ENTREPRENEURIAL BRICOLAGE AND INNOVATION ECOLOGY: PRECURSORS TO SOCIAL INNOVATION?

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ENTREPRENEURIAL BRICOLAGE AND INNOVATION ECOLOGY: PRECURSORS TO SOCIAL INNOVATION?

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ABSTRACT

Social entrepreneurship is primarily concerned with the development of innovative solutions to society’s most challenging problems. Within resource-constrained environments, social innovation may depend on the extent to which social entrepreneurs can combine and apply the resources at hand in creative and useful ways to solve problems – ‘bricolage’. Moreover, innovating for social impact relies on a set of institutional and structural supports – ‘innovation ecology’, which can facilitate or impede innovation. Our research empirically examines these variables as drivers of systemic social change through scaling and replication – ‘catalytic innovation’. Results of a survey conducted with 113 social entrepreneurs indicate that, while innovation ecology is associated with the degree of catalytic innovation, it is mediated by the role and degree of bricolage that social entrepreneurs bring to solving problems. These findings reinforce the role of entrepreneurs as the indispensable agents of social change.

INTRODUCTION

Within the field of entrepreneurship, social entrepreneurship is primarily concerned with the creation of social value for disenfranchised members of society. It is an alternative to the exclusive focus on financial value creation that characterizes many new ventures. This domain of inquiry has emerged as perceptions regarding the role and function of markets have shifted, and it is considered instrumental in supporting economic activities historically viewed by the private sector as unprofitable (Di Domenico, Haugh, & Tracey, 2010). Social entrepreneurs are individuals who develop innovative solutions to society’s most challenging social problems and who discover novel ideas and opportunities for new value creation that serves a social purpose. Social entrepreneurship is abundant and often flourishes in resource-constrained environments (Desa, 2007), requiring social entrepreneurs to develop innovative solutions to society’s most challenging social problems.

Inclusion of the social venturing process within the realm of entrepreneurship scholarship is evidenced by an established and growing body of work (Steyaert & Hjorth, 2006). As described by Dees, Emerson and Economy (2001: 2), “social entrepreneurs are one species of the genus ‘entrepreneur.” Entrepreneurship scholarship – both social and commercial – addresses similar conceptual questions about the discovery, evaluation and exploitation of opportunities and the set of individuals who engage in these actions (Shane & Venkataraman, 2000). Further, social enterprises like commercial ventures, offer products and services to gain financial sustainability (Di Domenico et al., 2010). There is cross-fertilization of knowledge between social and commercial entrepreneurship such that boundaries between social and economic value creation can blur and are more difficult to detect (Mair & Marti, 2006).
There are areas of differentiation, however, between social and commercial entrepreneurship. Austin, Stevenson and Wei-Skillern (2006) identified four key areas that distinguish commercial and social entrepreneurship: the social nature of the opportunity, motivation due to fundamentally distinct missions, human and resource mobilization, and performance measurement. As an overview of social entrepreneurship’s distinctions, Di Domenico et al. (2010) described the pursuit of revenue generation strategies that lead to financial sustainability (Di Domenico, Tracey, & Haugh, 2009); striving for goals that meet community needs (Borgaza & Defourny, 2001); the importance of accountability to constituents; the tendency to be market-driven (Dart, 2004); and to be associated with resource-scarce communities (Di Domenico et al, 2010).

In summary, social entrepreneurs discover and enact social improvements that benefit their communities, including attractive return on social and financial investments to their key stakeholders. Among the ways social entrepreneurs assess their influence is through successful innovation. The social entrepreneur’s capacity to innovate can be strengthened or weakened by the degree of structural support in place, including financial and human capital, that sustain any innovative activity. Such supports form an infrastructure for innovation known as the innovation ecology, and entrepreneurs’ perceptions of the degree to which their environment is favorable to the generation and evaluation of new ideas and opportunities enabled by these support systems may impact their innovative capabilities.

The role of this ecology in stimulating entrepreneurial action in social ventures is worthy of exploration, given the unique environmental constraints of the social entrepreneurship context. To date, relatively little attention has focused on understanding the processes by which social entrepreneurs mobilize resources to initiate, develop, and grow their enterprises. While anecdotal evidence suggests that social entrepreneurs make do with the resources they currently possess (Bornstein, 2003), there have been few research studies on the environmental influences that enable social entrepreneurs to innovate and bring about change by assisting marginalized individuals, groups, and communities. We argue that such innovations may depend on the extent to which social entrepreneurs can apply and combine the resources they have at hand to new problems – a behavior known as ‘bricolage’.

