

## BRIDGING BEHAVIORAL MODELS AND THEORETICAL CONCEPTS: EFFECTUATION AND BRICOLAGE IN THE OPPORTUNITY CREATION FRAMEWORK

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**Research summary:** Opportunity creation, effectuation, and bricolage are three concepts that describe value creation and the central role of entrepreneurial action in that process. Although research often conceptualizes these concepts as interrelated, precisely how they relate to and complement one another and where they diverge remains unclear. This article examines the roots of each of these concepts and their underlying assumptions, organizing them within a unifying conceptual frame. Our analysis reveals a set of entailing implications that can guide future conceptual and empirical work in entrepreneurship, and it advances our understanding of value creation and capture in strategy, organization theory, management, and related fields.

**Managerial summary:** What are entrepreneurs doing? At the highest level of abstraction, entrepreneurs are identifying and exploiting opportunities. Recently, several lines of research have examined how certain types of entrepreneurial action can result in forming, rather than merely encountering, opportunities. Scholars engaged in this work have used both deductive and observational approaches, which have been rarely examined jointly or integrated into a comprehensive framework. This article focuses on the literature on opportunity creation, effectuation, and bricolage, examining each of the approaches and their underlying assumptions, and it organizes them within a unifying conceptual frame. Doing so reveals avenues for future work, in particular the development of new theories of opportunity formation, and implications for research in related fields such as strategic management, organization theory, and economics. Copyright © 2016 Strategic Management Society.

### INTRODUCTION

As a relatively young field, entrepreneurship has borrowed many theoretical frameworks from existing fields such as strategy (Alvarez and Busenitz, 2001; Alvarez and Barney, 2004; Azoulay and Shane, 2001;

Kistruck *et al.*, 2013), psychology, cognitive science (Busenitz and Barney, 1997; Baron, 1998; Gaglio and Katz, 2001), and sociology (Ruef, Aldrich, and Carter, 2003; Ruef, 2010). Theories drawn from these and other domains have been used to illuminate questions of interest to the field. Short of distinctive theory of its own, entrepreneurship research has focused on a potential distinctive domain: opportunities (Shane and Venkataraman, 2000).

While initial work exploring opportunity in entrepreneurship took the existence of opportunity as a given, focusing most often on identification and

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subsequent exploitation (Shane and Venkataraman, 2000), these insights do not provide a direct explanation of how opportunities are formed (Alvarez and Barney, 2007, 2010; Klein, 2008). In recent years, complementary frameworks focused on the formation of opportunity have been developed. Opportunity creation (Alvarez and Barney, 2007) focuses on the nature of opportunity, deriving implications for entrepreneurial action deductively from this underlying ontology. Effectuation (Sarasvathy, 2001) and bricolage (Baker and Nelson, 2005) focus on the actions of entrepreneurs, producing behavioral models reflecting what entrepreneurs do in practice and inductively deriving implications for opportunity. Although both the deductive and inductive approaches focus on similar questions, each literature has largely followed its own developmental arc, with little integration (Wood and McKinley, 2010; Arend, Saroghi, and Burkemper, 2015). While seemingly tackling the same research question and often cited together, these three frameworks are rarely, if ever, analyzed jointly (Archer, Baker, and Mauer, 2009; Fisher, 2012).

With that in mind, the purpose of this article is to clarify these three theoretical frameworks, highlighting their overlaps and divergences, and present an empirically tractable perspective on the formation of opportunities that offers guidance to future entrepreneurship research. A joint consideration of these literatures has potential to inform our understanding of each and advance entrepreneurship research as a whole.

To achieve our aim, we first describe the questions and core assumptions each framework aims to address. Then, we illustrate how bricolage and effectuation offer different perspectives on how to operationalize opportunity creation and provide a framework that integrates these perspectives. This integration provides a common ground on which to further develop theory on the formation of opportunities and behavioral models of entrepreneurial action, while clarifying these frameworks for those outside the field of entrepreneurship.

## THE ANALYTICAL FRAME: OPPORTUNITY, CONTEXT, AND INDIVIDUAL

Since Shane and Venkataraman's (2000) description of entrepreneurship as action in the individual-opportunity nexus, the opportunity construct has

assumed primacy in the entrepreneurship literature. For the purposes of this article, we build on the definition of opportunity as a competitive imperfection in product or factor markets (Shane, 2003; Alvarez and Barney, 2010). As both opportunity creation and behavioral models in entrepreneurship are preoccupied with opportunities, we add two other components to our analytical framework: the context in which the action occurs and the entrepreneur as actor in that context. We will present opportunity creation, effectuation, and bricolage and their assumptions with regard to these three dimensions, in order to subsequently derive boundary conditions and overlaps.

### Opportunity creation

Historical conceptions of entrepreneurial action in entrepreneurship have often been bounded by a simplifying assumption: they take the existence of the opportunity, conceptualized as a market imperfection generated by an exogenous shock, as a given (Shane and Venkataraman, 2000). Traditional research on entrepreneurial action spanning several literatures, such as cognition, teams, and the entrepreneurial process, adopts this simplifying assumption to advance our understanding of two questions: why do some people and not others discover opportunities? And, why do some people and not others act to exploit them (Shane, 2003)?

Alvarez and Barney (2007) distinguish two approaches to entrepreneurial action. In one approach, called discovery, the product or factor market imperfection is taken as a given, and the mechanism that generates that imperfection is exogenous to the process. In the second approach, called creation, how the market imperfection is generated is the question at hand, and the mechanism, human action, is endogenous to the process (Wood and McKinley, 2010).

Recent work in the opportunity formation stream has considered how opportunities come to be (Alvarez and Barney, 2007; Suddaby, Bruton, and Si, 2014), how they are exploited, and by whom (Alvarez and Barney, 2008; Haynie, Shepherd, and McMullen, 2009), the influence of resource constraints on their formation (Alvarez, Young, and Woolley, 2015), and how individuals and teams organize to capture the rents they have created (Alvarez and Barney, 2004, 2005).

