mediated model, exploring direct and indirect effects (mediated by bricolage) of these two TMT attributes on organizational ambidexterity. We tested these hypotheses on a cross-industry sample of 237 SMEs. The results provide substantial support for our hypotheses.

Introduction

Extant research emphasizes the role of organizational ambidexterity for firm financial performance (Tushman and O’Reilly, 1996; Junni et al., 2013). To achieve ambidexterity, firms do not only have to compete in mature markets and technologies, where efficiency, control and incremental improvements are required, they also need to enter new markets, where flexibility, autonomy and experimentation are needed (O’Reilly and Tushman, 2013). For small and medium-sized enterprises (SMEs) it is even more challenging to attain ambidexterity because these firms often lack the necessary resources and managerial capabilities to sustain such complex processes (Voss and Voss, 2013). As a result, ambidextrous SMEs have to find non-conventional ways to manage their scarce resources and preserve their financial stability. A creative resourcing behavior that could enable SMEs to reconcile the tensions between exploration and exploitation is entrepreneurial bricolage.

Bricolage, refers to “making do by applying combinations of the resources at hand to new problems and opportunities” (Baker and Nelson, 2005), challenges objectivist views on resource construction. Bricolage theory posits that resources are socially constructed and that firms may overcome the objective limitations of their resource environments by combining and using the resources “at hand” for purposes they were not originally intended for. Several qualitative studies suggest bricolage is beneficial for firm performance and survival, in particular for young firms that lack a convincing track record, or firms operating in resource constrained environments (Halme, Lindeman and Linda, 2012; Garud and Karnøe, 2003, Baker and Nelson, 2005; Mair and Marti, 2009).

Our understanding of bricolage is however limited in two ways. First, there is little empirical evidence to explore how the use of bricolage impacts firm outcomes. A commendable exception is the study by Senyard and colleagues (2013) reporting a positive effect of the use of bricolage on firm innovativeness in a large sample of new firms. Second, little attention has been given to the
characteristics of bricoleurs (Duymedjian and Rüling, 2010). While several attributes of bricoleurs emerge from qualitative studies, such as resourcefulness (Halme et al., 2012), “persuasiveness” (Di Domenico, Haugh and Tracey, 2010) or creativity (Baker and Nelson, 2005), there is still limited insight into how entrepreneurs or managers can engage in bricolage successfully.

This study has three main contributions to management research. First, it contributes to the discussion on how SMEs can attain ambidexterity. Achieving ambidexterity is generally difficult due to inherent conflicts between exploratory and exploitative processes, which compete for limited internal resources and require paradoxical behaviors (Simsek et al., 2009; Andriopoulos and Lewis, 2009). SMEs targeting ambidexterity also have to overcome considerable resource constraints and may lack the managerial capabilities to effectively balance exploration and exploitation. While ambidexterity is beneficial for the performance of SMEs (Lubatkin et al., 2006; Voss and Voss, 2013), it is not clear how managers of SMEs can attain ambidexterity (O’Reilly and Tushman, 2013; Birkinshaw and Gupta, 2013). We direct our attention to the emerging strand of literature on entrepreneurial bricolage to explore whether managers in SMEs can use this creative resourcing behavior to overcome resource constraints and resolve the paradoxes associated with pursuing an ambidextrous strategy.

Second, this study contributes to the literature on entrepreneurial bricolage by examining the effect of top management team (TMT) attributes on entrepreneurial bricolage. If bricolage is a desirable way of managing resources in SMEs, the question arises how these companies can successfully engage in bricolage. Several studies signal the importance of individual characteristics of managers or entrepreneurs in sustaining bricolage activities. For instance, Halme and colleagues (2012) propose that bricolage requires a mindset of resourcefulness to be effective. Baker and Nelson (2005) also emphasize that bricoleurs require networking skills to access the resources “at hand”, (i.e., that are available in their social networks). However, to our knowledge, no study has empirically examined (top) management or entrepreneurial team characteristics that are conducive to entrepreneurial bricolage. In line with Sonenshein (2013), we start from the premise that managerial action plays an important role in how firms make creative use of resources. In our study we focus on two TMT attributes, namely TMT networking ability and TMT cognitive diversity. We examine how these two attributes, representing a team's level of human and social capital, affect bricolage.

