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Creative Self-efficacy and Innovation Speed of New Ventures: The Mediating Role of Entrepreneurial Bricolage

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***Abstract*—**Evidence shows that start-ups success is positively correlated with the launch of the first product. However, new ventures are seldom able to acquire abundant resources for new product development (NPD), which means that entrepreneurs may depend on personal creativity instead of physical investments to achieve and accelerate innovation speed. This study accentuates the role of entrepreneurial bricolage, which defined as making do by applying combinations of the resources at hand to new problems and opportunities, in the relations of creative self-efficacy and innovation speed. This study uses the multiple regression analysis to test the hypotheses in a sample of 203 start-ups operating in various creative markets in Taiwan. Results reveal that creative self-efficacy is positively and directly associated with innovation speed, whereas entrepreneurial bricolage plays a full mediator. These findings offer important theoretical and practical implications.

***Keywords*—**Creative self-efficacy, innovation speed, entrepreneurial bricolage, new ventures.

I. Introduction

NEW ventures attempting to spur growth and profits must successfully develop and introduce new products and manage their life cycle [1]. Reference [2] mentioned that the formation of the new product development (NPD) as a process of resources recombination, while assuming that NPD can be viewed as acquiring resources [3] and recombining existing materials [4]. This process becomes more complex as new ventures emerge at the very early stage of creating their firms and developing new products or services. While start-up ventures begin by selling unique products or services in leading markets, entrepreneurs rely on commercial skills and managerial expertise, as well as the ability to fully utilize resources. Although considerable attention has been paid to explore how entrepreneurial behavior is stimulated in the entrepreneurship literature, the entrepreneurship initiative of acquiring resources under constrained environmental conditions is seldom addressed. Furthermore, researches based on the resource-based view (RBV) research has suggested that entrepreneurs attempting to launch new ventures should develop valuable, rare, inimitable, and non-substitutable resources (VRIN) to achieve a sustainable and competitive advantage [5]. Those intangible resources, capabilities, or competences generally rely on firm age to nurture a cumulative experience, allowing firms to fully utilize "doing more with less" [6]. In terms of new firms, entrepreneurs always struggle for scarce resources [7] and strive "to create something from nothing" [8] from available resources, which is the first step in taking advantage of VRIN characteristics.

Most prior literature based on RBV has explored the valuable resources in the early stage of NPD [4], examined how resources are exploited, discovered, and constructed in limited surroundings [8], as well as studied how organizational capability, development efficiency, and the performance of NPD are related [9]-[11]. Although prior literature at firm level has suggested the feasibility of generating novelty by recombining knowledge, expertise or capabilities within a firm [12], [13]. Whether the novelty of a product can be created through the recombination of tangible resources remains unclear. Besides, RBV also neglected the dimension of inventing resources from existing materials which were critical to the development cost while focusing on the process efficiency and product effectiveness. The purpose of this study is to explain such phenomena by introducing the theoretical concept of bricolage [14].

Bricolage is defined as making do with what is at hand by applying combinations of available resources to new problems and opportunities [15], [16]. Bricolage has become increasingly prevalent focus of research on entrepreneurship [8], [16]-[18], organizational theory [19]-[21], and research and development (R&D) management [12]. For example, entrepreneurship scholars have proposed that bricolage is an innovative direction for start-ups as they are resource constrained [22]. A creator or an entrepreneur facing candidate resources recalls their memories retrospectively to utilize existing elements creatively and invent a new dimension. Therefore, we believe that the value of a new product can be created through bricolage. As our knowledge, this issue has not been examined in prior literature.

This work describes a novel construct of entrepreneurial bricolage and examines its consequence (i.e. innovation speed) and its mediating role between entrepreneur creative self-efficacy and innovation speed. However, while most of empirical studies adopted the bricolage concept to explain the entrepreneurship initiative process, those studies failed to explore the determinants which enables start-ups to do more with less.

As shown in Fig. 1, the conceptual model is developed based on two hypotheses introduced in the next section. This study argues that entrepreneurial bricolage activity is essential for

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creators or entrepreneurs to construct resources and discover the values of new products that increase the speed of innovation, especially when creators or entrepreneurs attempt to initiate new ventures under a resource-constrained environment. Additionally, the creative self-efficacy is an essential element for them to recombine exiting materials for the entrepreneurial initiatives.