Bricolage, a long-established pattern of behavior first examined in the writings of Levi-Strauss (1967), implies the creation of something new through a process in which actors recombine and transform existing resources (Venkataraman, 1997; Garud, Kumaraswamy, & Nayar, 1998). More specifically, bricolage involves the creative adaptation and manipulation of resources such as human capital, materials, financial resources, and social capital to solve a problem or embrace a new opportunity. For example, a new service to fill a market need may be the result of combining specific competencies of business owners, employees, or volunteers, with available technologies, materials, or other resources available. The key element of bricolage is that these resources are ‘existing’ or ‘available.’ Bricolage tends to be especially applicable in situations characterized by resource scarcity, where new resources cannot be easily acquired. The degree to which ‘bricoleurs’ are successful may determine the ways persisting societal problems are solved, the development of products and services desired and valued by markets, and the new organizational forms shaped by their efforts.

In the entrepreneurship domain, bricolage constructs were further refined by Baker and Nelson (2005) as the focus on ‘using what’s at hand to do good’ or ‘creating something out of nothing’. As Baker and Nelson (2005) have noted, research on entrepreneurial bricolage can address
an important theoretical gap in the literature as founders and their organizations are increasingly working to resolve challenging problems and opportunities without the benefit of additional resources. As such, bricolage behavior may predict entrepreneurs’ attempts to bring social innovations to the marketplace to solve meaningful problems and challenges. Recent research has built upon the earlier work on bricolage behavior in established, for-profit ventures to examine this construct within the social entrepreneurship arena (Griffiths, Gundry, Kickul, & Fernandez, 2009).

As social entrepreneurs work to develop effective solutions to the complex problems faced by their constituents, they must develop new approaches that are both scalable and sustainable – a process known as catalytic innovation (Christensen, Baumann, Ruggles, & Saddler, 2006). Catalytic innovations provide ‘good enough’ solutions to social challenges that are not adequately addressed by established organizations using traditional methods and solutions. To what extent can social entrepreneurs attempt to use the resources they have at hand – bricolage – to initiate solutions that benefit their markets and communities, thereby becoming catalytic innovators?

This paper extends the literature on innovation in the social entrepreneurship context by examining the entrepreneurs’ perceptions of the innovation ecology, the bricolage behavior in which they engage, and the catalytic innovations they bring to their marketplace. We examine whether social entrepreneurs are more willing to use bricolage, depending on their perceptions of the ecology for innovation and the specific bricolage behaviors they perceive as most effective for change. Indeed, within constrained environments, social entrepreneurs may engage in bricolage as a means to discover new and novel ways of solving social problems and meeting needs; access human and financial capital to implement the selected ideas; and remedy any strategic weaknesses that obstruct their pursuit of desired social improvements (Anthony, Johnson, & Sinfield, 2008). Thus, this study addresses the extent to which bricolage behavior mediates the relationship between the entrepreneurs’ perceptions of the innovation ecology and their ability to engage in catalytic innovation.

**Innovation Ecology: An Infrastructure for the Creation of New Social Value**

Social entrepreneurs create new value for their stakeholders by identifying pressing needs and solving complex social challenges. This creation of new value is innovation, and is contingent upon a set of institutional and structural supports, known as the ‘innovation ecology’ (Wulf, 2007). Innovation ecology is characterized by a collection of people and organizations that provide infrastructure and support for innovation activities, including the generation and evaluation of new ideas and opportunities. The contributions of these support systems make breakthroughs possible (Canabou, 2004) and can include government-funding agencies, venture capitalists, designers, technology and human capital accessible to social entrepreneurs. They enable innovators to remedy any strategic weaknesses in their pursuit of desired social change and growth (Anthony et al., 2008). Innovation relies on a supportive infrastructure that is both economic and social (Griffiths et al., 2009) and can be strong or weak, facilitating or inhibiting innovation.

