

Time and the Entrepreneurial Journey: The Problems and Promise of Studying Entrepreneurship as a Process

Jeffery S. McMullen and Dimo Dimov

Indiana University; University of Bath

ABSTRACT We examine the growing disconnect between the process-oriented conception of entrepreneurship taught in the classroom and theorized about in premier journals and the variance-oriented conception of entrepreneurship that characterizes empirical studies of the phenomenon. We propose that a shift in inquiry from entrepreneurship as an act to entrepreneurship as a journey could facilitate process-oriented research by initiating a dialogue about the nature of the entrepreneurial journey, when it has begun and ended, whether it might be productively subdivided into variables or events, and what if anything remains constant throughout the process. Finally, we propose that a clearer understanding of the entrepreneurial journey is necessary to distinguish the field horizontally from research on creativity and strategy, and vertically from research on more practical business functions or more abstract systems-level concepts.

Keywords: action, agent-based modelling, entrepreneurship, opportunity, process, time

INTRODUCTION

Entrepreneurship is a process. Although debate has raged for years about which outcome best captures the content or culmination of this process (e.g. Gartner, 1990; Lumpkin and Dess, 1996; Schumpeter, 1934; Shane and Venkataraman, 2000; Wiklund et al., 2011), few scholars challenge this claim. If anything, this process orientation seems to be gaining momentum as it becomes increasingly reflected in the classroom (Brown, 2009; Read et al., 2011) and in the theoretical models permeating premier academic journals (Cornelissen and Clarke, 2010; McMullen and Shepherd, 2006a; Sarasvathy, 2001). But the same cannot be said about empirical research on entrepreneurship, where a process orientation has been conspicuously absent. Most empirical studies of entrepreneurship continue to employ linear models that are presumed to occur at a single point in time (Dimov, 2011), and calls for longitudinal methods have become a hallmark of our field

Address for reprints: Jeffery S. McMullen, Kelley School of Business, Indiana University, 1309 East Tenth Street, Bloomington, IN 47405-1701, USA (mcmullej@indiana.edu).

largely because they have gone unheeded. Why is time conspicuously absent from empirical work supposedly devoted to understanding the emergence of new ideas, products, firms, industries, etc.? And what would the field look like if it were present?

In this article, we examine the problems as well as the promise of studying entrepreneurship as a journey. We start by throwing a glimpse back at process in prior empirical work to outline major demarcations and gaps. We argue that time is either inconvenient, a source of noise in variance-oriented designs, or irrelevant – i.e. too short to matter in studies of more proximate outcomes. Prior work has thus tended to diminish the role of time in the entrepreneurial process by studying entrepreneurship as an act, as opposed to a journey that explicitly transpires over time. To look forward, we reiterate and illustrate the tenets of a process approach by paying attention to the unit of explanation, logic of causal relationship, and nature of cause. We propose that a shift in inquiry from act to journey may advance scholarly understanding of the entrepreneurial phenomenon by evoking a number of challenging questions. These involve the nature of the entrepreneurial journey, when it can be said to have conclusively begun and ended, whether it can be meaningfully divided into necessary variables and/or events, and what if anything remains constant throughout the process. Through a number of analogies, we seek to clarify the conceptual and methodological implications of each question.

By studying entrepreneurship as a journey that takes place over time, we believe that entrepreneurship researchers can offer a perspective that is underrepresented in management research but essential to understanding the transformative process by which desires become goals, actions, and systemic outcomes. Indeed, a process approach may be necessary to distinguish the field horizontally from creativity research at the beginning of the entrepreneurial process and strategy research at the end, and vertically from more abstract systems-level concepts (e.g. variation) of which it is an example and from more concrete tasks (e.g. negotiation) that it encompasses. If so, a process approach may be the distinctive hallmark of entrepreneurship research, offering a qualitatively different view on the perennial debate about the distinctive domain of entrepreneurship research (Low and MacMillan, 1988; Shane, 2012; Shane and Venkataraman, 2000; Sorenson and Stuart, 2008; Wiklund et al., 2011).

A GLIMPSE BACK AT PROCESS IN ENTREPRENEURSHIP RESEARCH

We begin by reflecting on current process research in the field of entrepreneurship, not to conduct an extensive or comprehensive literature review, but to refine and extend our initial sense of the approaches utilized to study process. This sense was informed by discussions of process in the broader organizational literature. We start with Van de Ven's (2007) distinction between two meanings of process that commonly characterize the literature. The first pertains to process as a category of concepts such as decision making and information processing. Although using process in this sense presumes a set of activities conducted between particular start and end points, process is represented empirically as a fixed entity measured by relevant (fixed) attributes that are then related to particular outcomes of interest (Langley et al., 2013). The second meaning pertains to process as a sequence of events or activities that describe how particular things change over time.

Table I. Types of process studies in entrepreneurship research

		<i>Process focus</i>	
		Proximate	Distal
<i>Process meaning</i>	Entity	I	II
	Sequence	III	IV

In addition to this entity-sequence distinction related to the empirical meaning of process, we apply a second distinction, based on the empirical focus of process. Specifically, we distinguish papers that focus on distal outcomes such as new venture creation or growth (and thus on the entire span of the entrepreneurial process) and those that focus on proximate outcomes such as resource acquisition or team formation. Table I summarizes our interpretation framework. In our discussion below, we refer to specific papers to illustrate the themes within each quadrant.

Current research of the entrepreneurial process tends to cluster in Quadrants I, II, and III. Quadrants I and II contain papers that focus on proximate or distal outcomes and operationalize process as entity characterized by attributes. Although these papers claim to study the entrepreneurial process or to apply a process perspective to understand a particular relationship, there is divergence between the starting notion of process and its subsequent operationalization in the paper. Such divergence is mostly due to the need to accommodate a large-scale research design in the paper. Thus, in terms of theoretical predictions and empirical measures, process is treated as a fixed entity with varying attributes across observations. The measures of those attributes (variables) are then used to represent the process and link it to the specific outcomes of interest. An example of a Quadrant I paper is Shepherd et al. (2003) who discuss venture capitalist decision making processes but focus on the experience of the decision maker as the main attribute of the process and examine its relationship with the reliability and performance of decisions. An example of a Quadrant II paper is Gruber (2007) who applies a process perspective to examine the link between planning and performance in new venture creation. Although the focus is on information processing and decision making processes as facilitated by planning, the hypotheses and empirical study deal with the attributes of the planning processes such as use of information sources, planning for specific aspects, and time spent, and their effects on new venture performance.

Quadrant III contains papers that focus on proximate outcomes and operationalize process as a description of how things change. Such papers typically use smaller-scale designs (both static and longitudinal) and seek to highlight the pathways through which entrepreneurs reach particular milestones. For example, Baker and Nelson (2005) focus on the process of resource construction among entrepreneurs on their path to survival and growth in the face of resource constraints. They identify three different pathways through which bricolage occurs as well as follow-on sets of activities that ultimately enable or constrain growth. Another example is Scarbrough et al. (2013) who focus on how technology ventures make deals. They identify different types of trust that matter in

the early and late stages of the deal process and how strong and weak ties can be utilized to develop such trust. The proximity of the outcome in this quadrant is notable as is the fact that only more aggregate sets of events or actions (as opposed to many minute daily occurrences) are theoretically meaningful. These qualities effectively reduce the process to a set of descriptive concepts rather than proper sequences, an inevitable consequence of the constriction of the time period in consideration.

Some papers span both Quadrants I and III, reflecting an aim to turn inductive insights into testable propositions. For example, Zott and Huy (2007) focus on the process through which entrepreneurs acquire resources and identify symbolic actions as major elements of the process. To develop propositions, however, they treat the resource acquisition process as an entity characterized by the overall variety and frequency of symbolic actions.

Quadrant IV is the least populated, yet arguably the most interesting. A relevant example is Venkataraman et al. (1990) who use longitudinal observation of ten educational software firms to formulate a process model of firm failure. In the model, the initial leveraging and tight coupling of transactions that were used to overcome initial resource constraints and legitimacy hurdles later contribute to firm failure when those key customer transactions fail.

To corroborate our insights, we reviewed all papers related to the phenomenon of 'emergence of new economic activity' and published in the *Journal of Management Studies* since 2007. We identified 29 papers, of which 14 were non-empirical (theory, conceptual reviews, and special issue introductions). Of the remaining 15 empirical papers, only 3 (20%) reflected a process orientation. Incidentally, Chandler and Lyon (2001) reported the same prevalence of event-driven work among empirical studies in the entrepreneurship literature in the 1990s. Of the three process papers in this journal, two fall into Quadrant I (with some spillover into Quadrant III) and one falls into Quadrant IV.

Prashantham and Dhanaraj (2010) focus on the role of social capital in the international growth of new ventures. Based on longitudinal case studies, they describe a process of social capital decay and then develop propositions based on attributes of the process such as founder experience and use of network learning to explain initial levels of social capital and international growth. Similarly, Rasmussen et al. (2011) focus on the development of entrepreneurial competences to create new ventures, conducting a longitudinal study of four university spin-offs. Based on identified competences, the authors propose relationships that link process attributes such as the nature of the team's experience, the acquisition of competency, and the ultimate meeting of a credibility threshold. In contrast, West (2008) provides a historical account of the commercialization of Shannon's communication theory and a narrative of the contrasting paths of two early spin-offs.

SIGNPOSTS FOR LOOKING FORWARD

Two insights emerge from our cursory overview of empirical work on process in the entrepreneurship literature. First, there is clear demarcation of the two meanings of process, and it is driven by focus on and prevalence of variance-oriented designs. Thus, studies that focus on explaining variation in a particular outcome inevitably reduce

process to a set of varying attributes (Langley et al., 2013). Second, there is clear demarcation of the time horizons of the process in question, with most studies applying constricted horizons, focusing on individual links in a long chain of events. To use a metaphor, this is tantamount to the accumulation of video shots of scattered individual scenes, without weaving them into a coherent motion picture. The entrepreneurship field has thus failed to capitalize on the main strength of process explanation, namely how things change and develop over time.

To look forward, we reiterate the nature of the explanation that process research aims to provide. Van de Ven and Engleman (2004) provide a comprehensive view of the nature, logic, and main differences between process and variance explanations/theories. Other classic writings on the topic include Mohr (1982), Aldrich (2001), Bruner (1986), and Poole et al. (2000). We outline the main points of this distinction in the context of a stylistic example from one of the well established relationships in the literature, between human capital and success (Unger et al., 2011). For the sake of simplicity, we abstract from the various ways in which human capital can be defined (e.g. general or specific, entrepreneurial, industry or managerial experience) and the different conceptualizations of success (venture emergence, profitability, growth). Thus, we will refer to human capital and success in a generic sense. The key to this relationship is that, in terms of their observation, human capital and success are separated by time.

Unit of Explanation

Variance explanation focuses on relationships between variables; process explanation focuses on arrangement or sequence of discrete events. The distinction between variable and discrete events is key in the context of how we deal with multiple observations of a phenomenon. A major step in the research process is the transformation of raw observations into a format suitable for analysis. Because no two observations are literally identical, they need to be aggregated in some manner. This involves creating partitions in our observation space such that observations within a partition are considered identical (replications) and observations across partitions are considered different (McGrath, 1982). The interplay between replication and partitioning is a major judgment call in research as it reflects an arbitrary choice based on the analytical purpose at hand.

