

## Finding Myself Staring at the Future

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Imagine thinking about a theory of something, whereby your thinking process about the something is a very example of the theory you are trying to develop. The image that comes to mind is of Baron Munchausen trying to pull himself out of the water. In a way, it seems that what I have been trying to capture in my mind is myself trying to capture myself in my mind...

A theory is a sort of intellectual taming, of containing an object or situation in your mind. As such, an intellectual journey represents an attempt to rise to and stay on top of the subject of inquiry. The strive is to find a firm ground on which to stand and grasp the subject in full view – akin to watching a tiger at the zoo from behind a glass wall. The observer has the power, the subject having fully revealed itself, to distill the essence of the subject in his or her mind. But again, what if your own thinking process is part of the subject of inquiry.

Now imagine this intellectual effort against the constant flow of time. The firm ground is a position somewhere ahead from which you can take in what has happened so far. But you are soon overtaken by the flow of time and find yourself part of the past. Think of trying to take a close-up picture of people running towards you: you run ahead, turn back, shoot; then run ahead again, turn back, and shoot. You have to keep running. And your picture turns ‘old’ the very moment it is taken.

The process of intellectual distillation is well represented by Piaget’s (1950) theory of cognitive development, based on an interplay between assimilation and accommodation. The former entails perceiving new objects through existing mental schemas, while the latter entails adapting the schema to incorporate ill-fitting objects or situations. This idea forms the basis of experiential learning theory (Kolb, 1984), which also specifies – as part of an overall learning cycle – the way new schemas arise through reflective observation and abstract conceptualization and the way they are put to the test through active experimentation and concrete experience.

The interplay of assimilation and accommodation captures well the engine of my intellectual journey. But its subject of inquiry – entrepreneurial opportunity – has been tricky on two fronts. First, it inevitably involves a person and there is no *a priori* reason why that person could not be me. Second, it pertains to the future and, to the extent that the future has not yet

happened, the best viewpoint for it is now. And the most accessible “now” is the one in which I am in. As a result, much of the churn of assimilation and accommodation has been contained within myself, steered and intensified through the various experiences of my academic career and visible only through the papers I have written.

### **Hooked on Opportunity**

I enrolled in the PhD program at London Business School (LBS) in October 2000. The decision to pursue a PhD degree was sudden, stressful, and exciting all at the same time. I had given no previous thought to becoming an academic, even if the career profile from my MBA study suggested ‘college professor’ to be one of the suitable realizations. And I was poised on a steep career trajectory in the industry I loved, hospitality. Just 18 months earlier, at the age of 24, I had become CFO of two Marriott hotels in Budapest, Hungary and oversaw a business with \$25 million turnover, over 400 employees, and over \$100 million of serviced debt. Oh, and I had recently met the person who would become my life partner and we were on course for getting married.

I received an email in late January 2000 announcing that LBS were starting a new PhD program in Entrepreneurship and looking to recruit their first cohort of students. The context of this was the dot.com boom of the late 1990s where entrepreneurship had become hot and all the talk was about the next economy where none of the old rule apply (e.g. Dow 36,000). The premise of the LBS initiative was an expected surge in demand for entrepreneurship faculty over the following decade. The application deadline was in a week’s time.

I was sold on the opportunity, not because of what it would bring but because of what it would not, if I had stayed on the career path that looked familiar and well trodden. When I received the offer letter, my wife and I shared a sense of not wanting to wonder for the rest of our lives what would have happened if I had gone down the PhD route. I faxed in my acceptance from our honeymoon hotel. My farewell present from Marriott – a picture of the Budapest Marriott Hotel signed by my colleagues – is a constant reminder of the uncertainty that lied ahead, despite the retrospective clarity with which I can look back now.