Third, this study provides additional insight into how SMEs make use of their managerial capabilities to attain ambidexterity, by exploring direct and indirect effects of TMT characteristics on organizational ambidexterity. While ambidexterity largely depends on managerial capability, there is little understanding of how executives deal with the tension between exploratory and exploitative innovation (Birkinshaw and Gupta, 2013; O’Reilly and Tushman, 2013; Cao, Simzek and Zhang, 2010). Bricolage may enable managers to reconcile some of the paradoxes associated with ambidexterity by alleviating resource constraints and challenging objective purposes and limitations of resources. Consequently, management teams may be able to pursue ambidexterity, by using their cognitive skills and social networks, to engage in bricolage, as a creative resourcing behavior. By including bricolage as a mediator, we gain a better understanding of how the attributes of top management team members influence the way in which they manage their resources, which in turn affects organizational ambidexterity.
The remainder of this paper is structured as follows. The next section offers an overview of the theory and our hypotheses. The subsequent section covers our data collection and measures. The third section includes our analyses and the last section our main conclusions and implication of our study.

Theoretical Background

Ambidexterity in SMEs

Organizational ambidexterity, defined as the ability of firms to exploit current competencies and explore new opportunities with equal dexterity (Lubatkin et al., 2006), relates positively to firms’ financial performance (Tushman and O’Reilly, 1996; Jinni et al., 2013). However, ambidexterity is difficult to achieve, due to inherent conflicts between exploratory and exploitative processes, which compete for limited internal resources and require paradoxical behaviors (Andriopoulos and Lewis, 2009; Simsek et al., 2009; March, 1990). Thus, firms have a natural tendency to focus either on exploration or on exploitation, but not on both (Henderson and Clark, 1990; Levinthal and March, 1993). Andriopoulos and Lewis (2009) identify three paradoxes of innovation that entrepreneurs have to reconcile to attain ambidexterity. One paradox concerns the firm’s strategic intent, and the apparent opposition between profitability and breakthrough. On the one hand, firms have to make efficient use of their resources and ensure stable revenues from existing customers. On the other hand, firms have to take risks and sustain long term adaptability. Another paradox regards the customer orientation, captured by tight versus loose coupling. Tight coupling involves a strong focus on meeting customers’ requirements, which in turn guarantees customers’ satisfaction and loyalty. However, a loose coupling emphasizes innovation beyond customers’ current needs, and enables firms to extend their knowledge base, probe new products and technologies and pursue new opportunities. A final paradox refers to the personal drivers of employees and the relative contrast between discipline and passion. A culture of discipline is important because it promotes execution of processes in a timely manner, and focus on the deadlines and goals of the firm. Nonetheless, a culture that encourages passionate, expressive work is more likely to lead to employee creativity and originality.

Larger firms can manage some of these contradictory processes through structural ambidexterity, by creating separate business units, some focusing exclusively on exploitation, and some on exploration (Tushman and O’Reilly, 1996; Benner and Tushman, 2003; Jansen et al., 2009; O’Reilly and Tushman, 2004). For smaller firms however, structural ambidexterity is rarely a financially viable alternative (March, 1991). Contextual ambidexterity, defined as the behavioral ability to demonstrate alignment and adaptability across the same structural unit (Gibson and Birkinshaw, 2004) poses other demands on smaller firms. SMEs may not have the necessary resources and managerial capabilities to accommodate concomitant exploratory and exploitative processes (Voss and Voss, 2013). Lubatkin and colleagues (2006) conducted the first empirical study on ambidexterity in SMEs and find a positive effect of ambidexterity on firm financial performance. They identify TMT behavioral integration (defined as the extent to which members collaborate, share information and take decisions jointly) as an important antecedent of ambidexterity in SMEs. Overall, their study is consistent with the idea that SMEs have to rely to a greater extent on the capabilities of their TMTs to pursue ambidextrous strategies as compared to larger companies. Voss and Voss (2013) adopt a contingency approach and examine under what circumstances ambidexterity is beneficial for the performance of SMEs in the non-
profit professional theatre industry in the US. They find general support for the positive effect of ambidexterity on the performance of SMEs; nonetheless, this effect varies depending on the firms’ size and age, and on the strategic combinations of exploration and exploitation in both market and product domains. While it is generally acknowledged that for SMEs it is even more challenging to engage in organizational ambidexterity successfully (Cao et al., 2009; Voss and Voss, 2013), there is limited insight into how SMEs can attain ambidexterity (Lubatkin et al., 2006).

