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## ENTREPRENEURIAL BRICOLAGE: TOWARDS SYSTEMATIC EMPIRICAL TESTING

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### ABSTRACT

The behavioral theory of “entrepreneurial bricolage” attempts to understand what entrepreneurs do when faced with resource constraints. Most research about bricolage, defined as “making do by applying combinations of the resources at hand to new problems and opportunities” (Baker & Nelson 2005: 333), has been qualitative and inductive (Garud & Karnoe, 2003). Although this has created a small body of rich descriptions and interesting insights, little deductive theory has been developed and the relationship between bricolage and firm performance has not been systematically tested. In particular, prior research has suggested bricolage can have both beneficial and harmful effects. Ciborra’s (1996) study of Olivetti suggested that bricolage helped Olivetti to adapt, but simultaneously constrained firm effectiveness. Baker & Nelson (2005) suggested that bricolage may be harmful at very high levels, but more helpful if used judiciously. Other research suggests that firm innovativeness may play an important role in shaping the outcomes of bricolage (Anderson 2008). In this paper, we theorize and provide preliminary test of the bricolage-performance relationship and how it is affected by firm innovativeness.

### INTRODUCTION

Most entrepreneurs face substantial resource constraints (Shepherd et al., 2000). As Aldrich (1999:41) noted ruefully, most firms in creation... “can’t always get what they want, and certainly don’t always get what they need.” The modal firm is created with inadequate financial, social, temporal and other resource buffers (Wiklund, Baker & Shepherd, 2009; Bruderl, Prinsendorfer & Ziegler, 1992; Bourgeois & Eisenhardt, 1988). Bricolage behaviors have been identified as a way that some entrepreneurs “make do” by applying combinations of the resources at hand to new challenges (Baker & Nelson 2005). Successful bricolage behaviors may assist in the development of firms that are better able to manage market uncertainties, survive and perhaps even flourish despite resource constraints.

The relationship between bricolage and performance, however, is far from straightforward. In particular, prior research indicates that bricolage can have both beneficial and harmful effects. Ciborra’s (1996) study of Olivetti suggested that bricolage helped Olivetti to adapt, but simultaneously constrained firm effectiveness. Garud and Karnoe’s (2003) study of the emergence of the Danish wind turbine industry showed that firms benefitted in several ways from reliance on bricolage rather than “breakthrough” strategies. Hatton’s (1989) studies of bricolage by Australian school teachers documented primarily negative outcomes for students. Baker & Nelson (2005) suggested that bricolage may be harmful at very high levels, but more helpful if used judiciously. Prior case research in bricolage has predominantly been tested in high innovative contexts (e.g. Ali & Bailur, 2007; Ciborra, 2002) with mixed results. Little is known, however, about how innovativeness affects the relationship between bricolage and firm performance.

The paper is structured as follows. We first develop hypothesis concerning the bricolage-performance relationship and the contingent effect of innovativeness. We then test our hypotheses using data from the Comprehensive Australian Study of Entrepreneurial

Emergence (CAUSEE) project (Davidsson, Steffens, Gordon, & Reynolds, 2008), including 625 nascent (pre-operational) firms and 561 young firms that are operational but less than four years old. In our tests, we make use of the new Davidsson-Baker survey measure of bricolage behavior. We conclude by discussing the theoretical implications of our findings.

### **Bricolage and Performance**

Entrepreneurs often attempt to overcome resource constraints by engaging in resource-seeking behaviors, for example by engaging in sometimes time-consuming processes of trying to attract new investments into their firms (Brush, Greene & Hart, 2001). They may also respond to resource constraints by deciding that now is not a good time to pursue a new opportunity. Such time consuming delays may be particularly common among nascent entrepreneurs, who, because they don't face the pressures of day-to-day operations may find it easier to wait for a "better time" or to control more resources before acting. In bricolage, however, "making do" includes a bias for action (Baker & Nelson, 2005; Stark, 1989), suggesting that entrepreneurs construct and pursue opportunities without potentially delaying attempts to pursue the "right" resources for the challenge. Therefore, we hypothesize that:

