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Making It Happen: Beyond Theories of the Firm to Theories of Firm Design

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Current theories of the firm provide no explanation for entrepreneurial success except in terms of firm success. Even when the focus is on the entrepreneur, s/he is entirely cast as a bundle of traits/behaviors or heuristics/biases that serves to explain firm performance. In this article, I suggest putting the entrepreneur center stage, adopting an instrumental view of the firm. Drawing upon the work of Simon in symbolic cognition and Lakoff in semantic cognition, I explore how we can go beyond explanations based on economic forces and evolutionary adaptation to entrepreneurial effectuation; I end with specific research questions pertaining to firm *design*.

"Making it happen" is one of the oldest bromides about what entrepreneurs do. The prevailing wisdom in economics (bolstered by inconclusive results in management research) might suggest that all entrepreneurs do is throw darts at the proverbial bell curve, with the more successful ones merely being those that happen to land in the correct tail of the distribution. Yet the popular press and increasingly business school programs that offer courses in entrepreneurship appear to fall back on the bromide. For example, a Web search with the phrases "making it happen" and "business school" brings up thousands of links to business schools that precisely use this bromide to describe and market their entrepreneurship programs.

As researchers, however, we are more likely to be embarrassed by such clichés and would rather look for necessary and sufficient conditions for making it happen—the "it" being precisely defined and completely specified a priori, of course. But Occam's razor does suggest that it often pays to pick the simplest explanation and clichés are nothing if not simple. I learned from Herbert Simon that simplicity itself is not that simple a concept (Occam's razor has a double edge as he pointed out in 1979, p. 495). It is also not a good idea to throw something away because it seems too commonplace and clichéd to be considered serious research. As Gigerenzer has shown, very often it is extraordinarily simple heuristics that actually make us smart (Gigerenzer & Todd, 1999). Therefore, in this article, I plan to look at the bromide "Making it happen" much more carefully and dig deep for what it might suggest about our efforts to understand this curious and

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exciting phenomenon to which all of us working in the scholarly field of entrepreneurship have committed a large part of our intellectual lives.

The first thing that leaps out at us when we examine the phrase "Making it happen" is the necessity of agency—the idea that "it," whatever it might be, might not "happen" if it were not for someone making it happen. The second thing is a little more subtle—it points to the rather ambiguous role of the "it" in making it happen. In other words, it is not immediately clear what "it" might be. It turns out, as I will argue in the following pages, that both these features of the bromide have significant implications for studying entrepreneurship. Not only do they suggest questions that we have not yet asked in our research, but they also point to scholarship we might draw upon that we are currently overlooking. At the very least, the phrase calls us to refocus our attention from the firm to the entrepreneur.

Why We Need to Go beyond Theories of the Firm

Almost all prevalent economic theories of entrepreneurship are theories of the firm. Either they try to explain entrepreneurship as the existence and survival of firms, or as firm performance in one way or another. And with rare exceptions, their explanations tend to be couched in terms of market forces, industry dynamics, or population ecology. Even the prolific literature focusing on the psychological traits of the entrepreneur tries to relate entrepreneur variables (attributes, behavior, cognition, and so on) to the existence, survival, and performance of firms rather than to the achievement of the entrepreneurs' individual aspirations and performance goals. Ten years later, Baumol's words still ring true—The Prince of Denmark is largely absent from Hamlet,[1] (Baumol, 1993, p. 12) and our scholarship continues with him as a bit player at best.

There are at least three good reasons that it is necessary to rectify this absurd anomaly in entrepreneurship research and go beyond theories of the firm: because theories of the firm (a) tend not to distinguish between the firm and the entrepreneur; (b) tend to assume homogeneity of goals for the entrepreneur; and, (c) tend to rest on assumptions of opportunism both at the individual and firm levels of analysis.

(a) The Entrepreneur ≠ The Firm

The first good reason for going beyond theories of the firm consists in the explicit recognition that the entrepreneur is not the same as the firm. Nor is firm success the only, or even the most important, measure of entrepreneurial success. In fact, firm failures may be important inputs into entrepreneurial success, both at micro (individual) and macro (the economy) levels of analysis.