**Entrepreneurial Bricolage**

Bricolage enables firms to orchestrate their resources “by applying combinations of the resources at hand to new problems and opportunities” (Baker and Nelson, 2005). In bricolage “making do” represents a bias for action, suggesting that bricoleurs pursue new challenges and opportunities, even though their resource base may not seem sufficient. The “resources at hand” refer to existing resources the company already acquired or resources that are available for the company at no or low cost. Resources at hand also include resources freely available in the bricoleurs network (Baker, Miner and Easley, 2003). The combination of existing resources typically involves using resources for purposes they were not originally designed for. Thus, bricolage enables entrepreneurs to pursue new opportunities without having to acquire resources externally. Bricolage is an alternative to optimization, which involves the use of standard resources that have proven capabilities for the specific application for which the resources are intended (Desa and Basu, 2013; Baker, 2007).

Research suggests that bricolage is beneficial for company performance or survival, in particular for young firms (Fisher, 2012), small firms (Baker and Nelson, 2005), and firms operating in environments with low munificence (Halme et al., 2012, Garud and Karnoe, 2003; Di Domenico et al., 2010; Mair and Marti, 2009). Some fundamental insights emerge from these qualitative studies. First, bricolage may enable firms to overcome resource constraints (Di Domenico et al, 2010) and institutional barriers (Mair and Marti, 2009), which in turn should positively impact their survival and performance. Second, the extent to which firms can apply bricolage successfully depends on the capabilities of their managers or founders (Baker and Nelson, 2005; Halme et al., 2012). For instance Halme and colleagues (2012) propose that bricoleurs should have a mindset of “resourcefulness”. Baker and Nelson (2005) also note that bricolage elicits creativity and improvisation, while Duymedjian and Rüling (2010) signal the importance of resilience. Third, in line with constructivist views, networks play an important role in sustaining entrepreneurial bricolage. Baker and colleagues (2003) examine the process through which entrepreneurs make use of their networks to access resources “at hand”. Stakeholders’ participation is facilitated by the persuasiveness (Di Domenico et al., 2010) and social skills (Baker and Nelson, 2005) of bricoleurs.

However, few studies have empirically examined the antecedents and consequences of entrepreneurial bricolage. A few of studies investigate the institutional determinants of bricolage in the context of social firms (Desa, 2010; Desa and Basu, 2013). Social firms are more likely to engage in bricolage when they operate in countries with low technological development and high costs of doing business through formal channels (Desa, 2010). The use of bricolage also has a U-shaped relationship with the macro-environment munificence and the size and age of the social firm (Desa and Basu, 2012). Senyard and colleagues (2013) find that bricolage relates positively to the innovativeness of new firms (i.e. nascent firms and young firms), confirming theories on the role of bricolage in overcoming resource constraints.
Bricolage and Ambidexterity

Acquiring sufficient resources for pursuing exploitation and exploration is particularly challenging for smaller organizations (Cao et al., 2009; Voss and Voss, 2013). SMEs experience difficulties in accessing external funding due to liabilities of newness and smallness, which lead to information asymmetries between entrepreneurs and investors (Winborg and Landström, 2001; Bhide, 1992). Even when they manage to attract external financing, SMEs generally have to accommodate higher costs of capital compared to larger, more established organizations. As a result, SMEs are confronted with higher resource constraints when building and pursuing ambidextrous strategies. We propose that ambidextrous SMEs will find ways to creatively use their available resources and overcome their resource limitations, which can be achieved through entrepreneurial bricolage.