*Assumptions about the opportunity, context, and actor in opportunity creation*

In opportunity creation, opportunities for entrepreneurial profit are formed endogenously through

action. In this view, opportunities cannot exist apart from the actions that form them and the human social institutions in which they are embedded. They are, necessarily, human social institutions requiring human action for their generation and social agreement for their persistence (Alvarez *et al.*, 2014).

The decision-making context in opportunity creation is that of Knightian uncertainty (Knight, 1921; Alvarez and Barney, 2007). Knightian uncertainty is the condition where neither outcomes nor their probabilities can be estimated *ex ante*. The alternative context is that of Knightian risk, where outcomes probabilities can be estimated *ex ante* (Knight, 1921).<sup>1</sup>

Another assumption in the literature about opportunity creation is the role of the actor in opportunity formation. Although this perspective ascribes a central role for individual action as a necessary condition for opportunity formation, opportunity creation offers few explicit assumptions about their cognitive or behavioral aspects and most often is invoked as an abstraction to contrast the difference between entrepreneur-as-generator of market imperfections with its counterpart, the traditional entrepreneur-as-discoverer. While it is possible that the process of forming an entrepreneurial opportunity may alter the actors engaged in the process and reveal differences *ex post* (Alvarez and Barney, 2010), empirical work testing this conjecture has not yet emerged.

## Effectuation

Effectuation captures the decision-making heuristics of expert entrepreneurs, empirically derived through quasi-experimental interviews with serial entrepreneurs (Sarasvathy, 2001; Dew *et al.*, 2009a). These heuristics are contrasted against another decision-making archetype called causation, contextualized in entrepreneurship as traditional business planning processes. A core claim of effectual reasoning is that actors can create a variety of effects when they attempt to exert influence over the things they can control, e.g., their current means, and ‘focus on selecting between possible effects that can be created with that set of means’ (Sarasvathy, 2001: 245). Said another way, effectuation processes do not set a specified

end point, but focus on what can be done (given the capacity to influence and means at hand) to move toward a yet-to-be-determined near-term future end point.

Sarasvathy (2001) details how effectuation processes begin by focusing on the means entrepreneurs have at their disposal, decomposing the means through which an actor can exert control over the world into three categories: who they are, what they know, and whom they know. Beginning with these highly individual means, effectual thinking diverges from causal logic by promoting actions that take into account affordable loss rather than expected returns, the commitments of local stakeholders rather than competitive analysis, and exploiting contingencies rather than preexisting knowledge (Sarasvathy, 2008).

Recent work on effectuation has made steps toward quantitative measuring, starting with Read, Song, and Smit (2009), who conducted a meta-analysis, finding significant results for the use of effectual logic on firm performance, and continued by Chandler *et al.* (2011) and Brettel *et al.* (2012), who have developed survey constructs to test differences between effectual and causal reasoning. In addition, recent qualitative studies continue to address more detailed mechanisms behind the identified heuristics, for example dynamic patterns of effectuation in combination with causation (e.g., Berends *et al.*, 2014; Reymen *et al.*, 2015). This recent work has also noted the need for a more clearly defined theoretical model of effectuation (Perry, Chandler, and Markova, 2012; Mauer, 2015; Arend *et al.*, 2015).

### *Assumptions about the opportunity, context, and actor in effectuation*

As effectuation keeps goals flexible and builds on mean-based action, it describes a process through which opportunities may be created (Sarasvathy *et al.*, 2003). The literature suggests that *control* is the essence of this entrepreneurial expertise and a viable alternative in light of the difficulties that prediction faces in uncertain situations (Sarasvathy, 2001; Wiltbank *et al.*, 2006). Control can be understood as a preference for directly and immediately executable actions toward an unknown future state. In essence, decisions are made that permit future actions and, ideally, expand the actor’s ability to create (or cocreate) one of many possible futures. Effectuation assumes that an opportunity may result via these control-based strategies (Wiltbank *et al.*, 2006). As the framework evolved, conceptual studies

<sup>1</sup> Throughout this manuscript we use the term ‘uncertainty’ to refer to Knightian uncertainty and the term ‘risk’ to refer to Knightian risk.

considered the implications of the effectuation process within the context of an emerging dialogue about the nature of opportunity (Sarasvathy *et al.*, 2003; Sarasvathy, 2004; Sarasvathy *et al.*, 2014), concluding that ‘opportunities were often endogenous to and artifacts of the effectual process’ (Sarasvathy, 2012: 3).

For the context, it is important to remember that effectuation was developed through entrepreneurship-related think-aloud experiments with expert entrepreneurs (Sarasvathy, 2001, 2008). As such, the literature on effectuation is rooted in the entrepreneurial phenomenon, suggesting that it applies to uncertain contexts and to the creation of economic artifacts. In risky contexts, prediction and planning are potential decision models, but entrepreneurial decisions are rarely made in predictable contexts (Wiltbank *et al.*, 2006). Furthermore, the future state of an uncertain context does not arise exogenously, but is affected by the actions of the effectuating entrepreneur (Read *et al.*, 2009; Sarasvathy, 2008). Thus, it is assumed that a context with an uncertain future that can be sculpted through action is the backdrop against which effectuation is set. In fact, the entrepreneurial problem space has been described as being characterized by Knightian uncertainty, goal ambiguity, and information isotropy (Sarasvathy, 2008).

Finally, effectuation does not address the motivations of entrepreneurial actors directly, but the means-based principle includes answers to the question of *who I am*. Thus, the actor in effectuation influences his/her environment through his/her means and iterates based on the response from the environment. While effectuation initially focused on expert entrepreneurs, more recent work (e.g., Chandler *et al.*, 2011, Reymen *et al.*, 2015) has relaxed this restriction.

### Bricolage

Underpinning entrepreneurship’s traditional focus on opportunity discovery is a description of man as a calculator. In this view, the core challenge for entrepreneurs is search and running the search calculations involved in opportunity discovery and subsequent exploitation.<sup>2</sup> Bricolage emerged as a

<sup>2</sup> Shane and Venkataraman (2000) argue that opportunity discovery ‘requires that he or she recognizes the opportunity exists, and has value...’ (2000: 222) and that the decision to act involves ‘weighing the value of the opportunity against the costs to generate the value and the costs to generate that value in other ways...’ (2000: 223).

description of a unique form of entrepreneurial behavior, and it has evolved to become a catalog of entrepreneurial activities that do not seem to fit a model of man as rational calculator and profit-maximizing engine (Baker and Nelson, 2005; Di Domenico, Haugh, and Tracey, 2010; Desa and Basu, 2013).

