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Investigating Design, Creativity and Entrepreneurial Processes

ABSTRACT

Entrepreneurship, creativity, and design are all ingredients of the innovation process and are sometimes confused, misapplied, and used interchangeably. This conceptual paper responds to recent calls for further investigation of the links between entrepreneurship and related disciplines, and explores a solution focused approach most strongly developed and applied in new product and enterprise development — that of design and design thinking. The paper extends prior research on entrepreneurship, creativity, and design, and argues for tighter links between these notions in the establishment and ongoing evolution of enterprises.

INTRODUCTION

Research into notions of entrepreneurship, creativity, and design has been influenced by opposing views and contrasting understandings and has often originated from different world views and disciplines, such as economics (Kirzner, 1973; Schumpeter, 1934, 1998), small business (Wennekers & Thurik, 1999), psychology (Guilford, 1951; Sternberg, 2006), and architecture and the arts (Cooper & Press, 1994; Lawson, 1997). Each notion is independently thought to produce positive economic outcomes and each field has been the focus of government programs in many countries, as they are considered to contribute to and stimulate economic growth (Cox Review, 2005). However, the potential linkages between entrepreneurship, creativity, and design have largely not been explicitly investigated. Some exceptions include Nystrom (1993), and more recently, Ko & Butler (2007), Sarasvathy (2004) and Ward (2004).

Strong links between entrepreneurship and creativity were established by Schumpeter (1934) through his notion of creative destruction and the notion that entrepreneurs demonstrate boldness, imaginativeness, and creativity. Entrepreneurship has more recently been linked to notions of creativity (Manimala, 2009; Nystrom, 1993) and design (Sarasvathy, 2004), where each of these processes leads to the generation of new ideas and business opportunities. This paper investigates design, creativity, and entrepreneurship initially as separate notions, and then compares their similarities and differences in terms of enterprise development. The paper extends previous notions of design and its relationship to entrepreneurship (Sarasvathy, 2004), and argues for a closer linking of design and design thinking with entrepreneurship. We argue that the process through which this enterprise shaping occurs can be compared to a design process, and that further exploration of processes of design and creativity may enhance entrepreneurship processes.

The purpose of investigating these notions is to explore some potential ways that may enhance and sharpen entrepreneurship processes and practices within firms and in new enterprise development. This paper responds to Zhou's (2008) recent call for more research regarding creativity and entrepreneurship, Mitchell et al.'s (2007) call for links between thinking and doing in entrepreneurship, and contextualizes prior research on mental simulation and counterfactual thinking (Gaglio, 2004).

Many firms in dynamic environments are seeking ways to encourage entrepreneurship in their employees (De Simone et al., 1995), in an attempt to increase the likelihood that such processes and practices will lead to new enterprises, new products, new ways of working, and new business models. The paper's investigation of research into notions of processes related to entrepreneurship, such as creativity and design, presents some implications for research, theory, and practice, and proposes a framework for their relationships. We argue that design processes are clearly implicated in entrepreneurial processes of generating ideas for new

businesses and experimenting towards new enterprises, and that design and design thinking have potential for entrepreneurial enterprise development. Opportunities for enterprises can be created as well as discovered (Alvarez & Barney, 2007) and such opportunities can be further advanced by understanding and applying design thinking to the development of the product or service, as well as market possibilities and business models.

We begin with a focus on design as a process, continue with creativity as a process and follow with entrepreneurship as a process, where entrepreneurship is “what entrepreneurs do” (Gartner, 1988), understanding that entrepreneurship involves a number of behaviors that entrepreneurs often perform sequentially over time. These processes include “all the cognitive and behavioral steps from the initial conception of a rough business idea or realization of business activity until it is either terminated or has resulted in running a business venture with regular sales” (Davidsson, 2006, p. 4).

We use a broad definition of entrepreneurship, *the creation of economic activity that is new to the market* (Davidsson, 2008), which may include launching of products, services, or business model innovation, and also imitative entry, which can be found in creating new opportunities in large companies and in all independent business start-ups. The paper is structured as follows. We begin our brief review of these processes by starting with a number of views of design as a process. Second, we discuss in some detail processes central to creativity and entrepreneurship. Third, we examine links between design, creativity and entrepreneurship. Finally, we suggest that commonalities, overlaps, and differences between these notions have important implications for entrepreneurial theory and practice. We begin with the three separate notions as illustrated in Figure 1.

