

EVOLUTIONARY BIOLOGY RESEARCH, ENTREPRENEURSHIP, AND THE MORALITY OF SECURITY-SEEKING BEHAVIOR IN AN IMPERFECT ECONOMY

Ronald K. Mitchell

Abstract: This article investigates whether there is an underlying morality in the ways that human beings seek to obtain economic security within our imperfect economy, which can be illuminated through evolutionary biology research. Two research questions are the focus of the analysis: (1) What is the transaction cognitive machinery that is specialized for the entrepreneurial task of exchange-based security-seeking? and, (2) What are the moral implications of the acquisition and use of such transaction cognitions?

Evolutionary biology research suggests within concepts that are more Darwin- v. Huxley-based, an underlying morality supportive of algorithm-governed economizing arising from the behaviors that are most worthy of long-term reproduction. Evolutionarily stable algorithm-enhanced security-seeking is argued to be a new view of entrepreneurship, but one that, somewhat ironically, is grounded in a primordially-based entrepreneurial morality that is at the core of economic security.

Introduction

Is there a primordially-based global entrepreneurial drive toward ever-escalating levels of economic exchange—the continual creation of new value-adding transactions that are at the core of economic security (Mitchell, 2001; Venkataraman, 1997)? And if so, is there an underlying morality in the ways that human beings seek to obtain economic security within our imperfect economy that can be illuminated through evolutionary biology research?

Ideas that contribute possible answers to these questions were presented at the Ruffin Lectures on Business Science and Ethics, held at the University of Virginia in April 2002. These lectures, and subsequent research and development, make possible a further assessment of relationships among evolutionary biology research, entrepreneurship, and the morality of security-seeking behavior within the imperfect economy that characterizes our present business and ethical environment.

From Ruffin Lecturers we learned that:

- Social exchange is an ancient, pervasive, and central part of human social life (Cosmides, April 20, 2002);
- Evolutionary biology research leads us to look for things that we otherwise would not search for (Cosmides, April 20, 2002);
- The existential challenge for an organism is to live and adapt while staying ahead of the entropy it creates (Frederick, April 20, 2002);
- The modern corporation (understood by me to represent more basically: the transacting system) is the main life support system for homo sapiens (Frederick, April 20, 2002);
- There are both economizing and algorithmic moral dilemmas posed in the security-seeking process: economizing (transacting) moral dilemmas—because survival requires economizing/ transacting (i.e., it is not an option), and economizing/ transacting produces entropy (the extent of which is variable) that is exported to the community and is *disorder* creating; and algorithmic (cognitive) moral dilemmas—because coalition members within a security-seeking society carry with them ancestral algorithms, which cue prior-age responses (algorithmic impulses) that can be, and often are morally contradictory (Frederick, April 20, 2002).

The foregoing ideas guide the formulation of two more precise research questions that are the focus of this paper: (1) What is the transaction cognitive machinery that is specialized for the entrepreneurial task of exchange-based security-seeking? And, (2) What are the moral implications of the acquisition and use of such transaction cognitions?¹

In this paper I shall explore the four conceptual connections implied by the foregoing questions, those being the relationship between:

- Evolutionary biology research and exchange-based morality,
- Evolutionary biology research and transaction cognitions (economizing/ transacting and algorithmic reasoning/ cognitions),
- Transaction cognitions, entrepreneurship, and security-seeking behavior, and
- Entrepreneurial security-seeking behavior and morality.

Evolutionary Biology Research and Exchange-Based Morality

The presenters during the Ruffin Lectures argued persuasively that there is a relationship between evolutionary biology research and exchange-based morality. Some of the concepts and logic contained in their arguments are as follows:

- Socioeconomic exchange involves an approximate logical form: *If person A provides the requested benefit to or meets the requirement of person or group B, then B will provide the rationed benefit to A:* and

we refer to the resulting behaviors as a social contract. (Cosmides, April 20, 2002);

- This social contract arises in response to the long-enduring problems that humanity faces (Cosmides, April 20, 2002), (e.g., as I interpret these remarks: obtaining food, shelter, and in sum, attaining economic security: “provisions in store for an uncertain future” [Durant, 1935: 2]);
- This social contract also results in cooperative socioeconomic behavior generated by cognitive machinery specialized for that task (Cosmides, April 20, 2002): e.g., a support system;
- The support system that leads to economic security is not the same as the moral system that is created to guide the process (de Waal, April 19, 2002);
- There exists a hierarchy of moral prerequisites that flows from the necessities of operating the support system, which includes (in order) sympathy, norms, reciprocity, getting along, and trust (de Waal, April 19, 2002);
- The support system—which in its essence must accommodate and utilize competition, differs from the moral system—which in its essence must engender reconciliations among competing (group) aims and those of individuals (Margolis, April 19, 2002);
- Evolutionary biology research suggests that exchange-based morality was not devised to subjugate the independent economic interests of individuals, but rather emerged out of the interaction of both individual and group interests (de Waal, April 19, 2002).

Evolutionary Biology Research and Transaction Cognitions

As earlier noted, Frederick has suggested that both economizing and algorithmic-based behaviors have moral implications (Frederick, April 20, 2002). A clear understanding of the nature of economizing (transacting in an imperfect economy), and of algorithmic responses (security-seeking based upon transaction cognitions) is therefore a prerequisite for the analysis of the moral implications of entrepreneurially-driven socioeconomic behavior, one of the key objectives of this inquiry. In the following paragraphs I conduct this analysis by rigorously defining what is meant by the terms: transactions, economic imperfections, and transaction cognitions.

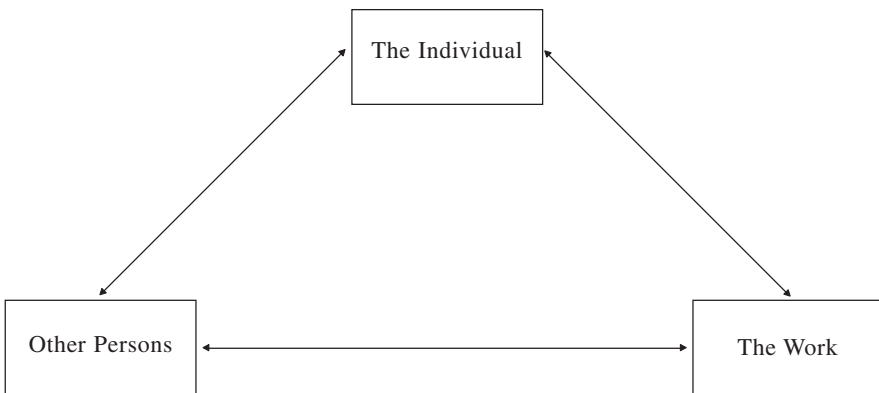
Transactions

Aristotle noted the centrality of transactions when he stated: “There would be no society if there were no exchange” (DelMar, 1968 [1896]: 1). Exchange forms the basis for transacting. A rigorous definition of a transaction ought therefore to specify the irreducible components of exchange. This assertion

poses a challenging question: Does the transaction have a basic form, analogous, for example, to the planetary model developed by Niels Bohr for field of nuclear physics, or the double helix developed by Crick and Watson for the field of genetics?