In anthropology, Levi-Strauss (1967) initially described bricolage as ‘making do with what’s on hand.’ Baker and Nelson (2005) extended this original description and applied it to the process of value creation,<sup>3</sup> observing that some entrepreneurs prefer to engage in a process of ‘making do by applying combinations of the resources at hand to new problems and opportunities’ (Baker and Nelson 2005: 333). ‘Making do’ describes a state of action where *bricoleurs*—that is, those who utilize bricolage—view resource limitations as both a problem and an opportunity. Rather than focusing on activities that enable them to obtain an advantaged resource position (as perspectives on entrepreneurial action infused by strategy and organization theory suggest) or acting in ways to shape near-term reality (as the logic of effectuation suggests), *bricoleurs* engage in a different activity entirely. They use resources on hand to solve the problem in a new way or combine existing resources to potentially unlock a new source of value. The combinations that result from bricolage may come from an individual actor (Baker, 2007) or a collective group of actors (Garud and Karnøe, 2003).

In recent years, conceptual work has applied the concepts of bricolage as the theoretical underpinnings for entrepreneurial phenomena that resist the model of man as rational calculator (Di Domenico *et al.*, 2010; Desa and Basu, 2013; Phillips and Tracey, 2007) and extended to inform research on economic organization and entrepreneurial founding teams (Duymedjian and Rüling, 2010; Baker *et al.*, 2003). Empirically, the work to support bricolage has typically utilized the case study (Mair and Marti, 2009) or multiple case study approach, although recent research has developed a

<sup>3</sup> Levi-Strauss (1967) initially described two types of bricolage: ideational and material. Ideational bricolage describes the process of recombining earlier myths to create new myths serving new functions; whereas, material bricolage represents the combination of resources at hand to find novel and workable approaches to overcome problems and exploit opportunities (Baker and Nelson, 2005). Although ideational bricolage has received some attention in the entrepreneurship literature (Mair and Marti, 2009), the majority of research has focused on material bricolage (Baker, Miner, and Eesley, 2003; Garud and Karnøe, 2003; Baker and Nelson, 2005; Baker, 2007).

measure for bricolage (Senyard *et al.*, 2014). Although narrative (Baker, 2007) has been employed to further clarify the points of bricolage, there have been frequent calls for scholars working in the bricolage stream to engage in both experiments and systematic empirical testing (Senyard, Baker, and Davidsson, 2009) to provide a clear delineation between bricolage and other related entrepreneurial concepts (Stinchfield, Nelson, and Wood, 2013).

*Assumptions about the opportunity, context, and actor in bricolage*

Existing research employing the bricolage framework makes no explicit claims about the underlying ontology of entrepreneurial opportunity. However, its intellectual roots (Levi-Strauss, 1967; Weick, 1979; Baker and Nelson, 2005) reinforce its core conclusion that ‘many or most entrepreneurial opportunities are more enacted than they are discovered’ (Baker and Nelson, 2005: 359). It would seem that theories of bricolage, along with adjacent work in entrepreneurial improvisation and planning (Hmieleski and Corbett, 2006; Miner, Bassof, and Moorman, 2001) may most readily apply in a world of formed, rather than encountered, opportunities.

The most crucial assumption in the bricolage framework is the backdrop upon which entrepreneurial action occurs—a world of scarce resources in which the main challenge entrepreneurs face is ‘making something from nothing’ (Baker and Nelson, 2005: 340). Because *bricoleurs* often draw from unrelated or underdeveloped resources during the opportunity-formation process, it ‘represents a form of value creation that does not depend on the Schumpeterian assumption that assets are withdrawn

from one activity for application in another’ (Baker and Nelson, 2005: 362).

The actor figures prominently in bricolage as the catalyst that ‘generates heterogeneous value from ostensibly identical resources’ (Baker and Nelson, 2005: 330). Although the entrepreneurial actor has not received significant elaboration or attention in the literature on bricolage to date, the entailing implications of bricolage, the intellectual heritage of the framework, and its connections to adjacent literatures strongly suggest a view of the *bricoleur* as a creator. Value-creating *bricoleurs* operate in resource-constrained environments and may select these environments characterized by extreme resource scarcity as a value-creating strategy (Baker, 2007; Duymedjian and Rüling, 2010). The tendency of *bricoleurs* to eschew socially constructed constraints for how resources ‘ought’ to be used (Baker and Nelson, 2005) and a tendency to self-identify and take pride in doing things differently (Gioia, Schultz, and Corley, 2000; Rao, Davis, and Ward, 2000) suggests a perspective on the actor (or actors) as creative, improvisational, and novelty seeking.

Table 1 summarizes the existing assumptions regarding the opportunity, context, and actor for each of these theoretical frameworks. With an understanding of each of these frameworks in place, we turn to discussing the boundary conditions and conceptual overlaps for these three frameworks.

**BOUNDARY CONDITIONS**

Boundary conditions can be understood by examining what values the units of the three assumptions—opportunity, context, actor—could take (Dubin, 1978).

Table 1. Assumptions about the nature of the opportunity, context, and actor in opportunity creation, effectuation, and bricolage

|                      | Opportunity                             | Context  | Actor  |
|----------------------|---|--|--|
| Opportunity creation | Market imperfection                     | Objective state of Knightian uncertainty                     | Interacts with environment to form a market imperfection   |
| Effectuation         | Unspecified possible (near-term) future | Bounded rationality stemming from perceptions of uncertainty | Employs means-based heuristics to interact with the environment, potentially forming a market imperfection |
| Bricolage            | Unspecified (known or unknown problem)  | Perception of resource scarcity                              | Uses resources on hand to solve an existing problem in a new way or create a new means-ends relationship   |

The boundary conditions of opportunity creation are the most straightforward of the three frameworks because opportunity creation began as a deductive exercise, with its assumption states as priors. For effectuation and bricolage, the boundary conditions have to be implied due to the fact that they were inductively derived.