Coming from finance background, I wanted to do something related to finance and venture capital seemed to be the closest fit. My start of PhD training coincided with the publication of Shane and Venkataraman’s AMR paper “The promise of entrepreneurship as a field of research”, which placed the research focus on the study of opportunities. The paper took center stage in my first PhD seminar in Entrepreneurship, taught by Professor Paul Reynolds. Just as the seed of ‘opportunity’ was being planted in my head, another intellectual imprinting from those early days was Paul Reynolds’s consisted retort “Yes, but how are you going to measure it?” to any attempts to go off on a theoretical tangent when discussing the phenomenon of entrepreneurship. Thus, the assimilation-accommodation cycle was set in motion, whereby any emerging conception of opportunity was followed by a search for empirical manifestation.

At the intersection of venture capital and opportunity lied the investment selection decision, which formed my initial focus of inquiry. Against the theoretical background of normative decision theory, early work on venture capital decision making was highlighting the role of intuition and the inability to make decision making criteria explicit. Taking an opportunity as given, there was a sense that certain characteristics would place some individuals in a superior position to recognize it.

## **The Glasses of Experience**

Reading Ana Lee Saxenian's *Regional Advantage* (1994) was a key early influence. It was the early story of Silicon Valley that left an imprint, and particularly the origins of Kleiner Perkins, the pre-eminent venture capital firm. I found out that Eugene Kleiner had come from Fairchild Semiconductor (as his team-mates Andy Grove and Gordon Moore had gone off to found Intel) and that Tom Perkins came from Hewlett Packard. This did not square with pre-conceived notions about the backgrounds of venture capitalists and certainly not with my observations of the decision making processes inside a venture capital firm. I had attended the investment committee meetings of a London VC firm. The idea that experience shapes what we see was born and was to take shape as part of my PhD dissertation.

The quest for intellectual underpinning of this idea led me to experiential learning theory (Kolb, 1984) and its central idea of learning as the transformation of experience. I read everything I could about experiential learning theory and kept coming to Kolb's seminal book for missed insights. Learning style emerged as a construct that could differentiate among individuals on the basis of their different patterns of experience and thus different ways of grasping and transforming new experience.

In search for some sort of empirical validation, I started looking at the background profiles of venture capital partners. As I captured this information in a dataset, I tallied this with the firms' investment activity and performance extracted from the VentureXpert database. The result was a simple dataset that enabled me to explore the relationship between background experience and investment performance. I presented the paper at my first conference, the 2002 Babson conference at University of Colorado, where I also participated in the doctoral consortium.

Dean Shepherd was one of the consortium facilitators and I was familiar with his work on venture capital decision making at the time. After some productive discussion at the consortium, I sent Dean the draft paper for feedback and we started working on it together to develop it for publication. This eventually became the 2005 *Journal of Business Venturing* piece "Human Capital Theory and Venture Capital Firms..." (Dimov and Shepherd, 2005) from which two main insights came out. The first was that there was more to human capital than simple proxies (as used in economics); its qualitative composition mattered. The second was that maximizing success and minimizing failure were distinct forms of success, each linked to distinct backgrounds and experience. One set of factors were associated with more successful exits (IPOs or "Home Runs") and another with fewer failures (bankruptcies or "Strike Outs"). These threads would be picked up and developed in later work.

I viewed the investment selection by venture capitalists as a form of opportunity recognition. Such recognition was second-order in nature, i.e. it pertained to opportunities already recognized by entrepreneurs presenting them. Thus, it was logical to extend the PhD inquiry and its emerging theoretical framework to the first-order recognition, i.e. by the entrepreneurs themselves. In including the entrepreneur's side of opportunity, the idea was that entrepreneurs and investors look at different sides of the same thing: entrepreneurs recognize them, while investors select them. The next step was to develop experiments that would capture how differences in experience and learning styles would translate into differences in opportunity recognition. But how was opportunity recognition to be measured?