Previous research on innovation ecology has focused on influences observed at the level of country or region, including the role of government in fostering innovation, financing mechanisms for innovation and the entrepreneurial ethic (Bollier, 2000). Venture capital has been shown to be an important component of a country’s innovation ecology, since insufficient economic capital has been described as one of the ‘liabilities of newness’ (Morse, Fowler, & Lawrence, 2007).
As Steensma, Marino, Weaver, and Dickson (2000) noted, new ventures are more likely to be characterized by resource scarcity rather than resource sufficiency. Social ventures are likely to retain this characteristic throughout their life cycle, relying perhaps much more significantly on an adequate infrastructure to help them pursue their social mission. Therefore, the context of social entrepreneurship provides a particularly useful setting in which to examine the external marketplace supports for innovation, and the extent to which they influence the entrepreneur’s capacity to bring about social change.

Bricolage in Social Entrepreneurship: Resource Adaptation and Recombination

The notion of ‘bricolage’, explored in the writing of Levi-Strauss (1967) implies the creation of something new by individuals who recombine and transform existing resources, and it has been applied to a diverse set of disciplines and organizational contexts (Venkataraman, 1997; Garud et al., 1998; Baker & Nelson 2005). Bricolage, often construed as “using what’s at hand to do good” and “making do” has been affiliated with social entrepreneurship (Nicholls, 2009; Yujuico, 2008; Zahra, Gedajlovich, Neubaum & Shulman, 2009). Creating order of the materials at hand (Weick, 1993), it represents the resourcefulness and adaptability frequently demanded within this field of entrepreneurship as ‘bricoleurs’ develop novel combinations of ideas, opportunities, and organizations (Di Domenico, Haugh, & Tracey, 2010). Bricolage, as a strategy, is a useful response to circumstances that are unpredicted and often surprising (Ciborra, 1996).

Bricolage recognizes the interrelationship of the environment and the social entrepreneur/firm, leading to the development of novel solutions and the viewing and targeting of distinct markets. It is also connected to notions of knowledge spillover, economic regeneration, and proximity designs, i.e., regeneration through firm development using local depleted or minimal resources available with little or no cost. Desa (2007) noted that bricolage appears to be appropriate and applicable to the understanding of social venture development since these firms operate in resource-poor environments. Expectations exist for social entrepreneurs to create within these penurious environments despite limited information, knowledge and capital (Baker & Nelson 2005; Baker, Miner, & Eesley 2003).

Previous bricolage research focuses on sense-making in regard to what entrepreneurs do when they continue to pursue their goals despite substantial resource constraints, whether they be external (depleted or inaccessible resources) or internal (lack of skills and knowledge). In the literature, financial strategies have been examined (e.g., bootstrapping), along with venture creation processes such as non-linear process designs (Bhave, 1994; Sarasvathy, 2001). Bricolage is also connected to the processes of creativity and improvisation (Baker, Miner, & Eesley (2003). For example, bricoleurs have been described as tinkerers searching for new, unexpected cultural resources (Miettinen & Virkkunen, 2005). Within their resource-scarce context, social entrepreneurs are often compelled to use creative approaches to attract nontraditional resources and, to apply those resources in new ways to the social challenges within their mission. Further, since many of these challenges have persisted for some time and perhaps have resisted traditional methods in resolving them, social entrepreneurs may be especially inclined to engage in bricolage behavior. Di Domenico et al. (2010) proposed that social bricolage is conceptually different from other forms in a study that uncovered processes unique to social entrepreneurship: social value creation, stakeholder participation, and persuasion.

Given the unpredictable environmental conditions surrounding social entrepreneurs, and the resource scarcity they might experience in their attempt to achieve a double bottom line, we argue
that social entrepreneurs’ perceptions of an environment encouraging the evaluation and generation of new ideas, will positively influence their use of bricolage as a means to develop innovative activities, particularly in the social sector.

_Hypothesis 1: There will be a positive relationship between innovation ecology and entrepreneurial bricolage._

**Enacting Solutions to Social Challenges: Catalytic Innovation**

As discussed earlier, social entrepreneurs are motivated to identify new approaches and methods to solving some of the most pressing and persisting problems faced by communities. Christensen et al. (2006) noted that social ventures must develop fundamentally new approaches that are scalable and sustainable, with the ability to influence system-changing solutions. This emphasis on creating social change is referred to as ‘catalytic innovation,’ and derives from Christensen et al. (2006)’s characterization of innovations as sustaining or disruptive. ‘Sustaining’ innovations offer increased quality, better or more features and functions, and other changes targeted to existing customers (Christensen & Bower, 1995). Disruptive innovations, on the other hand, do not meet existing customers’ needs as effectively as sustaining innovations. They tend to be simpler, more accessible and convenient, less costly, and likely to attract new or different customer groups (Christensen & Bower, 1995). Disruptive innovations are likely to appeal to markets inadequately served by existing product and service solutions.