Opportunity creation can be considered a system state whereby all the units take specific values (Welter and Alvarez, 2015). In this case, a competitive imperfection arising from an uncertain context, endogenously formed, with no particular requirement of the actor to 'be something' is the result of an opportunity-creation process. Alternatively, a competitive imperfection arising in a risky context, exogenously formed, which is identified and exploited by an 'alert' actor, represents opportunity discovery (Eckhardt and Shane, 2003).

In effectuation, boundary conditions strongly focus on the actor. As such, the boundary conditions seem to be delineated through the specific decision-making heuristics, including behavioral implications referred to in the literature as *principles* (Sarasvathy, 2001; Dew *et al.*, 2009a). For effectuation to be occurring, entrepreneurial action must show elements of these heuristics. Empirical work so far has largely analyzed effectuation as a set of these independent principles (Read *et al.*, 2009; Chandler *et al.*, 2011; Brettel *et al.*, 2012). Although Chandler *et al.* (2011) proposed that effectuation may represent a multi-dimensional construct based on factor analytic results, subsequent studies have often concluded that a set of actions were representative of effectual reasoning even if there was only evidence for individual principles and not the full set. Following all principles clearly represents a case of effectuation. However, literature remains inconclusive about whether all effectuation principles have to be present at the same time. Thus, it also remains unclear if the set of principles forms an appropriate boundary condition for effectuation.

Still, on the side of the actor, one may also consider expertise to be a boundary condition of effectuation. Although expertise has been a primary assumption of effectuation, the fact that the elements of this expertise can be extracted, conceptualized, taught, and learnt (Sarasvathy, 2008) does not make entrepreneurial expertise a boundary condition of effectuation. The difference may lie in the fact that expert entrepreneurs develop the competences intuitively (without conscious rationalizing) through their previous experiences, whereas novices will likely have to be taught. In addition, if the entrepreneurial experiences represent a track record of coping with

uncertainty, one could argue that there may be other experiences that are non-entrepreneurial and still may constitute the build-up of similar expertise. In that case, entrepreneurial expertise would be only one representative of a certain type of decision making.

Turning to the context, literature on effectual reasoning typically states that the actor is boundedly rational and has become an expert at action in an uncertain world (Knight, 1921). However, there is reason to differentiate between objective and subjective uncertainty, as well as between applicability and appropriateness for risky and uncertain contexts. With its focus on individual decision making, effectuation emphasizes perceptions of uncertainty over objective uncertainty. Furthermore, the original think-aloud experiment—a marketing and entrepreneurship game called Venturing (Dew *et al.*, 2009b)—could easily be construed as a risk-based decision context. In fact, it was specifically designed to not discriminate subjects by keeping perceptions of technological uncertainty at a low level. Although the context was not particularly uncertain, expert entrepreneurs did demonstrate patterns of a non-predictive logic, interpreted as effectuation principles. Several useful implications follow. First, although largely understood as a paradigm for decision making under uncertainty (in terms of appropriateness), effectual reasoning may not *necessarily* require an (objective) uncertain decision-making context to be applied. This aligns with recent research (Arend *et al.*, 2015) suggesting that the relationship between effectuation and uncertainty has not been sufficiently defined in the entrepreneurship literature specifically (and the management literature more broadly). These insights align work at the intersection of strategy and entrepreneurship that attempts to take a more nuanced look at this construct (Folta, 2007; Hsieh, Nickerson, and Zenger, 2007). Second, as effectuation dominates expert entrepreneurs' thinking they may represent individuals who have built up an expertise in (and have a preference for) non-predictive decision making (Wiltbank *et al.*, 2006). Third, if the essence of effectuation is a non-predictive way of coping with uncertainty, it may also be applicable to domains other than the creation of economic artifacts (Sarasvathy, 2001: 256). We explore these implications in more detail later in the discussion.

Similar to effectuation, bricolage focuses heavily on the actor. Baker (2007) points out that one action may be bricolage to a given individual, but may not be bricolage to another party of the same transaction.

The opportunity, though, can be considered emergent. In selective bricolage (Baker and Nelson, 2005), actions function more as a stopgap for a lack of resources to pursue a specific, typically exogenous, problem. However, these actions may give rise to an endogenous opportunity that would not have otherwise existed, if not for those specific actions. Similarly, the context here is emergent depending on the results of the actions. Pursuing an exogenous opportunity typically falls under a risky context. In the formed opportunity, however, the context is uncertain. To better understand whether the actor is a *bricoleur*, it is worth exploring the concept of resource scarcity in further depth.

For bricolage, the primary assumption is the condition of resource scarcity. Nearly all organizations meet with resource scarcity at some level, so scarcity is a necessary, but not sufficient, condition to consider an actor a *bricoleur*. ‘Simply seeking out or paying discount prices does not, of course, constitute bricolage. But making use of a resource because it is available cheaply or for free, rather than because it is the ‘right’ resource, and then combining it with other resources to take advantage of some new opportunity, exemplifies bricolage’ (Baker, 2007: 705). The measure of bricolage, then, depends not on the cost of the item, but on its comparison to the *right* resource and its use. If a resource is used for its intended purpose, then the action is not bricolage. However, determining whether a resource is the *right* resource is simultaneously subjective and difficult to verify (Rumelt, 2005). Yet, this boundary condition is important because it differentiates actions that uniquely describe bricolage from actions taken as a result of resource constraints generally. The examination of novel uses of resources in the face of constraint is an endeavor unique to bricolage studies in entrepreneurship. The novel combinations of resources formed by bricoleurs may give rise to an entrepreneurial opportunity where previous assumptions had proven that there was no opportunity present. With these boundary conditions clarified, we can now more easily discuss the areas in which these concepts overlap.