*H1: Bricolage has a positive effect on making progress in the emerging stage of firm creation.*

Used as a stop-gap tactic, as a way of getting by temporarily, or as a form of inexpensive "forward looking probe" (Brown & Eisenhardt, 1997), bricolage may be a useful way to make do when the only other choice is to wait or do nothing. However, to the extent that solutions built through bricolage tend to be imperfect, and to the extent that customers for products and services built through bricolage may tend themselves to be resource constrained and relatively undemanding, firms that engage in high levels of bricolage may find it difficult to learn to meet the higher quality and performance demands of other less resource constrained and demanding customers. As Baker & Nelson (2005) suggest, firms that engage non-selectively in bricolage may find it difficult to grow. We extend this logic to argue that to the extent that entrepreneurs engage in very high levels of bricolage, they may find it difficult to move beyond the "good enough" solutions they offer initially in order to appeal to a larger group of customers. Therefore, we hypothesize:

*H2: Bricolage has a negative effect on performance once the firm is up-and-running.*

### **Bricolage and Innovation**

The literature on radical innovation suggests that such innovations may emerge from complex combinations of existing resources (Green & Welsh, 2003; Olson, Walker & Ruekert, 1995; Schoonhoven, Eisenhardt, & Lyman, 1990) and require skills and capabilities across varied domains (Swink, Sandvig & Mabert, 2003). In the absence of severe resource and skills constraints and if firms adopt very high standards for what is "good enough," bricolage behaviors might be one mechanism of radical innovation. Levi-Strauss (1967) and others have suggested that bricolage can occasionally produce highly innovative outcomes.

Indeed, because bricolage involves the creation of novel solutions to problems and opportunities, the products of bricolage are typically innovations in the sense of an innovation as simply the introduction of something new and potentially useful (Gopalakrishnan & Damanpour, 1994). The prior literature suggests, however, that innovations produced through bricolage (as through most innovation processes) are typically relatively mundane. Even the most valuable innovations documented as outcomes of bricolage – such as the wind turbines described in Garud and Karnoe (2003) – are often not "breakthroughs" or radical departures, but are instead more likely to be largely incremental, or even stopgaps. For example, the

bricolage that famously saved the lives of three Apollo 13 astronauts was not then adopted as an engineered solution to the original problem (Rerup, 2001).

Under more typical conditions, we expect entrepreneurs engaged in bricolage to be doing so in the face of substantial resource constraints and to be focused on doing work that is “good enough.” Because of this, we expect that attempts to produce radical innovations through bricolage under resource constraints may be unlikely to succeed but also likely to undermine some of the advantages that may otherwise accrue from entrepreneurs’ selective engagement in bricolage. In particular, the attempt to produce radical innovations from combinations of the resources at hand, including reliance on self-taught and amateur skills that are typical of bricolage, is likely to be a slow going process of trial and error experimentation and very gradual accumulation of skills. The combination of bricolage and the attempt to engage in high levels of innovation may therefore result in a slow pace of progress. We therefore hypothesize:

H3 Firms (both emerging and those firms that have recently been established) that combine bricolage behaviors with high innovativeness will attain lower firm performance.

## METHOD

### Sample and Data

#### *The main sample*

The data for this research was drawn from the CAUSEE project, a 4-year longitudinal study studying firm emergence (Davidsson, Steffens, Gordon, & Reynolds, 2008) administered through telephone surveys. This study builds on the general empirical approach, some contents and lessons learned from the Panel Study of Entrepreneurial Dynamics (PSED) studies in the US (Gartner, Shaver, Carter, & Reynolds, 2004; Reynolds & Curtin, 2008).