In Figure 1, we show the raw observation space, which encompasses different entrepreneurial efforts traced over time – i.e. from onset to some ultimate outcome. Because variance explanation focuses on relationships between variables, and variables pertain to characteristics of fixed entities, the partitioning of the observations in variance explanation occurs vertically, i.e. creating partitions or distinctions between different characteristics of the entity, as exemplified by work in Quadrants I and II in our earlier discussion. Because determining the strength of a relationship between variables requires estimation of their moments (e.g. average), within each variable partition the observations are treated as identical (i.e. replications). Thus, in our human capital–success example, applying a variance explanation is based on a presumption of the observed entrepreneurial efforts as identical replications, varying in terms of human capital and success. Partitioning like this not only shrinks the time dimension of the observational space, but also, by virtue of treating entrepreneurial efforts as fixed entities, makes it redundant.

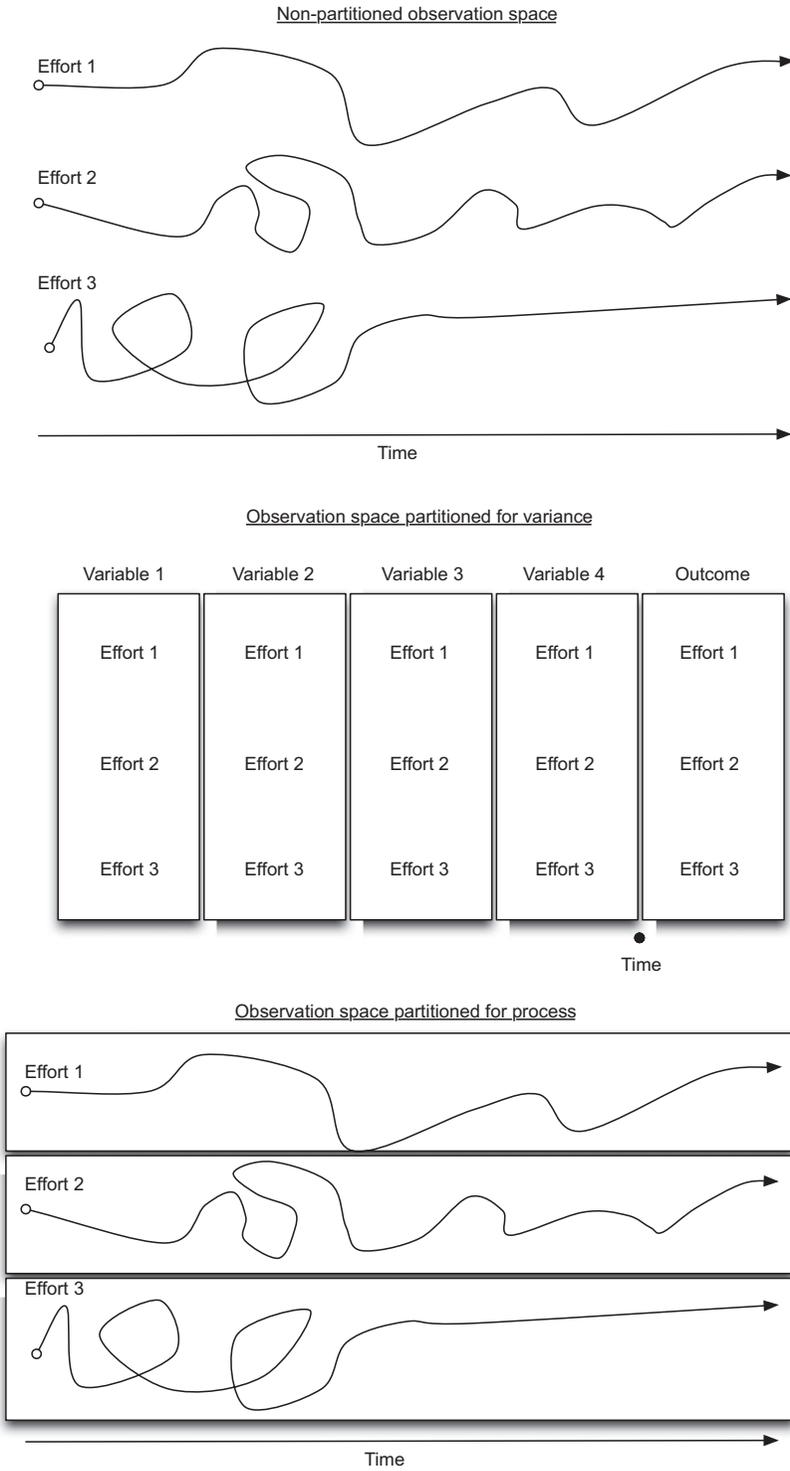


Figure 1. Observation space partitioning

Without loss of generality, it could be assumed that all predictor variables operate at the same time. What happens in between predictor and outcome is simply noise.

In contrast, in a process explanation, the sequence of discrete events that comprise the history of each entrepreneurial effort is treated as a holistic unit. In other words, the partitioning of the observation space is done horizontally, separating each entrepreneurial effort and treating it as a different observation in its own right. Such partitioning makes the entire span of time inherent to the observation. Everything that happens in between is an indelible part of the explanation of the outcome that emerges eventually. Because explanation in this setting comprises a sequence of events, human capital has no explanatory meaning on its own. It represents static potential and does not constitute an event of any kind. Thus, its usefulness in the explanation is limited to the extent to which it can be shown to contribute to the occurrence of some of the discrete events that lay on the path to the final outcome. This, of course, broaches two important questions that we will return to later: what is this final outcome and what discrete events lay on its path?

Logic of Causal Relationship

Variance explanation involves necessary and sufficient causes; process explanation involves only necessary causes. The implicit assumption of the former is that each variable is by itself necessary and sufficient for explaining a portion of the variance in the outcome. This is achieved – having first partitioned the observation space in accordance with each variable – by decomposing the variance of the outcome into the distinct contribution of each predictor variable. This has three implications for the nature of variance explanation. First, because each explanatory variable simply increases the amount of explained variance, removing one has no effect on the rest (unless it interacts with them). Second, the time ordering of the variables makes no difference in the final outcome (Langley et al., 2013). Collectively, these two implications feed an important insight into the third implication below: by virtue of the presumed sufficiency of the variables of interest, there is no need to specify any variables that act as conduits between the variable of interest and the outcome (Mohr, 1982).

The third implication involves the distinction between causal relationship and causal explanation and resonates with the distinction above between variables and events. Variance explanation establishes a causal relationship, which by itself provides no causal explanation, i.e. elaboration of the mechanism through which one variable acts on the outcome. This mechanism is provided by the theory informing our hypotheses, which is typically presented in process terms, to acknowledge that predictor and outcome are separated in time. Thus, to use a typical example of theorizing from Dimov (2010), human capital contributes to performance by: (1) providing valuable lessons to entrepreneurs for dealing with customers, suppliers, and other stakeholders; (2) making more elaborate decisions; (3) identifying essential sources of information at critical junctions; and (4) contributing to higher tolerance for decision uncertainty and ability to act in the context of missing information. These four premises lay a long processual chain that links human capital and outcome. But notably, none of these premises are actually verified as occurring because the fundamental premises of variance explanation negate the need to do so.

In contrast, process explanation deals only with necessary causes. Each event on the path to the eventual outcome is necessary to explain that outcome, but by itself it is not sufficient: what is sufficient are all the events that occur after it, without which it would be plausible to presume that the outcome would not occur as actually observed. This is consistent with the entire chain of events being the explanatory unit. Thus, human capital may have contributed to performance by enabling the entrepreneur to attract a key first customer, which was then used as a milestone to raise venture capital, which in turn enabled the building of a formal organization and large-scale market launch, which led to the ultimate outcome. Arguably, had the particular first customer not come along, or had venture capital not been raised, the business would have developed differently. It is reasonable to presume that human capital was instrumental not only in attracting the customer, but also in raising venture capital, building the organization, and implementing the market launch. But in contrast to its treatments as a necessary and sufficient cause in the variance explanation, human capital according to a process explanation operates through discrete events (milestones), which are contingent upon future events. Thus, we are once again left wanting greater articulation of these discrete events and the nature of the ultimate entrepreneurial outcome they enable.

Nature of Causes

Variance explanations rely on efficient causes; process explanations resort to final causes. An efficient cause pertains to immediate, 'push-type' causality, commonly represented by a directed arrow in our model diagrams. In contrast, final cause represents 'an end point whose existence connotes the occurrence of certain prior events' (Mohr, 1982, p. 59).

When examining distal outcomes in the context of entrepreneurship, time poses difficulties for the notion of efficient cause because many things can happen after the cause has acted and before the outcome has been achieved. This reflects a history-related threat to validity – i.e. observed effects are due to non-treatment events that occur in between the time of the treatment and the time of the outcome measure (Cook and Campbell, 1979). The longer the time span, the more tenuous the reliance on efficient cause becomes. The theoretical coherence of the relationship between human capital and outcome across time is therefore maintained by reference to a multitude of intermediate steps, none of which tend to be articulated in our empirical work.

A particular challenge to the exclusive reliance on efficient cause is the notion that seemingly trivial, non-consequential events early on may have vast, unintended consequences for the ultimate outcome. For example, consider how Microsoft obtained the software contract for IBM's PC project. There are multiple accounts of how and why this happened, including the refusal by Digital Research, the first choice for developing the operating system for IBM's PC, as well as IBM's own reluctance to own code developed by others. The challenge for viewing this as an efficient cause is to attribute a priori significance to this event such that what is to follow can be anticipated. This challenge is readily resolved in process explanation through reference to final cause. The importance of certain events is evident only in the context of some meaningful eventual outcome such as Microsoft's dominance of the PC operating system. Because the ultimate outcome

highlights certain prior events as significant, a 'pull-type' causality seems to be at work here.

AN ILLUSTRATION OF UNFOLDING PROCESS

To illustrate the distinction between variance and process explanations in the context of a particular entrepreneurial story, we offer an example, not of spectacular success, but of spectacular failure. The movie *Startup.com* is widely used in classrooms to illustrate the entrepreneurial process and is by itself an interesting case of the tribulations of venturing. In some ways the movie is the epitome of process research. Shot in *cinema verite* style, in which the objective is to gain full access to events as they are unfolding by recording hundreds of hours of film from which to draw an impressionistic portrayal of the event, the film spotlights govWorks, a firm chosen for its open-ended promise as an internet company.

Directed by Chris Hegedus and Jehane Noujaim, the movie won the Grand Prize at the 2001 Sundance Film Festival. Hegedus had previously produced and directed the documentary *The War Room* about the 1992 presidential election, but the idea for *Startup.com* and its filming came from Khaleil Isaza Tuzman, who left his job at Goldman Sachs in 1998 to work with his former Harvard classmate Tom Herman to create Public Data Systems (eventually renamed as govWorks), an online portal to facilitate interactions between citizens and local governments. Tuzman and Noujaim, one of the directors, had been roommates at Harvard University. Noujaim had recently left a producing job at MTV to start Noujaim Films and *Startup.com* was her first project. She contacted Hegedus and her partner D.A. Pennebaker for help with the movie.

The movie captures well the promise and high flying path of the company. The company raised over \$60 million in venture capital financing from blue chip investors Mayfield Fund and Kohlberg Kravis Roberts (KKR) as well as from prominent other actors such as Hearst Corporations (media), New York City Investment Fund, Sapiient Corporation (IT and professional services), and Vignette, Inc. (web content management). They won New York City's parking ticket payment processing contract and signed up as customers other prominent government entities such as the State of Massachusetts and local governments in Boston, Providence, Greenville, and New Orleans. Employment at the company grew from 30 in 1998 to 250 in April 2000. Tuzman (the CEO of govWorks) was invited to the White House for a roundtable discussion on the New Economy and appeared on the cover of prominent magazines such as Forbes and Fast Company.

