

E T & P

Entrepreneurship as Method: Open Questions for an Entrepreneurial Future

Saras D. Sarasvathy
Sankaran Venkataraman

In this essay, we outline the provocative argument that in the realm of human affairs there exists an “entrepreneurial method” analogous to the scientific method spelled out by Francis Bacon and others with regard to the natural realm. We then suggest a series of open questions that we believe will help future scholars spell out the contents of such a method and ways in which it can be put to work in the design and achievement of socioeconomic ends. At least one normative implication of accepting the argument would be to teach entrepreneurship not only to entrepreneurs but to everyone, as a necessary and useful skill and an important way of reasoning about the world.

Introduction

Scientific progress often occurs through phenomena that do not “fit” dominant wisdom—be it the kink in the orbit of Mars that led to Kepler’s laws or the Galapagos islands that necessitated *The Origin of Species*. Entrepreneurship, in our considered opinion, is proving to be such a beast. Over four decades of research have almost always led either to “mixed” results in terms of theories from other disciplines or have actually raised challenges to dominant wisdom in both the disciplines and the functional areas. Take for example, the evidence for and against psychological traits such as risk-propensity (Miner & Raju, 2004; Stewart & Roth, 2001) or the liability of newness, adolescence, and obsolescence (Bruderl & Schussler, 1990). Or the uneasy need for the notion of “institutional entrepreneur” in sociological approaches that otherwise seek to privilege structure over agency (Battilana, Leca, & Boxenbaum, 2009; Dimaggio, 1988). Or the futile struggles of economists to create a place for “The Prince of Denmark” in their otherwise powerful and persuasive morality play (Baumol, 1968; Schumpeter, 1942). Combine this with the growing trends in pedagogy and practice that have moved beyond for-profit firms into social, sustainable, and even public entrepreneurship. All of these cry out for us to confront the possibility that we might have made what philosophers call a “category error”—namely, putting a thing into a class to which it does not belong, or mistaking a larger set or meta-category for one of its constituent subsets (Ryle, 1949).¹

Please send correspondence to: Saras Sarasvathy, tel.: 434-982-2079; e-mail: SarasvathyS@arden.virginia.edu.

1. See Wikipedia for specific examples of category-errors from Ryle (1949).

What if we have been thinking about entrepreneurship the wrong way? What if we temporarily suspend our thinking of it as a sub-discipline of economics or management, or a subset of courses taught in business schools, and recast it as something as large as a social force—somewhat like democracy in the eighteenth century or the scientific method in the seventeenth? In fact, when we examine the history of the scientific method and its incorporation into basic education, the parallels are uncanny. Without getting mired in the philosophical debates surrounding the existence and usefulness of *the* scientific method, we simply use the name “scientific method” to capture the notion that the world can be systematically studied and understood in terms that do not include divine revelation or special mystical abilities. As the eminent cosmologist and science educator Carl Sagan explained it, key elements of this notion can be traced back to the craftsmen and merchants of Greece, prominent among them being Democritus (Sagan, 1983). However, it was only as recently as the sixteenth century that Francis Bacon urged the idea that the work of navigators, inventors, and craftsmen can be a model for scholars (Bacon, 2004). Eventually, through the eighteenth and nineteenth centuries, the scientific method developed into the predominant and most reliable way to harness Nature’s potential for the achievement of human purposes.

The Analogy Between the Scientific Method and the Entrepreneurial Method

For the analogy between the scientific method and the burgeoning notion of the entrepreneurial method to work, we do not particularly need to get into the details of what exactly constitutes each method, although we do not hesitate to outline certain possibilities in Table 1. The point of imminent importance is the realization that such methods can and do exist. Putting this realization to work does not require us to accept a utopian view of either science or entrepreneurship in terms of the outcomes they engender. Nor does it dismiss the role of other ways to achieve positive social impact. Again the point of immediate relevance is not that entrepreneurship or entrepreneurs are universally good or that other methods are to be discarded, but that this new(er) instrument—the entrepreneurial method—is of considerable value worthy of packing in our rucksack as we move forward as a species.

The specification of teachable and learnable principles of scientific approaches to understanding nature and then putting that understanding to work in the pursuit of individual and societal objectives took several centuries. Yet today the scientific method is taught not only to potential scientists in professional schools at graduate or post-graduate levels, but to everyone, starting at an early age, as an essential mindset and skill that forms the core of all education—in line with reading and writing and arithmetic. Such broad and early dissemination has propelled a democratization of what was originally accessible only to a few who were endowed with divine revelation, inborn genius, or the wealth and status that allowed science be pursued as a “gentleman’s pastime.” The democratization begun in the seventeenth century by Bacon and others, moreover, has now led to millions of “ordinary” scientists working in systematic ways to make possible the amazing industrial, technological, and subsequent social revolutions of the eighteenth, nineteenth, and twentieth centuries. As Shamoo and Resnik (2009) point out, “it is estimated that there are more scientists alive today than all of the scientists who have lived during the past 2,500 years of human history (Weaver & Dickson, 1988).”

Table 1

Comparing the Entrepreneurial Method with the Scientific Method

Comparison	Scientific method	Entrepreneurial method
Similarities in historical development	<p>Early explanations: Some special people are able to (are even born to) “read the signs”—from the True Book (of God or Nature) Real science is born when the experimental method of the craftsmen is adopted by the university-scholar and the humanistic literati Scholars begin to argue that: There is no qualitative difference between the processes of revolutionary science and journeyman science—i.e., anyone can learn to do science and do it well</p>	<p>Early explanations: Some people are able to (are even born to) see opportunities while others are not University-scholars (whether they are theoretical social scientists or empirical policy researchers) begin to understand what actual entrepreneurs really DO Scholars begin to argue that: Key elements of the entrepreneurial method can be the same for the extraordinarily successful entrepreneur as well as the ordinary entrepreneur—i.e., it can be taught and learned</p>
Differences in content	<p>Harnesses the potential of Nature Purpose: To achieve human ends Aims to discover general “laws”—the emphasis is on universality and inevitability Focus is on the objective Mechanisms involve data gathering, formal models, analytical techniques, and testing for correspondence with reality Dominant logic: Experimentation</p>	<p>Unleashes the potential of human nature Purpose: To engender new ends as well as achieve old ones Aims to generate and refine design principles—the emphasis is on locality and contingency Focus is on the inter-subjective Mechanisms involve action, interaction, reaction, transformation, and explicit co-creation Possible candidate for a dominant logic: Effectuation</p>