Insert Figure 1 here

DESIGN AS A PROCESS

Design involves purposeful behavior which is targeted toward certain goals and the creation of solutions. The goal of design may be to solve a problem that affects many people or only one. In the design field, design is not seen as the prerogative of a select few. On the contrary, “We all can and do design; we can learn to design better” (Lawson, 1997, p. vii). Design processes are a way of thinking and doing, a perspective which is open to the challenge of developing new ideas, products, and processes, and includes playing and experimenting with multiple ways of working.

Design thinking is often used for situations or problems which are ill-defined or complex, and design problems are usually among the most complex and ill-structured kinds of problems encountered in practice. Within the conception of design understanding, it is well understood that there is no one right way. Dunne and Martin (2006) distinguish between a design attitude and a decision attitude, where designing means bringing about alternatives where it is taken for granted that designing will require invention of new possibilities. In contrast, a decision attitude is “where the manager is the idea generator who gives form to new possibilities”. From a design perspective, “Each project is an opportunity for invention that includes a questioning of basic assumptions and the resolve to leave the world a better place than we found it” (Dunne & Martin, 2006).

Design thinking has been described as an approach to problems that a designer might take, and Brown (2008) argues that business people need to become designers. One popular example is where design firms such as IDEO apply their expertise in design, not only to high technology issues and product development, but also to complex organizations such as healthcare organizations. Many of the processes used by IDEO, a well-known design firm previously described as creative or innovative, are centered on a design approach to

situations. IDEO's methodology of observation, brainstorming, rapid prototyping, refining, and implementation (Nussbaum, 2004) has been applied to the development of many products and services by firms such as Intel, Samsung, and Lufthansa.

Design is understood as both cognitive and affective, and deals with constraints through interpersonal processes (Dunne & Martin, 2006, p. 513). The design process is described as endless, with no infallibly correct process, and it involves finding, as well as solving, problems. "Design inevitably involves subjective value judgment, is a prescriptive activity and designers work in a context of a need for action" (Lawson, 1997, p. 121). Simon (1973) characterized design problems as ill-structured because they have ambiguous specification of goals, no determined solution path, and need to integrate multiple knowledge domains. Designing requires the application of general and domain specific schemas as well as procedural knowledge.

In investigating design, we review understandings of design and design thinking, not in the context of industrial design, but as an approach to the world. Design, design thinking, and a design attitude, where designing could be translated as developing new alternatives, have not often been studied in this context. Here, the focus is on finding some of the best possible solutions given skills, time, and resources. It is taken for granted that design will generate new possibilities, and hence design has some similarities with improvisation and bricolage.

Design thinking can also be applied to situations or redesign of products, processes, structures, and forms, and may be particularly useful in corporate entrepreneurial situations. Designers work with ideas and artifacts in an action context, often with frequent experimentation and prototyping (Lawson, 1997). In summary, design processes are ways of thinking and doing, a perspective which is open to the challenge of developing new ideas, products, processes, and playing and experimenting with multiple ways of working, which

are improvisational, exploratory, emergent and sometimes ad-hoc, often working with resources at hand to develop new ideas, products, services and systems.

CREATIVITY AS A PROCESS

Following many debates over definitions of creativity, forms of creativity, the possible effects of creativity, its relation to the firm, and development and discussion of methods to increase creativity, it is generally accepted that creativity involves ideas that are novel and are potentially useful or of value. The definition used here is that creativity is the capacity to produce novel or original work that fits with task constraints (Lubart, 1994), or the development of appropriate and novel solutions (Ward, Finke, & Smith 1995). Recent research suggests that creativity can be relevant to notions of people, process, product, and situation (Isaksen, Dorval, & Treffinger, 2005).

Early research on creativity focused on the characteristics or traits of individuals (Kirton, 1976; Koestler, 1969), and further development of individual profiles added extra dimensions over time (Basadur, 2004; Puccio, Murdock, & Mance, 2007; Sternberg, 2006). Component and confluence theories of creativity are multi-factor models that argue several separate but interacting components must come together to yield original and productive outcomes. For example, creativity can be expressed as the intersection between three separate components, namely task motivation, domain-relevant skills, and creativity-relevant skills (Amabile, 1996, 1998). Creativity has been also described as a combination of six elements. Sternberg's "investment theory of creativity" describes the nature of creativity as a confluence of six distinct but interrelated resources—intellectual abilities, knowledge, styles of thinking, personality, motivation, and environment. Sternberg (2006) suggests that the intellectual skills required for creativity include three particular skills: a synthetic skill to see problems in a new way and to escape the bounds of conventional thinking; an analytical skill

to recognize which of one's ideas is worth pursuing; and a practical-contextual skill to persuade others of the value of one's ideas.