In the CAUSEE main study, 28,383 adults (with equal male/female representation) from randomly selected households completed a screening interview for eligibility. Like the PSED, in order to qualify for inclusion as nascent and young firm in the survey, the respondent first had to answer affirmatively to at least one of the following questions:

1. Are you, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others?
2. Are you, alone or with others, currently trying to start a new business or a new venture for your employer, an effort that is part of your normal work?
3. Are you, alone or with others currently the owner of a business you help manage, including self-employment or selling any goods or services to others?

The nascent respondents to be eligible also had to confirm that:

- They were (or intended to be) owners or part owners of the nascent firm.
- They had undertaken some tangible “start-up behavior” e.g looking for equipment or a location organizing a start-up team within the last 12 months.

If respondents did not answer affirmatively to the above questions they were deemed under qualified and did not continue to the full survey. Further, if nascent confirmed that revenues had exceeded expenses for six of the past 12 months they were deemed overqualified and screened as a young firm.

Young firm respondents also had to confirm that:

- They were owners or part owners of the young firm.

- They confirmed that they started “trading in the market doing the type of business you are currently doing” in 2004 or later.

This process yielded 977 Nascent Firms (3.4%) and 1,011 Young Firms (3.6%). These were directed to the full length interview (40-60 minutes) either directly following the screener or later by appointment. The full length interviews were completed by 594 NF and 514 YF cases (representing response rates of 60.8% and 50.8% of eligible cases identified in the screener) that are used in our analyses.

As CAUSEE is a 4 year longitudinal survey it enables us to study nascent and firm development as it happens. This paper however analyses data from the first of these four years, and owing to this, may be considered cross-sectional in nature. Additional longitudinal analysis is expected in future research to evaluate bricolage processes and firm performance over time: the first year data was used here for initial tests of bricolage and performance using both nascent and young firms to illustrate firms at the different stages of development.

### **Measuring Bricolage**

We used a newly developed bricolage instrument and scale to measure bricolage. As a new instrument, this required extensive development based on prior grounded research and the multidimensional Baker and Nelson (2005) definition. Its development followed standard protocols for scale development (Brown, Davidsson & Wiklund, 2001; DeVellis, 2003).

One key challenge was the need to design the construct to enable its applicability across multiple industries and its use in heterogeneous firms and stages of firm growth. We began by writing a large number of items based on the literature. We then reduced the number of items through a variety of processes, including review by other scholars familiar with the entrepreneurship and bricolage literatures and by two rounds of pilot testing using a questionnaire. After extensive pretesting and screening 9 items were developed to tap each element of the Baker and Nelson’s (2005: 333) definition of the bricolage: “making do by applying combinations of the resources at hand to new problems and opportunities.” In the questions we used a response scale where 1 means “never” and 5 means “always” (rather than levels of agreement) in order to reflect the behavioral nature of the phenomenon.

In choosing, developing and adapting the new bricolage measure, we considered the appropriateness of it being either a reflective measure or formative measure (MacKenzie, Podsakoff, & Jarvis, 2005). During this evaluation, we performed a Cronbach alpha on the bricolage measures. If we were to proceed with reflective modeling, the results revealed Cronbach alphas that were above Nunnally’s recommended level for consistency ( $\alpha = .823$ ). However, further assessment and consideration of bricolage, discussion with scholars, and the use of decision criteria by Mackenzie et al. (2005) indicated that we should treat the measure as formative and also resulted in dropping one item as inconsistent with the Baker and Nelson (2005) definition. Unlike reflective measures, formative models do not assume that the measures are all caused by a single underlying construct: it assumes that the measures all have an impact on (or cause) a single construct. Our final instrument consists of 8 items.

### **Innovation Measure**

Twelve questions were developed for the innovation measure. We use a 4 item scale which is an elaboration of the scale developed by Dahlqvist (2007) to measure the innovativeness of the venture idea. This scale identifies four categories of the venture idea newness: (1) new to the world, (2) new to the market (3) ideas substantially improved and or (4) imitative venture ideas. These categories are then defined through four classifications of venture ideas; (1) product, (2) method of production, (3) method of promotion and (4) type

target market/customer. A continuous variable was computed for these responses and summated to develop the overall newness measure used in this research. This newness measure has a theoretical range of 0 to 12. The actual range in the data is 0 to 12 with a mean value of 3.88.