## CONCEPTUAL OVERLAPS

Building from the boundary conditions and underlying assumptions within each of these areas, we have constructed Figure 1 to visually demonstrate the relationships between these concepts. Note that the

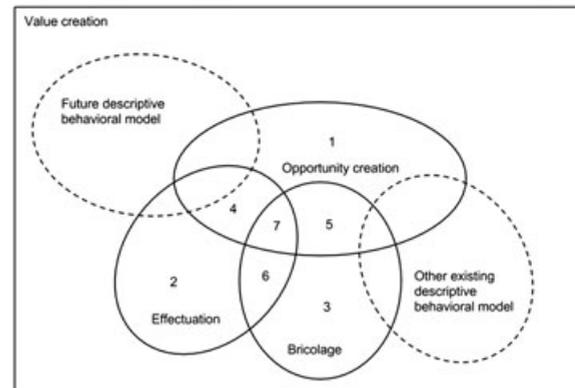


Figure 1. Bridging models of entrepreneurial behavior with opportunity creation

universe here is value creation. These frameworks do not represent all forms of value creation (for example, causation or opportunity discovery), but these frameworks all speak to value creation.

*Area 1* represents opportunity creation absent bricolage and effectuation. As such, there are presumably many different ways to form the competitive imperfection. The process, in general, has been described (Wood and McKinley, 2010), but that general description may involve processes other than effectuation or bricolage. There may be other processes—currently described in other literatures or not yet developed—that could explain how an opportunity may come to be endogenously in an uncertain context. In other words, Area 1 can be considered opportunity creation under any other behavioral model. Thus, opportunity creation is in need of further exploration in regard to alternative decision-making frameworks that may be appropriate or effective.

*Area 2* represents effectuation in the absence of opportunity creation and bricolage. Although effectuation was developed specifically from a study with expert entrepreneurs (Sarasvathy, 2008), this group of decision-making heuristics may apply to fields beyond entrepreneurship (Sarasvathy, 2001). Whether in concert or individually, the heuristics of effectuation may be applied to non-business decisions, such as making dinner, that are outside the bounds of opportunity creation and would not require bricolage. Also, as we will address later, we believe effectuation may have implications for other fields.

*Area 3* represents bricolage absent effectuation and opportunity creation. In many cases, bricolage may not be directed toward the formation of an opportunity or rely on the heuristics of effectuation. Baker and

Nelson (2005) describe several instances of parallel bricolage whereby the actor in question acts as a bricoleur without prospect or direction of forming an opportunity and apart from applying effectual logic.

*Area 4* represents the overlap between effectuation and opportunity creation that excludes bricolage. This area includes all aspects of effectuation that are not a matter of making novel use of what is on hand. The decisions made in this case would represent a means-based logic, but would exclude the novel use criterion of bricolage with regard to resources that are part of the effectual means base or go beyond it. Two separate yet similar cases should be considered in this realm. First, an entrepreneur may have the means on hand that are put to their typical use, thus not involving bricolage. Second, an entrepreneur may be independently wealthy and, thus, able to finance all the appropriate required resources. The entrepreneur's wealth is a resource on hand, but its use is not novel. Furthermore, this is less of a resource-constrained environment than the prototypical bricolage environment.

*Area 5* refers to situations that involve both opportunity creation and bricolage and it excludes effectuation. This represents aspects of opportunity creation, such as human resources drawn from the entrepreneur's social network, that involve making do with what's on hand in novel ways (Banerjee and Campbell, 2009). All of bricolage requires a means-based approach by definition of using what's *on hand*. Thus, a view of any means-based approach as effectuation would require bricolage to be a special case of effectuation. Thus, this situation requires a view of effectuation as a multi-dimensional construct (Chandler *et al.*, 2011), where effectuation is defined by the existence of all heuristics. With a multi-dimensional construct, it is easy to imagine situations where a bricoleur does not employ all or any of the other heuristics involved in effectuation.

*Area 6* shows effectuation and bricolage coinciding in the absence of opportunity creation. It may represent situations outside the economic sphere in which effectuation is applied and informed by bricolage. Both concepts coincide in the notion of means that are close at hand. Bricolage adds the notion of means being used in novel ways. Literature on effectuation has touched upon a similar concept before: exaptation (Dew, Sarasvathy, and Venkataraman, 2004). Exaptation refers to a resource characteristic that once served a particular function, but evolved to serve another. A prominent example is feathers that were necessary for temperature regulation (i.e., down)

before being co-opted for flight. Stemming from the evolution literature, the term somewhat represents evolutionary bricolage.

*Area 7* represents the overlap of all three of the concepts. We believe this to be the most common area involving opportunity creation (although that is an empirical question beyond the scope of this article). Part of the confusion around these topics may stem from the frequency of their occurrence together. These are situations in which an effectual decision model requires the making do with what's on hand in novel ways, while pursuing the creation of a market imperfection. One of the examples given in Sarasvathy (2001) is that of U-Haul. The company used customers as sales people to rapidly gain a nationwide network. The customers were available resources who were not typically used as salespeople. Therefore, this represents bricolage.

This last example represents the case where both bricolage and effectuation are present in opportunity creation (*Area 7*). Sarasvathy (2001) uses the case of U-Haul as an example of effectual logic, citing that formal case analysis would suggest that the idea was untenable. Nonetheless, the Shoens (U-Haul's founders) enacted this opportunity in the face of uncertainty by enlisting friends, family members, and customers to make down payments on trucks and lend them the use of those trucks, as they personally invested no more than \$5,000. Furthermore, the Shoens gave incentives to early customers if they would establish an outlet for the trucks at their final location. This example describes how the Shoens represented each of the four principles of effectuation, and it can be further understood as an example of how effectual actions led to actions linked to bricolage.

Specifically, U-Haul did not have a national sales force to locate appropriate sales outlets throughout the country. What they had *on hand* was customers moving to various parts of the country. They made use of these customers as a sales force. In a resource-constrained environment, the Shoens used the resource of relocating customers to make do for the lack of a sales force to potential franchisees. The motivation of the Shoens was to apply an available resource (customers) that was not the *right* resource (paid sales force) to accomplish a different task than that resource's typical application (customers establishing franchise locations). Seen in terms of bricolage, the customers were resources that were combined in a novel way as a sales force; yet described using the principles of effectuation, customers became

committed stakeholders with Shoens' idea and cocreated the opportunity.

The other spaces in Figure 1 represent other potential frameworks for action that may describe how an actor can form an opportunity. These frameworks may exist in other fields currently, or they may not yet be identified. In either case, we include these spaces to illustrate that bricolage and effectuation do not represent the only ways to operationalize what an actor does in opportunity creation.