## **From insight to intention**

This question was a crucial aspect of the research design. But it was also more than an empirical issue since any measure reflected implicit assumptions about the nature of opportunities and the nature of recognition. Without facing these assumptions head on, there was no firm ground to stand on. It was at that time that John Butler invited me to contribute a chapter on opportunities to a book, *Research in Entrepreneurship in Management* (Dimov, 2004). This offered a disciplining chance to conduct a critical review of prior literature on entrepreneurial opportunities and flesh out the formal premises for development of the topic. These emerged from the need to explain the intuition that what individuals see as opportunities is rather idiosyncratic, that the same individual would see different things in different context, and that different individuals would see different things in the same context.

The first premise pertained to clarifying the nature of opportunities at the same level of analysis as the factors seeking to explain opportunity recognition, i.e. the individual prospective entrepreneur. At that level, it is impossible to separate an opportunity and its recognition. Equally, some sort of enactment is necessary to maintain a distinction from pure ideas or imagined possibilities. The second premise related to making the nature of the context more explicit, particularly in terms of the information it conveys to prospective entrepreneurs. The third premise related to specifying the nature of individual differences that can not only account for making different sense of the same information but also evolve with experience.

These ideas were put together in the first study as part of my dissertation, an early version of which was presented at the Babson Conference in 2003 (Dimov, 2003). The paper introduced the ideas of opportunity recognition as an outcome of an experiential learning process and of representing the contexts in which it occurs in terms of different epistemological structures or logical leaps from informational premises to insights / hypotheses. The early results were very encouraging in that they highlighted a person-situation interaction. This idea was developed further in the paper “From Opportunity Insight to Opportunity Intention...” published in *Entrepreneurship Theory and Practice* (Dimov, 2007a). The concept of “person-situation learning match” captured the person-situation and emerged as a regulator of the relationship between prior knowledge and opportunity intention. This paper also helped draw a distinction between opportunity insight and opportunity intention (i.e. pure vs. enacted idea) as well as between entrepreneurial intention and opportunity intention (i.e. the general intention to pursue opportunities vs. the intention to pursue a specific opportunity).

## **Beyond single person, single insight**

My PhD dissertation had zoomed in on the momentary nature of opportunity recognition, whereby one’s prior experience blends with situational circumstances to produce a sense of perceived possibility and to propel some action towards it. Having completed the PhD, I started looking to unclasp the boundary conditions that had been necessary for isolating and taking a close look at that momentary transformation. At the same time, I took my first faculty job at the IE Business School in Madrid and started preparing for teaching entrepreneurship in its top-ranked MBA program. As entrepreneurship emerged as one of the distinguishing features of the program, there was an opportunity – upon joining IE Business School – to re-design its entrepreneurship curriculum. Thus, the first of three courses in this area focused on the generation and development of entrepreneurial opportunities.

The most important boundary condition to open up was the gateway to thereafter, i.e. what happens after opportunity recognition and early action. While the typical account of a great entrepreneurial story would suggest that “the rest is history”, there is not such sense of history-making when the gate of time is open. This point was vividly made in the entrepreneurship classes, where students burst with excitement and confidence when pitching their initial ideas, only to become dejected and frustrated a few weeks later. The initial excitement was undeniable, but so was the eventual dejection. What happened in between was a search for validation of their initial hunches as well as attempts to work around the various setbacks or retreat from dead ends. By the time of the final pitches the ideas inevitably looked different. Not only did they have new or modified elements, but also these elements came from various inputs from third parties as part of the research process.

This empirical reality did not square with the exiting conception of opportunity as a single entity, attributed to particular a person and represented as one particular insight. An evolving idea represented a particular challenge for being contained within what had essentially been a static conception. On the one hand, when first articulated, and as long as it compels someone to take some action in its pursuit, an idea cannot be ruled out as being a non-opportunity. But, on the other hand, does this mean it should be considered an opportunity? As soon as action is taken, everything needs to be re-assessed in the light of the new information that had been revealed only because of the action. And so on. In other words, as long as action continues to take place, the possibility of opportunity remains alive.