We believe a similar path of revolutions is waiting in the wings with entrepreneurship. Based on about four decades of rigorous research into the phenomenon of entrepreneurship, we are beginning to realize that the phenomenon may hide a generalized method capable of changing the way we live, work, and play, and transforming the courses of the careers we build, the shapes of the communities we live in, and the evolution of the socio-political and economic systems we are a part of. That is why delving a little deeper into the history of the development of the scientific method may be a useful task here. Let us begin with Francis Bacon, usually recognized as the earliest of modern philosophers of science to spell out the key elements of what we now know as the scientific method. In the preface to his treatise on the subject, *Novum Organum*, Bacon states as one of the aphorisms: “The sole cause and root of almost every defect in the sciences is this; that whilst we falsely admire and extol the powers of the human mind, we do not search for its real helps.” There are two laments here—the first, that the dominant wisdom of his day overemphasized the traits and abilities of individual scientists and the second, that the philosophers of his day did not search for the codifiable principles and techniques that lay beneath what masqueraded as special abilities a very few people were endowed with. Both laments evoke conversations in entrepreneurship research today.

The first lament is not unusual. Early explanations for science, like those for most endeavors resulting in valuable contributions to human and social welfare, tend to hinge on the observation that these accomplishments can be attributed to a few selected people. Only as we study and understand what these people actually do that a more accessible pattern emerges that can then be codified and taught and propagated widely enough to

become a viable tool of value creation writ large. Thus pre-scientific explanations of knowledge creation consisted in the notion that some special people are able to (are even born to) “read the signs”—from the True Book (of God or Nature). In other words, scientific ability was largely an inborn trait or an accident of birth and circumstance, and not a matter of systematic study or training. This strikes us as an interesting parallel to the traits literature in entrepreneurship. It was natural for our field too to begin trying to describe entrepreneurs in terms of their traits (McClelland, 1961) and also to try to isolate what made entrepreneurs different from non-entrepreneurs (Brockhaus, 1982; Stanworth, Blythe, Granger, & Stanworth, 1989; Woo, Cooper, & Dunkelberg, 1991). And even though some believe that this stream of work has been discredited, it appears to resurface in new ways (Baron & Ensley, 2006; Baum, Frese, & Baron, 2007; Gartner, 1988; McClelland; Zhao & Seibert, 2006).

Of course the argument is more nuanced in recent studies and goes beyond simply differentiating entrepreneurs from non-entrepreneurs in general or trying to identify certain traits as predictors of startup and success. Even strong proponents of the importance of personality traits tend to aver that “. . . a model of the effects of personality traits on business creation and business success must include other individual differences variables as well as nonpersonality variables, such as action strategies, cognitive ability, and environment, which are additional predictors of performance” (Rauch & Frese, 2007).

The second of Bacon’s laments is not as usual, and was especially radical for his time. The idea that scholars should observe in detail and actually learn from “craftsmen and tradespeople,” however talented, was not easily palatable. Yet, that was indeed the source of the “real helps” that Bacon sought to codify into the principles of the scientific method and techniques such as the “crucial experiment.” In articulating these, Bacon had to do two things: on the one hand he had to struggle against the traditions of the times, especially with regard to what counted as “evidence”; and on the other, he had to draw together fragments of ideas from his contemporaries that held the seeds of a new way of thinking about basic concepts such as “evidence.” What counted as evidence in his day consisted primarily of testimony and authority. Both of these could involve religious sources such as the scriptures as well as secular ones such as human witnesses and opinions. The idea of evidence as independent of any person or divine revelation, in other words empirical evidence of the kind familiar to us, was just beginning to be spelled out around the time Bacon wrote his thesis on the scientific method (Hacking, 1975).

We believe we too are beginning to grapple with Bacon’s second lament as applied to entrepreneurship, namely the central tenets of how to do entrepreneurship as opposed to key traits that differentiate entrepreneurs from other presumably “normal” or mundane human beings. Here too the historical parallels are evocative. In a study of the social origins of the scientific method, Zilsel (2000) showed that real science was born when the experimental method of the craftsmen was adopted by the university-scholar and the humanistic literati. A similar trend can be found in entrepreneurship where in-depth case studies and qualitative research combined with larger empirical tests are beginning to provide details of how actual entrepreneurs make decisions and take action (Baker & Nelson, 2005; Eisenhardt, 1989; Ozcan & Eisenhardt, 2009; Santos & Eisenhardt, 2004; Sarasvathy, 2008). The movement here has the potential to go beyond a purely scholarly one of formulating and testing hypotheses to active interactions between research and pedagogy and practice that can inform and transform one another. If we pursue this potential, the result will be a *method* of thought and action whose efficacy is established as much through actual applications and the resultant outcomes in the world (i.e., technologies) as through their verisimilitude established through statistical or other types of evidentiary analyses (i.e., theories, models, and laws).

The next stage in this historical progression, from fascinating achievements attributed to individual ability or chance circumstance to the study and codification of a systematic method, is the realization and acceptance that the codification can (and arguably should) be made available to all. This stage is not yet a *fait accompli* even in the case of the scientific method. As recently as the second half of the twentieth century, Simon (1979), for example, was driven to take the time and effort to argue that there is no qualitative difference between the processes of revolutionary science and journeyman science—i.e., anyone can learn to do science and do it well. In other words, extraordinary scientists are neither a separate species of scientists, nor is the way they do science mystical and beyond the comprehension of more “ordinary” scientists. Furthermore, he had to shore up this argument with a series of experimental and historical studies that laid bare the basic elements of scientific discovery as it actually happens, rather than as it is supposed to happen according to armchair theorists and philosophers of science (Klahr & Simon, 2001). This raises a central issue for entrepreneurship researchers: Can key elements of the entrepreneurial method be the same for the extraordinarily successful entrepreneurs as well as the ordinary entrepreneur (who may or may not ever succeed in terms of standard measures of performance such as return on investment)? In other words, can anyone who wants to learn it be taught to do entrepreneurship well? We believe the answer is yes.