Creativity was initially understood as a generic process, and the notion of creativity as a domain specific process has led to a more systemic view of creativity which recognizes the importance of the context and situation as being vital ingredients, and perhaps drivers or shapers, of creativity (Csikzentmihalyi, 1996).

Creativity as a creative thinking process

Creativity has been understood as the creative thinking processes and creative problem-solving. Creative problem-solving as a process was described as a four-stage process of preparation, incubation, illumination, and verification (Wallis, 1949). Guilford (1951) challenged this as a superficial approach which did not articulate any of the mental processes such as sensitivity to problems, the capacity to produce many ideas, the capacity to change one's mental set, the ability to reorganize, the ability to deal with complexity, and the ability to evaluate the ideas generated. As a result of this call to research, in some circles, creativity has come to mean divergent thinking.

Creativity has also been described as problem finding, problem formulation, and problem redefinition (Runco, 1994), and the synthesis or combination of information. Koestler (1969) described creativity as the process of bi-sociation, or the combination of previously unrelated frames of reference, often found in situations of humor. Understanding creativity as a process often leads to a focus on creative problem-solving. Creativity training usually includes some training in techniques which promote divergent thinking. The Creative Problem Solving (CPS) program, sometimes called the Parnes-Osborn model, developed by Parnes and colleagues, consists of six stages of creative problem solving: mess finding, fact finding, problem finding, idea finding, solution finding, and acceptance finding.

Most researchers agree that ongoing creativity requires more than individual idea generation. The idea selection process, idea evaluation, and implementation are critical to success commonly used in studies of innovation in firms. Other variations include idea combination, idea aggregation, idea selection, and transformation of the everyday. A review of creative problem solving training in the workplace indicates that training in creative problem solving does enhance organizational performance (Puccio, Firestien, Coyle, & Masucci, 2006). Creativity also entails a focus on product as an outcome or a result of creativity, at times through bi-sociation or bringing together two very different ideas or ideas from different domains.

Creativity in a work environment largely builds on individual creativity (Amabile, Conti, Coon, Lazenby, & Herron, 1996), where stimulants to creativity include challenging work, work group supports, organizational encouragement, supervisory encouragement, freedom, and sufficient resources. Obstacles to creativity include workload pressure and organizational impediments (Amabile et al., 1996). The popular press provides examples of environments which encourage creativity such as Google, Apple, and design firms such as IDEO and Design Continuum, where well-established processes such as structured brainstorming and improvisation are used to generate new ideas, often combining insights from users. Here, well-developed methodologies are used to enhance creative problem solving with a strong focus on empathic design using depth of knowledge of the market, the client, the technology, the perceived constraints on the problem, detailed observations of potential customers, visualization, and evaluation and rapid prototyping followed by commercialization (Kelley, 2001).

In summary, the process of creativity is not limited to particular individuals and every person has the potential for creativity (Runco, 2004). Creative people often are open to new ideas, can consider multiple possibilities and experimentation, may need to have well-

developed skills of persuasion, and encourage positive responses to new ideas and management of change. Hence, creativity can be characterized as being concerned with person, process, product, press (situation), persuasion, and potential (Runco, 2007, p. 384). The message here is that creativity builds on previous knowledge and may be a combination of existing knowledge, or may be able to move past barriers of existing knowledge to generate and explore new ideas and solutions (Ward et al., 1995).

ENTREPRENEURSHIP AS A PROCESS

The process of setting up a new enterprise often involves an idea-generating process where individuals use their knowledge, experience, networks, and resources, to experiment with a number of options before settling on their course of action, and the form, location, and value proposition that the enterprise will take (Bhave, 1994; de Koning, 2003).