Indulging these thought experiments formed the backbone of another paper published in *Entrepreneurship Theory and Practice* (Dimov, 2007b). The paper was framed around an analogy with the fundamental attribution error in psychology, whereby individual factors are overplayed and situational factors downplayed. In this case the situational factors were compressed in ‘the rest is history’, whereby the only meaningful marker of the entrepreneurial process is often seen as the initial idea and the person behind it. Separating idea from opportunity and placing them at opposite ends of a time continuum shines the light on the process that connects the two. The process is essentially one of development, of keeping the possibility of opportunity alive by working around various situational and social contingencies. Thus, this paper signified a move in thinking about opportunities from instantaneous recognition to gradual, iterative development.

### **Opportunity Confidence and Two Types of Success**

The idea of opportunity development as gradual, iterative process called for revisiting the fate of the original opportunity insight and opportunity intention, i.e. they get the process going but how far? Keeping the possibility of opportunity alive in the face of various contingencies implies a repeated judgment of whether to go on or abandon the entrepreneurial effort. The interesting question that arose was whether abandoning the effort could be seen as the best decision in certain circumstances. Again, the thought experiments that followed, blended with the personal experience of teaching entrepreneurship revealed a host of implicit assumptions.

Teaching the case “3M Optical Systems: Managing Corporate Entrepreneurship” brought to the fore the idea of well intentioned failure. It was the kind of failure that deserves praise and not punishment, and that is seen as an essential component of an innovation process, as captured in A.G. Lafley’s insightful quote “the key is to fail early, fail cheaply, and don't

make the same mistake twice” or in IDEO’s slogan “fair fast in order to succeed early” from “The Deep Dive” documentary. These ideas spurred a lot of class debates about how to draw the line between persistence as a virtue and persistence as a folly; or between giving up as a weakness and giving up as a wisdom.

The arguments arising from the practicalities of persistence did not square with the academic literature on nascent entrepreneurship, which drew a dichotomous distinction between reaching operating status and abandoning the effort, implicitly treating abandonment as a ‘bad’ outcome. To the extent that the decision to abandon was based on a reasonable judgment, given how the promise of the original business idea had unfolded, it should be treated more appropriately as optimal rather than ‘bad’. But how to distinguish shades of abandonment?

This question drove further reflection and analysis that became the basis of the paper “Nascent Entrepreneurs and Venture Emergence...” published in *Journal of Management Studies* (Dimov, 2010). I had worked with the Panel Study of Entrepreneurial Dynamics (PSED) dataset as part of my dissertation. In fact, the very first version of the paper – which bore little resemblance to the one published eventually – came out of the dissertation and aimed to find patterns in the human capital of nascent entrepreneurs that corroborated the person-context interactions established in the earlier study on opportunity intention. The review process quickly steered the paper towards the more meaningful outcome of venture emergence and ruled out that the concept of learning match could be validly operationalized with the PSED data.

With the focus on venture emergence, the aim was to take advantage of the longitudinal nature of the data. This meant recognizing that judgments about the merits of the pursued opportunity could vary across the waves of data collection and that these judgments could be the most proximate explanation for the venturing outcome at each stage. I termed this intermediate judgment ‘opportunity confidence’ as a way of reflecting its target and of keeping up with the ‘opportunity’ series of constructs: insight, intention, development, confidence.

The theoretical breakthrough for the paper was to recognize that in the context of uncertainty, things could really go either way in between actions and that at least some of the consequence of actions cannot be known before the actions are undertaken. This suggests that there are two distinct considerations behind a persistence decision: (1) discontinuing the pursuit of opportunities that show now promise and (2) continuing to convert the opportunities that show promise into viable businesses. Empirically, the crucial bit for validating this logic came through demonstrating that the different status descriptions for the venturing efforts (gave up, inactive, active, operating) were indeed ordered in nature, i.e. the baseline probabilities of transitioning across categories were different.