Take the event space for the probability of entrepreneurial success/failure. As argued elsewhere (see Sarasvathy & Menon, 2002), there are in actuality two separate (albeit related) event spaces for entrepreneurial success as distinct from firm success. And simple calculation shows that so long as entrepreneurs are willing to fail a few times, they can amplify the probability of their success several times over the expected success rate for firms. This has two parallel implications for our understanding of entrepreneurial success. First, cognitive factors (such as Adversity Quotient—Markman et al., 2002) involving both a willingness to fail and effective techniques of failure management would be impor-

1. Schumpeter was the first to refer to *Hamlet* without the Danish prince in 1942—see page 86 of the 1975 edition of *Capitalism, Socialism and Democracy* published by Harper Torchbooks, New York.

tant issues at both micro and macro levels of analysis in management research. And second, firm failures should be studied as important *inputs* into entrepreneurial success (as in the use of real options logic, McGrath, 1999)—again at both micro and macro levels of economic analysis.

(b) Assumptions of Homogenous Goals for the Entrepreneur

The second major problem in research that focuses on the firm rather than the entrepreneur arises from assumptions about homogeneous goals on the part of firm founders/management. The entrepreneurs' goals are assumed to be either homogenous in the sense of some optimization problem (usually profit maximization) or else are assumed to be collapsible into some well-specified ordering that can be smoothly mapped to firm goals. In such a universe, firm heterogeneity becomes a fundamental problem to be solved by our research (Rumelt, Schendel, & Teece, 1994). And theories that focus primarily on firm success as opposed to entrepreneurial success are unable to explain phenomena such as the one identified by Gimeno et al. (1997), namely, why financially underperforming firms survive over very long periods of time (sometimes longer than market outperformers).

In current theories of the firm, entrepreneurs rarely survive, and those who do are largely residuals of forces and processes beyond their control. Since all surviving firms are shaped by the same macro forces, why firms differ is an important unexplained phenomenon. But in a world where entrepreneurs are not entirely at the mercy of external forces, but actually make things happen by reshaping some of those forces, why firms are different is a nonphenomenon. Heterogeneity of firms is the norm, not the anomaly, because firms are products of individual abilities and expectations that are heterogeneous to begin with. In the absence of strong homogenizing forces such as the commoditization of certain industries, such heterogeneity at the root continues to diverge unchecked, leading only to more variety and novelty rather than otherwise.

(c) Assumptions of Opportunism

One of the most dominant prevailing theories of the firm that several of us draw upon is Transaction Cost Economics (TCE) or more recently, the new institutional economics. Even many of us, who make evolutionary arguments for the existence, scope, and performance of firms, tend to align our explanations with those of TCE. As Maria Moschandreas (1997) has shown, TCE rests almost entirely on a strong assumption of opportunism in individual behavior. She argues persuasively and in great detail that the assumption is empirically refuted and theoretically unsound. Similar behavioral assumptions of existing theories of the firm have also been called into question by several organizational economists in a recent edited volume by Augier & March (2002).

Simon (1993) suggested alternate assumptions based on intelligent altruism and demonstrated through computer simulations that creatures whose behavior is based on intelligent altruism are more likely to survive and dominate the population in an evolutionary sense than either the selfish opportunist or the idealistic altruist. In particular, the notion of fitness here does not refer to the "survival of the fittest" in some global sense. Instead, as in all well-received evolution theories, fitness is merely a measure of advantage along certain key parameters in the match between organism and environment that give the species a higher likelihood of reproductive success. For example, in an environment of tall trees with denudation at lower levels of forestation, a herbivore with a longer neck (say, a giraffe) has a higher likelihood of surviving till it reproduces than a herbivore without such a long neck. Similarly, in a social environment consisting of

relatively free individuals, the intelligent altruist beats both the unintelligent altruist and the selfish individual in survival along certain key measures of fitness.

Recent evidence from socio-biology and primatology (De Waal, 2002) also support this view from reciprocal altruism, particularly in social insects and the higher primates. If we are to build theories of the firm based on a truncated distribution of intelligent altruism (that reject both tails—that of pure altruism and unadulterated opportunistic greed), we would have to begin by recognizing that firms are likely to be as heterogeneous as their founding and controlling stakeholders. Theories of the firm, therefore, will have to take into account entrepreneurial agency, and theories of firm design will have to be rooted both in individual as well as social cognition.

In sum, one simply cannot get away from the fact that firms are created by entrepreneurs, and entrepreneurs are human beings—evolved socio-biological beings whose psychology, history, and culture matter.