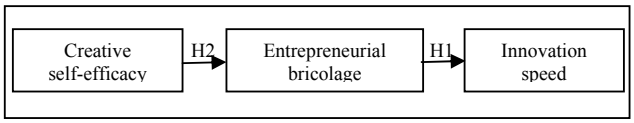

Fig. 1 The research framework

II. Theory and Hypothesis Development

A. Bricolage

"Animals and plants are not known as a result of their usefulness; they are deemed to be useful or interesting because they are first of all known" [14]. The French anthropologist [14] pioneered the bricolage concept in 1967, under the premise that an engineer and bricoleur must be distinguished from each other; the latter uses with what is at his hand and redefines the means that he already has. Previous studies on bricolage in organizational contexts viewed it as integral to entrepreneurship [15], [23], [24]. For example, [15] defined bricolage as making do with current resources, as well as creating new forms and order from tools and materials. Based on this guideline, [23] proposed the concept of inventing resources, which refers to the invention of resources from available materials to resolve unanticipated problems. Recent works have empirically examined the bricolage concept by using case studies [16], [25] to verify the linkage between resource bricolage and the entrepreneurial process of new ventures.

B. Entrepreneurial Bricolage and Innovation Speed

Reference [8] defined that bricolage is explicated three elements: resources at hand, recombination of resources for new purposes, and making do- as the core concept of bricolage. "Making do with what is at hand" is the major feature of bricolage. Individuals interacting with materials can observe, examine and test the limitations of those elements. In defining the resources at hand, [8] included available resources that are inexpensive or for free, often because others determine them to be useless or inferior. Reference [17] found that available materials "such as wood and lorry gears," other "modest resources" and miscellaneous "embedded" individuals providing inputs for development of Danish wind turbines. As entrepreneurs can acquire, collect and exploit resources with lower cost or even for free, they will benefit for learning by doing which deals with skill improvements and resource invention that grow out of the productive process.

Bricolage improves innovative outcomes in the emerging stage of firm creation [22]. A commodity value can be created by recombining different recombined firm's resources and capabilities [26]. A number of studies have emphasized the relation between bricolage and value creation. For example, in [25] qualitative study, they applied the bricolage concept to social entrepreneurial action and proposed a theoretical framework of social bricolage using qualitative data from eight social enterprises. They found that social value can be created in social enterprises from social bricolage processes (i.e. the processes of making do, refusal to be constrained by limitations, and improvisation). This situation also occurs during the entrepreneurship initiative process of product design area, in which an improved component in product design or development causes customers to perceive a similarity from the previous one. Recently, [27] found that entrepreneurial bricolage as a path to innovativeness for resource-constrained new firms, and they suggested that new ventures who engage in entrepreneurial bricolage behaviors can be more innovativeness under resource constraints. As a result, bricolage can improve the performance of NPD, including value creation, product innovativeness and time to market. We thus postulate the following:

- *Hypothesis 1:* Entrepreneurial bricolage has positive effect on innovation speed.

C. Creative self-efficacy and Entrepreneurial Bricolage

Reference [14] discovered that the bricolage behavior could facilitate bricoleurs to enter into a dialogue with what is at their hand and try to find the new use of materials. Reference [14] found that the bricoleur must turn to an already constituted set, formed by tools and materials; take, or re-take an inventory of it; finally, and above all, to index and engage into a kind of dialogue with it, right before choosing among those tools and materials, then the possible answers to the dialogue is what the set can offer to his problem. So, the bricolage activity can be considered as an experimental process that creators or entrepreneurs will try to solve problems with what is at their hands by trial and error process.

However, to elucidate the value of uselessness from existing resources is a very complex task. Reference [28] found that when individuals facing complex tasks will experience cognitive faculties and processes that generate creativities. Besides, [28] also mentioned that creative self-efficacy is an important role of solving complex tasks. Consequently, we propose that creative self-efficacy will benefit the behaviour of entrepreneurial bricolage.

- *Hypothesis 2:* Creative self-efficacy has positive effect on entrepreneurial bricolage.

III. Method

A. Research Context and Data Collection

This study focuses on bricolage and innovation speed of innovative products, in which creativity markets in Taiwan are appropriate research contexts since new products are displayed. Creativity markets are commonly characterized by several unique features. First, participating creative workers are typically tiny start-ups or small scale design teams at the beginning stage that have greater challenge of obtaining resources. Second, the host organization demands a substantial

amount of "originality" with the products on display. There is even a "gate-keeping mechanism" to prevent large discrepancies in the product quality. New products were displayed on the street, square or plaza, so it was very convenient for researchers to investigate each start-up and collect questionnaires. 203 start-ups in the creative market agreed to participate in this study.