The key finding of the paper was that opportunity confidence mediates the effects of entrepreneurial experience and early planning on venture emergence. It demonstrates the endogenous nature of opportunity development – one of gradual resolution of uncertainty – whereby initial assumptions are converted into positive or negative signals. In this regard, the skills and actions that are instrumental for teasing out the initial assumptions enable the entrepreneur to make a more informed judgment down the line, but cannot guarantee that this judgment would be positive. Thus, simply connecting inputs such as human capital and planning to eventual outputs, while ignoring the endogenous considerations in between is a

weakness in research design. The final reflection of the paper suggests a need to distinguish and more explicitly consider two types of success in entrepreneurship: Type I (sticking with the good ideas) and Type II (abandoning the bad ones).

### **Grappling with the Unbearable Elusiveness**

Eight years into studying opportunities I still had not observed one. The closest I had gotten to them were the reactions of the entrepreneurs engaged with them – insight, intention, confidence, as represented in the constructs proposed so far – as well as the overarching sense of the process (i.e. development) in which these reactions are embedded. It was intuitively clear that opportunities were obvious in retrospect but quite opaque and nebulous in prospect. Hence the persistent question of how to study something that cannot be observed, something that had become “unbearably elusive”. Two different strands of experience converged into what eventually became the namesake paper in *Entrepreneurship Theory and Practice* that aimed to outline an empirical research program around entrepreneurial opportunities (Dimov, 2011).

The first was the ever vibrant and stimulating classroom experience. I had moved to the University of Connecticut and started teaching undergraduate classes on opportunity generation and assessment, in which the gist was to work with students to develop opportunities. I was constantly looking for example to share in class. I identified a company, Chegg, that had recently received first round venture capital. I was portraying it in class as an example of analogical reasoning (Netflix-type rentals for textbooks) and I picked up a CNBC video to demonstrate that transferring insights across domains can be a great starting point. The video was perfect in the sense that it said exactly what I wanted to hear: asked “where did you get this idea, textbook rentals?”, the Chegg CEO replied, “well, it is a lot like Netflix, but for college textbooks”.

Little did I know that I had fallen into the trap of retrospective clarity. Looking further back into the history of the company proved to be a slippery slope. Various contemporaneous newspaper accounts suggested that the company had gone through different identities in the textbook space: first Craigslist (classified ads), then E-bay (online marketplace), then Netflix (rentals). The earlier accounts suggested different identities – Craigslist, Ebay, and then Netflix. All of a sudden, my classroom story rang very hollow: its retrospective telling of the story had little to do with its prospective construction. This became eventually the opening premise of the paper, but the problem was that it was not clear for a while how the paper was to unfold from there. I had a promising beginning but no real end in sight.

As an aside, the rummaging into the history of Chegg uncovered over 350 Chegg-alike ventures in the US, all student-led and all looking to solve the problem of high textbook prices. This reinforced the idea that Chegg was not really very special at its outset, even if it is a very special, billion-dollar unicorn today. The scale and dynamics of the entrepreneurial effort to solve the same overarching problem became the basis of a great (we thought) paper written with David Gras, who was a PhD student at University of Connecticut at the time, and presented at the Babson conference (Dimov and Gras, 2010). To this day, the paper is still looking for a home and has fallen into obscurity, just like most of the ventures it studied.

The second strand of experience was taking part in the workshop “The Future of Entrepreneurship Research”, organized by Johan Wiklund and Per Davidsson in Sweden in the Summer of 2008 and aimed at laying the groundwork for a special issue at

Entrepreneurship Theory and Practice. My presentation had the mundane title “From opportunity formation to business creation” and invited a discussion of what to study (empirically). Even today, the transcript of the discussion easily brings back the sense of confusion, lack of consensus, and complexity when trying to explain a realized end from some beginning. There was no clear steer from the workshop, except for sense of a need to look for ideas elsewhere and to revisit the deterministic frame that was implicit as a logic of explanation.