### Performance Measures

Early performance assessment in nascent and young firms is difficult (Davidsson 2008). For the nascent firms we follow recent nascent entrepreneurship literature that measures performance through speed of making progress (Liao and Welsch 2003), calculated through the number of gestation activities completed. The firm outcome variable of prior 12 month sales is used in this research for newly established young firms. To reduce skewness in the sales response, the data was categorised into 4 classes after removing outliers.

### Controls

We use three categories of control variables. The first category aims to capture the overall level of resources – time and money - that have been invested in the firm. Specific variables include amount of loans accessed by firm (log), time since the first business activity commenced, if the business is being run as a parallel firm i.e. running more than one firm at the same time.

The second group of control variables aims to capture some of the heterogeneity concerning the ability the firm has to acquire and develop resources. We include three measures of the human capital of the start-up team: education (number of owners with a university degree); industry experience (number of years); management experience (number of years).

The third group of variables account for various characteristics. These include: team (versus solo dummy); spouse and other type of team (dummy); service (versus product dummy) and industry controls.

### Results

Table 1 and 2 reports the result of the regression analysis that models bricolage in relationship to firm performance. Hypothesis 1 proposed bricolage has a positive effect on performance in the emerging stage of firm creation. The results indicate that bricolage has a statistically significant positive relationship ( $p < 0.05$ ) to number of relevant gestation activities completed in the emerging stage of firm creation. Hypothesis 2 stated bricolage has a negative effect on performance once the firm is up-and-running owing to difficulty in meeting quality and performance market demands through potentially imperfect bricolage offerings. The results show bricolage has a significant negative relationship ( $p < 0.05$ ) to sales, confirming hypothesis 2. Both Hypothesis 1 and Hypothesis 2 were therefore supported.

Hypothesis 3 proposed firms (both emerging and those firms that have recently been established) that combine bricolage behaviors with high innovation will attain lower firm performance. Table 3 provides the results for the moderated regression. Hypothesis 3 was not supported in nascent firms: innovativeness did not significantly moderate the bricolage-performance relationship. However, there was a significant negative moderation effect of innovativeness on the relationship between bricolage and venture performance ( $\beta = -0.011$ ,  $p < 0.05$ ) in young firms thereby confirming, in part, Hypothesis 3. Figure 2A illustrates this relationship. Sales have been assigned into 4 equal categories after removing outliers. Thus the effect of bricolage on venture performance (sales) becomes significantly stronger if firms make limited use of innovativeness.

Following Venkataraman's (1989) expanded perspective on fit and co-alignment and recent work by Edelman, Brush and Manolova (2005), did preliminary tests of mediating effects of innovativeness on the bricolage-performance relationship was tested in nascent firms. Mediation tests specify the existence of a significant intervening mechanism (e.g., innovativeness) between an antecedent variable (e.g., bricolage) and the consequent variable (e.g., firm performance).

As such, the mediator variable (e.g., innovativeness) accounts for a proportion of the relationship between the predictor and the criterion variables. Figure 1 provides a schematic representation of the mediated "bricolage→newness →performance" model.

Fig. 1 The "bricolage→newness →performance" model. (a) The model is of an indirect model, in that the antecedent variable  $Z$  (i.e., bricolage) has a direct relationship with the dependent variable  $Y$  (i.e., performance) as well as an indirect relationship with the dependent variable  $Y$  (i.e., performance) through the intervening variable  $X$  (i.e., Newness/Innovativeness). (b) The model can be written as a set of equations where  $Y=a_0+a_1Z+a_2X+e$ ; and  $X=b_0+b_1Z+e$ .

Following recommendations in Baron and Kenny (1986) we ran separate regression models to test the relationships between bricolage and newness, newness and firm performance and bricolage and performance. Our preliminary tests found that innovativeness has a partial mediating effect on the interaction between bricolage and nascent firm performance.