An Instrumental View of the Firm

The central shift of research focus from firm to entrepreneur can now be stated more precisely. In a universe where we begin with firms, we get an instrumental view of the entrepreneur. In other words, when we have clear definitions of what a firm is in terms of existing theories of the firm—i.e., a firm is a portfolio of future cash flows (view from neoclassical economics); or that a firm is a stable network of contracts (TCE); or that a firm is a set of core competencies and dynamic capabilities that provide sustained competitive advantage in a marketplace (evolutionary theories and strategy)—we perceive the entrepreneur merely as an instrument that delivers the above preconceived outcomes.

When we recast this picture with the entrepreneur center stage, we need to develop an instrumental view of the firm, where the firm is a mortal implement that entrepreneurs and other stakeholders can use to shape the future according to their individual and/or collective imagination. In this view, *what the firm is* is itself an evolving phenomenon that is contingent upon particular founders/stakeholders and the zeitgeist that unfolds in specific spaces and epochs in history.

Just to give a concrete example of a research quest in this revised view: Instead of spending our effort and imagination on how to instruct, induce, and invent better entrepreneurs who will deliver on predetermined bottom lines, we can now ask ourselves how to build better firms, or different types of firms, or even invent new institutions that look nothing like our current firms (and markets), *given* particular classes and categories of entrepreneurs. In other words, by refocusing our attention on entrepreneurial agency—i.e., the person/s who is making it happen, we are able to unhook ourselves from preconceptions of "it" and allow it to float and transmogrify into a variety of possibilities, many of them yet to be imagined.

Firm Design or the Artificial Nature of the Firm

The firm, then, in this reformulation of entrepreneurship theories, is an *artifact* (Simon, 1996). Instead of a natural phenomenon resulting from blind forces, it is often an outcome (however unexpected and novel) of serious design, motivated and negotiated by particular aspirations forged in entrepreneur-stakeholder networks that evolve over time. In this reformulation, then, entrepreneurship can be studied as a science of the artificial (See Sarasvathy, 2003, for more details).

In his 1996 edition of the book, in what I personally consider to be some of his most creative work (and I am very conscious of the fact that in an oeuvre of over 1,000 papers and hundreds of books that is a strong claim!), Simon set out the beginnings of how the sciences of the artificial might resemble and differ from the natural sciences and also how we can set about studying them. Under the rubric of a science of the artificial, we can study the creation of a firm as essentially a design problem; and, as he explicated on pages 162–167, even as a problem of designing without final goals, for, as he suggests, in selecting today's ends we are but selecting tomorrow's constraints.

Also, in this view, entrepreneurial cognition is a subdiscipline of creative cognition—and therefore, can take us beyond the heuristics and biases literature. The heuristics and biases literature has proved extremely useful and provided provocative insights (Baron, 1998; Busenitz & Barney, 1997) into our understanding of entrepreneurs as creators of "successful" versus "unsuccessful" firms. But that is a small slice of a much larger pie that is available to us as scholars of cognition. Heuristics and biases usually involve deviations from formal rationality, and therefore, tend to buy into the presumption of one or more ideal solutions, from which the heuristics and biases deviate. Creative cognition, however, mixes in heuristics into the production of novelty, which by definition cannot be idealized ex ante, or else it would not be *novel.* The element of surprise, or the "Aha!" feeling, as Simon referred to it is a necessary ingredient of novelty. In the production of novelty, the emphasis is not on deviations from rationality. Rather, creative cognition stresses imagination, difference, and variety—all ingredients of surprise.

Accepting the *artificial* nature of the firm, or the notion of entrepreneurship as firm *design*, enables us to move beyond heuristics and biases, to delve deeper into the cognitive realm and explore new implements from the toolbox of recent cognition research.

Cognitive Theories of Entrepreneurship as Firm Design

In this section, I am therefore going to try to explore at least two different perspectives from recent cognition research, and partially outline and cautiously speculate upon possible cognitive theories of entrepreneurship as firm design. The first draws upon the more familiar Symbolic Processing (SP) paradigm (also known as the problem-solving approach) of cognition. The second is more recent, and at the risk of wading too far into the unfamiliar, I will try to outline an approach based upon the work of George Lakoff (1987) and others using semantic categorization (SC) and conceptual metaphors—I will refer to this as the SC approach.