In his extensive analysis of human creativity, Gardner (1993: 9) relies on a model proposed by Csikszentmihalyi (1988) to explain the essence of a transaction. Each of three components specified—the individual (creator), the work (the creation) and other persons (the other party to the transaction)—adds a necessary element. All must be present at the same time for a transaction to occur. Any two alone are insufficient to accomplish a transaction. Thus, there can be no transaction when an individual offers to transact without creating anything to sell (the work). Nor can a transaction occur where an individual creates a work but has no buyers (other persons) to which to sell. And, the idea of a product (the work) being for sale to buyers (other persons) without a creator (the individual) is undefined. Arguably, then, although a transaction may occur using more elements than the three specified, it may not exist with fewer. A preliminary representation of a basic transaction is shown in Figure 1.

Figure 1
The Elements of a Basic Transaction



Based on Gardner (1993)

However, each component of the transaction introduces imperfections into the exchange. The individual introduces limitations to thinking processes: bounds to rationality; the work by its nature is specific: candles not crops, buns not beer, guns not butter; and other persons introduce opportunism: self-interest seeking with guile. In the following paragraphs, these attributes of an imperfect economy are discussed, and are specified in terms of their effects on transaction basics.

An Imperfect Economy

The two decades encompassing the mid-1960s through the mid-1980s saw the development of economic theories that attempted to relax the neoclassical economic assumption of perfect rationality to take into account behavioral assumptions (Cyert and March, 1963; Nelson and Winter, 1973; Simon, 1979; Williamson, 1975; Williamson, 1985) that more accurately identify the sources of imperfections within an economy. Helpfully, these assumptions also relate economic outcomes to cognitions of individuals about themselves, about others, and about the work that they produce, i.e., cognitions about the elements of the basic transaction (Figure 1).

One of the more comprehensive of these theories is transaction cost economics, which is especially suited to the articulation of the *economizing* roots of moral dilemmas in transacting (Frederick, April 20, 2002), and which specifies three attributes of frequent transacting under uncertainty: bounded rationality, opportunism, and asset specificity (Williamson, 1985: 31). Bounded rationality refers to the cognitions that convert intendedly rational behavior into limitedly rational behavior (Williamson, 1985: 30). Opportunism—a behavioral condition of self-interest seeking with guile (1985: 30)—creates the cognitions of social friction due to moral hazard and distrust. Asset specificity refers to cognitions surrounding the non-trivial investment in transaction-specific (non-redeployable) assets (Williamson, 1985; Williamson, 1991: 79). These attributes create transaction costs, and the attributes themselves arise due to particular cognitions. A brief explanation of these assertions about transaction costs and cognitions follows.

Transaction costs

Transaction costs are defined as the costs of running an economic system (Arrow, 1969: 48), and are one way of describing the entropy that Frederick (April 20, 2002) suggests is disorder-creating as it is exported into the community. The notion of transaction costs is quite useful in the development of a model of transacting in an imperfect economy, because it calls for us to specify the behavioral features of the economic environment that are not perfect—the factors which cause costs, and are therefore at the core of economizing moral dilemmas. Transaction costs in socioeconomic systems are thus thought to be the equivalent of friction in physical systems (Williamson, 1985: 19).

At the organizational level of analysis, the concept of transaction costs has been utilized extensively to argue that hierarchies (firms) and markets are alternative systems for governing transactions based on transaction cost-driven “substitutions at the margin” (Coase, 1937: 387; Williamson, 1975). But there appears to be no reason to suppose that the application of transaction cost-driven substitution at the margin is limited solely to questions of how firms form when markets fail (Coase, 1937). Theoretically, transaction costs could explain a variety of alternative system choices at various levels of analysis, including the individual level.

Thus, for example, there are well-documented instances reported as “prospect theory” (Kahneman and Tversky, 1979) where (in psychological prospect) losses loom larger than gains (1979: 288), and individuals’ actual utility has been found to be less than expected utility—a difference likely due to transaction costs.² Or a person’s choice between a job and self-employment might also be explained by a transaction cost-induced substitution at the margin (a decision to transact with a “boss” v. with multiple customers in a marketplace), as perhaps could success or failure in a job or a venture (“in” or “out” of a particular economic governance system: e.g. “boss” system or industry system).

Cognitions

Cognitions are the algorithmic root of moral dilemmas in the security-seeking process. Thus, there is strong support for an explanation of market imperfections which, though economic, appeals to psychology. In his Nobel Prize acceptance speech, Simon (1979) reaffirmed Marshall’s proclamation that economics is a psychological science (Marshall, 1920; Simon, 1979: 493). Also, Maurice Allais, 1988 winner of the Nobel Prize for economics for his theories on economic markets and the efficient use of resources, advanced (although not included in the Nobel citation) the Allais paradoxes (1953, published by himself over the objections of his reviewers), which—while virtually ignored for several decades—provided a psychological explanation (Lopes, 1994: 203) for irrationality in the economic behavior of individuals (Allais, 1953). Furthermore Arrow (1982), when he observed that failures of the rationality hypothesis in economics are compatible with the observations of cognitive psychologists (Arrow, 1982: 5), pointed to a branch of psychology within which one could look to find relevant models. Thus, generally, there is reason to suggest the use of psychological constructs as the basis for theory that describes security-seeking transacting in an imperfect economy; and specifically, to suggest further examination of the social cognitive model as a theoretical engine that can drive an explanation of important relationships.

Transaction Cognitions

The making of transacting choices among alternatives in economic systems may thus be thought of as relating to the cognitions—specialized mental models (Arthur, 1994)—that surround individuals’ responses to the three previously noted sources of market imperfections: bounded rationality, opportunism, and specificity. This model of entrepreneurially-driven socioeconomic behavior may therefore be characterized as a transaction-cognitive model. Williamson (1985) argues that the world of contract (which may be broadly interpreted to include economic relationships in general, i.e., *social* contract) is variously described as one of: (1) planning, (2) promise, (3) competition, and (4) governance/ hierarchy, depending (respectively in each instance) upon the presence/ absence combination of the sources of market imperfections as illustrated in Table 1 (as adapted from Williamson, 1985: 31).

Table 1
Some Attributes of the Contracting Process

<i>Behavioral Assumption</i>			<i>Implied Contracting Process</i>
<i>Bounded Rationality</i>	<i>Opportunism</i>	<i>Asset Specificity</i>	
0	+	+	Planning
+	0	+	Promise
+	+	0	Competition
+	+	+	Governance

0 = absence

+ = presence

Adapted from Williamson (1985: 31)