There are several reasons to expect a positive relationship between the use of bricolage and ambidexterity. First, bricolage alleviates resource constraints by promoting the use of the resources at “hand” to pursue new opportunities (Senyard et al., 2013). This entails that firms engaging in bricolage can either pursue a larger number of projects or projects with higher expected returns and greater resource requirements, than firms not using bricolage. A related implication is that bricoleurs will refrain from waiting for the “right” bundle of resource, and instead take action to pursue a promising opportunity. Ambidextrous firms have to sustain a greater range of projects, to be able to exploit current competences and explore new opportunities simultaneously. Because firms involved in bricolage have the possibility to engage in a wider range of strategic initiatives or pursue initiatives with higher expected returns, they may be more willing and better equipped to balance exploration and exploitation activities.

Second, bricolage may foster a culture of “resource alertness” that is beneficial for the efficient use of resources within the firm. Resource management, defined as “the process of structuring the firm’s resource portfolio, bundling the resources to build capabilities and leveraging those capabilities with the purpose of creating and maintaining value for customers and owners” (Sirmon, Hitt and Ireland, 2007) offers a comprehensive framework to understand how bricolage can impact different stages in the value creation process. Resource management is important because it can produce different outcomes for firms holding similar resources and facing similar environmental contingencies (Zott, 2003). Bricolage affects the resource portfolio, encompassing all the resources controlled by a firm, by influencing the way resources are structured and bundled. Bricolage enables firms to acquire resources “at hand”, via their personal networks (Baker et al., 2003), instead of acquiring standard resources at market price. At the same time, bricolage facilitates the development of resources internally; due to its emphasis on existing resources, bricolage may allow a more in depth understanding of what resources are available and how they can be used efficiently. Lastly, bricolage may contribute to the efficient bundling and divesting of resources. Bricoleurs are more alert to the way they use resources; thus they may be better able to bundle their resources efficiently. In addition, they are more likely to identify the resources that do not contribute to value creation and either divest them or re-allocate them to other activities. In the context of SMEs pursuing ambidextrous strategies, efficient and dynamic use of resources enables firms to reconcile competing demands for limited resources. Because firms engaging in bricolage constantly challenge the limitations and purposes of resources, they may be better able to allocate their resources efficiently between exploratory and exploitative activities within the firm.
Third, bricolage involves the creative and flexible combination of resources, which should improve the resource allocation and re-allocation within the firm. Bricoleurs combine resources “at hand” and use them creatively for purposes they were not originally intended for. These combinations can lead sometimes to what Levi-Straus called “brilliant unforeseen results” (1967, p.17). In their study on the Danish wind-turbine industry, Garud and Karnøe (2003) describe how actors creatively combined scavenged resources for novel purposes, and managed to develop an innovative product, capable of competing with products with considerably higher R&D costs. Baker and Nelson (2005) also offer a rich depiction of how bricoleurs combine their scarce resources creatively to create “something from nothing”. In turn, the creative and flexible bundling of resources leads to a wide array of resource configurations which can be used to balance exploratory and exploitative activities. Because achieving ambidexterity is contingent on a firm's ability to orchestrate the allocation of resources across exploitation and exploration activities (Smith and Tushman, 2005; O'Reilly and Tushman, 2013), and because bricolage should free up resources for competing activities and improve resource allocation in general, we predict that bricolage will increase organizational ambidexterity. Thus, we hypothesize:

**Hypothesis 1: Bricolage is positively related to a firm’s ambidexterity.**

**TMT Attributes and Bricolage**

Qualitative studies on bricolage provide consistent support for the idea that resource environments are socially constructed and that different stakeholders are involved in the resource mobilization process (Baker et al., 2003; Baker and Nelson, 2005; Di Domenico et al., 2010). To take advantage of their networks, bricoleurs require networking abilities (Baker and Nelson, 2005). We define the networking ability of the TMT, as the team’s ability to build relationships with key stakeholders, and extract value from these relationships (Semrau and Sigmund, 2012). Management teams that emphasize networking should be better able to access resources available “at hand” in their existing networks (Baker, 2007; Di Domenico et al., 2010). For instance, Baker and colleagues (2003) show that bricoleurs hire most of the early employees directly via their network. At the same time, management teams can use their networking ability to expand their existing network, and thus increase the portfolio of resources available “at hand” in their network. A potential benefit of network expansion is the increased likelihood of discovering scavenged resources (i.e. discarded resources that are not used by any stakeholder), that may prove valuable for the firm. Management teams that invest considerable time and effort in networking are likely to have access to strategic information (i.e. about new technologies, competition, market changes). This in turn should enhance their ability to identify new opportunities before their competitors, which can be pursued by making use of entrepreneurial bricolage. Lastly, management teams may use their networking abilities to gain legitimacy for their firm, by inducing key stakeholder participation. Di Domenico and colleagues (2010) find that bricoleurs create, extend and strengthen relationships with relevant stakeholders, which enhances the legitimacy of their social firms and the support they receive. To conclude, the networking ability of the TMT should enhance the firm’s access to resources “at hand”, its exposure to valuable information and new opportunities and its ability to gain legitimacy. Thus, we hypothesize:

**Hypothesis 2: TMT networking ability is positively related to bricolage.**
While social networking skills enable firms to expand their portfolio of “resources at hand” and gain support and expertise from various stakeholders, top management teams can also build on their own skills and expertise to identify new opportunities, and combine their resources to pursue them. Management teams with diverse skills and knowledge benefit from a wider range of perspectives and experiences and show more creativity in their work (Van der Vegt and Janssen, 2003; Woodman, Sawyer and Griffin, 1993). As a result, diverse management teams may be better able to identify out-of-the-ordinary uses for existing resources and creative ways of combining them. In addition, diverse teams use a wider range of information and exhibit more depth in information use (Dahlin, Weingart, and Hinds, 2005). Consequently, diverse TMTs may be better equipped to identify promising market opportunities and more willing to take action to pursue them, even despite objective resource limitations. TMT cognitive diversity, which captures differences among TMT members in terms of knowledge, values and skills (Van der Vegt and Janssen, 2003), should then have a positive effect on bricolage, because it is associated with greater creativity in resource use and higher likelihood of identifying and pursuing new strategic initiatives. Thus, we hypothesize:

**Hypothesis 3:** TMT cognitive diversity is positively related to bricolage.

**The Mediating Role of Bricolage**

In addition to the inherent resource constraints encountered by SMEs targeting organizational ambidexterity, TMT members also have to accommodate the different processes and behaviors associated with exploration and exploitation (Birkinshaw and Gupta, 2013). A key tenet of prior research is that managers have to consider rich and diverse information to avoid managerial myopia and sustain ambidexterity (Lubatkin et al., 2006; Smith and Tushman, 2005). Managers of ambidextrous firms can make use of their networks to access information about the firm’s internal and external environment (Raisch et al., 2009; Simzek, 2009). Cao and colleagues (2010) show that CEOs with extensive external networks are better able to identify additional valuable resources that reside outside of the firm and, as a result, to properly mobilize resources to support ambidextrous initiatives. Due to these benefits, TMT members as a group are likely to put effort in building and cultivating relationships with key stakeholders, and extract value from them. Thus, TMT networking ability, defined as the team’s ability to build relationships with key stakeholders, and extract value from these relationships (Semrau and Sigmund, 2012), should stimulate ambidextrous performance. Top management teams that are skilled and invest time and effort in networking will be more likely to access relevant information and identify valuable resources that can sustain ambidexterity. In addition, the first two hypotheses developed in this study suggest a positive effect of bricolage on ambidexterity, and of TMT networking ability on bricolage, respectively. For these reasons, we propose that TMT networking ability has both a direct effect on organizational ambidexterity and an indirect one, mediated by bricolage. Thus, we hypothesize:

**Hypothesis 4:** Bricolage mediates the relationship between TMT networking ability and ambidexterity.

SMEs have to rely to a greater extent on the capabilities of their TMTs to pursue ambidextrous strategies (Lubatkin et al., 2006). One TMT attribute that may enhance the team’s ability to balance competing exploratory and exploitative initiatives is team cognitive diversity, which captures the degree to which team members differ in their knowledge, values and skills (Kilduff, Angelmar and...
Cognitive diversity increases the team’s cognitive resources and its ability to engage in more complex and creative problem-solving (Bantel and Jackson, 1989; Jackson and Ruderman, 1995; Watson, Kumar and Michaelsen, 1993). Diverse teams benefit from a wider network of external advisors, from various areas of expertise (Hambrick, 1994), and have a greater absorptive capacity (Cohen and Levinthal, 1990). Because diverse teams have access to more non-redundant information (Dahlin, Weingart, and Hinds, 2005) and dispose of a greater variety of perspectives and skills (Cao et al., 2009), they are more likely to overcome the tensions between exploration and exploitation, and counterbalance tendencies to focus on one in the detriment of the other. Prior research supports the idea that diverse management teams are more likely to succeed in achieving ambidexterity. Taylor and Greve (2006) find that, despite the fact that exploration and exploitation may be contradictory processes, diverse teams perform better at both. Similarly Beckman (2006) argues that teams with different experiences are more likely to simultaneously pursue exploration and exploitation. In addition, Hypotheses 1 and 3 developed in this study suggest a positive effect of bricolage on ambidexterity and of TMT cognitive diversity on bricolage, respectively. For these reasons, we propose that TMT cognitive diversity has both a direct effect on organizational ambidexterity and an indirect one, mediated by bricolage. Thus, we hypothesize:

Hypothesis 5: Bricolage mediates the relationship between TMT cognitive diversity and ambidexterity.

 METHODS

Sample and Data collection

The data for this study was collected in the spring of 2013 as part of a large scale research project on SMEs (i.e. firms with minimum 5 and maximum 250 employees) in the Netherlands. A survey was sent out to 6,000 SMEs, operating in different industries. 903 usable questionnaires from 654 companies were returned, which were filled out by CEOs and other team members. We use data for 237 companies for which both the CEO and a management team member filled out the survey. To mitigate common-method bias concerns, we take the dependent variable (i.e., explorative and exploitative innovation) from the management team member survey and the independent variables, mediator and control variables (i.e., bricolage, TMT networking ability, TMT cognitive diversity) from the CEO survey.

Measures

 Dependent variable: To measure ambidexterity, we make use of the six-item scales for exploration (α = 0.89) and exploitation (α = 0.76) from Jansen, Van Den Bosch and Volberda (2006). Following Gibson and Birkinshaw (2004) and Jansen et al. (2009), we use the product of exploration and exploitation to compute ambidexterity. Exploration captures the extent to which firms pursue radical innovations for emerging markets or customers and includes sample items such as “We experiment with new products and services in our local market” and “Our organization accepts demands that go beyond existing products and services”. Exploitation conveys the extent to which firms pursue incremental innovation for current customers and includes sample items such as “We regularly implement small adaptations to existing products and services” and “We improve our provision’s efficiency of products and services”.

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Mediating variable: The scale for bricolage ($\alpha = 0.79$) includes seven items, and is adapted from Senyard et al. (2013). Example items are “When we face new challenges we put together workable solutions from our existing resources” and “We usually combine our resources to act on new business opportunities”.

Independent variables: We use a 5-item scale for networking ability ($\alpha = 0.81$), adapted from Semrau and Sigmund (2012). Example items are “We are good at establishing relations with influential people” and “We use our networks to get things done”. We measure TMT cognitive complexity with a 5-item scale ($\alpha = 0.72$) from Van der Vegt and Janssen (2003). Sample items are “MT members have different fields of expertise” and “MT members have complementary knowledge and skills”.

Control variables: We control for several variables that should have an impact on organizational ambidexterity, including firm size (i.e., number of full time equivalent), TMT size (i.e., number of TMT members), company age. Furthermore, we control for environmental dynamism, measured as a 5-item scale ($\alpha = 0.80$) from Jansen et al. (2009).