The movie also captures the downfall of the company. The dot.com crash on 14 April 2000 dealt a significant blow to the company as it was rushing to release its first product. Personal strain between the CEO and CTO led to the firing of Tom Herman, one of the original founders. As funding ceased, the company had to reduce its capital burn and layoff employees. Tuzman was replaced as CEO at the end of 2000. With no prospective buyer on the horizon, the company filed for Chapter 11 bankruptcy protection in January 2001. The company's payment processing system was bought by eOne Global LP and American Management Systems, Inc. The original founders were left with nothing but a series of failed personal relationships.

After the demise of govWorks, Tuzman and Herman founded Recognition Group, a business aimed to help distressed companies. In 2005 Tuzman published a book, *The Entrepreneur's Success Kit: A 5-Step Lesson Plan to Create and Grow Your Own Business*. In 2005 he was brought in as CEO of start-up JumpTV and led its successful IPO in 2006. In 2007 he purchased controlling interest in ROO Group, an internet video technology company, and became its CEO and Chairman. The company went public in 2009.

The main question that emerges after this story is whether it can be explained other than in process terms – i.e. as a holistic sequence of its events. If we were to use a variance explanation – thereby chopping up time and partitioning the observation space along variables, the following variables would emerge: (1) the founders had impressive credentials – high human and social capital (Harvard and Goldman Sachs pedigrees); (2) the company had an all-star board of directors; (3) the company achieved impressive milestones such as venture capital funding, prominent customers, and rapid growth in employees; and (4) the company eventually failed.

From a variance or outcome-oriented point of view, the challenge that this story poses is that its outcome shifts over time, and at each point is simply a temporary halt in a constantly unfolding process. Thus, the company would have been marked as a spectacular success had it been observed prior to late 2000. In addition, the factors in question change in their nature and influence. Raising the significant amount of venture capital was necessary to fuel the rapid development of the company – vital for plugging the gaps in cash flow – but then made the company vulnerable once the economic environment changed. In other words, whether an action was ‘good’ or ‘bad’ was determined only from the point of view of an ultimate outcome (i.e. final, pull-type cause).

Finally, the story might have unfolded in a different manner had the events occurred in a difference sequence. This highlights a couple of implications. The first relates to the broader issue of limited diversity which goes against the notion of variables operating freely over their observable ranges (Ragin, 1987) and which in this case increased with time. When one event happens, subsequent events become part of a subset of possible histories, such that the counterfactual paths that include the non-event are no longer there. When events are rearranged, the subsets of possible histories change. This means that for entrepreneurial developments over a longer time span it is simply not plausible to partition the observation space along variables, with different developments treated as identical replications.

The second implication relates to increasing possibilities. At each point in time, the realm of possible actions is defined by what Kauffman (2008) refers to as the ‘adjacent possible’. With each action or event, the adjacent possible changes and it influences subsequent actions and events. Again, by rearranging the sequence of events, the adjacent possible would unfold in a different manner.

CONCEPTUAL IMPLICATIONS

In offering this technical description of process research and a portrait of what it looks like in practice, we have uncovered a number of conceptual questions that require answers if a process approach to entrepreneurship research can hope to gain traction. These include: what is the entrepreneurial journey, when has this journey concluded,

when has it begun, does it require particular variables or events in order to progress; and what, if anything, remains constant throughout the process? We now examine each.

Question 1: What Is the Entrepreneurial Journey?

Regardless of how entrepreneurship is defined, novelty is always used to characterize it (e.g. new organization (Gartner, 1990); new entry (Lumpkin and Dess, 1996); new combination of resources (Schumpeter, 1934)). Novelty requires a change in information, such that entrepreneurship in its most abstract form is a process in which an information system seeks to integrate new information. Concepts such as process and novelty cannot exist without the passing of time, but as the previous concerns about the sequence of events indicate, the importance of the time variable to entrepreneurship is more than a matter of logic, it can also pose structural challenges.

As information is acquired over time, individuals organize it into useful knowledge structures. If new information is consistent with these knowledge structures, it is likely to augment or extend them, but in some instances, new information demands a reorganizing of existing knowledge structures in order for the information system to realize the full benefit of the new information. Therefore the sequence with which information is acquired not only influences the ease or difficulty one encounters when attempting to make use of it, but also partly determines what can be created from it at any given moment.

For example, DeBono (1992, pp. 16–17) offers an elegant example of this ‘time sequence trap’ as follows:

Imagine a system that collects information over time. The information does not all arrive at once but in dribs and drabs. Suppose that at every moment the system tries to make the best use of the information available. Obviously this sort of system resembles individuals, institutions, corporations, cultures, and so on. Information is gathered over time and the system tries to make the best use of what has become available.

We can play a simple game in which letters are presented one at a time. The task is always to form a known word.

The first letter is A.

This is followed by T to give the word AT.

The next letter is R, which is simply added to give RAT.

The letters represent incoming information and the total available information is used to make up a word.

The next letter is E to give the word RATE.

The next letter is G, which gets added to give GRATE.

So far the new information has been easily added on to the existing structures.

The next letter is T.

There is no easy way this can be added on. A new word can only be formed by going back and disrupting existing structures to reassemble the letters to give TARGET.

In this simple example we can see how the time sequence of arrival of information sets up structures which have to be disrupted in order to put things together in a different way. It might be argued that at each stage all the letters should be freed up and then the new letter added to the jumble and a new word formed. In real life, of course, it is impossible to disrupt all existing concepts, perceptions, words, or institutions in order to put the old information and the new information together in the best possible way. After a while the items of information are no longer as separable as the letters in the game. For example, the cluster RAT has survived so long that it has now become a solid piece and resists disruption. In exactly the same way, basic perceptions resist disruption.

If the human mind were to work like a library, new information could simply be stacked on empty shelves with no attempt to integrate it into the existing system. That would then be a waste of new information. This, of course, is what we do when we do not use creativity and when the new information cannot be integrated into the old information. Creativity is not simply a way to make things better. Without creativity we are unable to make full use of the information and experience that is already available to us and is locked up in old structures, old patterns, old concepts, and old perceptions.

As the above passage makes clear, integration of new information is a process that is not unique to individuals, it characterizes the emergence of social structures, such as institutions, as well. In these instances, individuals can assume the role of change agent in which they introduce novel information in some actionable form – e.g. an idea for a consumer product, institutional improvement, or scientific advancement – to an information system that is shared across individuals. Like at the individual level, new information that augments or extends is likely to be integrated faster and more easily whereas that information which requires a creative restructuring of institutions in order to realize its full benefit poses a greater challenge to the information system.

Because institutions are partly knowledge structures that are shared across individuals (North, 2005), they are likely to be even more robust and rigid than individual knowledge structures. As a result, entrepreneurship is a multi-level creative process of information integration that begins with an individual, but eventually involves multiple agents who must engage in a social negotiation about what, if anything, the information means to them and, in many cases, what they believe it will mean to others (Corbett, 2005; Dimov, 2007; Dutta and Crossan, 2005).

This process of information integration can manifest in the form of many different artefacts depending on the information system involved. This understanding of the entrepreneurial process does not limit entrepreneurship to commercial activity. Indeed, to the extent that new economic activity refers to the creation of value through exchange, it can be applicable to social and moral dimensions as well as financial ones (Coleman, 1990; Elster, 2007; Molm, 2006). For the sake of clarity, however, we limit our exposition to the examination of ‘new economic activity’ in one of its more traditional

manifestations: the introduction of a new product that realizes a profit for the firm and/or economy. In this sense, the entrepreneurial journey comprises the sequential encounter and institution of information – through actions and interactions – that becomes embedded in the final product.

Question 2: When Has the Entrepreneurial Journey Concluded?

It may seem strange to address the conclusion of the entrepreneurial journey before discussing its initiation, but by working backward from the ultimate outcome, we may be better able to identify events or variables that are necessary for the process to begin and progress. Whether the entrepreneurial process has come to a conclusion cannot be determined if we do not know what the outcome of the process is. In this spirit, we have chosen (for reasons elaborated below) the introduction of a new product – good or service – that realizes a profit for the firm and/or economy. This operationalization of the outcome of the entrepreneurial journey does not preclude alternatives (e.g. the creation of a firm), but it offers a reasonable starting point for analysis.

Necessary elements for action: a crime analogy. Starting with the end of the entrepreneurial journey in mind allows us to make an analogy to a complex event whose nomenclature may be more accessible to the reader than the technical description of process research offered earlier. The investigation of a murder is a process that is familiar to anyone who has read a mystery novel or watched a television crime drama. The framework used by homicide detectives to solve a murder is a process explanation par excellence. It involves exactly the kind of ‘pull-type’ causality mentioned in our process explanation of the nature of causes. Like criminal behaviour, entrepreneurial behaviour results in a socially deviant outcome because the act does not conform to existing institutional conditions (Baumol, 1990). Although important differences exist between these acts, they are similar enough to generate theoretical insight by comparing and contrasting them.

When a death is ruled wrongful for any reason, it qualifies for classification as a homicide, prompting a detective to reconstruct the events to determine what happened: who was the victim, who was the perpetrator, how and why was the perpetrator responsible for the death of the victim? Was the act voluntary or involuntary – i.e. was it an intentional murder or a death resulting from negligence such as drunk driving? If intentional, was it premeditated (first-degree murder), conducted in the heat of passion (voluntary homicide), or something in between (second-degree murder) – e.g. Dan comes home to find his wife in bed with Victor. At a stoplight the next day, Dan sees Victor riding in the passenger seat of a nearby car. Dan pulls out a gun and fires three shots into the car, missing Victor but killing the driver of the car.

In instances where the perpetrator is unknown, detectives must generate an exhaustive pool of suspects and then seek to rule out each of them in order to focus their investigation on those suspects most likely to have been the perpetrator. To be a suspect, a person must have motive, means, and opportunity. Opportunity refers to geographic and temporal proximity – e.g. could the person have been in the vicinity of the victim at the time of the murder? Means refers to access to the resources used to commit the murder – e.g. did the person have the strength, skill, and/or knowledge to commit the murder?

Finally, motive refers to having a reason for committing the murder – e.g. is there any reason the person would have wanted to harm the victim? Unless a person meets these criteria, they do not qualify as a suspect, and therefore cannot be identified as the perpetrator. Motive, means, and opportunity are the pillars of process explanation. They are necessary for a person of interest to qualify as a suspect, but they are typically insufficient (alone or together) to determine the perpetrator. A good mystery writer knows this and generates numerous suspects for a murder to keep the reader guessing: ‘Who dunnit?’ In the end, the explanation consists of a narrative that ties together all the facts that establish motive, means, and opportunity.

The entrepreneurial process can produce behavioural outcomes through a process that resembles the highly intentional act of premeditated murder (e.g. Schumpeter, 1934) or the heat of passion more characteristic of voluntary homicide (e.g. Kirzner, 1973). But either way, before any insights can be drawn from investigating the parallels between the motive, means, and opportunity constructs of a murder investigation and the process components needed to explain entrepreneurship, an objective entrepreneurial outcome is needed that is equivalent to the death investigated by homicide detectives, against which all prior facts acquire new meaning. In the case of murder this objective outcome is typically the discovery of a dead body, but what would it be in the case of entrepreneurship? Though a number of possibilities exist (e.g. the first sale, the first realization of profit, legal registration of the business, the first cash infusion from an investor), we focus on the realization of profit from the introduction of a new product.