Thus started an intellectual excursion that continues to this day, uncovering thread after thread of new ideas, each putting the notion of opportunity in a new light and taking me away from the comfort zone of my training. Its early markers were evident in the fact that the eventual paper went through three different versions as part of the review process, each with a different title, suggesting different resolution to the problem of “unbearable elusiveness”:

1. The unbearable elusiveness of entrepreneurial opportunities: Time to let go?
2. Away from the unbearable elusiveness of entrepreneurial opportunities: A new conversation about emergence and the sociology of markets
3. Grappling with the unbearable elusiveness of entrepreneurial opportunities.

The Chegg story, as well as other stories, suggested that chance had played a role in how its opportunity had developed. Thinking about the relationship between chance and deterministic explanation raised interesting philosophical questions to which, to my surprise, there were already some answers elsewhere. In fact, there was quite a lot of frustration in realizing that what I thought might be an original insight had already been uncovered in the broader academic field. The prospective-retrospective asymmetry was nothing more than a reflection of the one-directional nature of time’s arrow. One of the key influences at the time was Anderson’s (1972) idea of the “broken symmetry” between levels of analysis and the insight that the ability to reduce something to a simple explanation does not imply an ability to reconstruct it from that explanation. This thread about emergent phenomena would resurface later on. It was not long before I ran into Abbott’s paper (1988) “Transcending general linear reality” that opened the door to the world of process.

The new ideas were overwhelming and ever expanding but there was also the time pressure of producing a coherent paper. In the end I had to stop reading (albeit for a little while), make sense of what I had read and synthesize it into the paper. Two main ideas came out. The first was the distinction between formal and substantive conceptions of entrepreneurial behavior. A formal conception, through its basic requirement for an opportunity to be defined exogenously, effectively stepping out of the realm of uncertainty and limiting the study of opportunity to pure theorizing. In contrast, a substantive conception aims to make sense of how entrepreneurs act in the face of uncertainty and an opportunity represent the lens for doing so.

The second idea was to elaborate on the substantive premises for studying opportunities, namely as happening through ideas, expressed in actions, and instituted in market relationships. For each of these, there is an asymmetry between the *ex ante* possible and the *ex post* particular. Accordingly, the research implications outlined the need to apply (1) process explanation to the specific instances of ideas, actions, and relationships observed in a given entrepreneurial journey; and (2) variance explanation for the possibilities in general representations.

The punchline of the paper was perhaps personally the most insightful. It suggested that the process of developing the paper was the epitome of the very process of opportunity development that the paper was trying to capture. Thus, what had seemed “unbearably elusive” for quite a while turned out to be like my shadow, always there but not always noticed.

### **No Time for Time**

This was the initial title of the paper with Jeff McMullen “Time and the entrepreneurial journey...” published in *Journal of Management Studies* (McMullen and Dimov, 2013). At the Academy of Management meeting in Boston in 2012, Jeff and I brainstormed ideas for a paper that could offer a forward-looking perspective for entrepreneurship in the context of the 50<sup>th</sup> anniversary issue of *JMS*. We settled on reclaiming entrepreneurship as a journey through facilitating process-oriented research, always called for but rarely done. Our both attending the Darden-Lally-Leeds retreat in Boulder, Colorado in October 2012 enabled us to hash out an outline. The development of the paper presented an opportunity to integrate some of our long-brewing ideas under the constructive editorial guidance of Andrew Corbett.

The paper offers a distillation of the main premises of process explanation, highlighting in particular the distinction between vertical and horizontal partitioning of the observation space. The former “chops” a journey into discrete variables, treating them as replications of an underlying factor and aiming to analyze their patterns of variation and co-variation. This effectively squeezes time out. In contrast, the latter retains the creative force of time by keeping the journey intact as a unit of explanation and acknowledging that everything that transpires in it is part of the same. Having established the need for such holistic grasp of the journey, the paper discusses five key questions related to its nature, boundaries, constituent elements, and permanent essence. It recognizes that, while the journey may be driven by the energy and momentum of evolving individual intent, its ultimate realization is part of a broader system with complex behavior. The methodological implications call for understanding that complexity through inter-disciplinary collaboration.