## DISCUSSION AND IMPLICATIONS

Our analysis thus far has brought together opportunity creation, effectuation, and bricolage by clarifying their assumptions, boundary conditions, and conceptual overlaps. By starting with the intellectual roots of the three concepts, we highlighted how these concepts have grown to address the formation of opportunities from either a theoretical base (opportunity creation) or an empirical base (effectuation and bricolage). The different starting points catalyzed research agendas that have converged in some areas, but not all, as Figure 1 illustrates. We discuss the implications of this analysis for: (1) behavioral concepts in the field of entrepreneurship like effectuation and bricolage; (2) the field of entrepreneurship as a whole comprising the theory discussion of opportunity creation; and (3) other fields in the area of and adjacent to management.

### Implications for behavioral concepts of entrepreneurship

#### *Effectuation*

Building upon the idea that the behavioral implications of effectual reasoning represent the most concrete current operationalization of an opportunity-creation process, we suggest five potential directions for effectuation research. First, research could intensify efforts to accurately capture effectuation—and at the same time uncertainty—empirically. Second, new work could address the direct and potentially more long-term effects of effectuation and move beyond testing performance measures related to firm formation. Third, principles of effectuation and their relationships to each other should be clarified (Arend *et al.*, 2015; Mauer, 2015). This may include the addition of other principles. Fourth, ways to teach

effectuation in the absence of entrepreneurial expertise need to be identified. Finally, building on the fact that effectuation principles may well work outside the area of entrepreneurial opportunities, other fields should explore the value of effectuation in their contexts, which we will discuss later.

Chandler *et al.* (2011) and Brettel *et al.* (2012) have begun making strides for the quantitative study of effectuation by developing survey instruments to distinguish between effectuation and causation decision-making paradigms. However, these are only first steps, which will need to be critically assessed and developed further (see, e.g., Alsos, Clausen, and Solvoll, 2014). To further this effort, measures need to be developed for understanding when these paradigms are appropriate. Specifically, measures of uncertainty need to be refined. Future work could further distinguish the difference between Knightian uncertainty (a claim about the state of the world) and bounded rationality (an actor's perceptual sense of the state of their world).

This view also raises the question of whether the effectual paradigm is as effective in risky decision-making contexts. Read *et al.* (2009) suggest that individual principles of effectuation have positive effects on firm performance regardless of context. Are these findings suggestive of the effectiveness of the principles of effectuation in and of themselves? In other words, do these findings prescribe that effectuation should be the decision-making paradigm of all entrepreneurs? Ultimately, this becomes a question of perception of the boundedly rational actor.<sup>4</sup>

If the context is given externally, that is, the context is not solely a matter of perception, then there are two possible mismatches between the perception of a boundedly rational actor and reality. First, an individual may perceive a context to be uncertain when it is, in fact, risky. This might lead the entrepreneur to elect to employ opportunity-creation processes, for example, effectual reasoning, in an attempt to form a competitive imperfection. To effectuate, in this case, would be to ignore relevant market information in a quest to reproduce that information again. Over time, the entrepreneur may gain enough experience and knowledge in an area to become alert to a preexisting opportunity. Seen in this way, effectuation is a framework for action that generates experience that could contribute to alertness

<sup>4</sup> We thank an anonymous reviewer for bringing the issue of perception to our attention.

(Shane, 2003). Moreover, competitive advantage in opportunity discovery is typically based on speed, secrecy, or entry barriers (Alvarez and Barney, 2007), so it is unlikely that a process approach to recreating existing knowledge would outperform an alert entrepreneur who simply recognizes the opportunity. Therefore, while this misperception and subsequent effectuation process may ultimately result in the discovery of an exogenous opportunity, we expect that this would be less efficient than following a causation process. Thus, this form of misperception would likely lead to inefficient processes of enactment and exploitation.

Second, an individual may perceive a context to be risky when it is, in fact, uncertain. This would lead the entrepreneur to follow discovery processes, including causation, in an attempt to exploit an exogenous competitive imperfection. Ultimately, this would prove unfruitful. Without an existing competitive imperfection, the attempt to form an organization in the pursuit of a perceived opportunity would lead an entrepreneur to acquire resources—financial, human, and physical—that are relevant to the perceived opportunity. Since the opportunity does not, in fact, exist, these resource acquisitions would likely be in vain. Thus, this form of misperception would probably lead to failure. This point of perception underscores the benefits of viewing effectuation as a process focused on bounded rationality rather than Knightian uncertainty.

Given that the effectuation literature is still inconclusive as to whether it is a multidimensional construct or held together by one shared mechanism, future research could benefit from clarifying the relationships among the effectuation principles. For example, if decision making is consistent with effectual principles in every area except that of affordable loss, what decision-making structure has occurred? Multi-agent simulation and experiments may be effective mechanisms for testing the decision-making paradigms of entrepreneurs as a whole and in parts. Conjoint research designs similar to Shepherd and DeTienne (2005) and DeTienne and Chandler (2007) could be used to further examine the nature of effectuation, untangling whether it is a learned process of the expert entrepreneur (Sarasvathy, 2001) or a general purpose decision-making schema activated under conditions of actual (or perceptual) uncertainty.

We still know little about how to teach antecedent factors of effectuation to those entrepreneurial novices who have not yet built up entrepreneurial expertise

through experience. It is likely that talking about effectual reasoning as a concept is easier when addressing an audience with some entrepreneurial expertise who hear their intuition being scientifically explained and reinforced as compared to novices who cannot draw on previous experience to relate to the mind-set and logic. However, going beyond expert entrepreneurs, another stream of research may inquire into alternative development paths that may produce a comparable set of experiences leading to a similar sort of intuitive thinking and acting.

### *Bricolage*

The implications for research involve studying both entrepreneurial actions and intentions behind resource use. Using a free or inexpensive resource does not make one a bricoleur, but employing that resource in a new manner does. Thus, research must distinguish between what the *right* resource for a particular problem may be and compare the actual resource being used. For the most part, this understanding will come from further qualitative research. However, there are quantitative directions for bricolage research as well. Researchers could use surveys or experiments to compare perceptions of the *right* resource compared with the resources they could gain access to or chose to gain access to.