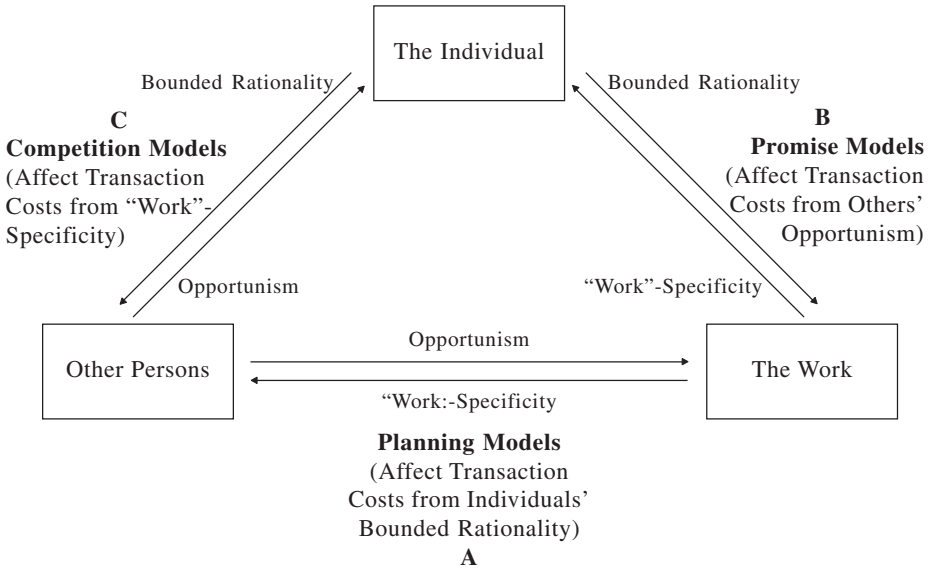
Interestingly, although his argument appears to be bi-directional, Williamson utilizes only one of the directions in his analysis of hierarchies v. markets. That is, he suggests (for example) that the absence of bounded rationality in the presence of asset specificity and opportunism implies planning (i.e., bounded rationality is inversely related to planning); but leaves under-utilized the logical extension that planning should therefore be useful in managing situations characterized by those same two conditions (because planning reduces transaction costs that arise from bounded rationality). The same logic follows for transaction costs created by opportunism and asset specificity. Each (respectively) should be affected by promise (trust) and by competition (value-based bargaining).

Thus, the specialized mental models that individuals possess about planning (e.g. mental models that assist in developing analytical structure to solve previously unstructured problems), promise (mental models that help in identifying and prioritizing stakeholders thereby building trust in economic relationships), and competition (specifically mental models that can create bargaining positions—small or large³), are expected to impact the success of transacting as a security-seeking behavior. The utilization of transaction costs through the employment of specialized cognitions has significant implications for transacting in an imperfect economy.

As noted previously, transaction cognitions about the self, the work, and others are impacted by bounded rationality, opportunism, and what might in its general form be termed “work”-specificity. That is, cognitions about the self in relationship to the work and others are shaped primarily by bounded rationality. Correspondingly, cognitions about other persons, in relationship to the individual and the work, are shaped primarily by opportunism. And finally, cognitions about the work in relationship to the individual and others are shaped primarily by work-specificity. It stands to reason, then, that cognitions about any of the dyad-based relationships (e.g. individual/ work) will be primarily

shaped by only two of the three behavioral conditions if influenced by the specialized mental models identified in the preceding paragraphs. Williamson’s analysis suggests in the general transacting case, that planning therefore ought to influence the effects of transaction costs related to bounded rationality when constrained by work-specificity and opportunism, etc. as illustrated in Figure 2.

Figure 2
The Source of Transaction Cognitions



Based on Gardner (1993) Williamson (1985)

Figure 2 illustrates the likely effects of specialized cognitions about planning, promise, and competition, and in doing so provides the basis for a rigorous derivation of transaction cognitions. That is, to the extent that individuals possess or can gain the specialized algorithmic knowledge for planning, promise, and competition, their ability economize on the transaction costs that impact the dyadic relationships illustrated should be enhanced. If the objective of entrepreneurially driven socioeconomic behavior is to increase economic security through the success of transactions, then entrepreneurial security-seeking behavior can be characterized as the utilization of transaction cognitions to economize on transaction costs.

Evolutionary biology research suggests the existence and profound influence of primordially-sourced cognitive machinery that has been specialized for social exchange-based tasks (Cosmides, April 20, 2002). And in his Ruffin lecture, Frederick (2002, Figure 2) suggests in his analysis of the natural substrate that gives rise to phenomena such as transaction cognitions, the equivalent of planning, promise, and competition cognitions.⁴ I now turn to a discussion of the relationships among transaction cognitions, entrepreneurship, and security-seeking.

Transaction Cognitions, Entrepreneurship, and Security-Seeking

For most people, the accepted way to accomplish economic security is getting and keeping a stable job. However, this course of action is becoming less and less reliable as Western economies yield to the pressures of globalization (Friedman, 2000). Some commentators have begun to claim that for many Americans, economic security no longer exists (Mandel, 1996). One response to this growing economic insecurity is the increasing emphasis on entrepreneurship in both the private and public sectors of the economy. In response to such interest, the research community has expended extensive effort to better understand entrepreneurship (please see for example reviews by Duchesneau and Gartner [1990] and Wortman [1987]), under the implicit assumption that should entrepreneurship be better understood, more jobs might be created (Birch, 1981; Birley, 1986; Kirchoff and Greene, 1995; Kirchoff and Phillips, 1988), with a resultant increase in economic security.

Figure 3 illustrates the three decision zones in this security-seeking process. Interestingly, the three previously identified sets of transaction-cognitions appear to apply sequentially to this decision process as also shown in the decision tree diagram. In a 1986 study, Leddo and Abelson (1986: 121) noted that cognitive scripts occur in a decision order that begins with "entry" and then proceeds to "doing." Read (1987) also documents that scripts proceed according to a known or relatively standard sequence.

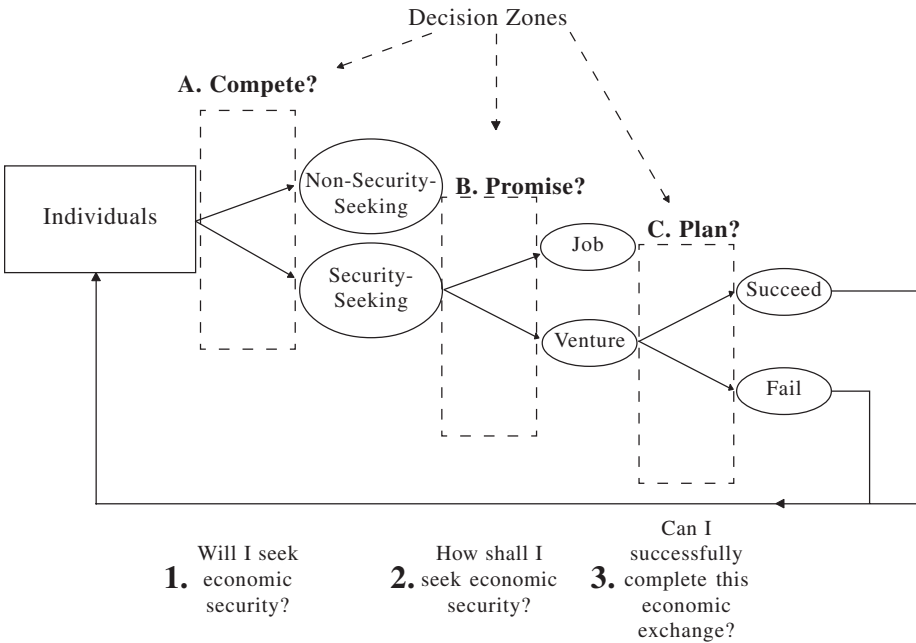
The transacting sequence illustrated is no exception (Mitchell, 2001; Vesper, 1996). The decision sequence in the accomplishment of economic results proceeds with the successive answering of the following age-old economic questions:

1. Will I seek economic security? (Will I prepare something of economic value to offer?)
2. How shall I seek this economic security? (Can I agree upon a socioeconomic exchange with another person or group?) and,
3. Can I successfully complete this economic exchange? (What will I do to deliver on this promise?)