Results

We performed OLS regression analysis to test the first three hypotheses. Hypothesis 1, predicting a positive effect of bricolage on organizational ambidexterity was supported ($\beta = 2.069$, $p < 0.01$). For details, see model 2 in Table 1. To address common method bias we used the bricolage measure from the CEO and we took the dependent variable, ambidexterity from the 2nd management team member. We also found support for Hypothesis 2, predicting a positive effect of TMT networking ability on the use of bricolage ($\beta = 0.271$, $p < 0.001$). Hypothesis 3, theorizing a positive effect of TMT cognitive complexity was confirmed by our results as well ($\beta = 0.180$, $p < 0.01$). Consult model 4 in Table 1 for the antecedents of bricolage. Model 1 and model 3, represent the models with only the control variables for ambidexterity and bricolage, respectively.

To test Hypothesis 4 we used the approach in Hayes (2013), with ambidexterity as the dependent variable, bricolage as the mediator, networking ability as the independent variable and controlled for firm age, firm size, TMT size, environmental dynamism and TMT cognitive complexity. Our analysis (5,000 bootstrap samples) shows that networking ability has a positive effect on bricolage at $p < 0.001$ and that bricolage and networking ability have a positive effect on ambidexterity at $p < 0.01$ and $p < 0.05$, respectively. TMT networking ability has a direct effect on ambidexterity ($\beta = 1.225$, $SE = 0.529$, $LLCI = 0.1285$, $ULCI = 2.2678$) and an indirect effect, mediated by bricolage ($ab = .553$, $SE = 0.209$, $LLCI = 0.2143$, $ULCI = 1.0643$). Hypothesis 4 was thus confirmed. We followed the same approach to test Hypothesis 5, with ambidexterity as the dependent variable, bricolage as the mediator, cognitive diversity as the independent variable and controlled for firm age, firm size, TMT size, environmental dynamism and TMT networking ability. This hypothesis was only partially supported. We did not find a significant effect of TMT cognitive diversity on ambidexterity ($\beta = .1626$, $SE = 0.6405$, $LLCI = -1.0993$, $ULCI = 1.4246$). We should note however that even though TMT cognitive diversity does not seem to have a direct effect on ambidexterity, it does increase ambidexterity due to its indirect effect, mediated by bricolage ($ab = .3832$, $SE = 0.2310$, $LLCI = 0.0700$, $ULCI = 1.0176$). For a summary of the results for the mediation analyses, see Figure 1.
DISCUSSION AND CONCLUSION

We set out to explore how the management teams of SMEs deal with the paradoxes of innovation associated with ambidexterity. Our study contributes to the ambidexterity and resource management literature by showing how SMEs make use of one particular resourcing behavior, namely entrepreneurial bricolage, to reconcile these paradoxes and pursue ambidextrous strategies. In line with prior studies emphasizing the role of bricolage in alleviating resource constraints (Senyard et al., 2013; Baker and Nelson, 2005; Desa and Basu, 2013), our findings show that bricolage is positively related to ambidexterity. However, having the necessary resources is not a sufficient condition to achieve ambidexterity; SMEs also have to be able to adequately allocate these resources across exploration and exploitation activities. In his study about how print newspaper firms adjusted to digital media, Gilhert (2005) observes that the problem was not the allocation of sufficient resources (i.e. investment) but the failure of the firm to change the processes necessary to use their resources effectively. Our results suggest that bricoleurs allocate their resources more efficiently and creatively across competing activities and are more flexible with respect to their re-allocation. Overall, our study brings additional support to the idea that bricolage as a resourcing behavior, is not only a viable option for severely resource constrained firms, or firms operating in environments with low munificence; on the contrary, bricolage may prove a useful tool for firms pursuing ambidextrous strategies.

This study also contributes to the literature on bricolage by examining several TMT level antecedents of bricolage. If bricolage is a beneficial resourcing behavior, it is important to understand how bricoleurs (entrepreneurs or managers) can implement it successfully. Our results provide support for two TMT attributes that positively relate to bricolage: TMT networking ability and TMT cognitive diversity. Our findings regarding the positive effect of networking ability on bricolage are consistent with prior qualitative research that emphasizes the role of network skills in pursuing bricolage (Baker and Nelson, 2005; Baker, 2007; Di Domenico et al., 2010). To our knowledge, this is the first empirical study to link bricolage with social network theories. We also find that TMT cognitive diversity relates positively with bricolage, possibly because managers with more diverse skills and knowledge are more likely to identify “out of the box” uses for resources, and creative combinations of resources. These findings have practical implications for entrepreneurs and management teams, as it signals the importance of putting time and effort in building networks with key stakeholders, and the relevance of management team composition in engaging in bricolage successfully.