Before justifying this choice, we wish to point out several major, consequential differences between the outcomes of homicide and entrepreneurship. The first pertains to the fluidity of the end of the process. In the case of murder, the dead body is an outright end of the process; the process does not continue. In entrepreneurship, however, the ‘end’ is fluid. The outcome in question – as marker for the end of the entrepreneurial process for the purpose of giving meaning to prior events – is artificially contrived. Business activities would normally continue after that outcome and, as a result, new ends will emerge that will give new meanings to the same events. The rollercoaster story of *Startup.com* clearly illustrates this. Another example is Enron: praised as ‘leading the revolution’ of strategic innovation in 2000 and as a showcase for greed and fraud in 2002.

The second difference involves the nature of the opportunity. In murder, opportunity simply refers to time and place. Was the individual in the proximity of the victim during the time of the murder? The victim, however, is treated as an object. Because the perpetrator can commit murder against the victim’s will, the victim’s consent is not necessary. Murder, therefore, is an act of force in which the other party’s preferences are considered irrelevant. In contrast, the other party’s preferences are integral to the notion of opportunity in entrepreneurship. Despite the exclusively supply-sided treatment of the opportunity construct by many entrepreneurship theorists (cf. McMullen, 2010), there is no entrepreneurial opportunity without customer demand. The entrepreneur can be in the right place at the right time, but what makes this place and time ‘right’ is the presence of a customer who is willing and able to pay the entrepreneur’s asking price. Without this demand, no opportunity exists (McMullen, 2011). The entrepreneur may engage in hard-sell tactics in an aggressive attempt to influence the customer, but ultimately the choice to engage in an exchange is the customer’s to make. Hence, entrepreneurship is

a two-sided transaction as opposed to a one-sided action and therefore entrepreneurship is better classified as a voluntary act of choice as opposed to a coercive act of force.

The third major difference between murder and entrepreneurship lies in the fact that entrepreneurship is more than a simple action or transaction; it is a series of feedback loops between the entrepreneur and customers as well as between the entrepreneur and various stakeholder groups such as investors and employees. Social acceptance of something new is a preference that all stakeholders must demonstrate repeatedly by choosing the proposed new alternative over the status quo until the new alternative becomes the status quo. With this understanding in mind, it becomes clear that several of the usual suspects used to represent the conclusion of the entrepreneurial journey are likely to be inadequate. For example, the first investment or even the first sale would merely be milestones on the path to this more final conclusion of the entrepreneurial journey. Indeed, one sale (with a few exceptions) is unlikely to ensure the widespread change in consumer behaviour needed for a particular producer of a new product, much less an industry, to achieve viability.

Is the product or the firm the objective conclusion of the process? Given the assumption that entrepreneurship involves a transaction that is more precisely conceived of as a series of feedback loops between the entrepreneur and stakeholders, we propose that there are two relevant but different conclusions to the entrepreneurial journey. The first is in reference to a new product offering. The second relates to the firm that is responsible for introducing this new product offering. Determining the conclusion of the former is much more difficult than the latter. In relation to the product independent of the firm that introduces it, the relevant question becomes: at what point does an innovation become the status quo, and for whom? The answer could be whenever the innovation transforms the structure of production (i.e. extends the production frontier or knowledge frontier) or whenever the product offering 'crosses the chasm' (Moore, 1991) or is adopted by the mainstream (Rogers, 2004). Interest in answering this question should lead entrepreneurship researchers to a careful examination of how organization scholars measure the diffusion of innovations in the technology and innovation management literature or how economists measure changes in the structure of production within economics.

Viability of the product and the firm are not the same thing. Often innovators do not capture the value they create despite transforming the structure of production. For example, TiVo practically invented the digital recorder for the television, yet struggles to survive against cable companies offering a technologically inferior DVR (Sinek, 2009). Or, consider Apple. When did the entrepreneurial journey conclude for Apple? Was it at funding? Was it with the success of the Apple II? Was it with the Macintosh? Was it with the iMac, the iPod, the iPhone, the iPad, etc.? Is it the firm or the product that is the appropriate unit of analysis? If it is the firm, then the entrepreneurial journey concludes once a product offering achieves viability for the firm that offers it to the market. Under this scenario it would seem that the entrepreneurial journey concluded for Apple once the Apple II succeeded. If it is when the product offering transforms the competitive landscape by altering consumer preferences, extending the structure of production, or both, then conclusion of the entrepreneurial journey is tied to a notion of profit that may be independent of the firm responsible for introducing the new product to market. In

such cases, the pioneering firm may or may not capture the profits it makes possible. Instead, we would need some measure of the improvement in the structure of production made possible by the product offering. For example, over the years Apple's products have created new profitable markets whose profits Apple has captured (e.g. the iPad led to the creation of the tablet market which Apple still dominates) and failed to capture (e.g. the Apple Newton led to the creation of the Personal Digital Assistant (PDA) market which Palm dominated with their Palm Pilot).

In reference to the question of when the entrepreneurial journey has concluded for the firm that is responsible for introducing a new product offering, the answer would likely be whenever the product has achieved financial viability. Once that milestone is achieved, much of the fog of demand uncertainty, like supply uncertainty, evaporates. The entrepreneur knows that production is feasible and viable and that the product will remain desirable for the time being. Growth may still occur as the entrepreneur seeks to determine whether additional markets also find the product to be a desirable solution to their problems, but once proof of concept has been determined, supply uncertainty is minimal. This, however, does not limit a firm to a single entrepreneurial journey. For example, Apple's entrepreneurial journey did not end with the Apple II. Each product introduction constitutes its own journey. Some of these journeys, such as those involving introductions of new products that are intended to create new markets, may simply be more uncertain and adventurous than others.

This line of reasoning equates conclusion of the entrepreneurial journey with establishment of viability – that customers will pay more for the product than the costs associated with producing it. This is a historical accounting metric, not a forward-looking financial metric. A financial metric would consider opportunity costs as well when deciding whether a profitable product should be discontinued in favour of other possible actions that appear to be more promising. Thus, we suggest that the entrepreneurial journey concludes *for the firm* once that venture definitively realizes a profit or loss from activities related to that product. Because losses may be and often are incurred for years before enough revenue is generated to cover the costs incurred to produce a product, even this profit and loss metric may be too ambiguous and historical in nature. For that reason, we propose that positive cash flow or an unsustainable negative cash flow from a new product may be a more pragmatic and appropriate proxy for measuring the conclusion of the entrepreneurial journey.

But it is also reasonable to make another argument, which is that the entrepreneurial journey (for Apple) has not yet ended and perhaps will never end. The notions of corporate entrepreneurship (Covin and Slevin, 1991), entrepreneurial orientation (Lumpkin and Dess, 1996), and the idea of entrepreneurial judgment as applicable to any context of resource deployment under uncertainty in anticipation of future gain (e.g. Foss and Klein, 2012), suggest that as long as time continues to pass – with the constant uncertainty this introduces to those looking forward – the entrepreneurial journey continues as a means to survive in a constantly shifting landscape.

The need for goal specificity when transitioning from post hoc explanation to a priori prediction. Our identification of this specific objective outcome of the entrepreneurial journey enables exploration of the possibilities and limitations of the process approach as further

illustrated by our murder analogy. For example, there is a difference between a framework that is used to solve murders and a framework that is used to solve a particular murder. In the case of the former, we know that motive, means, and opportunity are required for a person to be a suspect, and that a person must qualify as a suspect in order to be a perpetrator, but these categories are devoid of empirical meaning. Only after a particular death is identified does the detective know which facts, if any, are representative of motive, means, and opportunity. The crime framework is inherently post hoc and its efficacy is largely determined by the specificity of the objective outcome. It begins with a known outcome (the 'what') and then seeks to explain 'who dunnit?' by examining 'when', 'where', and 'how' it was done. The more specific the outcome being examined, the more discriminating the framework becomes.

Just as there is a difference between explaining a particular murder and explaining the act of murder in general, there is likely to be a difference between explaining a particular entrepreneurial act, e.g. Apple's creation of the Apple II, and explaining entrepreneurial action in general, e.g. the creation of a new product. Whereas many entrepreneurship theorists have focused on exploring entrepreneurship in general (e.g. Alvarez and Barney, 2007; Casson, 2002; McMullen, 2010; McMullen and Shepherd, 2006a; Shane and Venkataraman, 2000), empirical researchers of entrepreneurship do not have this same luxury. This may explain the fragmentation of the field into various segments such as technological entrepreneurship, social entrepreneurship, and corporate entrepreneurship (Sorenson and Stuart, 2008). Through such fragmentation, researchers may find it easier to agree upon a more precise outcome that allows them to identify and specify motives, means, and opportunities that are relevant (e.g. Miller et al., 2012).

The importance of this specificity becomes clearer when we seek to transform the inherently post hoc framework of process explanation into an a priori framework of prediction. There is a difference between explaining a murder and predicting a murder. The murder framework is not, and cannot, be predictive. It is not equipped to identify which people have motive, means, and opportunity in advance of a particular murder. Indeed, the post hoc nature of investigating a murder obscures the fact that in addition to motive, means, and opportunity, there is a fourth element: the goal to murder. Debate about whether a homicide is first-degree murder, second-degree murder, or voluntary homicide is largely a matter of determining the nature of this goal.

Unlike post hoc analysis in which an outcome has already occurred such that a universe of counterfactual behaviours through which a motive could have been fulfilled has been eliminated, this goal becomes extremely problematic when discussing a priori analysis. This is partly because there are countless goals that can be generated to facilitate the fulfilment of any motive, almost anything can be used as means for murder, and if time and place are not constrained, then opportunities can be created as well as discovered. In other words, anyone can be an a priori suspect of homicide in its most generic form because everyone has moments throughout their lives where they have the motive, means, and opportunity to harm another (thankfully, such motives rarely manifest as violence and, rarer still, murder). By the same token, anyone can be an a priori entrepreneur.

Precisely defining the outcome that concludes the entrepreneurial journey is important because this definition determines the nature of the prerequisite elements and

assessment of whether they are present. Motive, means, opportunity, and the goal are all a function of the outcome they produce. Without specification of this goal (as witnessed in either the post hoc form of action or in the a priori form of a precisely articulated goal), there is no way to determine whether data are representative of motive, means, and opportunity and thus no way to forcibly carve out relevant information from the perpetual flux of data people face (Chia, 2000; Weick et al., 2005).

Question 3: When Has the Entrepreneurial Journey Begun?

Determining the point at which any entrepreneurial journey begins is difficult, but it becomes even more difficult if we seek to answer this question before the event has concluded. For this question, we turn from the taking of life (i.e. murder) to the creation of it by drawing inspiration from the field of biology and its thorny question of what life is and when it can be said conclusively to have begun. Is life simply the act of consuming resources or is it something more? Does life begin at birth, after the first trimester, at conception, etc.? Are we talking about a baby, a foetus, a fertilized egg, or about a human being who goes through each of these phases? Indeed, if one carries this analogy forward, it would seem that the biological equivalent to the conclusion of the entrepreneurial journey is approximately the point at which children become self-sufficient. Does this imply then that the unit of analysis of the entrepreneurial journey must be analogous to the development of a child? And, if the new product – and/or new firm that introduces it – is seen in this light, then what does that imply for defining the logical starting point of this process?