Put in terms of transaction cognition theory, the cognitive scripts required to support/ or not support the accomplishment of economic results can be represented by the decisions that must be made to answer the foregoing questions. These choices are also represented in the decision tree shown in Figure 3 (p. 272).

As a general model, this depiction permits us to represent people's use of transaction cognitions as three steps in a standard sequence. Through the successive use of Competition, Promise, and Planning cognitions as steps in a standard decision sequence, individuals attain greater economic security through successfully completing transactions.⁵ Thus, using transaction cognition theory we can derive a simple representation of the cognitive machinery that is specialized for the tasks of the security seeker. This observation suggests that an investigation of the workings of the cognitive transaction process

Figure 3
Security-Seeking Decision Tree



might lead to a better understanding of entrepreneurially driven security-seeking in imperfect markets.

Why does the process of security-seeking by individuals work the way that it does? To account for the empirical evidence available with respect to individuals' security-seeking decisions (as revealed by demographic research), it is necessary to identify the reasons for the security-seeking *status quo* behaviors of individuals in an imperfect economy. In the process, I seek in answer to the questions highlighted by the decisions illustrated in Figure 3 (Why do some people seek economic security while others do not? Why do some seekers of economic security choose job employment while others choose self-employment? and, Why do some entrepreneurially driven security seekers succeed, while others fail?), to examine the morality of security-seeking behavior in an imperfect economy through the lens of evolutionary biology research.

Entrepreneurial Security-Seeking Behavior and Morality

The diagram in Figure 3 graphically illustrates the alternatives available to economic security-seeking individuals.⁶ As shown, some people don't seek economic security; some don't venture (utilize entrepreneurially based behaviors to seek economic security); and some don't succeed whether they venture or not. Echoing Coase (1937) cited earlier in the article, each of these choices involves making

substitutions at the margin, based upon the influence of entropy as represented by transaction costs. If theoretically robust, the model that has been developed should provide an explanation for the choices made by individuals in each of these three decision zones, and should also provide the basis for the assessment of the moral dilemmas posed by entrepreneurially-based choices.

The moral implications of the choice-making process in economic security-seeking can be assessed from a variety of vantage points (and has been in various forms and in a variety of non-evolutionary biology research settings e.g., (Kant, 1909; Rawls, 1971; Weber, 1985 [1930]), and others). However, of particular applicability to this analysis is an assessment of the moral implications of entrepreneurially-driven security-seeking behaviors using the lens offered by evolutionary biology research. In the following paragraphs I first summarize some of the pertinent concepts offered by Ruffin Lecturers, and then second, demonstrate how these ideas can be used to assess moral implications of the security-seeking sequence (Figure 3).

Concepts from Evolutionary Biology Research

Each of the Ruffin Lecturers presented concepts from, or in relationship to, evolutionary biology research that have implications for assessing the moral implications of economic behaviors. It is my intention in this section to present concepts that appear to be applicable, to thereby assemble a rough evolutionary biology-based framework for use in the assessment of the moral implications of the entrepreneurially-driven security-seeking behavior that occurs within our imperfect economy. These concepts, summarized in order of each distinguished lecture, are as follows:

1. Frans B. M. de Waal—April 19, 2002. In his Ruffin Lecture entitled “Monkey Business and Business Ethics: Evolutionary Origins of Human Morality,” Professor de Waal suggested following:

- The degree to which the tendency to develop and enforce moral systems is universal across cultures, suggests that moral systems do have biological origins and are an integral part of human nature;
- Common benevolence nourishes and guides all morality, but its morality is based upon reciprocity;⁷
- Unlike simultaneous co-operation or mutualism, reciprocal altruism involves exchanged acts that, while beneficial to the recipient, are costly to the performer (and, by extension, occur in sequence).

2. Paul R. Lawrence—April 20, 2002. The following concepts from the Ruffin Lecture by Professor Lawrence entitled “The Biological Base of Morality” further contribute to the assessment of the morality of entrepreneurially-driven security-seeking behavior:

- Morality arises primarily from the existence in humans of the drive to bond with others, which, as suggested by Darwin (1894) occurs “due to the small strength and speed of man, and the want of natural weapons.”

- Morality also arises because “good” can be defined in terms of the support of human drives as follows:

Drive	Rationale for What is Good
Acquisition	Preserving property; facilitation of pleasurable experiences
Bonding	Keeping promises; fair dealing
Learning	Telling the truth; sharing information; respecting another’s beliefs
Defense	Helping v. harming; Protecting; Not abandoning

3. Leda Cosmides—April 20, 2002. Professor Cosmides, in her Ruffin Lecture entitled “Breaking Faith: The Evolutionary Psychology of Moral Reasoning and Moral Sentiments,” suggested additional concepts from evolutionary biology research:

- Willingness to participate in a collective action is a public good (i.e., is moral);
- Incentives in many collective action problems (citing game theoretical analyses) are insufficient to promote voluntary contributions by individual, and instead favor free riding as the equilibrium outcome;
- Willingness to participate in collective action (contribute to the public good) can be evolutionarily stable as long as free riders are punished, along with those who refuse to punish free riders.

4. William C. Frederick—April 20, 2002. Entitled “The Evolutionary Firm and Its Moral (Dis)Contents,” the Ruffin Lecture by Professor Frederick contributes the following as concepts that are relevant to the assessment of the morality of entrepreneurially-driven security-seeking behavior:

- The evolutionary firm is an internal and external contradiction due to diverse neural algorithms;
- Nature has bequeathed the motivator-driver function to humanity; and it is not likely to go away (and, quoted with permission):

Business firms are first and foremost economizing organizations, made that way by nature. The firm’s moral problems arise from contradictions rooted in behavioral impulses of the human psyche in interaction with an entropic universe. Culture and reason can channel, moderate, and reconfigure—but cannot eliminate—these behavioral predispositions. Virtuous character can confront but not seriously deflect the natural course of embedded neural algorithms. Social contracts can design but cannot enforce or guarantee fair exchanges. Stakeholder claims on the corporation cannot exceed or violate the firm’s entropic limits. Philosophic principles and ideals not consistent with the firm’s natural architecture cannot be expected to stand.

- Moral action is a reconciliation, using adaptation, survival, creativity, experimentation, exploration, imagination, and expansion of the quantity and quality of life.

5. Edwin M. Hartman, April 21, 2002. In this final Ruffin Lecture, entitled “De Rerum Natura,” Professor Hartman suggested the following:

- If a certain trait or attribute contributes to the continuation of a community, that is reason for calling it a virtue;
- We want to avoid an evolutionary view of society that however, simply equates morality with viability and adaptability, because a society can be viable but bad; and (quoted with permission):

Human beings . . . may have problems with free riders ruining the commons because each of us can assess the selfish advantages of being a free rider. There is good moral reason to create communities in which people do not ride free. It requires some combination of developing mechanisms for enforcing cooperative behavior and encouraging people to think differently about what might motivate them. That is, we have to think about both politics (including the politics of organizations) and morality, and we have to think about them together. To put it in Aristotelian terms, human beings are (both) rational animals and political animals.