Finally, our study provides evidence that the link between managerial action and organizational ambidexterity is highly complex. By including bricolage as a mediator, we gain a better understanding of how the attributes of top management teams influence their resource management behavior, which in turn affects organizational ambidexterity. Our findings show that the TMT networking ability has both a direct effect on ambidexterity and an indirect one, mediated by bricolage. A practical implication is that management teams targeting ambidexterity have to build and maintain their social ties based on seemingly contradictory criteria. On the one hand, TMTs have to emphasize stakeholders that can provide them timely, relevant market information (i.e. new technologies, shifts in consumer demands, competition). On the other hand, TMTs have to nurture relationships with stakeholders that grant them access to resources “at hand” (i.e. discarded resources). While we do not find evidence of a direct effect of TMT cognitive diversity on ambidexterity, we do find an interesting indirect effect, because TMT cognitive
diversity increases the use of bricolage. It seems that TMT cognitive diversity alone is not sufficient to achieve ambidexterity, when it does not reflect in the mode in which the firm manages its resources. An explanation for not finding a direct effect of team diversity on ambidexterity may be due to the fact that diverse teams are likely to experience more difficulties in reaching consensus on strategic decisions, or exhibit a slower decision making process in general.

In conclusion, our empirical results emphasize the importance of entrepreneurial bricolage for ambidextrous SMEs. While we propose bricolage as a creative resourcing behavior that enables SMEs to attain ambidexterity, we also acknowledge, that bricolage itself, is not an easy task. Baker and Nelson (2005) also observe that not all firms are equally capable of engaging in bricolage successfully. We specifically look at the top management team, and find evidence for two attributes that enhance firm’s ability to engage in bricolage, TMT networking ability and TMT cognitive diversity. Further research should however, explore other aspects of TMTs, CEOs or entrepreneurs that influence the extent to which firms engage in entrepreneurial bricolage.

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REFERENCES


Table 1. Antecedents of Bricolage and Ambidexterity

<table>
<thead>
<tr>
<th></th>
<th>Model 1 (Ambidexterity)</th>
<th>Model 2 (Ambidexterity)</th>
<th>Model 3 (Bricolage)</th>
<th>Model 4 (Bricolage)</th>
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<tbody>
<tr>
<td><strong>Control variables</strong></td>
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<td>1.693***</td>
<td>0.178***</td>
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<td></td>
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<tr>
<td><strong>Independent variables</strong></td>
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<tr>
<td>TMT cognitive diversity</td>
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<td>0.163</td>
<td>0.180**</td>
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<td>TMT networking ability</td>
<td></td>
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<td>1.225*</td>
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<tr>
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<td>2.069**</td>
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Notes: N=237. Beta coefficients are reported. * p < 0.05, ** p < 0.01, *** p < 0.001.
Figure 1. Mediation Analyses

Notes: N=237. Beta coefficients are reported, 5000 bootstrap samples. * p < 0.05, ** p < 0.01, *** p < 0.001. Controls: firm age, firm size, TMT size, environmental dynamism and TMT cognitive diversity. The coefficient above the path from networking ability to ambidexterity represents the total effect, with no mediator included; the coefficient below the path represents the direct effect when the mediator was inserted in the regression model.

Indirect effect = 0.553.

Notes: N=237. Beta coefficients are reported, 5000 bootstrap samples, * p < 0.05, ** p < 0.01, *** p < 0.001. Controls: firm age, firm size, TMT size, environmental dynamism and TMT networking ability. The coefficient above the path from diversity to ambidexterity represents the total effect, with no mediator included; the coefficient below the path represents the direct effect when the mediator was inserted in the regression model.

Indirect effect = 0.3832.