Simon wrote in 1995 (p. 41), "I have shown why we need several levels of cognitive theory: a neurological level to deal with events of less than a few hundred milliseconds duration, and a symbolic level to deal with the more aggregated slower events. The hierarchical structure of psychological theories resembles the hierarchical structure of theories in the other sciences because, in the brain as elsewhere, hierarchy has provided nature with powerful means for building reliable complex systems by assembling collections of simpler stable components. Neuroscience and symbolic cognitive science must collaborate in order to create a comprehensive, well-formed psychology." As Simon has suggested, psychology is embodied in a hierarchical structure of cognitive processes—neural, symbolic, semantic, and so on. The two approaches I explore here are drawn from the latter two of the three—SP involves symbolic processes, and SC involves the semantic.

An Application of Symbolic Processing (SP) Approaches to Firm Design

The works of several scholars in the field of entrepreneurship and management incorporate ideas from the symbolic processing branch of cognitive science. Examples include Dutton, Dukerich, and Harquail (1994), Fiol (2002), Glynn (1996), Lant & Hewlin (2002), and so forth. But most of this work does not distinguish between the hierarchical layers of human cognition as laid out by Simon. Instead, they tend to consider information processing as an umbrella term that embraces a wide range of cognitive phenomena including semantic and symbolic processing, and altogether eschew any discussion of embodiment. Furthermore, cognition-based notions of information processing are often confounded and commingled with conceptual formulations of information and knowledge as they occur in economics and strategic management.

If we take a more fine-grained perspective on cognition, symbolic processing views are rooted in the argument that circuitry in computers and neural networks in brains are different hardware implementations of very similar software processes that involve the manipulation of symbols. In the second half of the twentieth century, our understanding of both computer programming (including artificial intelligence) and human cognition (particularly human problem solving) developed hand in hand, learning from each other and even changing each other in curious ways. For example, the brain's neural structures are often modeled by the same difference equations that move circuitry in a computer from state to state. In fact, the correspondence between the behavior of the brain and the computer has been achieved in several domains within a temporal resolution of a few seconds.

Some of these domains involve what we might consider very high-level cognition such as scientific discovery and other expertise that have routinely been attributed to mystic explanations such as "intuition." In a rather large body of work on the cognition of scientific discovery, Simon and others have shown that even the eureka experiences of a creative scientist are rooted in their expertise and prior knowledge. As Simon has argued, ". . . without prior knowledge and experience, there can be no expectations, hence no departure, hence no surprise." It follows then that design of all sorts of artifacts including firms can be examined using proven methods from the studies of scientific discovery and other forms of expertise.

Using such methods in my empirical investigations into the symbolic cognitive processes used by expert entrepreneurs in designing new firms, I discovered a set of principles and a logic of problem solving that I dubbed effectual reasoning. As explicated in great detail elsewhere, (Sarasvathy, 2003) my ideas on effectuation connect the empirical evidence with four key ideas from the *Sciences of the Artificial* that serve to illustrate how we can use the book as a launching pad for creating cognitive theories of entrepreneurship as firm design. The four ideas are:

(1) Natural laws constrain but do not dictate our designs;
(2) We should seize every opportunity to avoid the use of prediction in design;
(3) Locality and contingency govern the sciences of the artificial; and,
(4) Near-decomposability is an essential feature of enduring designs.

Effectuation is a set of nonpredictive control strategies that are primarily means-driven, where goals emerge as a *consequence* of stakeholder acquisition, rather than vice versa (Sarasvathy, 2001a). In contrast to predictive reasoning, effectuation has been shown to be highly preferred by expert entrepreneurs (Sarasvathy, 2001b). Without going into details of the theoretical exposition of effectual reasoning, that have been and are being developed in other papers (available at http://*www.effectuation.org*), I would like to emphasize here the fact that effectuation is at heart a theory of design.

In particular, it is a theory of firm design that heeds all the elements of the sciences of the artificial. Effectuators do not ignore external constraints imposed either by the environment (in spatial and temporal terms) or by events outside their control. Yet they do not let these constraints dictate the designs of their firms. Similarly, effectuation emphasizes nonpredictive strategies over forecasting; and embraces locality and contingency as levers to shape opportunities. Locality here refers to the fact that cognitive limitations on our rationality allow us to build artifacts that achieve only local optima at best. Yet, our artifacts can endure over time by learning to adapt to contingencies and sometimes even exploit those contingencies and negotiate with the local environments for their own survival and prosperity. Finally, by incorporating near-decomposability into the structures of their artifacts, i.e., by selecting design elements that exploit locality and contingency through both interdependence and independence of parts, effectual entrepreneurs build robust and enduring artifacts such as firms and markets.