## DISCUSSION

In this paper, we developed testable hypotheses from prior descriptive and inductive research on the behavior theory of entrepreneurial bricolage, and tested them using a new survey measure of bricolage and samples of nascent and young firms. As hypothesized, the main effect of bricolage on nascent firm performance was positive. Bricolage led to the completion of a higher number of gestation activities completed for nascent firms. Also as hypothesized, bricolage appears to lead to lower reported sales for new firms. Contrary to our theory, innovativeness did not have a moderating effect on the impact of bricolage in nascent firms; innovativeness did, however, moderate the bricolage-performance relationship in young firms.

In general, our results are supportive of the general theoretical thrust of prior theory about bricolage, which we take to suggest that because most new organizations are resource-constrained in important ways, resourceful behaviors – including bricolage – are likely to be play a key role in shaping entrepreneurial outcomes, *for better or for worse*. Importantly, our results support the theme from prior research that entrepreneurial bricolage is neither all good nor all bad. To the extent that bricolage in the face of resource constraints is very common, we believe that understanding patterns and results of bricolage is a central theoretical and research frontier for entrepreneurship. Our unexpected finding that innovativeness may mediate some of the effects of bricolage in nascent firms opens up additional important theoretical questions about bricolage and innovative behaviors.

At the most general level, the body of work on bricolage, ours included, suggests that within poorly understood bounds, what entrepreneurial firms do with the resources at hand may matter at least as much as what those resources are. Stated somewhat more strongly: resources are what entrepreneurs make of them. This research complements and also challenges the commonplace models of near resource-determinism that have dominated organizational research about entrepreneurship.

## CONCLUSION

We believe that ours are the first systematic empirical tests evaluating bricolage and firm performance and the results underline the interconnectedness of innovativeness and bricolage on nascent firm performance. Although our results have important implications for the further development of bricolage theory, we stress that these results represent only tentative first steps in providing a greater understanding of bricolage and its influence in venture creation and firm performance. As we continue our longitudinal study of bricolage, and also begin to examine our sub-sample of “high potential” firms, we will be able to develop and test much more nuanced theories of the interplay of bricolage behaviours, processes and outcomes. Future research should also examine a more comprehensive range of outcomes including other elements of firm performance and other theoretically relevant contingencies such as, for example, the role of environmental dynamism. Finally, the new measure of bricolage we have introduced provides an important tool for our own and other researchers’ continued investigations of entrepreneurial bricolage.

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**Table 1: Regression Analysis Results**