As Feyerabend (1993) and others have provocatively argued, there may be serious holes in the notion of an ironclad scientific “method”—be it the one embraced by Carnap or Popper or others before and after (Hacking, 1983). Yet the notion of a scientific approach to solving problems, especially those related to discoveries about physical and material reality is a meaningful and useful one. We usually know what we mean when say, “Let us approach this scientifically”—as opposed to say, biblically, or politically or any other way. Similarly, the notion of tackling problems in the human realm using an entrepreneurial as opposed to sociological, spiritual, or even an economic approach is a meaningful and useful distinction. Take, for example, effectual logic—a logic of thought and action that has been empirically shown to be an important component of entrepreneurial expertise (Read, Dew, Sarasvathy, & Wiltbank, 2009). This logic, like the logic of experimentation in science, is actionable and consists of mechanisms that specify how to work with readily available means to co-create local transformations through self-selected stakeholder commitments. Yet it is distinguishable both from the logic of collective action and from the spontaneous order of free markets (Sarasvathy, 2008). Therefore, our claim for entrepreneurship as a method akin to the scientific method rests both on the historical parallels and recent empirical findings that feed the possibility of a *Novum Artificium*, as it were.

With a view to populating this claim with actual content, we pose a series of open questions that involve both a reinterpretation of what we have already learned through past research and a reformulation of existing and future research agendas in the spirit of confronting and overcoming the category error we mentioned earlier. In other words, the questions we pose below are aimed at moving us beyond a view of entrepreneurship as a sub-discipline or “merely” a phenomenon or setting for testing high theory, toward a new view of it as a powerful social force analogous to the scientific method.

Open Question 1: What Do Entrepreneurs Do?

Over twenty years ago, Gartner (1988) made a compelling case for studying what entrepreneurs do rather than who they are—namely that they undertake activities leading

to the creation of organizations. Since then, the field of entrepreneurship research has come to consider “opportunity” as the central construct of its distinctive domain (Venkataraman, 1997). For now, we can begin our exposition of the entrepreneurial method with the provisional assertion that entrepreneurs recognize, find and make opportunities (Alvarez & Barney, 2007; Sarasvathy, Dew, Velamuri, & Venkataraman, 2003). Conventional wisdom as well as a large portion of academic research has focused on how good entrepreneurs are at searching for opportunities and finding and exploiting them (Baron & Ensley, 2006; Erikson, 2001; Shane & Venkataraman, 2001; Singh, 2001). Which begs the question, of course, where all these opportunities come from in the first place? Who leaves the big bills on the sidewalk for the alert entrepreneur to find and cash in? Answers range from new developments in science and technology to the dynamics of the socio-economic environment including demographic, regulatory, and institutional changes (Shane, 2004). These answers, while quite correct in some cases, are far from complete. For (a) not all entrepreneurial opportunities are created through demographic, regulatory, and institutional changes—some are co-created through the entrepreneurial process itself; (b) in fact, some of those demographic, regulatory, and institutional changes themselves result from entrepreneurial drivers, conscious or unconscious, intentional or unintended; and (c) even when opportunities may originate in demographic, regulatory, and technological changes, they are subject to the Panglossian fallacy—namely that they can be claimed to pre-exist the process and deemed “discoverable” precisely because the process discovered them. Counterfactually, it is virtually impossible to prove the existence of opportunities that did not come to be. Finally, it is also possible to conceptualize opportunities in different ways so that what appears as discovered at one point in time may be shown to have been co-created at another.

For example, there is mounting empirical evidence that opportunities are often created by the entrepreneurial process itself—in other words, entrepreneurs and their stakeholders often end up co-creating new opportunities that neither they nor those of us in their immediate periphery could or did anticipate (Read et al., 2009; Sarasvathy, 2008). What is more interesting is that the most experienced entrepreneurs explicitly implement such a co-creation process—that is, they act and behave in ways that generate and power this virtuous cycle (Read et al.). Entrepreneurial efforts thus generate a perpetual motion machine, as it were, that moves Adam Smith’s invisible hand beyond static efficiency into an endless dynamic of new opportunities. But there is a kicker to this cornucopian process—namely, that the nature of these new opportunities is inherently unpredictable—even what counts as an “opportunity” becomes in a way difficult to define before it actually comes to be.

For example, what was the elevator pitch for Starbucks? Coffee consumption in the United States had been on a steady downward trend for almost two decades before Starbucks was created. Could one really argue that this was a market waiting to be tapped by an alert visionary? Nor was it an act of heroic individual creativity—Howard Schultz did not found the original Starbucks company nor was Starbucks the first specialty coffee shop. Peets Coffee was already a niche business in California. The tapestry of the Starbucks we know so well today was painstakingly stitched together from a variety of stakeholder inputs including those from customers, commercial artists, and community leaders who knowingly or unknowingly participated in a co-creation process that has transformed urban landscapes from Seattle to Ankara (Koehn, 2001).

How about Google? Clearly not the first commercially viable search engine—and certainly not the magnitude of success envisioned even by its own founders who were at one time eager to sell it for a million dollars. Luckily for them, there were no takers (Battelle, 2006; Vise, 2005). If we are to twist the Google story to fit our theories of latent

demand, then we would be hard put to describe what is *not* a potential market. Our sidewalks will be strewn with big bills, or even constructed entirely out of stacks of currency that we only need pick up as we go (Kirzner, 1973, 2009; Olson, 1996). Surely we need a way out of this absurdity.

Open Question 2: How Are Markets Made?

Received wisdom in economics suggests that markets exist either as obvious or latent demand and market competition acts as a discovery procedure to develop technological and other forms of innovation to provide solutions to both (Hayek, 1984). Historical evidence does not always support this for demand does not always pre-exist even in a latent or dormant form (Lancaster, 1971). Moreover, a market is more than demand and supply (Fligstein, 2002). Markets are complex webs of relationships and logistics involving the entire spectrum of organizational challenges from individual initiative to collective action (Olson, 1996). Neither theories of free markets nor governmental and institutional theories are sufficient to explain the coming into being of new markets. According to Santos and Eisenhardt (2009), entrepreneurs use “soft power” strategies to co-construct organizational boundaries in order to dominate nascent markets. Histories of well-known ventures from Wedgwood to Estee Lauder suggest that creativity, wile, and chutzpah have to combine with serendipity and endless extended efforts in creating and sustaining new social networks (Koehn, 2001). That is why most new markets are surprises—highly improbable and hence difficult to predict before they actually come to be (Saravathy & Dew, 2005).

Two sets of evidence attest to this: Negative evidence provided by the sheer abundance of failed predictions (including those by entrepreneurs whose own endeavors helped falsify their own predictions) and positive evidence from unanticipated new markets. Here is a list in no particular order:

- “No imaginable commercial value. Who would pay for a message sent to nobody in particular?”—David Sarnoff’s associates in response to his urging investment in the radio in the 1920s.
- “Forget it. No Civil War picture ever made a nickel.”—MGM executive, advising against investing in *Gone With The Wind*.
- “With over 50 foreign cars already on sale here, the Japanese auto industry isn’t likely to carve out a big slice of the US market.”—Business Week, August 2, 1968
- “I think there’s a world market for about five computers.”—Thomas J. Watson, chairman of the board of IBM.
- “There is no reason anyone would want a computer in their home.”—Ken Olson, president of Digital Equipment Corp, 1977.