- Reciprocal altruism entails sacrificing self-interest—that is, the opportunity to be a free rider—by cooperating in support of the commons;
- Aristotle too holds that good citizenship in a good community is essential to being a good person: in fact, a good community is a necessary condition of being a good person. He also claims that a person of good character enjoys doing the right thing;
- (Morality) is about treating humanity in all its forms as an end in itself. It involves principles, which systematize our intuitions.

A Preliminary Assessment Framework

From the principles offered by Ruffin Lecturers, we can construct a preliminary assessment framework. Morality criteria⁸ summarizing these comments are presented in Table 2.

Table 2
Selected Morality Criteria from Ruffin Lectures

Ruffin Lecturer	Selected Morality Criteria—Behavior is moral when based upon:
Frans B. M. de Waal	Common benevolence rooted in reciprocity
Paul R. Lawrence	The support of human drives: acquisition, learning, bonding, defense
Leda Cosmides	Punishment of free riders along with those who refuse to punish free riders
William C. Frederick	Reconciliation of economic imperatives using a values hierarchy
Edwin M. Hartman	Good citizenship while treating members of humanity as ends in themselves

What is to be assessed using these criteria? The security-seeking decision tree (Figure 3) suggests that the object of assessment should be the decisions that lead to security-seeking behaviors because the transaction cognition model of security-seeking that has been developed herein is intended to: (1) provide the cognitive context for the economizing choices made by individuals in each of these three decision zones, and (2) provide the basis for the assessment of the moral dilemmas posed by such choices.

Each decision illustrated in Figure 3 has moral implications. Decision 1 (Compete?) while doubtless involving the individual choice between security-seeking and non-security-seeking, also requires a decision of whether or not to contribute to the commons. In this regard, some of the dilemmas/ questions that occur at this decision point call for moral assessments regarding free riders, disabled persons, and a determination of the nature of acceptable modes of competition.

Decision 2 (Promise?) requires the specification of what ends (in the form of social contracts) will be agreed to in the security-seeking process. This second decision zone entails the evaluation of the job v. venture choice (and with it the level of risk and uncertainty that it is moral to ask/ permit to be assumed), as well as the evaluation of the validity of underlying motives of a security-seeking system that enables venturing to become a viable security-seeking choice.

Decision 3 (Plan?) requires the specification of what means will be chosen to accomplish the agreed upon ends. Some of the dilemmas/ questions that occur at this stage of the analysis include: the examination of our definitions of success, and what behaviors are defined to be permissible for its attainment; reflection upon the extent to which we are to condone the success-driven treatment of human beings who participate in the production of products or services as means v. ends.

Thus, based upon criteria selected from the remarks of Ruffin Lecturers (Table 2), the contents of each set of essential transaction cognitions (competition, promise, planning) suggest morality criteria as shown in Table 3 (p. 277).

Using these criteria, then, it is possible to examine morality aspects of decision making at each stage in the transaction sequence: security-seeking, venturing, and success or failure.

Security-Seeking

Because it is at this beginning point in the security-seeking process (Figure 3, point A) that the decision is made whether to bargain/ exchange/ transact, or not, the choice between security-seeking and non-security-seeking invokes the specialized mental models that individuals possess about competing economically (specifically mental models that can create bargaining positions—small or large⁹). The reasons that some people do not engage in economic security-seeking flow from the definition of the construct—the need for economic security—itself. Where the need for economic security is defined to be the desire to have “provisions in store for an uncertain future” (Durant, 1935: 2), then

Table 3
Implications of Morality Criteria for Security-Seeking Decisions

		<i>Implications for security-seeking decisions based on:</i>		
Ruffin Lecturer	Morality Criteria	[1] <i>Competition Cognitions:</i> Mental models that can create bargaining positions—small or large Decision to compete or not:	[2] <i>Promise Cognitions:</i> Mental models that help in identifying and prioritizing stakeholders thereby building trust in economic relationships Decision on choice of ends:	[3] <i>Planning Cognitions:</i> Mental models that assist in developing analytical structure to solve previously unstructured problems Decision on choice of means:
de Waal	Common benevolence rooted in reciprocity	For the able, exchange-based security seeking is good; non-exchange based security seeking (e.g., robbery) is bad	Moral promises should provide for two-way and mutually beneficial exchanges	Moral plans are reciprocal over the long term, which suggests long- AND short-term planning
Lawrence	The support of human drives: acquisition, learning, bonding, defense	Security seeking decisions that add to/preserve property (provisions), or that help, protect, or prevent abandonment, are moral	Decisions that lead to keeping promises and fair dealing in forming economic relationships are moral	Plans for goal attainment consistent with acquisition, learning, or not harming are moral
Cosmides	Punishment of free riders along with those who refuse to punish free riders	Non-security-seeking behaviors should be closely scrutinized for free riding (e.g., welfare fraud audits)	Choice to accomplish (promise) job or entrepreneurship is moral where optimal contribution is enabled (e.g., intellectual property protections, protections of bankruptcy laws, fair labor standards, etc.)	Plans and systems should provide for detection and punishment of free riders
Frederick	Reconciliation of economic imperatives using a values hierarchy	Prima facie morality of both security and non-security-seeking behavior should be assessed	Values-consistent jobs and venture should be encouraged	Means must be reconciled with, v. justified by, ends
Hartman	Good citizenship while treating members of humanity as ends in themselves	Competing or not competing within market systems is moral depending upon both the quality of society and quality of life for its members	Promises that are more stakeholder-impact-based are better than those that are narrow-beneficiary-based	Humanity and citizenship-supportive plans are those most sought

logically, the reason why an individual may not be seeking economic security should relate to the absence of this need. According to the definition, absence of the need for economic security, and therefore the choice of non-security-seeking behavior, could arise due to lack of desire, lack of uncertainty, or both, each with moral consequences.

For example, in every society there are individuals who lack the desire or ability to accumulate provisions in store. The lens of evolutionary biology research can help us to assess the morality of such choices. The economizing stance characterized by this lack of desire/ ability to accumulate might (non-exhaustively) be due to a specific value choice (e.g. self-denial for a spiritual purpose), due to age (e.g. individuals too young or old to care for themselves), due to a disability (e.g. lack of awareness of need due to developmental difficulties), or merely due to an individual judgment that provisions in store are sufficient given the perceived level of uncertainty (e.g. an individual or a societal group is rich, or rich enough), which of course also varies by case. In other instances, the accumulations (such as savings and pension) might be perceived by an individual to be adequate given the present level of uncertainty, but inadequate in times of high inflation, war, or natural disaster. Thus—depending upon the case—society, parents, or individuals themselves provide for the economic security of non-security-seeking individuals.