Dependent Variable	Gestation Activities Complete				DV: Sales (12 months) n= 341			
	Model 1		Model 2		Model 1		Model 2	
	Coeff	St error	Coeff	St error	Coeff	St error	Coeff	St error
<i>Level of Resources Controls</i>								
YearsActive	0.025	0.046	0.027	0.046	-0.002	0.017	-0.011	0.016
Team /Solo (Dummy)	-0.118†	0.818	-0.112†	0.815	0.048	0.202	0.047	0.202
Spouse Team	0.129*	0.869	0.122*	0.866	0.073	0.208	0.086	0.208
Log_Loans	0.289***	0.166		0.165	0.238***	0.030		0.029
Services/Products Dummy	-0.048	0.689	-0.049	0.687	-0.020	0.160	-0.029	0.160
<i>Resource Heterogeneity Controls</i>								
Serial Entrepreneur	0.103*	0.691	0.095†	0.690	-0.008	0.131	0.006	0.131
Single/Parallel Entrep.	0.044	0.745	0.048	0.742	0.022	0.159	0.028	0.158
Education Level	0.049	0.214	0.047	0.213	0.093	0.048	0.091	0.048
Industry Exp	0.075	0.019	0.073	0.018	0.281***	0.004		0.004
General Manage.Exp	0.000	0.019	-0.008	0.019	-0.185*	0.004	-0.190	0.004
<i>Industry Controls</i>								
Retail	-0.058	0.989	-0.057	0.985	-0.124*	0.264	-0.113 †	0.264
Hospitality	-0.126**	1.479	-0.124**	1.474	-0.017	0.373	-0.021	0.371
Consumer_Services	0.030	1.007	0.026	1.004	-0.114 †	0.213	-0.104 †	0.213
Health, Education Social Services	0.028	1.010	0.029	1.006	-0.072	0.222	-0.068	0.222
Manufacturing	-0.100*	1.242	-0.102*	1.237	-0.044	0.298	-0.044	0.297
Construction	-0.023	1.289	-0.026	1.284	0.097	0.188	0.096	0.187
Agriculture	-0.050	1.472	-0.058	1.470	-0.097 †	0.303	-0.094 †	0.302
Mining	-0.036	3.823	-0.030	3.814	0.091 †	0.630	0.094 †	0.627
Transportation	-0.017	2.300	-0.017	2.291	0.013	0.423	0.013	0.421
Utilities	0.033	4.655	0.024	4.654	0.001	0.487	0.010	0.486
Communication	-0.013	1.407	-0.017	1.402	-0.014	0.323	-0.004	0.323
Real_Estate	-0.053	2.718	-0.060	2.714	0.051	0.702	0.053	0.699
Finance_Insurance	-0.021	2.156	-0.018	2.148	-0.026	0.372	-0.022	0.371
<i>Direct Effect</i>								
Bricolage			0.097*	0.453			-0.105*	0.093
F		3.374		3.476		3.302		3.350
Change F				0.009				0.048
R2		0.134		0.143		0.207		0.217
Δ R2				0.009				0.010

Control entries represent standardized regression coefficients.\* P<0.05, \*\*P<0.01, \*\*\*P<0.001, †P0.10 (two-tailed), with directional hypothesis entry (one tailed).

**Table 2: Moderation Results**

Dependent Variable	DV: Gestation Activities Complete n= 525				DV: Sales (12 months) n= 341			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>Level of Resources Controls</i>								
YearsActive	0.025	0.027	0.021	0.020	-0.002	-0.011	-0.011	-0.012
Team /Solo (Dummy)	-0.118†	-0.112†	-0.121*	-0.130*	0.048	0.047	0.050	0.045
Spouse Team	0.129*	0.122*	0.132*	0.138*	0.073	0.086	0.083	0.086
Log_Loans	0.289***	0.292***	0.294***	0.294***	0.238***	0.238***	0.238***	0.238***
Services/Products Dummy	-0.048	-0.049	-0.033	-0.032	-0.020	-0.029	-0.031	-0.039
<i>Resource Heterogeneity Controls</i>								
Serial Entrepreneur	0.044	0.048	0.055	0.056	0.022	0.028	0.029	0.027
Single/Parallel Entrep.	0.103*	0.095†	0.083	0.078	-0.008	0.006	0.008	0.007
Education Level	0.049	0.047	0.049	0.048	0.093	0.091	0.092	0.084
Industry Exp	0.075	0.073	0.069	0.073	0.281***	0.291***	0.288***	0.288***
General Manage.Exp	0.000	-0.008	0.006	0.008	-0.185*	-0.190*	-0.189*	-0.191*
<i>Industry Controls</i>								
Retail	-0.058	-0.057	-0.048	-0.047	-0.124*	-0.113†	-0.114†	-0.117†
Hospitality	-0.126**	-0.124**	-0.116*	-0.115*	-0.017	-0.021	-0.022	-0.024
Consumer_Services	0.030	0.026	0.024	0.026	-0.114†	-0.104†	-0.104†	-0.105†
Health, Education Social Services	0.028	0.029	0.027	0.028	-0.072	-0.068	-0.069	-0.070
Manufacturing	-0.100*	-0.102*	-0.095*	-0.095*	-0.044	-0.044	-0.043	-0.053
Construction	-0.023	-0.026	-0.022	-0.021	0.097†	0.096†	0.095†	0.094†
Agriculture	-0.050	-0.058	-0.050	-0.045	-0.097†	-0.094†	-0.096†	-0.099†
Mining	-0.036	-0.030	-0.024	-0.020	0.091	0.094	0.093	0.095
Transportation	-0.017	-0.017	-0.013	-0.015	0.013	0.013	0.012	0.011
Utilities	0.033	0.024	0.025	0.024	0.001	0.010	0.010	0.010
Communication	-0.013	-0.017	-0.021	-0.019	-0.014	-0.004	-0.002	0.002
Real_Estate	-0.053	-0.060	-0.054	-0.054	0.051	0.053	0.055	0.054
Finance_Insurance	-0.021	-0.018	-0.013	-0.010	-0.026	-0.022	-0.023	-0.029
<i>Direct Effect</i>								
Bricolage	0.025	0.097*	0.086*	0.083*		-0.105*	-0.102*	-0.173**
Innovativeness			0.090*	0.094*			-0.015	-0.008
<i>Moderating Effect</i>								
Bricolage x Innovativeness				-0.040				-0.111*
F	3.374***	3.476***	3.529***	3.426***	3.302***	3.350***	3.208***	
Change F		0.100	0.053	0.103		0.048	0.142	0.001
R2	0.134	0.143	0.150	0.152	0.207	0.217	0.217	0.225
Δ R2		0.009	0.007	0.002		0.010	0.000	0.008