Another possible area of research lies in examining areas where bricolage may be more effective than other approaches to opportunity formation. There are entrepreneurs nearly bereft of resources and there are those that lack only a few resources. Are there specific areas in which bricolage may be more effective as a tool for overcoming resource scarcity? Are there any areas in which bricolage is an inappropriate fit as a mode of entrepreneurial action? Lastly, if bricolage is making do with what is available, how could it lead to competitive advantage, and which environments likely provide the fertile ground for that advantage?

Perhaps the most interesting area for future research lies at the intersection of bricolage and effectuation, where opportunity creation takes place. There are both theoretical and practical avenues for research. What does a bricolage process look like within effectuation, when there is only a very generic goal or motivation at the start? What, if any, entrepreneurial attributes enable someone to use effectuation and/or bricolage? How does creativity factor in to these two concepts, separately and jointly? Since little research has explicitly put these concepts together, the

first attempts at understanding this relationship may best be served by qualitative examination.

### **Implications for the field of entrepreneurship as a whole**

As behavioral concepts in entrepreneurship, both effectuation and bricolage clearly affect the field of entrepreneurship as a whole. Advancing these concepts and refining them theoretically can provide the building blocks for a paradigmatic base for entrepreneurship research (Arend *et al.*, 2015).

Our analysis of opportunity creation, effectuation, and bricolage suggests several avenues for future investigation. First, future research could focus on empirically verifying conceptual advancements connecting the theorized nature of entrepreneurial opportunity to entrepreneurial action and the entrepreneurial process. Some research has described these opportunity process types as cyclical (Zahra, 2008), while others have attempted to reconcile differences (Edelman and Yli-Renko, 2010). Empirical investigation could clarify whether there are distinctive differences in opportunity process types and whether those differences matter. To investigate those differences, future research could employ our proffered analytical framework and develop measures of the underlying assumptions of opportunity creation to distinguish it from opportunity discovery. While longitudinal studies of entrepreneurial actions would be the most fruitful, retrospective studies could employ our framework to develop proxies for the assumptions about the opportunity, the context, and the actor.

Another approach would be to explore the implications of opportunity-creation processes for entrepreneurs and the organizations they create. For example, at the individual level, Hmieleski and Baron (2008) investigate the effect of regulatory focus on creation and discovery processes, and Alvarez and Barney (2007) suggest that activities commonly associated with the entrepreneurial process—such as human resources, financing, and entry strategy—will differ based on context. Other work theorizes that the opportunity context influences downstream processes such as how firms organize (Alvarez and Barney, 2005). Research could examine the variance in outcomes between the same functional activities in different opportunity processes, or research could examine two alternative functional sets of activities in the same creation-opportunity process.

A third approach would be the development of research that delineates, details, and tests the growing collection of research questions that emerge from the interaction of behavioral models and the theoretical frame of opportunity creation. For example, a voluminous literature theorizes and tests why, given a formed opportunity, some individuals identify them and others do not; why some individuals act to exploit an opportunity and others do not (Shane and Venkataraman, 2000); and, how and why some individuals learn (or do not learn) while engaging in these activities (Corbett and Katz, 2012). Opportunity creation frameworks provide the possibility for opportunities to be formed, rather than encountered, but provide little guidance as to why some people, and not others, attempt to form opportunities. No process of opportunity creation currently explains why an actor—given additional uncertainty and difficulty of creating an opportunity—chooses to engage in the hard work of simultaneously attempting value creation and capture (create a new opportunity, then organize to exploit it) given a seemingly more straightforward approach (identify an extant opportunity and organize to exploit it). It is far from obvious why it would be economically or behaviorally efficient to attempt opportunity creation and, if it is not, what the alternative motivation for this activity might be (Aldrich and Kenworthy, 1999; Shah and Tripsas, 2007). Here, insights from bricolage and its linkages to individual creativity and novelty could provide a framework for analysis of this potential puzzle.

A fourth direction could move beyond effectuation and bricolage, conceptualizing and testing other action frameworks for opportunity creation. Our analysis suggests an important avenue for entrepreneurship research in the creation stream, consisting of a collection of models describing processes through which market imperfections arise. One approach to extension might be to develop conceptual work that offers guidance and a research program for opportunity formation processes that are driven by human action, aligned with opportunity creation's overarching emphasis on actors as opportunity formers (Alvarez and Barney, 2007; Klein, 2008; Sarasvathy, 2001; Baker and Nelson, 2005). One can imagine a collection of actions and processes—conceptually distinct from effectual reasoning and bricolage—that can be either deduced as entailing implications of opportunity formation or induced by observation. A concept like enrollment (Burns *et al.*, forthcoming) is a recent example. However, the logic of opportunity creation also leaves open the possibility for other

things *besides* human action and exogenous shocks to form opportunities, leading some to suggest that institutions (Miller, 2008; Alvarez, Barney, and Anderson, 2013; Alvarez *et al.*, 2015) or collectives (Foreman, Westgren, and Whetten, 2013; Hofherr and Westgren, 2014) are opportunity-formation mechanisms that, while involving human action, do not necessarily require intention.

A fifth avenue for entrepreneurship research is the development of conceptual linkages between theories of opportunity formation (value creation) and opportunity exploitation (value capture). Although opportunity creation ascribes an important role for human actors in the creation of market imperfections and effectuation and bricolage explain what actors may actually do in the process of generating that market imperfection, the formation of an opportunity does not necessarily entail its pursuit or exploitation. One actor may form a market imperfection that another actor or group of actors may exploit. Alvarez *et al.* (2015) describe this process in the king crab industry; however, this case is one in which an actor exploited the opportunity and others followed. It may be fruitful for future research on opportunities to explicitly describe which aspect of the opportunity is addressed: how opportunities for value creation come about; who recognizes those opportunities given the means of opportunity formation; and who captures the value given that the opportunity has been formed and recognized.