Further, due to perceptions of an individual's circumstances when compared to perceptions of opportunity or threat in the environment, variations occur in levels of uncertainty. Thus, the level of security-seeking, and thereby the propensity to “compete” might be higher or lower given specific circumstances. As previously argued, economizing on transaction costs is expected to account for the alternatives: non-seeking v. seeking. For those who do not seek economic security, the transaction costs of competing for it are just too high. For those seeking economic security, the transaction costs of *not* seeking it are unacceptable. Thus there is reason to expect that,

Proposition 1: The choice between security-seeking and non-security-seeking behavior is associated with transaction cost minimizing substitutions at the margin of one state of seeking for its alternative.

This proposition, while appearing to be morality-neutral because ostensibly it is driven by the notion of cost minimization, nevertheless has implications that can be evaluated according to morality criteria suggested by evolutionary biology research. For example, we can intuitively assess the non-security-seeking decisions of the young, old and/ or disabled as being moral using the criteria summarized in Table 3, Column [1]. It is also intuitive to expect that punishing the non-security-seeking decisions of economic free riders will be deemed to be moral under Cosmides' criteria; or that regulations to limit restraint of trade or unfair competition practices are moral under criteria offered by de Waal. Perhaps less intuitive might be the use of evolutionary-biology-research-based criteria to assess the morality of those individuals and groups whose decisions and behaviors have the potential to damage the security-seeking system itself.

For example, questions relating to the morality of anti-globalization or anti-WTO protest—as phenomena that can impact the viability of the prevailing security-seeking system (a global economy)—may also be assessed using the criteria summarized in Table 3, Column [1].

Venturing

Once the group of individuals who are not security-seeking are accounted for in the model (Figure 3), the status of the remaining individuals¹⁰ may be described using either the level of venturing, or the level of job-holding—since these alternative states of economic security-seeking appear to be reciprocal. Making the choice between venturing or job-holding requires the use of the algorithms that individuals possess about promise (mental models that help in identifying and prioritizing stakeholders thereby building trust in economic relationships) to predict which course or action is likely to be more reliable. Promise-based cognitions assist individuals in assessing the likelihood that those with a “stake” (Clarkson, 1995; Mitchell, Agle, and Wood, 1997) in the economic well being of that individual will, in fact, contribute to economic security.

The transaction-cognitive model developed in this article appears to shed light on this decision point also. As noted earlier in the article, transaction costs represent the consequences of socioeconomic friction on economic security-seeking, and thereby enable the model to account for a variety of “alternative-system” substitutions at the margin. Under these assumptions, the social commitments made by individuals—such as choosing a job v. self-employment—ought to be related to costs that attend the transactions associated with that social choice. Thus, where the mental models of an individual might result in work-specificity (whether the preferred work is job- or self-employment) the costs of transacting in the alternative system become prohibitive. For example, if my mental models for security-seeking center on “work that I like and can do,” and if work that I like and can do involves using highly sophisticated equipment that is only available to people who take jobs in particular organizations, I may have high transaction costs relative to self-employment and see more “promise” in employment with such an organization. Alternatively, if I have been raised in a setting where the self-employment algorithms have been readily available and have been internalized by me with positive self-efficacy (Gist and Mitchell, 1992), then I may have high transaction costs relative to seeking job employment, and see more promise in a venture. The transaction-cognitive model is therefore likely to account—through a logical extension of transaction cost economic theory—for the broad range of social commitment/ promise decisions made in pursuit of economic security. Accordingly it is expected that:

Proposition 2: The choice between job v. venture employment is associated with the transaction cost minimizing substitution at the margin of one state of individual transacting for its alternative.

Proposition 2 appears to suggest that this second decision in the security-seeking sequence (Figure 3, point B) might also be a morality-neutral cost-based calculation of sorts. But while the extent of calculation v. visceral reaction to the choice of ends (what shall I do to obtain/ enhance my economic security?) may vary somewhat by individual or by societal group, it appears to be likely that this decision has moral implications to which evolutionary-biology-research-based criteria apply using, for example, the criteria summarized in Table 3, Column [2]. Recall that according to transaction cognition theory, promise cognitions are the algorithmic basis for making this decision, and that promise cognitions are defined to be: mental models that help in identifying and prioritizing stakeholders thereby building trust in economic relationships. Based on promise cognitions, individuals are therefore expected to assess the likelihood that stakeholders (those with a “stake” (Clarkson, 1995; Mitchell, Agle, and Wood, 1997) in the economic well being of that individual) will, in fact, contribute to their economic security.

In the venturing case, the assessment of such a promise is an assessment of ends in two respects: (1) because the focus of this choice is the selection from among a variety of economic relationships with potential stakeholders, those economic relationships that have the most promise to produce economic security, and (2) because the venture that results from this nexus of relationships (Hill and Jones, 1992) does itself make both express and implied promises to stakeholders, and these promises have consequences beyond those that strictly apply to the entrepreneur. As such, the decision to venture to gain economic security can also be assessed using the principles offered by evolutionary biology research.

Accordingly, in the first case, that of attempting to assess the morality of the individual choice between job- or venture-based security-seeking, one might apply the concepts articulated by Lawrence and Cosmides (Table 3, Column [2]). Lawrence suggests concepts that lead us to regard either choice that is made and enacted according to fair dealing, to be moral. Cosmides suggests that the moral choice for individuals is the one that leads to the making of an optimal contribution. Furthermore, where institutional barriers, or barriers due to cultural norms exist, then the incidence of decisions to venture v. to hold a job might be expected to vary (Mitchell et al., 2000; Mitchell et al., 2002b), and the reasons for such variations (institutions, culture, etc.) might have moral significance that merits analysis.

In the second case, that of attempting to assess the morality of underlying motives of the security-seeking (economic) system that enables venturing to become a viable choice, one might utilize criteria offered by Frederick and by Hartman (Table 3, Column [2]). Frederick encourages values consistency in promise-based choices, and Hartman’s lecture may be interpreted to suggest the superiority of promises that are more stakeholder-impact-based, than those that are narrow-beneficiary-based. Thus, where the motive purpose of ventures (Mitchell, 2002) is recast from the maximization of profits for stockholders to serving the interests of stakeholders (Venkataraman, 2002: 54) one can assess

as more consistent with the moral principles suggested by evolutionary biology research, a conception of the venture that is broader v. narrower in its citizenship (Mitchell, 2002: 224). This is because in the case of the former, an entrepreneur creates a venture within an environment of genuine uncertainty, by assembling resources to pursue an opportunity through ensuring fixed payments to other parties such as employees and suppliers, and by retaining residual rights (Dew, Velamuri, and Venkataraman, 2003: 2; Knight, 1921). The right to the residual is often construed to limit the moral scope of the venture to production-essential stakeholders at its widest, and to only stockholders at its most narrow. In the case of the earlier-noted broader conception of the venture, such a firm is created through a social contract of mutual promise to share in benefits and costs (v. only in revenue and expenses), which thereby widens the scope of accountability within which the morality of the decision to venture and consequent venturing behaviors can be assessed (Mitchell, 2002).