Effectuation is a useful theory of designing in a three-dimensional problem space consisting of Knightian uncertainty (Knight, 1933), Marchian goal ambiguity (March, 1982), and Weickian enactment (Weick, 1979). In other words, it is a tool for problem solving when the future is unpredictable, our goals are unspecified or simply unknown, and when the environment is not independent of our decisions. In such a space we do not begin by specifying where we want to go and by following some predicted path to our predetermined destination. Instead we remain firmly anchored in the reality of where we are, and proceed from there into the possible and the doable. By continuously and iteratively negotiating with those stakeholders who *actually* commit to particular elements of the design process, we make both new means and new goals possible and reshape reality as we go. Reality, in this worldview, is nothing but a negotiated set of constraints on our actions. We do not mold reality into some disembodied vision that we aspire to, but rather concurrently transform both constraint and aspiration by actively reimagining the possible through the actual.

Effectual entrepreneurs clearly prefer imaginative fiction to analytical forecast when it comes to transforming old information into new fact. This type of fiction is what is currently missing from our theories. If we are to create cognitive theories of firm design, we need to attend to the task that Nelson Goodman so evocatively urges us to undertake in his *Fact, Fiction and Forecast*, "We have come to think of the actual as one among many possible worlds. We need to repaint that picture. All possible worlds lie within the actual one."

Our next step in this endeavor therefore would be to move up from the symbolic processing level to semantic categorization in cognition.

Possible Applications of Semantic Categorization (SC) Approaches to Firm Design

In the last section, I illustrated an example of how SP approaches to understanding human cognition may be used to understand entrepreneurial effectuation. But even as we develop elements of this new theory, we can see that we need to move beyond the level of symbolic processes if we are to more concretely understand firm design. As shown in the previous section, symbolic cognition builds upon and is consistent with our ongoing understanding of neuroscience. Similarly, in order to develop theories of firm design we need to get the symbolic and semantic levels to collaborate. And for that, we need to turn to theories based on semantic categorization.

The SC approach to cognition has a simple but grand vision—the idea of grounding meaning in biology. Trained in mathematics and literary criticism and working in lin-

guistics and cognitive science for decades, George Lakoff (1995, p. 120) explains how he came to the realization that meaning was embodied:

> I noticed then that conceptual metaphor is a natural process. There are hundreds of thousands of generalized mappings in everyday English, and ordinary, everyday semantics is thoroughly metaphorical. This meant that semantics cannot be truth conditional, it could not have to do with the relationship between words and the world, or symbols and the world. It had to do with understanding the world and experiences by human beings and with a kind of metaphorical projection from primary spatial and physical experience to more abstract experience.

Citing the pioneering early works of Len Talmy (1983; 1985) and Ron Langacker (1982; 1986) leading to the discovery that natural language semantics require mental imagery and other basic level categories, he goes on to argue that "you could not have disembodied meaning, disembodied reason." In this he echoes the sociological philosopher Hans Joas who argues for the corporeal nature of human reasoning. Warding off criticisms of relativism, Lakoff (1995, p. 121) further explains the stream of work he is involved in as follows:

> The view that we have suggests that meaning is neither purely objective and fixed nor completely arbitrary and relative. Rather, there are intermediate positions, which say that meaning comes out of the nature of the body and the way we interact with the world as it really is, assuming that there is a reality in the world. We don't just assume that the world comes with objectively given categories. We impose the categories through our interactions, and our conceptual system is not arbitrary at all. It is greatly constrained by the nature of the body, by the nature of our perceptions, by the nature of the brain, and by the nature of social interaction. These are very strong constraints, but they do not constrain things completely. They allow for the real cases of relativism that do exist, but they do not permit total relativism.

One area where entrepreneurship scholars are preoccupied with the role of language and the concurrent ontological confusions about objective and relative reality has to do with the notion of *opportunity.* Whether opportunities exist in the world and need only be recognized or discovered, or whether they are spun into existence from within the minds of the entrepreneurs is a question of some import in our academic hallways. In this ongoing debate, the notion of entrepreneurship as firm *design* serves to incorporate both views in a less problematic way. Designing implicates an essential role both to the tools "out there" in the world as well as to the purely internal imagination of the designer about what to do with them. In the firm design perspective of entrepreneurship, what is *found* in the world is not opportunity but *possibility.* Designing entrepreneurs take up possibility as a tool and fashion it into opportunity through imaginative interaction both with their tools and with the society in which they live. Mere *recognition* and *discovery* of tools do not in themselves result in a valuable artifact—who the designers are, how specifically they use the tools, why they end up building a particular artifact, and how that artifact comes to be aesthetically or otherwise valued in the community they live in are all relevant issues to a design perspective.