Catalytic innovations, as a subset of disruptive innovations, provide ‘good enough’ solutions to social challenges that are not effectively addressed by existing organizations using traditional approaches (Christensen et al., 2006). In this way, they may be especially suited to the social entrepreneurship context. These innovations can be developed and deployed for long-term firm applications, or in response to a crisis – in which case these innovative responses can be replicated by other entrepreneurships in similar catastrophic circumstances. Catalytic innovation likely to be descriptive of the innovative activities of entrepreneurs and firms whose primary focus is on social change, as delineated by Christensen et al. (2006):

1. They create systemic social change through scaling and replication: These innovators are often new entrants that continually improve their offerings to expand their market reach. High transferability from one location to another enables the innovation to be scaled up and to be sustained across marketplaces.

2. They act in response to a need that is either overserved or not served at all: New entrants to the market provide less expensive, less functional alternatives to a segment of the market that is overserved by the dominant provider, or not served at all.

3. They offer products and services that are simpler and less costly than existing alternatives, and considered “good enough”. Catalytic innovators are thus able to attract new markets with alternatives and solutions that are affordable and effective enough to reduce the problems.

4. They generate resources, such as donations, grants, volunteers, or intellectual capital in ways that are unattractive to incumbent competitors. Catalytic innovators tend to be creative in their approaches to identifying needed resources, and these may come from nontraditional sources, such as micro-lending programs (Christensen et al., 2006).
Our study builds on previous work on bricolage behavior of social entrepreneurs by examining the degree to which these behaviors may influence these entrepreneurs’ ability to develop catalytic innovations for their communities and markets. That is, bricolage facilitates the ways in which they use creative approaches to attract and distribute resources, identify overserved or unserved market segments, and offer products and services that are simpler, less costly, and ‘good enough’ – all characteristics of catalytic innovators (Christensen et al., 2006). Disruptive social change that social entrepreneurs aim to bring to the markets, in particular to address unserved needs of deprived populations, is likely to be fostered by their ability to apply and combine available resources in creative ways. In other words, bricolage behaviors positively drive catalytic innovations in the social sector. Hence, we formulate the following hypothesis:

**Hypothesis 2:** There will be a positive relationship between entrepreneurial bricolage and catalytic innovation.

Since we have linked innovation ecology to entrepreneurial bricolage and bricolage to catalytic innovation, we have developed a model that examines the important role that bricolage has in the association between innovation ecology and catalytic innovation. That is, the extent to which social entrepreneurs perceive environmental support for innovation can enable them to discover novel solutions that create value for their markets by engaging in bricolage, using new approaches to apply existing resources to problems and opportunities. The final hypothesis and proposed research model (depicted in Figure 1) was developed, in which entrepreneurial bricolage mediates the relationship between innovation ecology and the catalytic innovations of social entrepreneurs.

**Hypothesis 3:** The relationship between innovation ecology and catalytic innovation will be mediated by entrepreneurial bricolage.

## METHODOLOGY

### Data Collection

To investigate the proposed three hypotheses and model, we surveyed 113 social entrepreneurs of organizations whose business activities are directly involved with and primarily working in the social enterprise sector (e.g., for-profit social ventures or not-for-profit organizations). Data collection through the use of a questionnaire survey is consistent with our research question and addresses the gap of quantitative, hypothesis-testing studies claimed by Short, Moss, and Lumpkin (2009). The entrepreneurs and their respective firms were sampled through an existing social entrepreneurship database maintained by a major research university. Having previously participated in programs and conferences at this East coast university in the US, they had previously agreed to be contacted. Social entrepreneurs included in the database serve a number of sectors, including education, environment, mental health, hunger, arts and culture, and social capital investing.

All of the information was gathered from the social entrepreneurs over a six-month period utilizing an online survey. E-mails containing the hyperlink to the online questionnaire survey were sent to the senior decision-makers (e.g., CEO, CFO, CIO) of the social enterprise organizations sampled, asking for their participation. The social entrepreneurs were informed that their candid opinions would help to clarify the different approaches that social entrepreneurs take in finding and implementing new ideas and opportunities within their respective markets. In addition to answering questions on personal characteristics, the entrepreneurs were asked to provide
information regarding the types of business practices and innovations implemented by social firms, as well as their perceptions of their contextual environment in terms of innovation. Upon completion of the survey, their responses were submitted to a secure internet database.