Even entrepreneurs celebrated as prescient and visionary after the fact often had to build their markets brick by brick, long after the proverbial light bulb of discovery went off over their unsuspecting heads. When Howard Schultz came back from Italy wanting to build his first coffee shop based on Starbucks, the original founders of Starbucks would have none of it. At the turn of the twentieth century in India the Kirloskar brothers could not sell their six metal plows even though they clearly increased productivity tenfold over wooden plows. Not until they worked with social reformers and the independence movement to educate a large swathe of farmers on the links between economics and patriotism could they grow their venture into the enduring firm it is today. Edison had to learn similar

lessons in marketing the incandescent bulb in the United States. Preachers inveighed against its use as the work of the devil—how else could the abominable separation of heat from light have been accomplished? (Baldwin, 2001). And Grameen Bank was no exception in having to change the world before it could grow its market for what might seem the easiest product to sell—uncollateralized loans—because Bangladeshis had a taboo against women touching money—literally (Yunus, 2009).

In most cases, successful entrepreneurs appear like visionaries after the fact, persistent, almost pig-headed visionaries at that, steadfast in the single-minded pursuit of their vision in the face of skeptic naysayers and in the absence of resources within their control (Tellis, Golder, & Christensen, 2001). But a microscope on their early actions highlights another story—one of doing the doable and stitching together a variety of stakeholder commitments, many from folks who *self*-selected into the process² in return for a shot at shaping the vision (Sarasvathy & Dew, 2005). Often neither entrepreneurs nor their stakeholders had quite articulated a coherent vision of the market until after it came to be. In fact, it is the co-creation of the vision, a vision that concurrently gets embodied into the components of the new market emerging from the process that is the primary result of the entrepreneurial process. Here the familiar story of uncommitted prospects haggling over a mouthwatering pie is replaced by the reality of self-selected stakeholders actively engaged in shaping committed ingredients into unanticipated new confections. So who is actually the “entrepreneur” in this process of market creation, if not the prescient, persistent visionary hero who makes it all happen against incredible odds?

Open Question 3: Who Is Not a Potential Entrepreneur?

If the category we call entrepreneurs includes not only those who seek and find opportunities but also those who make them almost serendipitously from readily available bits and pieces, and moreover, if we include their self-selected stakeholders who help transform the amorphous vision into valuable new ends through commitments contingent on the unexpected, who could we exclude from the category of potential entrepreneurs? The answer simply is: no one. Therefore, in our efforts to educate, legislate, and acculturate an entrepreneurial society, we may want to follow the precedent offered by the scientific method, not treating science only as a profession although it can be; instead treating it as an essential part of basic education. That means starting in middle school or earlier and excluding no one. The appropriate arena for entrepreneurial education will then consist in a distinct set of reasoning and problem solving skills with or without specialized business tools of the kind found in formal business schools.

Entrepreneurship, in this view, becomes even more than a specific set of skills; it becomes a generalized method such as the scientific method—a form of reasoning and logic the exercise of which would be as useful a skill as arithmetic, reading, writing, and basic scientific reasoning (Sarasvathy, 2008). And at least as important as civic engagement, civil discourse and the critical development of moral and ethical judgment. Entrepreneurship, then, is not merely a career option or a fallback position in cases of employer downsizing or economic downturns; it comes to be seen as a widespread driver of social change (Weber, Heinze, & DeSoucey, 2008).

2. That is, were not strategically pursued and “sold” by a visionary entrepreneur.

Open Question 4: How Does Entrepreneurship Go Beyond Technology Commercialization and Economic Development to Driving Social Innovation and Human Development?

One could argue that Bill Gates and Pierre Omidyar have done as much if not more for social change and human development than Turing, von Neumann, Mother Teresa, or Nelson Mandela. Yet there is an important difference. The latter are necessary but insufficient, the former sufficient but unnecessary. Turing and von Neumann were necessary to create computers, but neither computers nor electronic auction sites were necessary for human development. Yet sweeping social changes resulting in a variety of new possibilities for human development resulted from the products of eBay and Microsoft. Similarly, one cannot imagine the end of apartheid or the care of lepers without Mandela and Mother Teresa even if they could not have accomplished these alone. But one can imagine climate change problems being resolved through a variety of commercially viable renewable energy products each of which may not be necessary in itself. Entrepreneurs operate in and continually create a world in which no particular set of conditions is necessary for success and progress. Their job is to implement sufficient even if unnecessary conditions instead. Each solution they implement may be local and temporary, but successful solutions are usually spatially and temporally stable *enough* and profitable *enough* for us to move the goalpost to a new threshold of human aspiration.

One might argue that whether one emphasized the role of necessary but insufficient causes such as those embodied in heroic individuals or the sufficient but unnecessary solutions offered by a method such as the entrepreneurial method is a matter of one's worldview. But the choice of worldview makes a real difference in the world. And therefore, which worldview we adopt in formulating policies and designing pedagogy is not something we can leave entirely to individual scholars' subjective viewpoints. It is necessary to build on the variety enabled by such subjectivity, but an intersubjective consensus is crucial and worth striving for if we are to build on the potential offered by the thesis we are advocating here—namely to move beyond entrepreneurship as a phenomenon to extracting the principles and techniques comprising its method and making them widely available as part of basic education.

In social science, it is customary to regret the difficulty of finding sufficient conditions that guarantee the achievement of valued objectives, even as we discover necessary conditions upon which we ought to build our solutions. Utopias are notoriously hard to come by and impossible to sustain once found. The optimal social choice problem in economics is a case in point. The Nobel prize winning economist, Kenneth Arrow proved the impossibility of creating a system that would guarantee optimal social choice (Arrow, 1951). One inference we can draw from the theorem is that that mysterious and elusive thing called human "judgment" is and will always be inevitable in our efforts to achieving better social choice. On the one hand, this is cause for dismay, but on the other, it may be cause for real hope. Another Nobel laureate, Amartya Sen, showed the feasibility of achieving local optima with a little bit of effort at getting sufficient numbers of people on the same page (Sen, 1999). Others have also contributed to the optimism. Lindblom, for example, provided a marginal mechanism that could lead (or in his words "muddle through") to better choices even in the face of overall disagreement on larger principles (Lindblom, 1959).