Success or failure

The third decision that every security-seeking and, venturing individual must make from time to time, is whether or not it is possible to remain so engaged—a decision we can term the success or failure decision (Figure 3, point C). Transaction cost theory suggests that an alternative governance system will be invoked when the costs of organizing an extra transaction within the existing governance system become equal to the costs of carrying out the same transaction through an exchange on the open market (Coase, 1937: 396). Thus, when exchange behavior is no longer effective, transaction costs will drive the transactions into the open market (i.e. a venture will fail). Thus, transaction failure and venture failure are closely related (Venkataraman, Van de Ven, Buckeye, and Hudson, 1990). According to the transaction-cognition model, ventures fail when plans fail, because the mental algorithms that individuals possess about planning (e.g. mental models that assist in overcoming the limitations of bounded rationality) are expected to impact the economizing on transaction costs to effect success in transacting.

This simple but powerful idea appeals to the very essence of transaction cost economics: in short, confirming the notion that economizing (on transaction costs) is the best strategy/ plan (Williamson, 1991: 76, 90). Williamson suggests that transaction cost economizing (e.g. waste elimination) can have as much as a 10:1 influence on results as compared to the effect of the ordinary cost and pricing decisions made in exchanges (1991: 79). It stands to reason then—once again using the other half of this bi-directional argument—that lack of a plan for transaction cost economizing will have a great deal to do with the failure of security-seeking behaviors. For example, the plan to manage opportunism in a competitive marketplace can save a job or save a customer, which is a far more important result than the successful negotiation of wage rates, or sale prices. It is likely that the success or failure of ventures will be highly correlated with the effective planning for (first order economizing on (Williamson, 1991: 78)) transaction costs—a huge public policy opportunity (e.g., cut waste, not wages; increase productivity, not prices). Thus it can be expected that,

Proposition 3: The choice between venture success and failure is associated with the transaction cost economizing substitution of hierarchy for its alternative, the market, at the margin.

Proposition 3 suggests that success or failure involves an element of cognitive choice, contrary to the research-literature-rejected, but still popular-press-accepted conventional wisdom (Mitchell et al., 2002a). And where there is conscious choice, success or failure decisions cannot be stripped of their moral consequences. Thus, according, for example, to de Waal, plans that lead to short-term “success” (say, quarterly profits) that do not include long-term reciprocity (say, environmental sustainability) cannot be considered to be moral plans (Table 3, Column [3]). Or, according to Cosmides notion of Darwinian selection (which is not *survival of the fittest* but is rather *survival of the fittest to reproduce necessary behaviors*), plans that lead to evolutionary instability (e.g., plans that fail to detect and punish free riders, or further, plans that restructure ventures—such as laying people off—without regard to their skill at reasoning procedures involving social conditionals of exchange, interpreting their meaning, and successfully solving the inference problems they pose) would be a morally questionable planning decision on the choice of means.

Planning decisions, as decisions involving the choice of means, also have more far-reaching moral consequences, especially as they relate to the propensity of decision makers who view the business firm in technical-rational terms (Scott, 1987), and consequently view human beings to be means of production v. as ends in themselves. Both Hartman and Frederick (Table 3, Column [3]) are adamant on the moral necessity for recognizing *homo sapiens* as ends.

Conclusion

The notion of an imperfect economy—one where perfect, logical, deductive rationality rarely, if ever, prevails—has been used to denote a marketplace where individuals’ rationality is bounded due to complexity, and the inability to perfectly predict the actions of others (Simon, 1979). Such a setting demands that individuals utilize inductive and/ or algorithmic reasoning to be able to identify patterns within the complexity, to simplify decisions by using previously identified patterns to construct adaptable mental models/ hypotheses/ schemata, and to continually test these mental models for usefulness, replacing those with bad track records and retaining those with good ones (Arthur, 1994: 406). In an imperfect economy, therefore, the mental models that individuals possess about the best ways to satisfy security needs, compete for preeminence within the minds of individuals, and also between individuals (1994: 409).

As argued by Ruffin Lecturers and in other research articles (e.g., Holland, Holyoak, Nisbett, and Thagard, 1986), this competition forms an ecology of cognitions that evolves over time. In this article I have argued that security-seeking individuals utilize such cognitions subject to the friction of transaction costs that arise from bounded rationality, opportunism, and asset specificity

(Arrow, 1969: 48; Williamson, 1985: 19, 31), and that as a result a reliable security-seeking sequence exists that can be assessed for moral implications, using principles from evolutionary biology research.

Is there therefore an underlying morality in the ways that human beings seek to obtain economic security within our imperfect economy? Conclusions drawn from the analysis in this article suggest both the feasibility of a systematic explanation for security-seeking decisions in an imperfect economy, and a means for assessment of the moral implications of such decisions using concepts from evolutionary biology research. What emerges is an underlying morality that originates in the evolutionarily long-lived notions of (for example): reciprocity (de Waal), consonance with the basic human drives (Lawrence), discouragement of free riding (Cosmides), values-based dilemma reconciliations (Frederick), and good citizenship—where human beings are ends, not means (Hartman). The emergence within evolutionary biology research, of concepts that are more Darwin- v. Huxley-based, suggests an underlying morality supportive of algorithm-governed economizing arising from the behaviors that are most worthy of reproduction. The morality of security-seeking behaviors in an imperfect economy may thus be assessed based upon the likelihood that such behaviors will be evolutionarily stable.

Thus, if the continual creation of ever-increasing levels of new value-adding transactions in a modern economy by ever-increasing numbers of entrepreneurs is a global innovation, then it seems prudent to observe that the conditions are now ripe for society to move from producing entrepreneurial security seekers who are idiosyncratic early adopters (old-style entrepreneurs), to producing entrepreneurial security seekers who are systematically trained in the necessary cognitions/algorithms (sustainable entrepreneurs). It is appealing, therefore, to consider the logical outgrowth of this reasoning: the prospect that economic security is, in fact, compatible with entrepreneurship (a notion that—without the lens offered by evolutionary biology research—would not be intuitive); and is also consistent with a conception of morality that is supported by research in evolutionary biology. This, because new cognitions (algorithmic responses) can produce entrepreneurial behavior that is more secure: sustainable entrepreneurship that creates social and environmental sustainability, in addition to economic sustainability.

Although the articulation of many of the fine points, the exploration of new research questions, and the empirical testing of the propositions suggested remains to be accomplished, new maps (as Cosmides persuasively argues) appear to suggest new methods. Evolutionarily stable algorithm-enhanced security-seeking represents a new view of entrepreneurship, but one that is grounded in a primordially-based entrepreneurial drive that is at the core of economic security. And, according to the foregoing analysis, this new “sustainable” entrepreneurship appears to be possible across all imperfect market economies. The critical question which then remains for twenty-first century society to answer is this: People wanted security—did entrepreneurship deliver?

Notes

1. Henceforth within this article, the term “cognitions” may be taken to mean algorithms (e.g., Frederick, April 20, 2002) and, alternatively, cognitive machinery (e.g., Cosmides, April 20, 2002) or mental models (Arthur, 1994).

2. Prospect Theory (Kahneman and Tversky, 1979) provides one of the clearest illustrations of the transaction costs that arise from bounded rationality. Essentially Kahneman and Tversky found that the actual value of economic choices made by individuals (actual utility) was less than the possible value (expected utility) because individuals ignored or overweighted highly unlikely events, or neglected or exaggerated highly likely events due to: *reflection effects* (emphasis in original)—risk aversion in the positive domain and risk seeking in the negative (1979: 268), and *isolation effects*—disregarding the commonly shared attributes of decisions to focus on the distinguishing ones (1979: 271). According to Prospect Theory, these effects arise due to cognitive errors that occur in individuals’ *coding, combination, and/or cancellation* (1979: 274) of relevant information, which taken together limit/bound rationality.