**Measures**

The different variables in our model were measured employing scales previously used and validated in the literature.

**Innovation ecology.** Innovation ecology was assessed by evaluating social entrepreneurs’ perceptions of the attractiveness and feasibility of their social sector market. Social entrepreneurs had to indicate the extent to which they agreed or disagreed with four statements on a seven-point Likert scale (1 = ‘strongly disagree’; 7 = ‘strongly agree’). These four statements developed by the authors read as follows: “Businesses that offer more traditional services tend to ignore our business or its services (reverse scored),” “Existing players have encouraged us to provide offerings for our market segment,” “Existing players find our market segment unattractive and either avoid it or retreat from serving it (reverse scored),” and “Existing players disparage the work we do because they believe it is unprofitable (reverse scored).”

**Entrepreneurial bricolage.** The entrepreneurial bricolage behavior of the social firm was measured with a scale developed by Steffens, Senyard, and Baker (2009) who used the standard protocols for scale development. The scale they developed is consistent with Baker and Nelson’s (2005, p. 333) definition of bricolage as “making do by applying combinations of the resources at hand to new problems and opportunities”. Social entrepreneurs were asked to indicate the degree to which, on a seven-point Likert scale (1 = ‘strongly disagree’; 7 = ‘strongly agree’), they agreed or disagreed with a series of statements (e.g., “We are confident of our ability to find workable solutions to new challenges by using our existing resources”; “We gladly take on a broader range of challenges than others with our resources would be able to”; “We use any existing resource that seems useful to responding to a new problem or opportunity”).

**Catalytic Innovation.** We measured catalytic innovation – solutions to social challenges that are not effectively addressed by existing organizations, using traditional approaches – by developing a scale designed to capture four characteristics advanced by Christensen et al. (2006), i.e., ‘Creating systemic social change through scaling and replication’, ‘Meeting a need that is either overserved or not served at all’, ‘Offer products and services that are simpler and less costly than existing alternatives, and are considered “good enough”’, and ‘Generate resources, such as donations, grants, volunteers, or intellectual capital in ways that are unattractive to incumbent competitors’. For each of the characteristics, we created 3 to 5 items. Social entrepreneurs were asked to indicate how much they agreed or disagreed with each of the statements on a seven-point Likert scale (1 = ‘strongly disagree’; 7 = ‘strongly agree’). An overall composite score of all of the characteristics to comprise catalytic innovation was then developed and used in subsequent analyses.

**Control Variables**

We chose six control variables that can have an influence on a social entrepreneurial firm’s catalytic innovation, including: For-Profit Status (for-profit or not-for-profit status); age of the firm; number of full-time employees; cash flow status; whether success is dependent on one individual leader/entrepreneur; and whether regular evaluation meetings are held.

In Table 1, we provide the descriptive statistics for the 9 variables, including means, standard deviations, zero-order correlations, and reliabilities (where appropriate).
Data Analysis: Statistical Mediational Model

Zero-order correlations as well as the mediated regression approach recommended by Baron and Kenny (1986) were used to initially test our proposed model. In this mediational approach, three equations are estimated. First, the mediator (bricolage) is regressed on the independent variable (innovation ecology). Second, the dependent variable (catalytic innovation) is regressed on the independent variable. In the last equation, the dependent variable is regressed simultaneously on both the independent and mediational variable. Mediation is indicated when the following conditions are met: the independent variable must affect the mediator in the first equation; the independent variable must affect the dependent variable in the second equation; the mediator must affect the dependent variable in the third equation; and lastly, assuming that all of these conditions are in the proper direction, the effect of the independent variable on the dependent variable must be less in the third equation than in the second equation. Full or perfect mediation is supported when the independent variable has no significant effect when the mediator is controlled, while partial mediation is indicated if the effect of the independent variable is reduced in magnitude but still significant when the mediator is controlled (Baron & Kenny, 1986).