Studies of entrepreneurial action offer a procedural rationality for accomplishing such local coherences leading to spatially and temporally limited optima (Simon, 1978). Such optima provide sufficiently stable conditions that enable human progress. Progress can

include building on past successes as well as tearing down and reshaping parts of the present that do not work well. Which to do when is decided through the kaleidic dance of evolving stakeholder networks of varying sizes that implement the entrepreneurial process we have been describing. Entrepreneurial action, our studies show, is above all, *interaction*—interaction over time, between stakeholders, and through local transformations of every kind of environment imaginable. The procedural rationality embodied in these interactions not only reshapes economic and social landscapes, it reconstitutes individual preferences and values, making over everything from utility functions to cultural identities. Only by conceptualizing entrepreneurship as a method can we hope to push its uses beyond technology commercialization and economic development and put it to work to build social innovations that make a positive difference in human development.

In the face of such a radical and transformative process such as the one propelled by this larger view of the entrepreneurial method, how can we distinguish a for-profit venture from other kinds of endeavors?

Open Question 5: Are Social Ventures Different From For-Profit Ventures?

One simple answer to this question is that some ventures declare themselves for-profit by explicitly incorporating themselves as such and subjecting themselves to the discipline of markets—or price mechanisms of one sort or another. Others eschew the necessity to seek a positive cash flow at the end of the accounting year and deny any individual the residual claims of ownership at the end of the day. Several compelling arguments have been presented for the separation between for-profit ventures and other types of organizations—including market failure, the psychology of giving, the biblical equation of money with evil, cultural and historical dictates against profiting from the unfortunate, and of course, sheer habit (Bator, 1958; McKean & Browning, 1975; Wolf, 1979; Zerbe, Richard, & McCurdy, 1999). All these arguments and even the very question “Are social ventures different from for-profit ventures?” however continue to perpetuate a dichotomy that may not have served us well in the past and may hinder the promise offered by our project of spelling out the entrepreneurial method.

Consider the fact that some goods and services are set aside to be produced through the for-profit system and others through either governmental or some form of not-for-profit system. And as a practical matter, this difference usually means that entrepreneurs have to deal with at least two different systems of funding and accountability when endeavoring to stitch together the local optima in social choice. For practicing entrepreneurs this further means that valuable skills acquired in the production of wealth cannot smoothly be transferred to the production of social welfare. For example, knowing how to make a pitch to investors for funding a casino does not always translate into compelling arguments to private foundations for funding child healthcare. Nor can the creativity and passion that drive people to save the earth or protect children be easily leveraged to produce economies that can nurture and sustain them after they have been seized from the potential ravages of climate change or disease and poverty. That is why we find that societies with large well-meaning public sectors are not always leaders in job market growth or rapid commercialization of inventions. And as Mancur Olson demonstrated, countries with the most markets are often the ones with large numbers of unresolved social problems (Olson & Kahkonen, 2000). The friction between for-profit and nonprofit costs a lot more than individuals and societies can afford—not to mention being theoretically unnecessary and practically harmful to the very causes it is supposed to serve. Even Mohammed Yunus calls for a re-labeling of nonprofits to nonloss enterprises. We would

like to point out that all enterprises are de-facto nonloss for when they run out of positive cash flows, they, in fact, cease to exist.

But Professor Yunus' call for relabeling is not to be taken lightly. History often pivots on a single word or phrase—slavery, kismet, God, royalty, government—battles are waged and debates seem endless—until another word turns the pivot in another direction altogether—equality, choice, reason, evolution, democracy, market. It appears to us we are stuck for the moment on profit—for and against. May we suggest an easier pivot? The word is *investment*.

Open Question 6: *Investing in Social Problems?*

Why is it that we *invest* in Genzyme or Microsoft, but *give* to Red Cross or Transparency International? Why is it that it takes 44 cents on a dollar for a good nonprofit to raise a dollar compared to about 5 for for-profits (Sargeant, Jay, & Lee, 2006)? Arguments fly back and forth that nonprofits subsidize for-profits or that nonprofits are less efficient and more fragmented than for-profits. And of course, the same tired old pivot—that for-profits are profitable and nonprofits are not. We find it difficult to believe that investing in software is more profitable than investing in the creative fount from which such a thing as “software” originated in the first place. If a piece of code that moves around a bunch of electrical impulses can create wealth, it is absurd to think that the mind that creates that piece of code is less profitable—and societies that foster and develop such minds even less so. We seek answers elsewhere.

For millennia, human beings did not realize how to harness and use the energies locked up in steam or in the movement and structure of atoms—just as we today struggle to usefully harness the energy locked up in sun, wind, and corn. Similarly, we simply have not yet found the mechanisms that can unleash the potential to close the virtuous circle connecting healthy societies with healthy babies and wealthy futures. Once a society has grown the baby and the ensuing adult has produced goods and services of value, we have relatively efficient and useful ways of pricing them and distributing them to those who want them and are willing and able to pay for them. With the invention of credit, we even know how to identify some of these in advance and reap the benefits within reasonable time lags. But credit markets are relatively new in human history (Poovey, 2008). There is considerable creative work ahead of us to expand them effectively to close the larger circle of human and social improvement. We do not believe this is a task better left to the revolutionary or to the policymaker. Instead we find tremendous scope in innovations already existent in today's credit markets. Moreover, these innovations can be transferred and transformed through entrepreneurial initiatives. The history of micro-credit alluded to earlier attests to such a profitable transfer. There is more where that came from. To give you but one new example, we present a brief case study:

Care Note Case Study

In Pakistan there exists a nonprofit organization called *Care* that has founded and runs 120 schools. These schools are progressive in the sense that they teach both boys and girls, and their curriculum includes modern science and math. The schools collect data on several measures that can be compared with state-run and other types of schools in terms of relative performance. Like most nonprofits, *Care* meets its funding needs through donations.

Enter Marc Freudweiler, founder of Derilab—a Swiss for-profit venture that provides customized derivatives for high net worth individuals in Europe. Marc has designed a unique fixed investment instrument to fund *Care* in Pakistan. The idea is very simple. An interested donor (in this case *investor*) buys a 10,000 Euro *Care* note that is underwritten by a major bank—say UBS. Like any other fixed investment, the *Care* note is invested in global capital markets and earns a fixed income. The coupon payment that comes in at the end of the year goes to the *Care* schools if they have met pre-set performance metrics; if they fail to meet the metrics, the coupon payment reverts back to the investor. The specific metrics are decided by an independent body of experts—known to and trusted by both investor and investee in advance.