Entrepreneurial processes have been described as the desire to start a business, or the specific business idea that is being pursued (Timmons & Spinelli, 2006). Business ideas may be externally stimulated decisions, such as a desire to start a business, or an internal search for business opportunities. The development of a solution from the experience of problem-solving and the knowledge that others have the same problem and are happy to pay for a solution may provide opportunities to apply the new skill to a particular problem-solving activity, and also generate potential business opportunities. Some authors suggest that entrepreneurship can be understood as a 4-P framework, where the four major components of entrepreneurship are: pioneer, denoting the entrepreneur as an innovator or champion for innovation; perspective, denoting the entrepreneurial mindset; practice, denoting the entrepreneurial activities; and performance, denoting the outcome or result of entrepreneurial actions and activities (Ma & Tan, 2006).

Shane and Venkataranam's (2000) analysis of entrepreneurship identified up to 23 different gestation behaviors, and they argue that it is conceptually possible to differentiate these into two related sub-processes, *discovery* and *exploitation*. Davidsson (2006) explains that *discovery* is itself a process, and is thought to include idea generation, opportunity identification, opportunity detection, opportunity development, and opportunity refinement. A venture idea is usually not formed as a complete and changeable entity as a sudden flash of insight. The discovery process usually includes: ideas about value creation, ideas about value appropriation, development of commitment to and identification with the start-up on the part of key actors, and activities such as planning, making projections, and the gathering and analysis of information.

The second identified process of entrepreneurship, *exploitation*, describes the action side of venture development where ideas are implemented (Davidsson, 2006). Specific behaviors which are categorized as exploitation include: efforts to legitimize the start-up, efforts to acquire resources, efforts to combine and coordinate these resources through the creation of a functioning organization, and efforts to generate demand through marketing and contacts with prospective customers. While the processes of discovery and exploitation are discussed separately, in fact they may occur in parallel or even iteratively.

Many studies of entrepreneurs have examined existing entrepreneurial firms, and some authors contend that the selection of such firms may introduce success bias, and therefore perhaps a more useful approach would be to study individuals with a propensity to entrepreneurship or nascent entrepreneurs. Criteria for selection in such studies may include individuals who initiate at least one gestation activity directly related to the formation of a new business, such as conducting a market survey, producing a prototype, or obtaining legal rights (Carter, Gartner, & Reynolds, 1996). Davidsson & Honig (2003) argue that this focus on individuals who have recently made a declaration or decision to begin a new enterprise

provides an opportunity to examine the resource requirements, activities, and environmental constraints and supports provided in the activity.

Previous start-up experience is identified as a good predictor of individuals likely to become nascent entrepreneurs among the general population (Davidsson & Wiklund, 2001). Davidsson and Wiklund (2001) found that variables that were consistently strong and statistically significant across the 18 month time span of the study are “previous start-up experience” and “being a member of a business network”. In particular the networking variable was significant in each of the three time periods, suggesting that the importance of organizational network relations is a constant factor in successful nascent emergence (Davidsson & Honig, 2003).

The challenge is to match the entrepreneurial process to the characteristics of the idea, the environment and the person (Davidsson, 2006). The better the fit between the processes and other elements of entrepreneurship, and the higher the degree of uncertainty inherent in the process, the more important it is to take small trial steps forward (at as small a cost as possible), and to remain open to considering the business idea and the way to implement it until a concept that truly works has been found.

However, factors identified as influencing entrepreneurship include an ability to evaluate venture ideas and environments in order to assess: whether a systematic and planned process applies; a systematic search for ideas related to prior knowledge, experiences, and interests is carried out; or a more iterative and flexible approach is called for (Davidsson, 2006).

Much of the literature on entrepreneurship discusses the importance of planning in enterprise development. In contrast, Sarasvarthy (2001) argues that entrepreneurship, rather than being a causation process, is a more emergent process relevant to the attributes of the

individual. She named this emergent and interactive process an effectuation process. The four principles of the effectuation model are:

- focus on affordable loss rather than expected returns
- strategic alliances rather than competitive analysis
- exploitation of contingencies rather than pre-existing knowledge
- control of an unpredictable future rather than prediction of an uncertain one.

Sarasvathy's (2008) effectuation approach contends that entrepreneurs largely face uncertainties, not just of ideas and value, but also uncertainty about outcomes and uncertainty about goals, and it is often not clear which elements of the environment to pay attention to and which to ignore.

Entrepreneurship can be influenced by focusing on factors that are internal or external to the firm (Bhave, 1994). Other approaches to entrepreneurship include improvisation (Crossan et al. 2005; Crossan, 1998; Hmieleski & Ensley, 2004; Miner, Bassoff & Moorman, 2001), bricolage (Baker & Nelson, 2005), where individuals make do with existing resources, capitalizing on existing resources in a non-standard way, and bootstrapping (Bhide, 1992), where an entrepreneur may use his/her own resources and the resources of friends and family to launch an enterprise.