To confirm these initial findings we then follow the procedure of Preacher and Hayes’ (2004), implementing the Sobel test to test whether a mediator carries the influence of an independent variable to a dependent variable. Specifically, and as suggested by both Baron and Kenny (1986) and Preacher and Leonardelli, we also used the Aroian version of the Sobel test. MacKinnon, Warsi, and Dwyer (1995) indicate, in a Monte Carlo study, that the Sobel and Aroian tests seemed to perform best, and converge closely with, sample sizes greater than 50 or so. We have a sample size in excess of 100. To mitigate problems related to common methods variance, we follow the Podsakoff, MacKenzie, Lee, and Podsakoff’s (2003) suggestion of performing a confirmatory factor analysis. While there is not one statistical test of significance for model fit for structural equation modeling, we relied on several goodness-of-fit measures (Schumacher and Lomax, 1996, Hu and Bentler, 1999). The results of this test are detailed below.

RESULTS

The reliabilities of our continuous measures used were all above the .70 minimum established by Nunnally (1978), as shown in Table 1. We also found a number of zero-order correlations to be significant including those among and between our control variables as well as our dependent variable. For example, for-profit social firms tended to be younger, have less regular evaluation meetings, and few employees than their non-profit counterparts. Older more established social ventures tended to have positive cash flow and more full-time employees. Table 2 displays the approach and results to test the more stringent model by including our control variables, innovation ecology, bricolage, and catalytic innovation.

In analyzing the relationships further, we found initial support for the first part of our mediational model. That is, the relationship between innovation ecology and our mediator of bricolage was significant (β = .22, p<.05). While this was supported at a one-to-one relationship (zero-order correlations), we wanted to utilize the mediation approach to better understand and evaluate our proposed research model within the context of our social enterprises. With the three-equation approach suggested by Baron and Kenny (1986) and as discussed above, we found that catalytic innovation is fully mediated by bricolage activities. That is, the relationship between innovation ecology and catalytic innovation was no longer significant after accounting for bricolage. Thus, bricolage is a crucial link between innova-
tion ecology and catalytic innovation. Results from the Sobel and Aroian tests confirm statistically the results from the Baron and Kenny (1986) approach. Specifically, as we report below, we find that the mediator (bricolage) was significant at greater than the 5% level.

To investigate the potential bias from common methods variance, we performed confirmatory factor analyses (CFA), using Lisrel 8.50, on the scales in the model (using maximum likelihood estimation, see Joreskog & Sorbom, 1996). While there is not one statistical test of significance for model fit for structural equation modeling, we relied on several goodness-of-fit measures (Schumacher & Lomax, 1996; Hu & Bentler, 1999). According to the Hu and Bentler (1999) guidelines, the CFA measurement model fit the data well. A resulting 3-factor model had a Chi-square (df=187) of 445.18, *p*<.001, a RMSEA of .056, CFI of .95, and NNFI of .94. Hu and Bentler (1999) suggest that a good fitting model is one with values close to or greater than .95 for the CFI and NNFI and a value of or less than .08 for the RMSEA.

**DISCUSSION**

The purpose of our paper was to investigate the relationship between innovation ecology, entrepreneurial bricolage and catalytic innovation. Our results augment and extend previous empirical research on the innovation ecology and bricolage behavior (Kickul, Griffiths, & Gundry, 2011; Griffiths et al., 2009) in the field of social entrepreneurship, an area which provides a natural and relevant experimental setting in which to examine the role of bricolage, since social entrepreneurs are generally constrained to using existing resources and are forced to apply them in creative and useful ways to solving problems and creating new opportunities. By incorporating such behavior, we are able to investigate its influence on catalytic innovation. This catalytic innovation in creating social change may include the development of products and services targeted to unserved markets, generally with the goal of the reduction and resolution of social problems and challenges.

Our findings indicate that while the innovation ecology is associated with the degree of catalytic innovation, it is mediated by the role and degree of bricolage that social entrepreneurs bring to solving problems. That is, bricolage as implemented by social entrepreneurs results in novel approaches to attract and distribute resources, identify overserved or unserved market segments, and offer products and services that are simpler, less costly, and ‘good enough’. These catalytic innovations, as proposed by Christensen et al. (2006), may also help social enterprises determine their future growth in terms of their social contribution to both internal and external stakeholders. Within their impoverished environments and with finite and often sub-optimal resources, bricolage becomes one of the key behaviors that social entrepreneurs must adopt when they encounter institutional constraints and are without regulatory or political structure or support. The ability to mobilize resources available to social entrepreneurs may allow them to generate the types of needed solutions and innovations.