A final implication of our analysis suggests several opportunities to contribute to streams of active research in entrepreneurship and potentially reinvigorate less-active streams (Alvarez *et al.*, 2013). For example, taking the logic of opportunity creation seriously suggests opportunities to contribute new insights to the rich literature in entrepreneurial learning and cognition (Corbett and Katz, 2012). Emerging work has begun to grapple with these issues (Mitchell, Randolph-Seng, and Mitchell, 2011, for example), and some of the most interesting and promising work is in the earliest stages, generated by doctoral students studying entrepreneurship.

Opportunity creation could also catalyze new research on the microfoundations of entrepreneurship, returning to an old domain—entrepreneurial traits and personality—and reinvigorating it. By 1990, reviews of the entrepreneurship literature had concluded that there was no consistent relationship between personality and entrepreneurship and that future research under the trait paradigm was a dead end and should be abandoned (Gartner, 1988). While the

original research on traits, along with individual-level research that followed the reorientation of the field around the individual/opportunity nexus, has provided little insight, the majority of this work drew from functional descriptions of entrepreneurs in economics and the implications of the individual/opportunity nexus to hypothesize traits to look for—for example risk aversion (Busenitz and Barney, 1997), counterfactual thinking (Baron, 2000), and personality traits drawn from modern psychometric instruments such as the five-factor model of personality (Zhao, Seibert, and Lumpkin, 2010). These traits may or may not explain aspects of opportunity discovery. However, the conceptual question of what traits might matter (and the empirical testing of those conjectures) remains very much an open question in opportunity creation. Moreover, the initial work in this field raised the question of whether differences in cognition between entrepreneurs and non-entrepreneurs are an antecedent condition of entrepreneurship or a resulting condition (Alvarez and Barney, 2007). Thus, we cannot say ‘traits are dead’ with certainty, because we may have been looking for differences in the wrong places all along.

### Implications for other fields

If we understand models like effectuation and bricolage as behavioral responses to uncertainty in general, there may be applications to fields beyond entrepreneurship. The paragraphs below describes how effectuation and bricolage—as representatives of a larger number of behavioral models in opportunity creation—may benefit a variety of other fields. We provide four suggestions.

In the area of **strategy**, related research could integrate emerging insights about entrepreneurial action with the literature on search and experimentation processes (Davis, Eisenhardt, and Bingham, 2007; Pich, Loch, and Meyer, 2002; Sommer, Loch, and Dong, 2009) to contribute to active conversations in strategy about the relationship between search and value creation (Nickerson and Zenger, 2004). Although search processes are conceptualized in strategy as a crucial component of creating new economic value, which approaches to design and enact, what tools to employ in which sequence, and the alignment between search regime and problem context have not been well specified. Future research could consider the relative match between the opportunity type and the individual, the context, and the experimental approach.

In **organization theory**, opportunity creation may have important entailing implications for economic organization and, potentially, a theory of the entrepreneurial firm. One implication of opportunity creation is that theories in strategic management, employed to explain how existing firms organize to capture value, may not be able to be employed or extended to explain firm emergence or the role of the firm in the creation of value. Another implication is that for some types of opportunity creation, the firm is not a governance choice that an entrepreneur selects, but a necessary precondition for certain types of opportunities to be created. Behavioral models like effectuation and bricolage, with their specific understandings and treatments of means and ends, could provide organization theory with insights about how to structure organizations in pursuit of value creation, rather than value capture.

Historically, **economics** has had an awkward relationship with the entrepreneur. Where present, the entrepreneur is represented as an abstracted entity across various models as coordinator (Casson, 1982; Coase, 1937), equilibrator (Kirzner, 1973), harbinger of disruption (Schumpeter, 1934), and uncertainty bearer (Knight, 1921). Occasionally the individual entrepreneur makes an appearance in economics in the literature on innovation and technical change, but is notable mostly through absence—a ‘spectre’ haunting formal models (Baumol, 1968). This absence has made the development of new theory exploring the returns to entrepreneurial activity challenging. Previous work has referred to returns to economic activity as economic rents (Lippman and Rumelt, 1982), and the challenge in formal models is to model this entrepreneurial rent. Recent work at the intersection of strategy and entrepreneurship suggests that the traditional ‘entrepreneurial rent’ in economics is, actually, a set of distinct rent streams. Further work at the intersection of economics and entrepreneurship can model the economic role related to each rent stream to frameworks for entrepreneurial action that create those rents, analogous to an emerging perspective in strategy that examines market frictions, economic rents, and the frameworks in strategy that capture those rents (Mahoney and Qian, 2013).

In **psychology and cognition**, a concern about context and experimental strategy is that current research lacks a theoretical consideration for how actors think about and potentially learn from experiments across entrepreneurship and strategy. For instance, a variety of well-known ego and thinking traps identified by psychology and cognitive science

(Kahneman, 2003) can contaminate the design of experiments, creating frictions that impact their execution and interpretation of results. Search processes are often conflated with experimentation processes, suggesting metaphorically that actors engaged in search either in strategy or entrepreneurship are *doing science*. At best, search and experimentation processes are quasi-experiments; and the actors engaging in these experiments have both systematic bias and individual ego-preserving bias to contend with during this process. It is also possible that, in some cases, the experimentation processes themselves (selected or enacted) can anchor or influence results and learning. Future conceptual work can explore the implications for search, learning, and experimentation for individual actors, teams, and organizations.

## CONCLUSION

This article attempts to clarify and integrate three important concepts in entrepreneurship: opportunity creation, effectuation, and bricolage. Each of these concepts developed their own literature streams and, despite their conceptual overlaps, typically have not been examined jointly. To that end, we have described the historical roots and basic tenets of each concept, their boundary conditions, and conceptual overlaps (explicit and implied) using a common analytic framework, and we considered the implications for research.

Our insights underscore the necessity to bring together literature that addresses creative aspects in entrepreneurship and management. Our joint examination of these three important frameworks in entrepreneurship has provided greater clarity for each by providing an organizing framework around the opportunity, the context, and the actor. This framework can support future conceptual work and empirical testing both within entrepreneurship research and other fields. Advancing theoretical development requires increasing evidence to support a concept before it becomes paradigmatic. To truly distinguish entrepreneurship as a field, these concepts must be further developed into refined theories that can contribute to other fields within business and beyond. This research solidifies the foundational theories of entrepreneurship to provide a firm base on which to describe the origination of market imperfections.

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