Cardon et al. (2005) suggest that entrepreneurship scholars may benefit by viewing firms through this biological and paternalistic lens. Although there are insights to be achieved in doing so, we also acknowledge that there are fundamental differences between the life of the human event and that of the entrepreneurial journey, such that too literal an interpretation of the analogy is likely to be misleading. The life analogy captures the vagaries that make determining the starting point of the entrepreneurial process so difficult, but it also implies an autonomy and inevitability that exist for biological life that does not exist for new products or ventures.

For the sake of our analogy, assume that a human being exists when sperm fertilizes an egg. These beings typically go from embryo to foetus to baby to toddler to pre-pubescent to adolescent to young adult to middle-aged adult to elderly adult. To some degree this process is influenced by the environment, but there is an inevitability to the progression that is not shared by the entrepreneurial journey. There is a potentiality embedded in the biology of a human being such that some DNA can no more grow into a seven foot human than an acorn can become a pine tree. Short of death by sickness or starvation, the embryo will grow into an adult that may or may not realize his or her full biological potential, but there is a limit to that biological potential no matter how munificent the environment may be. Can the same be said of the entrepreneurial journey? Does an entrepreneurial journey have a conceptual equivalent to DNA with all its innate potential and limitations?

Unlike fields that study the behaviour of a unit of analysis that remains relatively constant (e.g. individual, organization, nation) even though the behaviour does not, the

field of entrepreneurship studies the conditions under which the very nature of the unit of analysis transforms from one form (e.g. idea) into another (e.g. product, firm, etc.). When can it be said that the entrepreneurial process yielding this final outcome – the new product that generates positive cash flow for the firm or economy – has begun?

One possible starting point is with an idea. Like an embryo, an idea is a combination of elements and one that is unlikely to survive without nourishment, such that its continued existence and development depends greatly on those who provide it with the resources it needs. Unlike an embryo, which grows or dies, an idea can languish unattended for years only to catch fire later. Can ideas that go unnourished or undernourished such that they never manifest as new products much less generate positive cash flow still be considered the beginning of the entrepreneurial journey? If we say that the beginning of human life is the formation of an embryo even if that embryo never reaches maturity as an elderly adult, can we say that the beginning of a new product is an idea even if that idea never reaches maturity as a good or service that generates positive cash flows? Is it possible to label an idea the beginning of the entrepreneurial process if that idea does not even lead to the creation of a product, but is instead sold as, say, a patent or license to existing firms?

These arguments seem to suffer the same vice as labelling a spouse's infidelity the beginning of a murder when that infidelity led only to divorce. Many murderers might point to infidelity as a reason for their action, but it need no more be a cause of murder than a cause of divorce. Such is the problem with the transition from post hoc explanation to a priori prediction: the assumption of inevitability is revealed to be an illusion created by the passing of time. In real time, the cause of murder is no such thing at all – a victim of a spouse's infidelity has options other than murder – e.g. divorce, forgiveness, etc. The same is true of the idea that may or may not manifest in the form of a new product, much less one that generates positive cash flow for the firm or transforms the structure of production.

At the other extreme, there are theories that suggest that the culmination of the entrepreneurial process may be the moment at which the entrepreneur realizes that potential exists for a new product that ultimately yields profit (e.g. Kirzner, 1973; Klein, 1999). Indeed, most theories and models of entrepreneurship interested in explaining, describing, or predicting the awareness, identification, discovery, recognition, or creation of opportunities would appear to favour some starting point that precedes the idea and suggests that the entrepreneurial journey is a process that consists of at least two stages punctuated by idea formation and concluding with a new product generating positive cash flows for the firm and/or the economy. This suggests that only the second stage of the entrepreneurial process begins with an idea, meaning that the first stage would have to begin with something more primitive than an idea (Autio et al., 2013; McMullen and Shepherd, 2006a).

Many economic theories of entrepreneurship assume that this alternative starting point is an insatiable desire for profit. This desire for profit is, in essence, the problem that entrepreneurs are perpetually seeking to solve (Baumol, 1990). This desire may find its source in different motives (e.g. Kunkel, 1965; McClelland, 1967; Schumpeter, 1934). The opportunity to satiate (partly and temporarily) this desire comes from new circumstances that offer new means or new ways of understanding existing means (Companys

and McMullen, 2007; McMullen et al., 2007). Thus, the opportunity at this point in the process would be nothing more than a new idea about how profit might be realized through a recombination of resources (Kirzner, 1999).

Such reference to stages reiterates the fact that entrepreneurship is a process. We have suggested that this process begins with a desire for profit that interacts with new information about motive, means, and/or opportunities to form an idea. If the entrepreneur has the motive, means, and opportunity to act, then this idea can, but does not have to, become a product, which in turn may or may not generate positive cash flows for the firm and/or economy. Words like 'can' and 'may' demonstrate that the outcome is not inevitable and that neither the desire for profit, nor the idea, are an efficient cause of a new product, much less a new product that yields positive cash flows. Looking back from the culmination of the entrepreneurial process to its beginning may not help to reveal necessary and sufficient causes of the outcome. If anything, it seems to reveal the futility of such a search. What it does highlight, however, is that entrepreneurial action requires motive, means, and an opportunity to convert a goal into behaviour. In turn, formation of that goal requires an idea, which also requires motive, means, and opportunity. Thus, by defining the journey and its conclusion, we reveal its antecedents and origin. We now examine whether the sequence in which one encounters the variables that are needed to transform the desire for profit into positive cash flow from a new product matters.

Question 4: Does the Entrepreneurial Journey Require Particular Variables or Events to Progress?

Continuing our use of analogies for insight, we look to work in psychoanalysis about ego development. One such example is provided by Erik H. Erickson's (1980, 1997) research on identity and the life cycle. Erickson suggests that individuals undergo a series of psychosocial crises associated with the life cycle as they move from the infancy of Stage I to the mature age of Stage VIII. The biological life cycle is similar to the analogy used in discussing Question 3, but biological life cycle is only loosely correlated to ego development. For example, reaching the mature age of Stage VIII does not guarantee that one will respond well to the psychosocial crisis it presents. As a result, an unhealthy personality can develop an identity characterized more by self-disgust and despair than by a sense of integrity.

Entrepreneurial process as ego development. This notion of life progressing through stages over time can be found in comparative mythology (Campbell, 2004, 2008), human resources (Catford and Ray, 1991), and the literature on storytelling (Brown, 2009). Each of these models in turn can be traced back to Jungian psychology (Jung, 1958) from which Campbell (2004) argues that ego development is largely a 'hero's journey' characterized by a pattern of personal myth making in which life is a series of journeys that begin with the comfort and complacency of 'innocence', move through the identification and recognition of the 'call to adventure', the testing of 'initiation', the strength and help of 'allies', and the new awareness or resolution of 'breakthrough', and finally end with the 'celebration' of returning home victorious and thus as a different being. This process is

repeated throughout life in different domains (e.g. work, relationships, stress) and at different levels of difficulty (see, e.g. Catford and Ray, 1991).

In both conceptions, the process of ego development is marked by stages of transformation in which an entity enters a stage, morphs into something more, and then exits to enter the next stage in a different and presumably more enlightened state. The healthy personality is thought to achieve eudaimonia (Aristotle, 1987) – ‘self-actualization’ (Frankl, 1963; Maslow, 1943) in which individuals fulfil their ‘personal destiny’ by staying true to their authentic self and becoming who they are (Norton, 1976). This involves a process of moral development (Erickson, 1980, 1997) in which individuals ‘follow their bliss’ to achieve a ‘state of rapture’ (Campbell, 2004, 2008) or peak optimal experience (Csikszentmihalyi, 1991).

The entrepreneurial journey shares some similarities with this process and is also characterized by some notable differences. In terms of similarities, the entrepreneurial journey appears to have equivalent stages to the hero’s journey. Clearly, there is a period in which entrepreneurs are ignorant of profit potential and where they become aware of a potential opportunity (McMullen and Shepherd, 2006a). This mirrors the stages of ‘innocence’ and ‘the call’ as the individual escapes ignorance enough to consider a new idea. A plunge decision that resembles the ‘initiation’ stage is often required of the entrepreneur who can no longer pursue his or her dream on the side and must instead abandon the stable income of regular employment to move forward with the venture (Dew et al., 2009). In essence, ‘initiation’ appears to be a point at which an idea becomes a more binding goal. The entrepreneur recruits investors, employees, and other stakeholders who resemble the ‘allies’ of the hero’s journey who offer help through their skills, knowledge, and resources in shaping and advancing this goal. ‘Breakthrough’ is the introduction of the new product to the market while ‘celebration’ is the stage at which positive cash flows are generated for the firm or economy.

Software vs. hardware constraints and the importance of sequence. Should the entrepreneurial journey begin with the goal of ‘initiation’, the idea of ‘the call’, or should it begin with the ignorance of ‘innocence’ and then seek to explain how individuals successfully complete the journey? If entrepreneurial action is indeed equivalent to the introduction of a new product that yields positive cash flows, then there would seem to be two levels upon which this progression could occur: software and hardware. Software involves the origination of the idea and addresses the knowledge, cognition, creativity, education, and other mental prerequisites needed to generate a new product. Hardware refers to the material resources an entrepreneur must marshal to transform an idea into a new product. It seems that acquisition of the motive, means, and opportunity needed for new product development may occur on both the hardware and software planes concurrently, such that one may have the resources necessary to act, but lack the idea, or have the idea but lack the resources to act. If this is true, then it is unclear whether ‘the call’ and ‘initiation’ need to precede the stakeholder support of ‘allies’ in the march towards ‘breakthrough’. Indeed, even though action (product introduction) must be preceded by a goal (to introduce a new product), which in turn must be preceded by an idea (for a new product), these phases, according to different theorists, may be experienced in an instant

or they may be experienced over an extended period of time depending on whether the theorist focused on software-related or hardware-related obstacles to entrepreneurial action.

For example, both the Schumpeterian and Kirznerian conceptions of entrepreneurial action appear to be consistent with a view of entrepreneurship as a journey, but they differ from each other in terms of the sequence with which they propose that entrepreneurs become aware of their access to the motive, means, and opportunity necessary for them to realize a profit. For Kirzner, the motive, means, and opportunity needed to convert a new product idea into a new product introduction (i.e. hardware-related constraints) are assumed to be present so that emphasis can be given exclusively to software-related constraints. Motive and means related to software are also assumed to be present such that the opportunity construct is all that is preventing the individual from becoming an entrepreneur. As a result, opportunity is a situation that, once encountered, reveals the information needed to generate an idea about how the structure of production can be reorganized to the benefit of the individual and the price system of which he or she as an entrepreneur is a part.

In contrast, consider the entrepreneur of Schumpeter's (1934) theory of economic development. Schumpeter assumes software-related constraints have been met and focuses on hardware-related constraints. Opportunity at the hardware-level is also assumed and attention is given to hardware-related means and motives, such that Schumpeter discusses means mostly in terms of credit while using non-hedonic motives, such as empire building, as isolating selection mechanisms (Licht, 2010; Schumpeter, 1934). In this scenario, 'the call' and 'initiation' phases clearly predate 'breakthrough'. Time passes as the entrepreneur cobbles together the resources needed to convert goal into behaviour. Indeed, the hallmark of the entrepreneur for Schumpeter is his or her willingness to act when others will not (McMullen and Shepherd, 2006a).