The need to create environments for entrepreneurship has been raised by some large companies in an attempt to generate new ideas in new product development and sometimes new business models (Wetlaufer, 1999). Research indicates that everyone has the potential to be an entrepreneur given the right set of circumstances. Indeed, Davidsson suggests "the research based evidence suggests that "when faced with an opportunity that suits them, and in interaction with people with complementary skills, most people would be able to pursue a successful career as entrepreneurs" (Davidsson, 2006, p. 2). Hence the potential for entrepreneurship is not limited to a small number of select people but is much more universal,

even if not commonly recognized (Aldrich 1979; Gartner 1988). Furthermore, entrepreneurs need skills of persuasion to convince others from family and friends to bankers and investors to pursue their ideas and launch new enterprises.

In summary, entrepreneurship as a process includes the creation and/or discovery of business ideas and opportunities. The exploitation of such opportunities, recognized to be a key component of entrepreneurship, has been enhanced by recent research which includes the processes of bootstrapping, improvisation, bricolage, and effectuation. Previous start-up experience, business networks, and the environment in which such processes occur may be as important as the individuals involved in the identification of the opportunities.

Having looked briefly at each of these topics of design, creativity and entrepreneurship as separate and distinctive, we now drill down and make comparisons between them.

COMMON ATTRIBUTES OF DESIGN AND ENTREPRENEURSHIP

The links between design and entrepreneurship are not as well articulated as those between creativity and entrepreneurship, although there is some indication they are becoming stronger. Recent research has explicitly linked entrepreneurship and design. Indeed, Sarasvathy (2004), following Simon's approach, has declared entrepreneurship as design:

Entrepreneurs not only design firms as instruments that adapt to their environments—and help exploit profit opportunities within those environments; but they also shape parts of their environments to more closely resemble both their personal aspirations and their firms' resource endowments—so they can create new opportunities for wealth for themselves as well as values for their stakeholders. (Saravathy, 2004, p. 714)

We could suggest that entrepreneurship and design also extend the business model developed by the entrepreneur to create novelty and value in the market, e.g., Dell's business model for selling computers.

Drucker's (1985) views are that managers are entrepreneurs as well as designers, and are responsible for creating and exploiting business opportunities. More recently, managing as designing has largely been accepted and encouraged in management education (Boland & Collopy, 2004). Entrepreneurs have also been described as designers: "Entrepreneurs are wonderful examples of designing managers—giving form to valuable new products, services and sometimes creating whole new industries" (Boland, Collopy, Lyytinen & Yoo, 2008, p. 11).

There have been recent calls for staff in organizations to act as designers (Dunne & Martin, 2006), or to engage with designers to develop new solutions for what are seen as intractable problems (Brown, 2008). Many firms may seek a better design or approach unless there has been some association with design firms and their ways of working. Some exceptions might be the involvement of design firms such as IDEO, to create new ways of working or new structures as a consequence of design processes. Another area of close linkage between design and entrepreneurship can be seen in the increasing numbers of higher education institutions establishing technological entrepreneurship and design schools in the USA and Europe. Some of the interesting differences between design and entrepreneurship are design's focus on collaboration with multifunctional teams and customers, active experimentation, and the development of prototypes for problem solutions.

COMMON ATTRIBUTES OF ENTREPRENEURSHIP AND CREATIVITY

Entrepreneurship is concerned with novelty in business, new business ideas, and the reality of achieving positive returns in the market and in existing and new business models. Creativity

is also concerned with the creation of novelty and value. Research into both entrepreneurship and creativity has followed similar trajectories in terms of the focus on the processes used. Some of the common attributes of creativity and entrepreneurship are found in the agency of the individual or group that produces novelty and value and in approaches used to generate new business ideas. Manimala (2009) suggests that there are some benefits in the use of formal techniques of creativity for generating business ideas and identifying opportunities.

The creation of something new may include sometimes discovering or creating opportunities in existing fields and sometimes establishing new fields or new market opportunities (Alvarez & Barney, 2007). Early stages of generating new ideas may be characterized by divergent thinking in both entrepreneurship and creativity, and may be the result of a dynamic process, or fluid and changing patterns of activities. Improvisation is important in both creativity and entrepreneurship, and bricolage, or making do with the resources one has in non-standard ways, has relevance for both creativity and entrepreneurship.