The design is simple. The schools only need to continue doing what they need to do well anyway—and they are not only guaranteed funding, they can clearly estimate the magnitude of the funding in advance so they can plan ahead. And they do not have to incur the usual costs of fundraising. Nor do they have to worry about donors unexpectedly renegeing on pledges. Similarly, donors do not lose their principal since only the income earned on the principal is sent to *Care*. Nor do they have to worry about taking their money out in case of unanticipated contingencies; they can simply sell the Note on the bond market. Most guesswork and whim are taken out of the process—and the virtuous circle of need and funding is closed through that purest link of all—performance.

The beauty of the design is the way it stands a more familiar view of investment on its head, while at the same time pivoting us away from that old dichotomy of for- and nonprofit. Here the investment is based on the return—both the for-profit return from the market and the nonprofit return from the investee. Yet no generalized measures are required; specific metrics designed to fit the needs of the particular venture and its spatio-temporal or socio-political environment are sufficient. This is in contrast to other initiatives to “rationalize” social ventures—such as the development of SROI and other generalizable accounting metrics for nonprofit ventures.

There are of course, problems with even such an ingeniously simple design. Formidable hindrances come from the tax code as well as from the pervasive separation thesis that keeps for- and nonprofit apart. Not only is the effort to overcome the separation considered radical and quixotic, it is also assumed that society as a whole, or at the very least, governments and policy makers will have to step in to spearhead such a revolution. A more general principle is at work here: whenever it is not clear which components of a problem are to be left to private enterprise and which to collective or governmental action, the meta-decision between market and nonmarket mechanisms should be left to socio-political processes and not to creative entrepreneurial actions. Our challenge to this principle brings us to one of our most provocative questions.

Open Question 7: Is Entrepreneurship an Instrument of Free Markets or Is it an Alternative to the Market Versus Government Debate?

Long after Frank Knight emphasized the importance of entrepreneurial “judgment” in creating the very notion of “profit,” entrepreneurship scholars from Schumpeter to Baumol have bemoaned the lack of a central role for the entrepreneur in economic theory (Baumol, 1968; Knight, 1921; Schumpeter, 1942). The oft-repeated quote about the Prince of Denmark is a notable symptom of this lament. Yet economists refer to the “entrepreneur” all the time—a word that pinch-hits for the firm, the production function, the manager, and more recently the innovator, besides being a surrogate for a variety of other mechanical devices at the heart of the economic system of supply and demand

equilibrated by the invisible hand. In this rhetorical free-for-all, the entrepreneur has simply disappeared into the market versus government debate. Instead of empirically examining where new markets come from we simply assume this elusive and obliging figure called the entrepreneur will miraculously produce it out of thin air. Even Arrow (1962) acknowledged it: “When a market can be created, we assume it will be.”

Clearly entrepreneurship, embodied in the process we have so far sketched in this essay, is not merely an instrument of free markets. Instead it uses both markets and governments as instruments in formulating and achieving new ends, even inventing other types of institutions along the way. Entrepreneurship thus provides a way to transcend the market versus government debate just as it provides new pivots away from the old dichotomy of for-profit and nonprofit ventures. In our view, entrepreneurship is a method, a meta-logic or procedural rationality if you will, to help us coherently yet pragmatically rethink and reformulate the categories that matter to human and societal progress.

It may be useful at this point to remind ourselves once again of the historical analogy with the development and role of the scientific method. For millennia, until Francis Bacon spelled out the techniques and logic of systematic discovery embodied in scientific experiments, inventions were occasional events, products of serendipity or thanks to so-called gifted men who could “read” the signs of nature (North, 2003). But by the nineteenth century, to paraphrase Whitehead (1997), invention had been routinized and millions of scientists trained in the scientific method have since helped move the world (literally) from a speed record of about 20 mph in chariots to over 18,000 mph in orbit over the course of less than two centuries (Toffler, 2005).

Imagine what the entrepreneurial method could do if we are able to extract, codify, and disseminate the “how” as well as the “what” of the outcomes of entrepreneurship. Already, the artifacts attributed to entrepreneurial action include not only firms and economic value, but also the creation of new markets (Santos & Eisenhardt, 2004; Sarasvathy & Dew, 2005), new opportunities (Alvarez & Barney, 2007; Sarasvathy et al., 2003), new institutions (Battilana et al., 2009; Pacheco, York, Dean, & Sarasvathy, 2010), and social change (Austin, Stevenson, & Wei-Skillern, 2006; Dean & McMullen, 2007; Mair & Marti, 2009; Townsend & Hart, 2008; Zahra, Gedajlovic, Neubaum, & Shulman, 2009). In order to nudge future entrepreneurship research in the direction of this task of spelling out the entrepreneurial method, we offer three immediate possibilities that we hope serve as stepping stones to the real work ahead of us.

Toward the Specification of the Entrepreneurial Method: Three Suggestions for Future Research

To summarize our arguments so far, there exists a distinct method of human problem solving that we can categorize as entrepreneurial. The method can be evidenced empirically, is teachable to anyone who cares to learn it, and may be applied in practice to a wide variety of issues central to human well-being and social improvement. These arguments imply that it could be a useful and valuable enterprise for scholars of entrepreneurship to begin researching entrepreneurship as a *method* as well as a phenomenon or setting for testing theories from other disciplines. We believe that researching entrepreneurship as a method will entail (1) making the inter-subjective a key unit of analysis, (2) seeing heterogeneity as a basis for the design of human artifacts, and (3) specifying the role of the entrepreneurial method and the mechanisms that embody it.

Making the Inter-Subjective a Key Unit of Analysis

Currently, the dominant convention with regard to psychological and sociological approaches to entrepreneurship research consists in using either the individual or the team as the unit of analysis (Packalen, 2007; Ruef, 2003). An exhaustive search of the literature turned up virtually no journal article on details of the numerous relationships and deals that entrepreneurs routinely negotiate with a wide variety of stakeholders. Even a rare exception such as Rea (1989) used survey methods that call for individual responses from one party to the relationship—venture capitals in this particular case. It is rather surprising that over four decades of empirical work has not even scratched the surface of inter-subjective interactions between entrepreneurs and their stakeholders, be they early partners, customers, suppliers, professional advisors, employees, or the local communities within which the fledgling new venture is located. Considerable work has been done on alliances and social networks. But the bulk of these studies seek to identify characteristics of alliances and networks that contribute to firm performance. After a comprehensive review of the literature (Hoang & Antoncic, 2003) summarized their findings as follows:

Network-based research in entrepreneurship is reviewed and critically examined in three areas: content of network relationships, governance, and structure. Research on the impact of network structure on venture performance has yielded a number of important findings. In contrast, fewer process-oriented studies have been conducted and only partial empirical confirmation exists for a theory of network development. In order to address unanswered questions on how network content, governance, and structure emerge over time, more longitudinal and qualitative work is needed. Theory building in this field would benefit also from a greater integration between process- and outcome-oriented research.