Both of these classic entrepreneurship theories address software- and hardware-related concerns, and they both recognize a progression from desire to idea to goal to action, but to make their arguments, both theorists superimpose a sequence onto that process. Both conceive of the entrepreneur as an economic agent engaged in a process of reassessing the current deployment of means given new means, motives, and opportunities available. This is the time sequencing challenge described earlier by DeBono (1992) regarding the integration of new information, but whereas this process seems to serve as the conclusion of Kirzner's argument, it is the beginning of Schumpeter's.

Does it make sense to superimpose a structure on the entrepreneurial process that requires software-related constraints related to idea generation to be met before the hardware-related constraints related to idea implementation or vice versa? For Kirzner, it is important that formation of the idea occurs after the entrepreneur has everything else he needs. This is because Kirzner assumes an evenly rotating economy and wishes to explain some Pareto efficient version of profit in which the benefit is not completely offset by search costs. Also, he wishes to avoid having to discuss uncertainty about whether the idea can be implemented successfully. In contrast, Schumpeter does not limit the entrepreneur to having to mine the evenly rotating economy as a source of inspiration for new ideas. Moreover, he assumes that uncertainty is inherent within the process of applying knowledge that is created outside the price system to solving

problems within it. The only real software constraints that Schumpeter's entrepreneur has, therefore, is the motivation to look for these ideas, assuming that incentives outside the price system continue to encourage the creation of new ideas.

The timing of goal formation may be important in determining entrepreneurship's implications for the economy, but it is less important for explaining entrepreneurial action at the level of the actor (e.g. Kirzner, 1999). Either software or hardware constraints can preclude action such that the issue becomes a matter of whether or not an entrepreneur has motive, means, and opportunity necessary for inspiration, ideation, and implementation. Research has only recently begun to examine the concurrent effects of motive, means, and opportunity in basic entrepreneurial outcomes, such as intent to start a venture. To our knowledge, no published studies have examined whether the sequence matters in which motive, means, and opportunity are met in the pursuit of a simple task at only the software level (e.g. idea generation) or hardware level (e.g. funding, recruiting), much less both levels simultaneously, as is likely to be the case in a complex goal such as introducing a new product that generates positive cash flows.

How does all of this talk about necessary elements and events reconcile with the discrete outcomes of variance-oriented studies? It seems to suggest that having the motive, means, and opportunity to act entrepreneurially may not be sufficient, not only because qualification as a suspect does not guarantee that one is the perpetrator of the act, but also because the order with which one acquires the necessary prerequisites is likely to interact with one's goal for entrepreneurial action to influence the nature of the outcome. In other words, acquisition of some means before other means or acquisition of means before motive, and other similar sequential combinations are likely to influence both the nature of one's goal and one's commitment to it such that the action it generates may be more determined by the order in which one acquires the necessary prerequisites than it is by simply having access to them. After all, as the time sequence trap suggests, information acquired over time forms structures that can calcify over time.

So far we have proposed that the entrepreneurial journey is bookended at the beginning with the desire for profit and at the end with positive cash flows for the firm and/or economy being generated by a new product. In between, motive, means, and opportunity are required to convert the goal into the desired outcome. However, motive, means, and opportunity are also required to generate the idea that was compelling enough to become this goal, an idea intended to satiate the desire for profit. Thus, we suggest that the formation of the goal is a key moment within the entrepreneurial journey and that the timing of this moment within the process matters. This is not to say, however, that the idea behind the goal or the goal itself is incapable of evolving. As feedback is sought and received from various stakeholders during goal striving, the idea and goal are likely to change with changes in information. This brings us to our final question.

Question 5: What, If Anything, Remains Constant throughout the Entrepreneurial Process?

Unlike identity development in which biological individuals stay the same even if their understanding of their place in the world evolves over time, the entrepreneurial journey seems to lack a similar nucleus. The desire for profit leads to an idea for a new product

that becomes a goal to introduce a new product that becomes a new product that may or may not yield positive cash flow for the firm and/or economy. This desire for profit provides constancy in the form of intent. Lewin (1999), for instance, defines intentions in this way, equating them with desires as opposed to goals. This desire intention, however, must lead to an idea that becomes a goal intention if entrepreneurial action is ever going to occur. A goal intention is a configuration of beliefs and desires that commit the individual to a course of action, moving him or her from the motivational, detached thinking of a deliberative mindset to the volitional, self-serving thinking of the implemental mindset (Gollwitzer, 1996). As allies are recruited, implementation intentions (i.e. if-then contingency plans) such as those discussed by Gollwitzer (1999) are negotiated, and as Sarasvathy (2001) suggests, the goal intention itself may be renegotiated. However, the desire intention for profit remains intact.^[1]

Thus, intent appears to offer the only constant throughout the entrepreneurial process, and although this intent begins with a desire that remains alive throughout the process but subject to various interpretations depending on the motives that various stakeholders bring to the endeavour at various stages, the process does not become an entrepreneurial journey until the desired intention is combined with a product idea that compels the formation of a goal intention. It is this goal intention that provides the motive through which the means and opportunities related to hardware concerns can be identified.

What we are witnessing in the entrepreneurial process is the evolution of intent (Bird, 1988; Krueger et al., 2000). This intent begins with a subjective belief that one has an idea to solve a problem for profit (Chiles et al., 2010). This intent becomes an intersubjective belief as others contribute to its formation, pruning and watering it in ways such that it becomes a prototype and eventually a product (McMullen, 2010). In turn, this intersubjective belief becomes an objective reality when consumers find the solution valuable as evidenced by enough customers paying enough for the product to achieve viability, from either the pioneer or imitators. Everything about this belief can change, including what the product is, how, why, when, and where it is being produced, who is producing it, why it offers value, and who, where, and when it offers value. The only thing constant is the energy and momentum that comes from the intention, an energy that comes from stakeholders believing that the endeavour is a means of advancing their own ends, whatever they may be. Ultimately the entrepreneurial journey is a journey to produce value for others, and this journey is fuelled by the belief of those involved that producing value for others is a ticket for producing value for themselves.

METHODOLOGICAL IMPLICATIONS

The questions addressed in the preceding section raise two methodological implications for the field regarding (1) how to structure the observation space and (2) the nature of the empirical entities that can be studied. We discuss these implications in order, noting that they represent nested choices for the design of empirical studies.

As depicted in Figure 1, the partitioning of the observation space should be done by journey rather than by its separate attributes. Consequently, the unit of explanation should be the entire process, with all its twists and turns. When the entrepreneurial

journey is discussed as a sequence of events and actions, each event/action constitutes an indelible part of how the process has played out and is sensitive to the history that preceded it. This requires researchers to reorient how we approach the empirical study of entrepreneurial processes, from focusing on variables (across journeys) to focusing on events (within journeys). Poole et al. (2000) offer a comprehensive guide to designing and conducting process research and there has been a Professional Development Workshop on the topic for eight consecutive years at the annual Academy of Management meetings. The entrepreneurship field should embrace this trend given that process is our fundamental object of enquiry.

Assuming that one chooses to answer the call to engage in process research, the question emerges of what data to get and how. Based upon our ruminations concerning the definitive starting and ending points of the entrepreneurial journey, there are two possibilities that immediately come to mind. The first is backward looking and involves selecting journeys that have already been completed (however completion is defined). Extensive retrospective narratives using historical methods and a variety of data sources are then constructed. This requires a distinct set of skills and vast patience, but such studies can play a vital role in building a vibrant research ecosystem around entrepreneurial journeys. The second possibility starts in the present and moves forward in real-time using longitudinal studies of unfolding processes, as exemplified by the Minnesota Innovation Research Program (MIRP) summarized in Van de Ven et al. (1999). This approach requires patiently awaiting processes to run their course, while diligently recording the meaningful incidences along the way. Again, such work is invaluable to the research ecosystem of the field.

We anticipate two immediate reactions to these two possibilities. One is that the work is too time consuming and risky given short-term academic performance constraints (McMullen and Shepherd, 2006b). Indeed, the MIRP took 17 years and 14 research teams to study 14 innovations as they unfolded from idea to implementation. A related concern involves the difficulty of selecting prospective projects that prove to be worthwhile for long-term study. The closer one gets to the origin of the entrepreneurial journey, the more likely it becomes that the only tangible markers of entrepreneurial action are ideas or goal intentions. This makes it difficult to distinguish the 'genius' from the 'lunatic' until one has already invested substantial time and resources. The second reaction is that process research involves a limited number of cases, thereby preventing robust generalizable conclusions. This concern plays into the implicit norms of the field regarding what constitutes rigorous, theoretically meaningful research and highlights an important problem. By focusing on how specific journeys unfold (or have already unfolded), we have no access to their counterfactuals – i.e. similar actions leading to different end points or different actions leading to the same end point.

We are not the first to call for longitudinal research. Indeed, all prior calls for conducting process research point to such studies as the way forward. Given these concerns, however, it is not surprising that these calls have gone largely unanswered. Instead, research has gravitated towards reducing process to attributes (Quadrant II of Table I), shrinking the timeline examined (Quadrant III), or both (Quadrant I).

Therefore, we would like to outline a third possibility: bottom-up computational modelling. Such computational modelling^[2] is an important tool for deriving theoretical

insights into interesting phenomena, particularly when they arise from complex interactions among many components (Miller and Page, 2007). Unlike mathematical, top-down modelling, which is based on a single, representative agent and evident in economic models of entrepreneurial behaviour (e.g. Levesque and Minniti, 2006), bottom-up or agent-based modelling enables closer correspondence to real-world agents of interest. There are four key characteristics of the agents in such settings: they are autonomous, interdependent, and adaptive (i.e. they learn from experience), and they follow simple rules. This set of characteristics readily applies to entrepreneurs and at the same time, through variation in individual characteristics, allows for the creation of a diverse community of entrepreneurs.

The goal of agent-based modelling (ABM) is to 'enrich our understanding of fundamental processes that may appear in a variety of applications' (Axelrod, 1997, p. 25). As such, simulation represents 'a third way of doing science' (Axelrod, 2005):

Like deduction, it starts with a set of explicit assumptions. But unlike deduction, it does not prove theorems. Instead, a simulation generates data that can be analyzed inductively. Unlike typical induction, however, the simulated data comes from a rigorously specified set of rules rather than direct measurement of the real world. While induction can be used to find patterns in data, and deduction can be used to find consequences of assumptions, simulation modeling can be used as an aid to intuition. Simulation is a way of doing thought experiments. While the assumptions may be simple, the consequences may not be at all obvious. (p. 5)

Again, we are not the first to advocate the use of agent-based modelling. Almost ten years ago, McKelvey (2004) called for ABM as an important tool for understanding the complex nature of entrepreneurship, and Yang and Chandra (2013) have recently repeated the call while offering more hands-on guidance. Other calls have been made for using ABM in the study of innovation/new product development (Garcia, 2005) and as a theoretical tool for bridging micro and macro levels in sociology (Macy and Willer, 2002). Recent work has also offered formal guidance for the development and assessment of such models in marketing (Rand and Rust, 2011), management (Davis et al., 2007), as well as social science in general (Gilbert, 2008; Gilbert and Troitzsch, 2005).