Both entrepreneurship and creativity benefit from depth of knowledge or expertise, with neither being limited by existing knowledge; and both often challenge and extend previous expertise in developing new ideas, processes, and application. Agents in both creativity and entrepreneurship require skills of persuasion to influence others within the firm and often outside the firm to support or invest in new ideas. Small firms are considered the nurseries of creativity in business (Marshall, 1930), who discussed the importance of such firms gathered in districts for the local and national economy. Further discussion of the contributions of business networks for entrepreneurship has been identified in prior research (Aldrich & Zimmer, 1986) and recent nascent entrepreneur research (Davidsson & Wiklund, 2001).

Research into the “entrepreneurial orientation” of a firm discusses notions of innovativeness, proactiveness, autonomy, competitive aggressiveness, and risk-taking (Dess & Lumpkin, 2005), which has some overlap with creativity and its role in innovative firms. Well-known examples of firms that use principles of creativity and entrepreneurship are often found in large firms that develop ideas for new enterprises. For example, the Harvard Business School Case of *Corporate Ventures at Proctor and Gamble* explicitly used Amabile’s *Keys to Creativity Scale* to investigate creativity processes used in generating new ideas for products and corporate venture development (Amabile & Whitney, 1997). The notion of problem finding or problem definition in the creativity literature has some similarities with the notion of opportunity finding or opportunity recognition in the entrepreneurship literature. To some extent, many of the characteristics of creativity as a process are encapsulated within the discovery phase of entrepreneurship where processes of idea generation are found. In summary, we find that entrepreneurship processes are initiated and shaped by individuals and teams, often using persuasive communication to initiate and exploit the potential of a situation. Much of the research in creativity and creative thinking processes is found at the level of the individual and the team. Research into entrepreneurship as a team-based process may well be an area of focus in entrepreneurship research, particularly in the nascent entrepreneurship studies

Differences between entrepreneurship and creativity

There also appear to be clear differences between entrepreneurship and creativity. The process of exploitation of the idea may occur in some contexts in terms of the business model approach. To some extent, we can see distinct areas of difference, where creativity can be thought of largely as an input and a process, and entrepreneurship largely a process and an outcome. We could contrast the “found versus made” perspective (Read et al., 2009) of

discovery and creation (Alvarez & Barney, 2007). Differences at the level of analysis can also act as barriers in comparative work. Networks as sources of knowledge, information, and influence have been more thoroughly investigated in entrepreneurship studies than in creativity research.

COMPARISON OF PROCESSES IN ENTREPRENEURSHIP, CREATIVITY AND DESIGN

Using some of the key entrepreneurship models such as creation and discovery (Alvarez & Barney (2007) discovery and exploitation (Shane & Venkataranam, 2000), improvisation (Crossan et al. 2005; Fisher & Amabile, 2009; Hmieleski & Corbett, 2006; Hmieleski & Ensley, 2004; Minor, Bassoff & Moorman 2001), bricolage (Baker & Nelson, 2005), and effectuation (Sarasvarthy, 2008), we summarize the views of entrepreneurship, creativity and design, comparing processes, potential, and orientation. We find that both creativity and design have similar processes to entrepreneurship across these dimensions: a drive to create new ideas, to create new and better solutions, as well as a positive orientation towards the potential of individuals to perform in this arena.

A comparison of the three notions of entrepreneurship, creativity, and design is contained in Table 1. At the individual level, there appears to be much similarity between entrepreneurship, creativity, and design. Given the appropriate situation/environment combination, the literature suggests that everyone has the potential to be creative, to design and be a designer, and to act in entrepreneurial ways. There also appear to be distinct similarities between creativity, design, and entrepreneurship in terms of idea generation and, to some extent, these similarities are captured in the discovery processes identified by Shane and Venkataranam (2000).

Insert Table 1 here

Kirzner's recent work argues that "creativity embraces alertness" (Kirzner, 2009, p. 151). However, there are also distinctions between creativity and entrepreneurship and these may be found largely in the orientation to exploit the benefits of new ideas—an active component of entrepreneurship but one which may be absent in a creative process. The design process includes exploitation in terms of taking new ideas to the market in varied forms.