Control entries represent standardized regression coefficients. \* P<0.05, \*\*P<0.01, \*\*\*P<0.001, †P0.10 (two-tailed), with directional hypothesis

Figure 1: The “bricolage → newness → performance” model

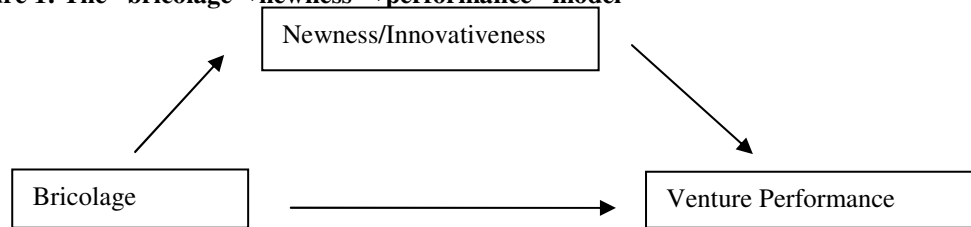
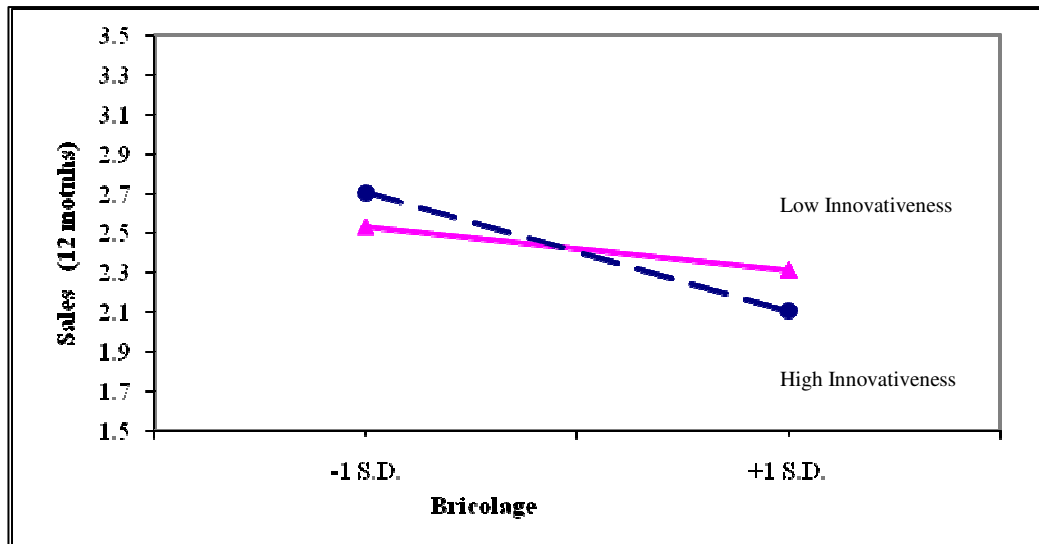