Given the aforementioned challenges associated with obtaining data on the early stages of the entrepreneurial journey and its unfolding over long periods of time, ABM may be especially attractive to entrepreneurship researchers because it would enable them to create their own datasets for theoretical exploration and insight. By systematically varying the contextual characteristics, agent characteristics, or rules for interaction, the approach also allows for rigorous experimentation. Perhaps its most promising benefit is the open availability of object-based modelling software, such as NetLogo or Repast, and the ability to make developed models available to researchers who could then replicate prior work or adapt models for specific theoretical purposes.

Rather than a 'silver bullet' cure to the dearth of process research in the field, we see agent-based modelling as one vital element of a broader research ecosystem around entrepreneurial process. Because of the distinct set of skills that it requires, ABM can naturally cause entrepreneurship researchers to feel threatened by those with superior

modelling or programming skills. Indeed, as Watts states, 'no one descends with such fury and in so great a number as a pack of hungry physicists, adrenalized by the scent of a new problem' (Watts, 2003, p. 61), but therein also lies an opportunity to build links to other disciplines and reinvigorate the entire research ecosystem. A major challenge for agent-based simulations relates to their verisimilitude (Lazer and Friedman, 2007), which refers to whether the assumptions necessary to simplify the model correspond to empirical circumstances. In this regard, model builders are likely to rely on the rest of the ecosystem to provide the descriptions and rules necessary for modelling realistic entrepreneurial agents. Studies of particular journeys as well as of proximate outcomes would become invaluable in this regard.

IMPLICATIONS FOR THE FIELD OF ENTREPRENEURSHIP

A process approach to entrepreneurship research may reveal predictable patterns and events that variance-oriented studies would otherwise miss. By acknowledging that the entrepreneurial process includes a series of events on the path to realizing positive cash flows from a new product, entrepreneurship research may avoid the danger of redundancy with creativity research at the front end of the entrepreneurial process and strategy research at the back end. An understanding of both creativity and strategy are required, but variance-oriented studies conducted at either end that do not acknowledge sequencing effects are suspect. How information is acquired is likely to affect the ideas that are generated, the goals that are selected, the behaviours engaged in, and ultimately the outcomes attained. Neither ideation nor implementation within the entrepreneurial process is likely to take place within a vacuum of full information. Consequently, the process is likely to be self-regulatory wherein a system's agents strive to reach their motives and goals by integrating new information they acquire during the journey.

Creativity and strategy researchers tend to examine either the feedforward of goal setting or the feedback of goal striving. Creativity research informs how the desire for profit, combined with information about resources, can yield new ideas for products, but tends to leave the study of modes of implementation (e.g. firms) to strategy researchers. Conversely, strategy research reveals why some firms manage to serve their customers better than their rivals do, but it presumes the existence of the firm (Sarasvathy, 2004) and often assumes that new ideas will be thrust upon the business by circumstance (McMullen and Shepherd, 2006a). Few studies trace this journey from start to finish. In contrast, a multi-level process beginning with individuals but ending with a transformed structure of production recognizes that the individual is part of a social system and that, when the individual acts to integrate new information into the system, he or she fills an entrepreneurial function that has personal, organizational, and systemic causes and effects. Whereas creativity research often ignores these systemic effects, strategy research has a tendency to neglect the personal causes.

In addition, examination of the entrepreneurial process as a series of events may help to distinguish the field from more abstract concepts, such as variation, or more concrete practices, such as negotiation. If entrepreneurship researchers start only with the conclusion of the entrepreneurial journey and look backward to understand its sources, antecedents, or causes, they run the risk of conceiving of the entrepreneurial process

deterministically. This approach tends to ignore the fact that systemic outcomes depend not only on the variation introduced by the entrepreneur but also on which individuals comprise the system because their motives, means, opportunities, and goals influence which variations will be proposed and ultimately integrated into the system.

At the opposite extreme is research that prefers concrete phenomena to abstract concepts such that entrepreneurship becomes dis-embedded from its systemic context and reduced to one of the tasks of which it is comprised. Negotiation, for example, is integral to entrepreneurship, but it is only one of many tasks in the entrepreneurial process. Moreover, this task depends partly on the institutional conditions in which the agent is embedded (McMullen, 2011). Failure to acknowledge the influence of those conditions may disqualify a negotiation study on, say, preference formation from informing the entrepreneurial process because the study would overemphasize agency and neglect the structural factors that influence whether entrepreneurship is both perceived to be and actually possible, as well as how it manifests and with what consequences. Failure to recognize that system conditions are being assumed can lead to misconceptions that entrepreneurship is equivalent to negotiation. Negotiation is indeed something entrepreneurs do, but is it definitive of entrepreneurial action, which may begin before an individual engages stakeholders?

CONCLUSION

Entrepreneurship researchers have long called for a more process-oriented approach to researching the phenomena, however defined. Arguing that entrepreneurship is organizational creation, Gartner (1990) pointed out that the process through which new ventures are created is an essential part of our understanding of this phenomenon. Wiklund et al. (2011) arrived at a similar conclusion while disagreeing with Gartner about the nature of the phenomenon. Instead, they posited that the central focus of entrepreneurship research should be on the emergence of new economic activity. Regardless of how the phenomenon is conceptualized, one thing is for certain, entrepreneurship is a process that transpires over time. In this essay, we have sought to explore what this would mean to the field by explicitly equating entrepreneurship to a journey that consists of a set of conditions that must be met, but not in any particular order to proceed – e.g. motive, means, opportunity, and a goal – and a series of events that may proceed in something closer to chronological order – e.g. innocence, the call, initiation, allies, breakthrough, and celebration. In the process, we hope to have shown why process is essential not only to the study of the entrepreneurial phenomenon but also for distinguishing the field of entrepreneurship horizontally from creativity and strategy research, which overlaps the process at the front and back ends, and from more abstract concepts (variation) of which it is a particular manifestation and more concrete concepts (negotiation) of which it is comprised.

NOTES

- [1] It is important to note that profit need not refer exclusively to accounting profit, defined as revenues less fixed and variable costs. The economic notion of profit is defined as accounting profit less opportunity

costs, which are in turn defined as the next best alternative use of resources (Primeaux and Stieber, 1997). Thus, the term profit in the way we are using it can refer to utility (Homans, 1972). However, we limit our discussion to efforts to improve utility through an eventual financial exchange. This is not to say that social or moral exchanges do not occur on the way to the ultimate financial exchange of a product being delivered to a customer for payment; instead, we simply mean to exclude manifestations of utility improvement in which no customer is involved, and thus no market transaction takes place.

- [2] Miller and Page (2007) distinguish modelling from simulation, based on the complexity of the entities and interactions. Modelling uses simple entities and interactions, while simulation creates more complex agents and communities.

REFERENCES

- Aldrich, H. E. (2001). 'Who wants to be an evolutionary theorist?'. *Journal of Management Inquiry*, **10**, 115–27.
- Alvarez, S. A. and Barney, J. B. (2007). 'Discovery and creation: alternative theories of entrepreneurial action'. *Strategic Entrepreneurship Journal*, **1**, 11–26.
- Aristotle (1987). *The Nicomachean Ethics*. Amherst, NY: Prometheus Books.
- Autio, E., Dahllander, L. and Frederiksen, L. (2013). 'Information exposure, opportunity evaluation and entrepreneurial action: an investigation of an online user community'. *Academy of Management Journal*, doi: 10.5465/amj.2010.0328.
- Axelrod, R. M. (1997). *The Complexity of Cooperation: Agent-Based Models of Competition and Collaboration*. Princeton, NJ: Princeton University Press.
- Axelrod, R. (2005). 'Advancing the art of simulation in the social sciences'. In Rennard, J. (Ed.), *Handbook of Research on Nature Inspired Computing for Economy and Management*. Hersey, PA: Idea Group, 90–100.
- Baker, T. and Nelson, R. (2005). 'Creating something from nothing: resource construction through entrepreneurial bricolage'. *Administrative Science Quarterly*, **50**, 329–66.
- Baumol, W. J. (1990). 'Entrepreneurship: productive, unproductive, and destructive'. *Journal of Political Economy*, **98**, 893–921.
- Bird, B. (1988). 'Implementing entrepreneurial ideas: the case for intention'. *Academy of Management Review*, **13**, 442–53.
- Brown, T. (2009). *Change by Design*. New York: Harper Business.
- Bruner, J. (1986). *Actual Minds, Possible Worlds*. Cambridge, MA: Harvard University Press.
- Campbell, J. (2004). *Pathways to Bliss*. Novato, CA: New World Library.
- Campbell, J. (2008). *The Hero with a Thousand Faces*. Novato, CA: New World Library.
- Cardon, M. S., Zietsma, C., Saporito, P., Matherne, B. P. and Davis, C. (2005). 'A tale of passion: new insights into entrepreneurship from a parenthood metaphor'. *Journal of Business Venturing*, **20**, 23–45.
- Casson, M. (2002). *The Entrepreneur*. Cheltenham: Edward Elgar.
- Catford, L. C. and Ray, M. (1991). *The Path of the Everyday Hero*. Forestville, CA: Creative Quest Publishing.
- Chandler, G. N. and Lyon, D. W. (2001). 'Issues of research design and construct measurement in entrepreneurship research: the past decade'. *Entrepreneurship Theory and Practice*, **25**, 101–13.
- Chia, R. (2000). 'Discourse analysis as organizational analysis'. *Organization*, **7**, 513–18.
- Chiles, T. H., Tuggle, C. S., McMullen, J. S., Bierman, L. and Greening, D. W. (2010). 'Dynamic creation: extending the radical Austrian approach to entrepreneurship'. *Organization Studies*, **31**, 7–46.
- Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge, MA: Belknap Press.
- Companies, Y. and McMullen, J. S. (2007). 'Strategic entrepreneurs at work: the nature, discovery, and exploitation of entrepreneurial opportunities'. *Small Business Economics*, **28**, 301–22.
- Cook, T. D. and Campbell, D. T. (1979). *Quasi-Experimentation: Design and Analysis Issues for Field Studies*. Boston, MA: Houghton Mifflin.
- Corbett, A. C. (2005). 'Experiential learning within the process of opportunity identification and exploitation'. *Entrepreneurship Theory and Practice*, **29**, 473–91.
- Cornelissen, J. P. and Clarke, J. S. (2010). 'Imagining and rationalizing opportunities: inductive reasoning and the creation and justification of new ventures'. *Academy of Management Review*, **35**, 539–57.
- Covin, J. G. and Slevin, D. P. (1991). 'A conceptual model of entrepreneurship as firm behavior'. *Entrepreneurship Theory and Practice*, **15**, 7–25.
- Csikszentmihalyi, M. (1991). *Flow*. New York: Harper and Row.
- Davis, J. P., Eisenhardt, K. M. and Bingham, C. B. (2007). 'Developing theory through simulation methods'. *Academy of Management Review*, **32**, 480–99.
- DeBono, E. (1992). *Serious Creativity*. New York: Harper Business.