Entrepreneurs are known to use creative cognitive processes to identify and develop innovative opportunities (Gaglio, 2004). The entrepreneurial processes of improvisation, of creating new ideas and new ways of working or interacting, of bricolage, making do with existing resources or creating novel combinations of existing resources to create the new, are common to entrepreneurship, creativity and design. Effectuation, starting with what is given and creating new possibilities in a market or creating a market, is common to both entrepreneurship and design. There appear to be close links between effectuation, described as "good at constructing a solution" (Read et al., 2009), and design, which has as one of its main functions the generation of multiple potential solutions.

An entrepreneurial firm tends to have an orientation to the world that favors innovativeness, proactiveness, autonomy, competitive aggressiveness, risk taking (Dess & Lumpkin, 2005), and to a large extent, design firms employ a similar orientation and processes which they use to engage customers, experiment with, develop prototypes, and create new and often multiple solutions. Design situations may not express all the components of entrepreneurial orientation, but certainly are innovative, proactive, requiring and respecting autonomy and risk taking, but may lack the competitive aggressiveness noted in entrepreneurship.

CONCLUSIONS AND APPLICATIONS

This paper examines some of the links between thinking and doing in entrepreneurship, and identifies the specific ingredients for developing new solutions which link thinking and action, and investigates processes which contribute to the notion of the agency of entrepreneurs. The paper extends prior research related to the challenges and opportunities in entrepreneurial thinking and action, discovery theory and creation theory (Alvarez & Barney, 2007), and opportunity identification, and suggests the importance of design and design thinking in generating new ideas, new ways of working, and new business models.

“The vocabulary used to talk about entrepreneurship is critical to the development of a theory about this phenomenon” (Gartner, 1993, p. 232). With few exceptions, the existing literature on the creation of value has largely treated research on creativity, design thinking, and entrepreneurship as separate notions, although increasing interest is being displayed in the relationships between creativity and entrepreneurship (Zhou, 2008), and between design and entrepreneurship. The notion of design as a central component of entrepreneurship responds to Gartner’s (1993) suggestion that “words lead to deeds”, and the power of new perspectives to enrich our views of the world, where “Words are windows for seeing what earlier was hidden or missing” (Gartner, 1993, p. 238).

The purpose of investigating entrepreneurship, creativity, and design is to identify ways in which firms create value, directly and indirectly for themselves and their customers, and to look for ways of increasing value creation. Capturing value in the business world is often related to business models that rethink or reframe within a paradigm, as well as being a process that breaks paradigms and creates new business models. Bringing together entrepreneurship, creativity, and design is a reminder of a firm’s need to refresh its approaches to generating and exploring ideas at multiple levels of the enterprise, and to

engage in conversations with customers to ensure ongoing value creation and capture. An explicit examination of the entrepreneurship processes of discovery and exploitation will be enhanced through a better articulation of the creative processes involved, and may lead to new ideas, new ways of working, and new forms of value creation enterprises (Kim & Mauborgne, 1997).

Entrepreneurship, creativity, and design are all ingredients of the innovation process and are sometimes confused, misapplied, and used interchangeably. This paper investigated processes involved in each of these notions, seeking clear areas of similarity as well as difference. At the firm level, we find that entrepreneurship is a multi-faceted process which combines elements of creative thinking and design thinking, but may be differentiated from an entrepreneurship orientation by a lack of competitive aggressiveness and, to some extent, risk-taking.

The vocabulary and concepts used to describe entrepreneurship are critical to the development of a theory about this phenomenon (Gartner, 1993), and one of the contributions of this paper is to extend the potential contributions from design and design thinking, with greater emphasis on design and its potential for generating multiple solutions and its usefulness in application to ill-defined problems and situations.

This paper differs from previous discussions regarding entrepreneurship, creativity, and design by articulating a brief review of the processes of each of these notions and identifying similarities and differences, recognizing that applications of these strategies may appear very different. Firms often suggest that they would like their staff to be more creative, and to achieve this outcome, may engage in some creative problem-solving technique training. Some firms, particularly large ones, express the desire for their staff to be more entrepreneurial, and we suggest that lessons in terms of strategies and practices developed in the fields of creativity and design from idea generation evaluation, selection to rapid

prototyping, and experimentation may be useful in generating more entrepreneurial behaviors.