In other words, firm design involves as much semantic categorization and metaphorical projection (if not more) as it does information processing and problem solving. For example, in designing a new firm, entrepreneurs often design new goods and services. And, as anthropologists would argue, our goods embody individual and social meanings (Douglas & Isherwood, 1982). Furthermore, as Fligstein (2002) would have it, even our markets are primarily institutions that embody new and established conceptions of

control. In building firms and markets, entrepreneurs tell stories (Lounsbury & Glynn, 2001) and negotiate new meanings through metaphorical projection (Ex; the Un-cola) as much as they coordinate physical production and deliver quality goods at affordable prices.

In this regard, it serves us as scholars of entrepreneurship to ask how cognitive processes at the semantic level operate and influence firm design. In a recent lecture on how he created the brand for Starbucks, Terry Heckler explained how he argued the founders of Starbucks out of naming their company "Pequod." Pequod is the name of Captain Ahab's ship in Moby Dick—a book that inspired the founders' imagination and entrepreneurial drive. Heckler believes that the name of a brand should embody not only the founders' vision, but also "the quintessential moment of use" by the consumer of the product. And he just simply could not "see" anyone reaching for a cup of Pequod. "Starbucks," however, brought to life the appeal of a sleepy hand reaching for a green can of coffee on a rainy morning in the Northwest and satisfied the founders in incorporating the name of the first mate on the good ship Pequod.

Besides serving as a goal for understanding firm design at the semantic level of cognition, the SC approach also suggests specific methods for our research. The SP approach has led some of us to use think-aloud protocols and other experimental and qualitative methods to understand entrepreneurial cognition. Similarly, the SC approach suggests tools from linguistic analysis and literary and textual analyses that we can use to develop and test theories of firm design.

To give just a fleeting glimpse of the type of empirical understanding that could be enabled by this approach, I will use a single instance from the personal history of an expert entrepreneur. Tom Fatjo, Jr., was an accountant in Houston when a community meeting in his subdivision challenged him to take up the garbage collection problem that the community was facing. Borrowing $7,000 for his first truck in 1970, Fatjo woke up at four in the morning and drove his own garbage truck for two hours every day before changing into a suit to go to work in his accounting office. This went on for over a year before he let go of his security blanket of a white-collar profession to found the billion-dollar waste management giant Browning Ferris. Of course, when he first made this decision to take the entrepreneurial plunge, he did not know it would be a billion-dollar giant. Here is how he describes his moment of "choice," if one could call it that, in his autobiography:

> Within a week I was almost frantic. My food wouldn't seem to digest, and I had a big knot in my chest. When I was doing one thing, I thought of two others that had to be done that same day.
>
> The pressure just kept building. Even though it was cold, my body was damp from continuous perspiration. Since so much of what I was doing in the accounting firm had to be done by the end of the tax year and involved important decisions with key clients, I needed to spend time thinking through problems and consulting with them as they made decisions. I was caught in a triangle of pressing demands, and I felt my throat constricting as if there were wires around my neck.
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> That night I was exhausted, but I couldn't sleep. As I stared at the ceiling, I fantasized all our trucks breaking down at the same time. I was trying to push each of them myself in order to get them going. My heart began beating faster in the darkness and my body was chilled. The horrible thought that we might fail almost paralyzed me.
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> I wanted to quit and run away. I was scared to death, very lonely, sick of the whole deal. As hard as I tried to think about my life and what was important to me,

> my mind was just a confused mass of muddled images. . . . I remembered committing myself to make it in the garbage business "whatever it takes!" I lay back on my pillow and felt a deep sigh within myself—"Good Lord, so *this* is what it takes," I thought, then rolled over and got some restless sleep.