- Dew, N., Sarasvathy, S., Read, S. and Wiltbank, R. (2009). 'Affordable loss: behavioral economic aspects of the plunge decision'. *Strategic Entrepreneurship Journal*, **3**, 105–26.
- Dimov, D. (2007). 'Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities'. *Entrepreneurship Theory and Practice*, **31**, 713–31.
- Dimov, D. (2010). 'Nascent entrepreneurs and venture emergence: opportunity confidence, human capital, and early planning'. *Journal of Management Studies*, **47**, 1123–53.
- Dimov, D. (2011). 'Grapppling with the unbearable elusiveness of entrepreneurial opportunities'. *Entrepreneurship: Theory and Practice*, **35**, 57–81.
- Dutta, D. K. and Crossan, M. (2005). 'The nature of entrepreneurial opportunities: understanding the process using the 4I organizational learning framework'. *Entrepreneurship Theory and Practice*, **29**, 425–49.
- Elster, J. (2007). *Explaining Social Behavior*. New York: Cambridge University Press.
- Erickson, E. H. (1980). *Identity and the Life Cycle*. New York: W.W. Norton and Company.
- Erickson, E. H. (1997). *The Life Cycle Completed*. New York: W.W. Norton and Company.
- Foss, N. J. and Klein, P. G. (2012). *Organizing Entrepreneurial Judgment*. New York: Cambridge University Press.
- Frankl, V. (1963). *Man's Search for Meaning*. New York: Washington Press.
- Garcia, R. (2005). 'Uses of agent-based modeling in innovation/new product development research'. *Journal of Product Innovation Management*, **22**, 380–98.
- Gartner, W. B. (1990). 'What are we talking about when we talk about entrepreneurship?'. *Journal of Business Venturing*, **5**, 15–28.
- Gilbert, N. (2008). *Agent-Based Models*. Thousand Oaks, CA: Sage Publications.
- Gilbert, N. and Troitzsch, K. (2005). *Simulation for the Social Scientist*. Maidenhead: Open University Press.
- Gollwitzer, P. M. (1996). 'The volitional benefits of planning'. In Gollwitzer, P. M. and Bargh, J. A. (Eds), *The Psychology of Action*. New York: Guilford Press, 287–312.
- Gollwitzer, P. M. (1999). 'Implementation intentions: strong effects of simple plans'. *American Psychologist*, **54**, 493–503.
- Gruber, M. (2007). 'Uncovering the value of planning in new venture creation: a process and contingency perspective'. *Journal of Business Venturing*, **22**, 782–807.
- Homans, G. C. (1972). *Social Behavior*. New York: Harcourt Brace Jovanovich.
- Jung, C. (1958). *The Undiscovered Self*. Oxford: Little, Brown.
- Kauffman, S. A. (2008). *Reinventing the Sacred*. New York: Basic Books.
- Kirzner, I. M. (1973). *Competition and Entrepreneurship*. Chicago, IL: Chicago University Press.
- Kirzner, I. M. (1999). 'Creativity and/or alertness: a reconsideration of the Schumpeterian entrepreneur'. *Review of Austrian Economics*, **11**, 5–17.
- Klein, D. B. (1999). 'Discovery and deepself'. *Review of Austrian Economics*, **11**, 47–76.
- Krueger, N. F. Jr, Reilly, M. D. and Carsrud, A. L. (2000). 'Competing models of entrepreneurial intentions'. *Journal of Business Venturing*, **15**, 411–32.
- Kunkel, J. H. (1965). 'Values and behavior in economic development'. *Economic Development and Cultural Change*, **13**, 257–77.
- Langley, A., Smallman, C., Tsoukas, H. and Van de Ven, A. H. (2013). 'Process studies of change in organization and management: unveiling temporality, activity, and flow'. *Academy of Management Journal*, **56**, 1–13.
- Lazer, D. and Friedman, A. (2007). 'The network structure of exploration and exploitation'. *Administrative Science Quarterly*, **52**, 667–94.
- Levesque, M. and Minniti, M. (2006). 'The effect of aging on entrepreneurial behavior'. *Journal of Business Venturing*, **21**, 177–94.
- Lewin, K. (1999). 'Intention, will and need'. In Gold, M. (Ed.), *The Complete Social Scientist*. Washington DC: American Psychological Association, 83–116.
- Licht, A. N. (2010). 'Entrepreneurial motivations, culture, and the law'. In Freytag, A. and Thurik, A. R. (Eds), *Entrepreneurship and Culture*. Berlin: Springer-Verlag, 11–40.
- Low, M. B. and MacMillan, I. C. (1988). 'Entrepreneurship: past research and future challenges'. *Journal of Management*, **14**, 139–61.
- Lumpkin, G. T. and Dess, G. G. (1996). 'Clarifying the entrepreneurial orientation construct and linking it to performance'. *Academy of Management Review*, **21**, 135–72.
- Macy, M. W. and Willer, R. (2002). 'From factors to actors: computational sociology and agent-based modeling'. *Annual Review of Sociology*, **28**, 143–66.
- Maslow, A. (1943). 'A theory of human motivation'. *Psychological Review*, **50**, 370–96.
- McClelland, D. C. (1967). *The Achieving Society*. New York: Free Press.

- McGrath, J. E. (1982). 'Dilemmatics: the study of research choices and dilemmas'. In McGrath, J. E., Martin, J. and Kulka, R. A. (Eds), *Judgement Calls in Research*. Beverly Hills, CA: Sage Publications, 69–103.
- McKelvey, B. (2004). 'Toward a complexity science of entrepreneurship'. *Journal of Business Venturing*, **19**, 313–41.
- McMullen, J. S. (2010). 'Perspective taking and the heterogeneity of the entrepreneurial imagination'. In Koppl, R., Horwitz, S. and Desrochers, P. (Eds), *Advances in Austrian Economics*. Bingley: Emerald, 113–44.
- McMullen, J. S. (2011). 'Delineating the domain of development entrepreneurship: a market-based approach to facilitating inclusive economic growth'. *Entrepreneurship Theory and Practice*, **35**, 185–215.
- McMullen, J. S. and Shepherd, D. A. (2006a). 'Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur'. *Academy of Management Review*, **31**, 132–52.
- McMullen, J. S. and Shepherd, D. A. (2006b). 'Encouraging consensus-challenging research in universities'. *Journal of Management Studies*, **43**, 1643–669.
- McMullen, J. S., Plummer, L. and Acs, Z. (2007). 'What is an entrepreneurial opportunity?'. *Small Business Economics*, **28**, 273–83.
- Miller, J. H. and Page, S. E. (2007). *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*. Princeton, NJ: Princeton University Press.
- Miller, T. L., Grimes, M., McMullen, J. S. and Vogus, T. J. (2012). 'Venturing for others with heart and head: how compassion encourages social entrepreneurship'. *Academy of Management Review*, **37**, 616–40.
- Mohr, L. (1982). *Explaining Organizational Behavior*. San Francisco, CA: Jossey-Bass.
- Molm, L. D. (2006). 'The social exchange framework'. In Burke, P. J. (Ed.), *Contemporary Social Psychological Theories*. Stanford, CA: Stanford University Press, 24–45.
- Moore, G. A. (1991). *Crossing the Chasm*. New York: HarperCollins.
- Noore, D. C. (2005). *Understanding the Process of Economic Change*. Princeton, NJ: Princeton University Press.
- Norton, D. L. (1976). *Personal Destinies*. Princeton, NJ: Princeton University Press.
- Poole, M. S., Van de Ven, A. H., Dooley, K. and Holmes, M. (2000). *Organization Change and Innovation Processes: Theory and Methods for Research*. New York: Oxford University Press.
- Prashantham, S. and Dhanaraj, C. (2010). 'The dynamic influence of social capital on the international growth of new ventures'. *Journal of Management Studies*, **47**, 967–94.
- Primeaux, P. and Stieber, J. (1997). 'Managing business ethics and opportunity costs'. *Journal of Business Ethics*, **16**, 835–42.
- Ragin, C. C. (1987). *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley, CA: University of California Press.
- Rand, W. and Rust, R. T. (2011). 'Agent-based modeling in marketing: guidelines for rigor'. *International Journal of Research in Marketing*, **28**, 181–93.
- Rasmussen, E., Mosey, S. and Wright, M. (2011). 'The evolution of entrepreneurial competencies: a longitudinal study of university spin-off venture emergence'. *Journal of Management Studies*, **48**, 1314–345.
- Read, S., Sarasvathy, S., Dew, N., Wiltbank, R. and Ohlsson, A. V. (2011). *Effectual Entrepreneurship*. New York: Routledge.
- Rogers, E. M. (2004). *Diffusion of Innovations*. New York: The Free Press.
- Sarasvathy, S. D. (2001). 'Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency'. *Academy of Management Review*, **26**, 243–63.
- Sarasvathy, S. D. (2004). 'Making it happen: beyond theories of the firm to theories of firm design'. *Entrepreneurship Theory and Practice*, **28**, 519–31.
- Scarborough, H., Swan, J., Amaeshi, A. and Briggs, T. (2013). 'Exploring the role of trust in the deal-making process for early-stage technology ventures'. *Entrepreneurship Theory and Practice*, doi: 10.1111/ETAP.12031.
- Schumpeter, J. A. (1934). *The Theory of Economic Development*. New Brunswick: Transaction Publishers.
- Shane, S. (2012). 'Reflections on the 2010 AMR Decade Award: delivering on the promise of entrepreneurship as a field of research'. *Academy of Management Review*, **37**, 10–20.
- Shane, S. and Venkataraman, S. (2000). 'The promise of entrepreneurship as a field of research'. *Academy of Management Review*, **25**, 217–26.
- Shepherd, D. A., Zacharakis, A. and Baron, R. A. (2003). 'VCs' decision processes: evidence suggesting more experience may not always be better'. *Journal of Business Venturing*, **18**, 381–401.
- Sinek, S. (2009). *Start with Why*. New York: Penguin.

- Sorenson, O. and Stuart, T. (2008). 'Entrepreneurship: a field of dreams?'. *Academy of Management Annals*, **2**, 517–43.
- Unger, J. M., Rauch, A., Frese, M. and Rosenbusch, N. (2011). 'Human capital and entrepreneurial success: a meta-analytical review'. *Journal of Business Venturing*, **26**, 341–58.
- Van de Ven, A. H. (2007). *Engaged Scholarship: A Guide for Organizational and Social Research*. Oxford: Oxford University Press.
- Van de Ven, A. H. and Engleman, R. M. (2004). 'Event- and outcome-driven explanations of entrepreneurship'. *Journal of Business Venturing*, **19**, 343–58.
- Van de Ven, A. H., Polley, D. E., Garud, R. and Venkataraman, S. (1999). *The Innovation Journey*. New York: Oxford University Press.
- Venkataraman, S., Van De Ven, A. H., Buckeye, J. and Hudson, R. (1990). 'Starting up in a turbulent environment: a process model of failure among firms with high customer dependence'. *Journal of Business Venturing*, **5**, 277–95.
- Watts, D. J. (2003). *Six Degrees: The Science of a Connected Age*. New York: W. W. Norton.
- Weick, K., Sutcliffe, K. M. and Obstfeld, D. (2005). 'Organizing and the process of sensemaking'. *Organization Science*, **16**, 409–21.
- West, J. (2008). 'Commercializing open science: deep space communications as the lead market for Shannon Theory, 1960–73'. *Journal of Management Studies*, **45**, 1506–32.
- Wiklund, J., Davidsson, P., Audretsch, D. B. and Karlsson, C. (2011). 'The future of entrepreneurship research'. *Entrepreneurship Theory and Practice*, **35**, 1–9.
- Yang, S. J. S. and Chandra, Y. (2013). 'Growing artificial entrepreneurs: advancing entrepreneurship research using agent-based simulation approach'. *International Journal of Entrepreneurial Behaviour and Research*, **19**, 210–37.
- Zott, C. and Huy, Q. N. (2007). 'How entrepreneurs use symbolic management to acquire resources'. *Administrative Science Quarterly*, **52**, 70–105.