IMPLICATIONS FOR ENTREPRENEURSHIP THEORY AND PRACTICE

The result of this preliminary study is a more detailed picture and deeper understanding of some of the commonalities, differences, and potentials involved in the notions of entrepreneurship, creativity, and design. It is clear that there are many overlaps and possible ways in which to build on their common processes, and to capture the benefits of diverse ways of thinking and doing in the generation of new ideas, products, and ways of working. Figure 1 indicates that creativity is a core process within design, and that both creativity and design have important roles within entrepreneurship, in discovery in particular, as well as in exploitation of ideas to generate new and successful outcomes. These figures map the multiple yet related notions, provide a guide for ongoing research, and can be further articulated for entrepreneurship educational purposes.

The research raises a number of issues regarding the many faces of entrepreneurship and innovation, including the relationships and potential contributions of creativity and design to entrepreneurship, and the importance of agency, novelty, and value. One factor which may have influenced this interpretation of similarities and differences was the use of a broad definition of entrepreneurship related to the creation of new economic activity, rather than the development of new enterprises. A tighter and more focused definition may not have considered the appropriateness and potential of creativity and design thinking for entrepreneurship.

The growth of interest in the use of creativity and design thinking in organizational renewal, together with a design attitude towards solving what appear as intractable problems, suggest that future studies should examine the relationships between entrepreneurship and design thinking in more detail and in a more focused way. The cognitions and behaviors

relevant to entrepreneurship, and the gaps between thinking and doing in entrepreneurship research (Mitchell et al., 2007) may be investigated through closer examination of the contributions of related disciplines to these processes. For example cognitions and behaviors relevant to design may provide some conceptual and practical linkages for further research. Some future research questions might include: What design processes are used by entrepreneurs in developing new enterprises? What ongoing design principles can entrepreneurs use in their enterprises? Will applying design processes in enterprise development lead to an active involvement of customers and to limitations on the functional exploitation of enterprise?

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TABLE 1. Themes and Processes from Entrepreneurship in Creativity and Design

	Themes in Entrepreneurship	Themes in Creativity	Themes in Design
Potential of the Individual	Potential of most people for entrepreneurship, from person plus suitable opportunity, plus interaction with people with complementary skills (Davidsson, 2006, p. 2) The challenge is the “fit” between the person, context and opportunity	<i>Everyone has potential for creativity</i> (Runco, 2004)	<i>Everyone is a designer</i> “We all can and do design; we can learn to design better” (Lawson, 1997, p. vii).
Processes			
<i>Seeing situation as an opportunity discover</i>	<i>Seeing situation as a potential opportunity creation or discovery:</i> includes idea generation, opportunity identification, opportunity detection, opportunity development, and opportunity refinement; Also ideas about value creation; value appropriation; development of commitment to and identification with the start-up on part of key actors; and activities such as planning, making projections, and gathering and analysis of information (Davidsson, 2006)	<i>Seeing a situation /problem in a new way</i>	<i>Developing new solutions</i>
<i>Exploitation of novelty</i>	<i>Exploitation of novelty</i> may include efforts to legitimize the start-up, to acquire resources, to combine and coordinate resources in a functioning organization, to generate demand through marketing, and contacts with prospective customers	Exploitation is largely ignored or may be seen as of secondary importance in creativity literature	Developing new solutions that open new possibilities to marketplace
<i>Improvisation</i>	<i>Improvisation:</i> creating new ways of working often linked with entrepreneurial intention; individuals high in entrepreneurial intentions tend towards improvisational behavior (Hmieleski & Corbett, 2006)	Creating new ideas or new products, often using jazz metaphors	Creating multiple varied products, active experimentation. Collaborative process creating multiple varied possibilities with diverse team
<i>Bricolage</i>	<i>Bricolage</i> (Baker & Nelson, 2005); Active engagement with problems or opportunities, capturing new ways of working, creating new resources, and exploiting possibilities	Creating novel combination of existing resources	Active engagement with team, creating multiple prototypes from existing tangible resources, combining with knowledge of other industries, or transformation of existing resources
<i>Effectuation</i>	<i>Effectuation</i> (Sarasvarthy, 2008) Fabricating rather than finding a market Developing a new market, transformation of extant realities into new possibilities	Start with means rather than ends or start with ends and develop different means	Collaboration with team and customers to develop from existing resources
Firm Orientation	Entrepreneurial orientation innovativeness, proactiveness, autonomy, competitive aggressiveness, risk taking	Fresh approach with new possibilities	Approaches to problem solving that improve existing solutions or creates new ones.

Figure 1. Processes of Creativity, Design and Exploitation