We can of course explain this "choice" in terms of risk preference, or the escalation of commitment bias, or adversity quotient, or merely the blind groping of a chaotic emotional reaction to stress. Or we could argue as does March (1994, p. 218) that ". . . life is not primarily choice; it is interpretation. Outcomes are generally less significant—both behaviorally and ethically—than process. It is the process that gives meaning to life, and meaning is the core of life." And we could align ourselves with Lakoff and find evidence in the above passage for the "embodied" nature of the meaning that March is talking about. And we could demonstrate through it the efficacy and usefulness of a Jamesian radical empiricism in our scholarship:

> I conclude, then, that real effectual causation as an ultimate nature, as a "category," if you like, of reality, is *just what we feel it to be*, just that kind of conjunction which our own activity-series reveal. We have the whole butt and being of it in our hands; and the healthy thing for philosophy is to leave off grubbing underground for what effects effectuation, or what makes action act, and to try to solve the concrete questions of where effectuation in this world is located, of which things are the true causal agents there, and of what the more remote effects consist.
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> —William James in *The Experience of Activity*
> in Essays in Radical Empiricism (1912, pp. 185–6)

Discussion

In this article, I set out to explore a little more of what cognitive science has to offer than what we have so far applied in our work involving entrepreneurial cognition. In particular, I drew upon Simon's hierarchical categorization of the levels of human cognition and Lakoff's more recent seminal studies of embodied metaphors. In my somewhat brief exposition, I have tried to heed Donne's warning, "A little knowledge is a dangerous thing; Drink deep or taste not the Pierian spring." And whether I have succeeded in achieving any depth at all or not, I believe the exposition does identify and open up a number of unexplored and underexplored research questions. A few examples follow.

Example 1: Names of New Ventures

What role does the name of a new venture play in its subsequent evolution and survival? At least some students in entrepreneurship classes do struggle with naming their new ventures and new products. Under what circumstances are they justified in worrying about this problem and when should they just pick one from a hat? For example, would it really have made a difference to Starbucks if it had instead been called Pequod? What processes do entrepreneurs go through in deciding names for their new ventures? Are there best practices for this decision making? If so, what are they?

Example 2: Designing for Failure versus Designing for Success

How should entrepreneurs deal with firm failure? When is firm failure an input into entrepreneurial success and when is it orthogonal to it? Under what circumstances should

entrepreneurs design for failure as opposed to designing for success? For example, Pierre Omidyar (as he himself reports it) built a robust system that would not need his continual attention and monitoring because eBay was originally a hobby to him and not a business. In other words, he designed his product not to fail, without worrying about what it would take to make it succeed. How often do entrepreneurs make this trade-off between Type I and Type II errors in their designs? And how does that affect firm growth and their own performance goals over a temporal portfolio of firms?

Example 3: The Plunge Decision

Entrepreneurship research has long focused on questions of motivation. But as we saw in the Tom Fatjo example earlier in this article, the "plunge" decision involves a lot more than motivation. It often incorporates factors of stress; emotional endurance; strength; efficacy of spousal, familial, and friendship ties; and sheer physical energy. Modeling the plunge decision as a physically and socially embodied process rather than a cross-sectional variance in given psychological traits and motivations not only might reflect empirical reality more clearly, but also might enable us to devise pedagogical exercises that allow students to more fully explore their own entrepreneurial potential.

For each of the above three streams of posited inquiry, it is rather obvious that we need to turn to more qualitative analyses than we are currently prone to do. Symbolic processing views of cognition have usually necessitated experimental methods, and have been particularly amenable to think-aloud verbal protocol experiments. Semantic processing views would necessitate the use of textual and linguistic analyses of a variety of hitherto unanalyzed entrepreneurial narratives including but not limited to interview data. Recent trends in management scholarship in this direction make it particularly apposite for entrepreneurship researchers too to take this turn in their intellectual expeditions.

Conclusion

In summary, while theories of the firm may dominate the landscape of our scholarship today, they are inadequate to inform our understanding of entrepreneurship in the way that cognitive science–based analyses permit. That is because, entrepreneurship, to use a familiar cliché, is about making it happen. Making anything happen suggests the existence of a maker and the importance of his or her role in making it happen. Not only will entrepreneurial agency matter in *how* things come to be, but also in *what* comes to be. That is why we need to begin with the entrepreneur and not the firm in our research endeavors. This leads us naturally to an instrumental view of the firm and the phenomenon of entrepreneurship as firm design. In moving from theories of the firm to the development of theories of firm design, we need to reckon with the hierarchical nature of entrepreneurial cognition. This is not necessarily an overwhelming task, as reputed scholars in human cognition have shown. Be it at the symbolic level or the semantic, existing theoretical and empirical work in cognitive science can help clear a path for us in our research ventures into firm design.

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