The paper also represented a shift in my personal intellectual journey. Grappling with the unbearable elusiveness of opportunities had opened up the gateway to understanding process and its logic. It had been a push away from my comfort zone towards an interdisciplinary space, an effort that continues to the present day in pursuit of various threads uncovered along the way. In the meantime, I moved from the USA to the UK, first to Newcastle University and then to the University of Bath.

### **Where Next?**

The *Innovation Journey* by Van de Ven and colleagues (Van de Ven et al., 1999) had been a watershed influence along the way, triggering a cascade of new pursuits. In its conceptual representation of the trajectory of a new venture, it made reference to chaos – as distinct from randomness – as a deterministic yet non-predictable process. This concept resonated with the inherent open-endedness of the entrepreneurial journey and invited further exploration. It opened up the world of complexity science, which in turn resonated with the idea of moving away from a general linear model of reality. In turn, attending a PDW on using simulation in entrepreneurship research at the 2011 Academy of Management Meeting in San Antonio, organized by Christopher Crawford, revealed the power and distinct, bottom-up logic of computational modelling. Alongside a constant stream of books and papers in this space, I completed a series of online courses: Modelling, Network Analysis, Introduction to

Complexity, Non-linear Dynamics and Chaos and, just recently, Fractals and Scaling. These were driven by a sense of relevance that is gradually beginning to crystallize.

A couple of new ideas have emerged from this so far, set to be developed further. The first, is of opportunity as social structure, as outlined in Crawford, Dimov, and McKelvey (2015) in response to continued attempts to perpetuate debates about the ontology of opportunities. An opportunity is perhaps best seen as an emergent phenomenon, consisting of ontologically real components (products, customers, suppliers, etc.) and epistemologically real functional relationships between them. In this sense, the role of the entrepreneur is to weave together the relationships through a multitude of actions and interactions. The logic of explanation falls within the broader realm of generative process theory in sociology, whereby interactions give rise to social forms (Cederman, 2005).

The second idea is that the focal engine of the process that generates the social structure of opportunity is recursive action, i.e. repeated action in which the outcome of one step becomes the input to the next. The underlying rules link positional information to action (Drazin and Sandelands, 1992). The central idea of chaos theory is that simple, deterministic rules, when applied recursively can lead to non-predictable outcomes that are highly sensitive to initial conditions (May, 1976). In this regard, recursivity is a powerful yet simple mechanism that can open non-linear paths and generate complex structures. This can be seen as a blindspot in current conceptions of the entrepreneurial process and offers an opportunity to elaborate on the cognitive and affective underpinnings of recursive action (Gregoire, Cornelissen, Dimov, and Van Burg, 2015).

With all the thinking about opportunity, one simple question has remained unanswered: how to study the future? This entails looking forward, together with the entrepreneur, rather than backward, to make sense of what s/he has done. To the extent that our goal is to describe and explain, we have to wait for something to happen before deploying analysis. But whether this is the only goal has underpinned the latest strand of thought, emerging from the idea of entrepreneurship as science of the artificial. It was triggered by Selden and Fletcher's (2015) discussion of the creation of artifacts as the essence of an entrepreneurial journey; I was the handling editor of the paper at *Journal of Business Venturing*. It connected to the earlier writings by Sarasvathy (2003) on the topic and led to being energized by Simon's (1969) distinction of natural and artificial phenomena: the former are defined by necessity and the latter by contingency, moulded by goals and purposes.

The ideas arising from this are still being shaped, but they all center on a core premise: the past is natural, the future artificial. As such, entrepreneurship is both a natural and an artificial phenomenon, depending on whether one looks back or forward. Design is about looking forward with some purpose. It represents a distinct mode of research (Romme, 2003), whereby the beacon of opportunity poses the question of what to do. I have just organized these thoughts into a new paper, aptly named "Toward a Design Science of Entrepreneurship" (Dimov, 2016).

In the spirit of the intellectual quest described in this essay, it would be inappropriate to offer any conclusion.



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