Almost the entirety of social networks research takes networks as mostly given and outside the control of human action, hence not a source of valuable input into developing a *method* of doing entrepreneurship. In a recent and rare exception that examined qualitative case studies of alliances in the wireless gaming industry, Ozcan and Eisenhardt (2009) asserts this: *Extant research addresses attributes of high-performing alliance portfolios but not how executives originate such portfolios . . .* and then goes on to develop an inductive model that seeks to take the literature beyond *a deterministic account of dyadic interdependence and social embeddedness*. Even scarcer are studies that actually look into the structures of deals and the processes through which the deals came to be structured the way they are. In our considered opinion, an entire unexplored terrain of possibilities lies dormant in the area of how entrepreneurs transform bits and pieces of current realities into valuable new opportunities through productive interaction with others.

Even the literature that is directly focused on negotiations has mostly neglected new venture creation processes. Consider for example, that Bazerman, Curhan, Moore, and Valley's (2000) classic and comprehensive review of the growing literature on negotiations does not include the words "venture" or "entrepreneur" at all. Also, the very idea of "transformation" or "design" or "co-creation" as opposed to "bargaining" is new to the literature on negotiations. Linda Putnam's (2004) exhortation to negotiation scholars to incorporate transformative notions is a case in point.

On the one hand, negotiation research has shown that people often fail to reach mutually beneficial agreements even when they may be readily available (e.g., Bazerman & Neale, 1992; Thompson, Gentner, & Loewenstein, 2000). On the other hand, research has also begun to show that such agreements are reached and even new and unanticipated

ones forged through repeated exchanges between the same negotiators (Pruitt & Rubin, 1986; Thompson et al., 2000). Indeed, Lawler and his collaborators have shown that commitment leading to stable group formation occurs through a process of repeated negotiated exchanges:

The development of relational cohesion and commitment is an endogenous process that emerges from the interaction between actors. (Lawler & Yoon, 1996, p. 90)

In the abstract to the paper, Lawler and Yoon (1996) summarize the results of their laboratory experiments as follows:

The behavioral consequences are a tendency for actors to (1) stay in the exchange relation despite attractive alternatives (2) provide each other token gifts, and (3) contribute to a new joint venture. (p. 89)

All these examples from sociological and psychological literatures on relational exchanges and interpersonal negotiations point to fertile untapped resources for future entrepreneurship research. Furthermore, fully embracing the proposition that “Most of our approaches to the world are mediated through negotiation with others,” (Bruner, 1986) has important implications not only for new research, but also for re-examining and challenging existing dogma in our field. Furthermore, we believe that a deeper understanding of stakeholder relationships in entrepreneurship can both challenge and contribute to the literature on negotiations and relational sociology.

Seeing Heterogeneity as a Basis for the Design of Human Artifacts

Heterogeneity is a pervasive problem in entrepreneurship research. As early as the 1980s, Low and MacMillan (1988) argued:

Being innovators and idiosyncratic, entrepreneurs tend to defy aggregation. They tend to reside at the tails of personality distributions, and though they may be expected to differ from the mean, the nature of these differences are not predictable. It seems that any attempt to profile the typical entrepreneur is inherently futile.

More recently, Davidsson (2008) has argued in some detail that the phenomenon of entrepreneurship exhibits heterogeneity along several dimensions and across every aspect of research including design, sampling, operationalization of variables, and analysis. The study not only catalogs the various types of heterogeneity problems that arise in the context of entrepreneurial/venture performance, but also suggests strategies for dealing with these problems. Several of these fixes have to do with taxonomizing the phenomenon, strictly bounding samples to particular industries or other dimensions of the taxonomy, developing comparable metrics, and seeking to find natural experiments or designing controlled laboratory experiments.

Davidsson’s arguments about heterogeneity are also applicable at the level of the entrepreneur. As we pointed out in the beginning of this article, the vast literature on the role of individual traits and personality variables has produced mixed results at best. One reason could be that “entrepreneur” is not a monolithic category. Instead it may be that we need a taxonomy of entrepreneurs (whether organized around motivations, skills, industry, opportunity, or other relevant dimensions) and look for differences between sub-categories in the taxonomy. However, we would like to contend that the problem of heterogeneity in entrepreneurial behavior goes deeper than the need to taxonomize

entrepreneurial phenomena, that it is a more fundamental characteristic of human beings and human action in general—a peculiar triple helix of heterogeneity at that. Studies ranging from genetics (Lewontin, 1972) to meta-analyses of industry histories (Mairéss & Griliches, 1990) all point to a possible fallacy in trying to categorize human behavior according to a priori traits or formal models. In other words, the evidence seems to suggest that heterogeneity is amazingly persistent and continues to appear at every level of analysis. Sarasvathy (2008) described three sources of unpredictability in human behavior as follows:

- *Heterogeneity.* People are very different from one another. However we might classify human beings into categories, variation *within* categories will be as likely and significant as *between* categories.
- *Lability.* People change over time. Not only behaviors, but traits and preferences change.
- *Contextuality.* People play multiple roles. For example, a person may be highly risk averse to jumping out of airplanes, but might nonchalantly short-sell stocks in a bull market.

Whereas heterogeneity as defined here appears to be a species trait that shows up in behavior in spite of institutions that nudge, push, and even compel people toward conformity and coherence, lability and contextuality appear to be just as likely to be driven through interactions with other individuals as being something innate and individual—i.e., inter-subjective, not merely subjective. Instead of starting with the assumption that human beings can a priori be grouped into stable categories in one way or another, what if we began our theorizing with the opposite assumption—that there are no stable categories; what matters is difference and change, continual flux of one sort or another? At first glance, this seems to make the problem of entrepreneurial (even all behavioral) research intractable and futile. But a second look suggests a productive opportunity for exciting new research. And that is the possibility that all categories are artificial—not in the sense of unreal and useless, but in the sense of carefully, yet interactively and iteratively designed (consider, for example, the U.S. Constitution) and/or emergent through patterned and path-dependent processes (such as technology ventures and standards bodies).