While bricolage behaviors are traditionally spawned from ad-hoc intuitive processes and through research, they may also be developed into a more strategic tool. For social entrepreneurs, the development of such a tool can be used to evaluate the innovation ecology, that is the changes of the nature and the amount of resources needed to provide the products and services that solve social challenges and problems. Additionally, through the application of bricolage, social entrepreneurs may also learn through doing (e.g., entrepreneurial skills) and instigate entrepreneurial behaviors linked with self-efficacy (see Hmielski & Corbett, 2006) and building social firm capabilities in the venture creation and growth process to bring about effective social change.
STUDY LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Although this research makes several important contributions, our results and conclusions must be evaluated within the context of the limitations of this study. The limitations include the relatively small sample size and the association between our predictor (innovation ecology), the intervening variables (entrepreneurial bricolage), and outcomes (catalytic innovation) included common method variance. That is, the measures used to tap each of these constructs were taken from one source (the social entrepreneur) and these associations could, therefore, be attributed to a bias on the part of the respondent. In addition to our confirmatory factor analyses, this bias could also be overcome by inclusion of alternative perspectives from multiple stakeholders (senior level managers, employees, partnering organizations, etc.) in the social enterprise. A thorough understanding of their viewpoints of how the social firm continually builds, adapts and reconfigures their internal and external resources to achieve congruence with the changing social, economic, and institutional environments would provide further insight into bricolage and social impact modeling. More of a systematic approach at multiple levels of the firm may suggest that social entrepreneurs do not compete on introducing radically new solutions or services, but rather are much more concerned with the capacity to develop solutions that have been traditionally overlooked by alternative services or organizations.

An additional limitation was that our study was cross-sectional, yet the hypothesized model and relationships suggests causal direction. Causal inferences created from cross-sectional designs are only inferences (Spector, 1981). On-going research should examine many of the same relationships in our study with longitudinal data to establish causality. This type of data collection along with a case study approach would provide an additional perspective of how bricolage and catalytic innovation occurs throughout the life cycle and strategy of the social enterprise. As demonstrated by our sample, the social capital market is expanding to include not only traditional nonprofit firms but also for-profit and hybrid entities that have strong social values and missions. This blurring of organizational structures among the different types of entities creates opportunities in which non-profits are adopting and engaging in profit-seeking behaviors, for-profits are aggressively seeking social value through operating and charitable activities, and public agencies are seeking to develop partnerships with all in their attempts to reduce social problems and advance positive public outcomes and benefits (Austin et al., 2006; Wei-Skillern, Austin, Leonard, & Stevenson, 2007).

CONTRIBUTIONS AND CONCLUSION

This paper offers at least two contributions to the fields of social entrepreneurship and entrepreneurship. First, our results show that bricolage mediates the relationship between innovation ecology and catalytic innovation. This helps us to understand that, while certain ecological conditions are likely to drive more catalytic innovation, the benefits of those conditions can only be gained if the social entrepreneur is able to “make do” with the resources available. This further leads us to think that the structural supports that sustain innovative activities are not sufficient to guarantee the actual development of innovative ideas: catalytic innovation is only made possible thanks to the actions of the social entrepreneur and the organizational mechanisms. Indeed, in environments often characterized by resource scarcity and uncertainty, social entrepreneurs’ bricolage becomes a necessary link in the chain. At the macro level, this implies that the policy measures taken in favor of an innovation-friendly environment, such as government funding
agencies, development of venture capital networks, availability of technologies, will have limited effects if there is no social change maker to act them. The power for change thus lies in the social entrepreneurs and in the strategic choices they make based on the resources they have at hand.

Second, this research also brings implications to the entrepreneurship scholarship. Indeed, the unpredictable environmental conditions that characterize the context of social entrepreneurship help show that, in case of great uncertainty, institutional and structural supports do not suffice to guarantee social innovation. To the extreme, this reasoning could lead policy makers think that investing in training programs, which introduce (social) entrepreneurs to make do practices, might turn out to be a more efficient policy decision than setting up government agencies and other support institutions.