Figure 2A: Moderation Innovativeness: Bricolage and 12 Month Sales (Young Firm)



\*Sales scale minimised to illustrate moderating effect

**Table 3: Mediation Results: Nascent Firms**

	Model 1	Model 2	Model 3	Model 4
	Bric-New	New-Perform	Bric-Perform	Bric/New-Perform
<i>Level of Resources Controls</i>				
YearsActive	0.074†	0.019	0.027	0.021
Team /Solo (Dummy)	0.107†	-0.128*	-0.112†	-0.121*
Spouse Team	-0.115*	0.137*	0.122*	0.132*
Log_Loans	-0.023	0.293***	0.292***	0.294***
Services/Products Dummy	-0.180***	-0.029	-0.049	-0.033
<i>Resource Heterogeneity Controls</i>				
Serial Entrepreneur	0.135†	0.090†	0.095†	0.083
Single/Parallel Entrep.	-0.077	0.053	0.048	0.055
Education Level	-0.018	0.048	0.047	0.049
Industry Exp	0.038	0.072	0.073	0.069
General Manage.Exp	-0.151*	0.013	-0.008	0.006
<i>Industry Controls</i>				
Retail	-0.099†	-0.047	-0.057	-0.048
Hospitality	-0.086†	-0.127*	-0.124*	-0.116
Consumer_Services	0.030	0.027	0.026	0.024
Health, Education Social Services	0.016	0.027	0.029	0.027
Manufacturing	-0.078	-0.092	-0.102*	-0.095*
Construction	-0.042	-0.020	-0.026	-0.022
Agriculture	-0.094†	-0.042	-0.058	-0.050
Mining	-0.070	-0.029	-0.030	-0.024
Transportation	-0.045	-0.014	-0.017	-0.013
Utilities	-0.005	0.032	0.024	0.025
Communication	0.044	-0.018	-0.017	-0.021
Real_Estate	-0.069	-0.046	-0.060	-0.054
Finance_Insurance	-0.049	-0.016	-0.018	-0.013
<i>Direct Effects</i>				
Bricolage	0.115**		0.097*	0.086*
Innovation/Newness		0.099*		0.090*
F	2.376***	3.551***	3.476***	3.529***
F value Change				0.053
R2	0.059	0.105	0.102	0.108
△ R2				0.006

Control entries represent standardized regression coefficients. \* P<0.05, \*\*P<0.01, \*\*\*P<0.001, †P0.10 (two-tailed), with directional hypothesis entries (one tailed).

**Appendix 1: CAUSEE Bricolage Measures**

Q1 OK, does the following represent how you never, rarely, sometimes, often, or always go about doing things for your start-up? Firstly, ... **READ STATEMENT**

	Never	Rarely	Sometimes	Often	Always	DK	Refused
We are confident of our ability to find workable solutions to new challenges by using our existing resources	1	2	3	4	5	9	8
We gladly take on a broader range of challenges than others with our resources would be able to.	1	2	3	4	5	9	8
We use any existing resource that seems useful to responding to a new problem or opportunity	1	2	3	4	5	9	8
We deal with new challenges by applying a combination of our existing resources and other resources inexpensively available to us	1	2	3	4	5	9	8
When dealing with new problems or opportunities we take action by assuming that we will find a workable solution	1	2	3	4	5	9	8
By combining our existing resources, we take on a surprising variety of new challenges	1	2	3	4	5	9	8
When we face new challenges we put together workable solutions from our existing resources	1	2	3	4	5	9	8
We combine resources to accomplish new challenges that the resources weren't originally intended to accomplish	1	2	3	4	5	9	8