Another way to capture this argument is to begin researching entrepreneurship not only as a social science, but as a science of the artificial (Simon, 1996). Some specific lines of future research along these lines could include: attributing coherence in risk-taking behavior not only to innate traits but also to learned experience and deliberate practice; or, taking traditional conceptions of team building as finding members with shared interests who buy into the leader's vision, and adding to that a conceptualization of leadership as a process of designing goals from partially articulated and partially vague and inchoate preferences of a growing stakeholder network. The latter would be consistent with Geroski's (2003) argument that new markets come not only from well-articulated but unfulfilled demand, but also from inchoate demand that can be shaped through particular product offerings that allow them to coalesce into new preferences, needs, and wants.

Specifying the Role of the Entrepreneurial Method and the Mechanisms that Embody It

If we accept the thesis that entrepreneurship is a method such as the scientific method and/or a social force such as democracy, there is an enormous task ahead of us in specifying when and where exactly the method can be applied, not to mention considering in great detail the mechanisms that constitute the method and how they can be applied. We have argued in this article that the entrepreneurial method can tackle a wide range of

problems in the human social realm. It is necessary, however, to investigate and explicate the problem space in more concrete terms. For example, when and how does the entrepreneurial method compete with other approaches such as scientific, regulatory, socio-political, etc.? More interestingly, perhaps, how can the entrepreneurial method complement and leverage other approaches, say, in the alleviation of poverty or in the achievement of social justice? We believe recent history is rife with natural experiments that can help tackle the task of greater specification of the problem space. Take the case of climate change, for example. Both nonprofit and for-profit entrepreneurial ventures compete with as well as leverage regulatory reform, R&D initiatives, corporate philanthropy, and international aid in this arena. It would be interesting, not to say impactful, to develop empirically grounded as well as a priori and formal theoretical frameworks that allow us to specify how exactly to mix and match synergistic strategies across different approaches and when and where to allow the methods to compete to let better solutions evolve.

The types of scholarly endeavors called forth by the task described above are also necessary at a more micro-level—namely in the case of particular mechanisms that embody the entrepreneurial method. With the historical advent of democracy as a form of political action, for example, voting mechanisms became a new area of research. Over decades of cumulative research, political scientists, economists, sociologists, legal scholars, and others have developed a vast body of work relating to a variety of voting-related phenomena (Riker & Ordeshook, 1968; Saari, 1989; Schuessler, 2000). We believe a similar fount of intellectual possibilities awaits us in connection with the entrepreneurial method. The mechanism of affordable loss in contrast with techniques such as DCF and real options (Dew, Sarasvathy, Read, & Wiltbank, 2009) provides a glimpse of one such mechanism. Bricolage is another such mechanism (Baker & Nelson, 2005). By mechanism therefore we mean specific learnable and teachable techniques such as those available in accounting, finance, and supply chain management. To be useful for becoming a building block of the entrepreneurial method, such mechanisms have to “hang together” logically—i.e., they have to be internally consistent with each other and “make sense” in terms of the overall purpose of the method, namely to unleash the potential of human nature to achieve desired ends and to generate viable and valuable new ends.

There exist several sources of data for building such mechanisms. Often these are data collected for other purposes. Take for instance the various types of stakeholder contracts that entrepreneurs enter into in building and growing their ventures. Several empirical studies in entrepreneurship use contracts as the basis for analyzing specific aspects of entrepreneurial performance. To cite but a few: Using alliance contracts as primary data, Weaver and Dickson (1998) challenged the importance of resource-based and environment-based factors in alliance performance and Reuer, Ariño, and Mellewig (2006) deepened our understanding of antecedents to governance choices. Franchisor-franchisee contracts have also proved useful in understanding how entrepreneurs create and manage relationships in trying to grow their ventures (Jambulingam & Nevin, 1999; Leblebici & Shalley, 1996). Other studies have looked into research (Deeds & Hill, 1999) and customer (Yli-Renko, Sapienza, & Hay, 2001) relationships and yet others have investigated the VC-entrepreneurial venture relationships through the design and ongoing management of “deals” and term sheets (Cumming, Schmidt, & Walz, 2010; Petty & Gruber, 2009). The relevant fact here is that a wide variety of contracts exist as potential data to examine how entrepreneurs craft and manage relationships with a wide variety of stakeholders. While these have mostly been used to understand performance of particular aspects of venturing, they could also be used as data to begin inductive theorizing about specific mechanisms (say equity versus debt) or particular relational preferences (say

control rights over certain types of decisions and not others) that constitute the entrepreneurial method.

Why and how would these mechanisms matter? Until now, for the most part, we have focused on entrepreneurship as a *phenomenon* and we have tried to understand how to create the conditions for good entrepreneurial performance whether at the firm level or at the societal level. That is akin to asking “What explains the discovery of penicillin or plate tectonics?” or trying to understand the role of government funding in the nature and magnitude of scientific output. To specify the *method* of science or of entrepreneurship, however, we have to roll up our sleeves and actually observe experienced entrepreneurs in action, read their diaries, examine their documents and sit in on negotiations—as did the scholarly and humanistic literati of Bacon’s time. And as we extract and codify the “real helps” of entrepreneurial thought and action, we need to figure out ways to embody them in particular techniques and mechanisms that we refine in the laboratory and the classroom with a view to carefully determining the logical relationships both between these mechanisms and how they connect to the unleashing of human potential. In short, we have an exciting time of hard work ahead of us.

Conclusion

In sum, we have argued here that by thinking of entrepreneurship as a subset of other disciplines such as economics or treating it as a setting for testing theories from these disciplines, we may be in danger of falling into a category error. One way out of this error is to reformulate entrepreneurship as a method of human action, comparable to social forces such as democracy and the scientific method, namely, a powerful way of tackling large and abiding problems at the heart of advancing our species. This reformulation puts us on the brink of an exciting new endeavor encompassing pedagogy, policy, and practice in ways that are yet to be invented. Only if we choose to embark on this endeavor may we actively participate in and help shape a revolution that is already tiptoeing into the twenty-first century.

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Saras D. Sarasvathy is Isadore Horween Research Associate Professor of Business Administration University of Virginia Darden School Graduate School of Business.

Sankaran Venkataraman is MasterCard Professor of Business Administration Research Director, The Batten Institute University of Virginia Darden School Graduate School of Business.