As pointed out in Mair and Marti (2006), the on-going study of social entrepreneurship provides the opportunity to integrate, challenge, and debate many traditional entrepreneurship assumptions in an effort to develop a cogent and unifying paradigm. Incorporation of the concept of entrepreneurial bricolage to the field provides a unique perspective in how social entrepreneurs mobilize and utilize existing resources to ‘catalyze’ innovations that address some of the society’s most pressing problems. As such, they are not only finding creative solutions, but also are utilizing their pre-existing knowledge and relationships to encourage stakeholders to take notice of these innovations and the impact they can have in driving long-term systematic change.

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NOTES
1. In line with Social Enterprise Alliance (see http://se-alliance.org/), we define social enterprise as any nonprofit, for-profit or hybrid corporate form that uses market-based strategies to advance a social mission.
2. These authors provide a macro for conducting the Sobel test that can easily be run within SPSS: http://www.comm.ohio-state.edu/ahayes/sobel.htm
4. The Aroian version does not make the assumption that the product of standard errors of the coefficient of the independent variable and the mediator and the coefficient of the dependent variable and the mediator is vanishingly small). See Aroian (1944/1947).
5. The table includes standardized Beta weight ($\beta$), $R^2$ and F value results for the last equation in the test for mediation.

REFERENCES


Table 1. Means, Standard Deviations and Zero-Order Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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</thead>
<tbody>
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<td>1 For Profit Organization</td>
<td>0.52</td>
<td>0.50</td>
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</tr>
<tr>
<td>2 Age of Firm</td>
<td>4.13</td>
<td>2.29</td>
<td>-.22*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3 Cash Flow Status</td>
<td>4.44</td>
<td>2.14</td>
<td>-1.2*</td>
<td>.32*</td>
<td></td>
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</tr>
<tr>
<td>4 Regular Evaluation Meetings</td>
<td>3.05</td>
<td>1.71</td>
<td>-.27*</td>
<td>.22*</td>
<td>.13</td>
<td></td>
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<tr>
<td>5 Success Dependent on Individual</td>
<td>0.25</td>
<td>0.43</td>
<td>.07</td>
<td>-.25*</td>
<td>-.02</td>
<td>-.25*</td>
<td></td>
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</tr>
<tr>
<td>6 Number of Full Time Employees</td>
<td>3.29</td>
<td>2.33</td>
<td>-.38*</td>
<td>.64*</td>
<td>.17</td>
<td>.28*</td>
<td>-.38*</td>
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<tr>
<td>7 Entrepreneurial Bricolage</td>
<td>5.41</td>
<td>1.04</td>
<td>.01</td>
<td>-.09</td>
<td>.11</td>
<td>-.02</td>
<td>-.14</td>
<td>.00</td>
<td>.84</td>
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<td>8 Catalytic Innovation</td>
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<td>-.08</td>
<td>-.09</td>
<td>.00</td>
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<td>-.01</td>
<td>.07</td>
<td>.60*</td>
<td>.91</td>
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<tr>
<td>9 Innovation Ecology</td>
<td>3.59</td>
<td>1.10</td>
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<td>.03</td>
<td>.05</td>
<td>-.04</td>
<td>.11</td>
<td>-.03</td>
<td>.22*</td>
<td>.26*</td>
<td>.81</td>
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Note. * significant at the .05 level.
Table 2. Mediated Regression on Catalytic Innovation

<table>
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<tr>
<th>Control Variables</th>
<th>β</th>
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<tr>
<td>For Profit Organization</td>
<td>0.02</td>
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<td>Age of Firm</td>
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<tr>
<td>Cash flow</td>
<td>0.12</td>
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<tr>
<td>Regular Evaluation Meetings</td>
<td>0.23</td>
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<tr>
<td>Success Dependent on 1 Individual</td>
<td>0.09</td>
</tr>
<tr>
<td>Number of Full Time Employees</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Mediational Approach†

(1) Innovation Ecology → Bricolage 0.22*
(2) & (3) Bricolage → Catalytic Innovation 0.58*
Innovation Ecology → Catalytic Innovation 0.13

R² 0.47
Adjusted R² 0.40
F 6.49*

Note. * significant at the .05 level. † the beta weights represent the values in the last step of the meditational analysis.

Table 3. Results of the Sobel and Aroian Tests

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Test Statistic</th>
<th>Std. Error</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Sobel Test</td>
<td>2.075</td>
<td>0.0598</td>
<td>0.038</td>
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<tr>
<td>Aroian Test</td>
<td>2.050</td>
<td>0.605</td>
<td>0.040</td>
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</tbody>
</table>