B. Measures

This study uses different questionnaires for measurement as Table I. The questionnaire rated all items on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). Besides, innovation speed means time to speed. Finally, the capital of start-ups and perceived resource availability of asset (semantic differential scale) were being considered as control variables.

TABLE I
RESEARCH QUESTIONNAIRES

Constructs	Items
Creative self-efficacy	[28]
Entrepreneurial bricolage	[27]

C. Result

Table II lists the means, standard deviations and correlations among variables. The results of the zero-order correlation refer to a situation in which entrepreneurial bricolage was positively correlated with the innovation speed ($r = -.143^{*}$, $p < .01$) and creative self-efficacy had a positive effect on entrepreneurial bricolage ($r = .687^{**}$, $p < .01$).

TABLE II
MEANS, STANDARD DEVIATIONS AND CORRELATIONS AMONG VARIABLES

Variables	Mean	SD	1	2	3	4
1.Capital	1187545 6.75	60785693 .47				
2.Perceived resource availability of asset	3.31	1.28	-.019			
3.Creative self-efficacy	4.46	1.02	-.027	.055	(.72)	
4.Entrepreneurial bricolage	4.38	.93	.008	.299**	.687**	(.87)
5.Innovation speed	.32	.40	.249**	.025	-.156*	-.143*

*p<.05, **p<.01

TABLE III
HIERARCHICAL REGRESSION ANALYSIS

Variables	Innovation Speed		
	Model 1	Model 2	Model 3
1. Capital	.25	.25	.26
2. Perceived resource availability of asset	.09	.08	.16
3. Creative self-efficacy		-.13*	.04
4. Entrepreneurial bricolage			-.25*
F	4.48*	3.68*	3.91**
R^2	.07	.09	.12
Adjusted R^2	.05	.06	.09

*p<.05, **p<.01

We tested the hypotheses using hierarchical regression analysis. According to Table III, creative self-efficacy was positively related to innovation speed ($\beta = -.13$, $p < .05$). Based on Model 3, entrepreneurial bricolage had a positive effect on innovation speed ($\beta = -.25$, $p < .05$). However, creative self-efficacy was disassociated with innovation speed while entrepreneurial bricolage involved. According to [29], entrepreneurial bricolage was fully mediated by creative self-efficacy and innovation speed. Thus, H1 and H2 are supported.

IV. CONCLUSION

A. Theoretical Implications

This study illustrates the relation between resource utilization, entrepreneurial behavior and innovation outcome by introducing [14] concept of bricolage. Results indicate that bricolage activity serves as a critical process for creators to construct resources and to discover new values. Besides, the creative self-efficacy plays a significant role in encouraging entrepreneurs' bricolage behavior that eventually benefits to innovation speed.

Our results offer several theoretical contributions. First, we enrich the literature on entrepreneurship and innovation management by examining the relationship of personal creativity, entrepreneurial behavior and the speed of time to market as the recent research only focused on bricolage and innovation performance [22]. Second, prior literature has suggested the theoretical relationships proposed in this study [8]; it has primarily focused on resource, while neglecting the effects of personal creativity conditions. We found that entrepreneurial bricolage mediates the relationship between creative self-efficacy and innovation speed. Time to market decreases when the entrepreneur has a high level of creative self-efficacy under a high level of entrepreneurial bricolage. The results suggest that appropriate bricolage behaviors are beneficial for shortening innovation speed.

B. Practical Implications

Our results provide a valuable reference for new start-ups or firms attempting to identify existing elements through meaningful bricolage behaviors to develop new products less expensively. To discover new values for innovative products, bricolage activities involve creative self-efficacy to facilitate creators to enter into a dialogue with available resources and to accumulate in-depth knowledge.

C. Limitations and Suggestions for Future Research

By exploring the relationships among creative self-efficacy, entrepreneurial bricolage and the innovation speed in creative markets where start-up design firms are gathered, we contribute to the literature on entrepreneurship and innovation management. The innovative climate of the public in Taiwan and the development of creative markets are thriving; however, a growing problem exists in innovative homogeneity. The same teams that continuously participate in activities may cause repeatability that result in a decreased sample size. At the beginning stage of start-ups, creators was led more by the customer requirements during the survival phase, the issue of intellectual property protections are neglected, which caused plagiarism from competitors that affects product originality.

The future research challenge is to examine whether the

bricolage behavior of new ventures has changed over time. This topic requires continuous investigation for a more detailed description of bricolage behavior to help start-ups capture the advantages of innovation outcome in the future.

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