3. A small numbers bargaining position occurs when, if you are a seller for example, and the number of sellers is small, negotiations in the transacting process lead to a division of the surplus that would not be the case in a competitive market. (That is not to say that the negotiation is not competitive, only that the seller for example, is able to raise the price above his lowest acceptable sale price in the course of the negotiation.) A large numbers bargaining position occurs when, if once again you are a seller and the number of sellers is large, negotiations in the transacting process are more perfectly competitive, and lead to prices that are at or near the point of lowest acceptability.

4. Although in a different order, the parallels suggested (with the three center constructs in the model in Frederick’s Figure 2) are planning: organizer/ coordinator, promise: innovator/ generator, and competition: enabler/strategizer.

5. The reader is invited to note that Figure 3, as bounded by the limits of the analysis attempted in this paper, illustrates only the entrepreneurially driven security-seeking pathway to increased economic security.

6. Note: However, if all pathways were illustrated, the diagram would represent an extensive form game (Watson, 2002: 9) and would thereby be further linked to the concepts suggested by evolutionary biology research, as noted by Cosmides (April 20, 2002).

7. The Ruffin Lecturers appear to use the terms reciprocity, reciprocal altruism, and social exchange interchangeably.

8. Please note that these criteria do not purport to represent the fully developed argument of a given Ruffin Lecturer. Rather, they are selected and presented to support an illustration of the manner in which concepts developed within evolutionary biology research can be applied to assess some of the moral implications of the security-seeking sequence represented in Figure 3.

9. See note 3, above.

10. Admittedly there are those who at this point in the sequence choose to engage in ventures or jobs who have low levels of security-seeking (e.g. they engage for the fun, the challenge, or a passion, more than for the security). Although there may be reason to examine the theory developed herein for application to non-security-seeking venture v. job, and non-security-seeking success v. failure decisions at the margin, such an analysis is beyond the scope of this article and is therefore left for subsequent consideration.

Bibliography

- Allais, M. 1953. Le comportement de l'homme rationnel devant le risque: critique des postulats et axiomes de l'Ecole Americaine. *Econometrica* 21: 503–546.
- Arrow, K. J. 1982. Risk perception in psychology and economics. *Economic Inquiry* 20: 1–9.
- , ed. 1969. *The organization of economic activity: Issues pertinent to the choice of market versus nonmarket allocation*. Washington, D.C.: U.S. Government Printing Office.
- Arthur, W. B. 1994. Complexity in economic theory: Inductive reasoning and bounded rationality. *AEA Papers and Proceedings* 84(2): 406–411.
- Birch, D. A. 1981. Who creates jobs? *The Public Interest* 65: 3–14.
- Birley, S. 1986. The role of new firms: Births, deaths, and job generation. *Strategic Management Journal* 7(4): 361–376.
- Clarkson, M. B. E. 1995. A stakeholder framework for analyzing and evaluating corporate social performance. *Academy of Management Review* 20(1): 92–117.
- Coase, R. H. 1937. The nature of the firm, *Economica* New Series 4. In *Readings in Price Theory*, ed. G. J. Stigler and K. E. Boulding. Homewood, Ill.: Irwin: 386–405.
- Cyert, R. M., and J. G. March. 1963. *The Behavioral Theory of the Firm*. Englewood Cliffs, N.J.: Prentice-Hall.
- DelMar, A. 1968 (1896). *The Science of Money* (2nd ed.). New York: Franklin.
- Dew, N., R. Velamuri, and S. Venkataraman. 2003. Dispersed knowledge and an entrepreneurial theory of the firm. *Journal of Business Venturing* (forthcoming).
- Duchesneau, D. A., and W. B. Gartner. 1990. A profile of new venture success and failure in an emerging industry. *Journal of Business Venturing* 5(5): 297–312.
- Durant, W. 1935. *The Story of Civilization*. New York: Simon and Schuster.
- Friedman, T. L. 2000. *The Lexus and the olive tree*. New York: Anchor Books-Random House, Inc.
- Gist, M. E., and T. R. Mitchell. 1992. Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review* 17(2): 183–211.
- Hill, C. W. L., and T. M. Jones. 1992. Stakeholder-agency theory. *Journal of Management Studies* 29(2): 131–154.
- Holland, J. H., K. J. Holyoak, R. E. Nisbett, and P. R. Thagard. 1986. *Induction*. Cambridge, Mass.: MIT Press.
- Kahneman, D., and A. Tversky. 1979. Prospect theory: An analysis of decisions under risk. *Econometrica* 47: 263–291.
- Kant, I. 1909. *Foundations of the metaphysics of morals*. London: Longman's Green.
- Kirchhoff, B. A., and P. G. Greene. 1995. Response to renewed attacks on the small business job creation hypothesis. In *Frontiers of Entrepreneurship Research*, ed. W. D. Bygrave, B. J. Bird, S. Birley, N. C. Churchill, M. Hay, R. H. Keeley, and W. E. Wetzel, Jr. Babson Park, Mass.: Babson College.
- Kirchhoff, B. A., and B. D. Phillips. 1988. The effect of firm formation and growth on job creation in the United States. *Journal of Business Venturing* 3(4): 261–272.
- Kirzner, I. 1980. The primacy of entrepreneurial discovery. In *The prime mover of progress*, ed. A. Seldon. Lancing, Sussex: The Institute of Economic Affairs: 3–26.
- Knight, F. H. 1921. *Risk, Uncertainty and Profit*. New York: Kelley and Millman, Inc.

- Leddo, J., and R. P. Abelson. 1986. The nature of explanations. In *Knowledge Structures*, ed. J. A. Galambos, R. P. Abelson, and J. B. Black. Hillsdale, N.J.: Lawrence Erlbaum Associates, Inc.: 103–122.
- Mandel, M. J. 1996. *The High Risk Society: Peril and Promise*. New York: Times Business Books.
- Marshall, A. 1920. *Principles of economics* (8th ed.). New York: Macmillan.
- Mitchell, R. K. 2001. *Transaction cognition theory and high performance economic results* (First ed.). Victoria, B.C.: International Centre for Venture Expertise: www.ronaldmitchell.org/publications.
- _____. 2002. Stakeholders of the world unite: Assessing progress on the path toward a stakeholder theory of the firm. In *Proceedings of the Thirteenth Annual Conference, June 27–30, 2002*, ed. D. Windsor and S. A. Welcomer. Victoria, B.C.: International Association for Business and Society: 223–225.
- Mitchell, R. K., B. R. Agle, and D. J. Wood. 1997. Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review* 22(4): 853–886.
- Mitchell, R. K., B. Smith, K. W. Seawright, and E. A. Morse. 2000. Cross-cultural cognitions and the venture creation decision. *Academy of Management Journal* 43(5): 974–993.
- Mitchell, R. K., J. B. Smith, E. A. Morse, K. W. Seawright, A.-M. Peredo, and B. McKenzie. 2002a. Toward a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship research. *Entrepreneurship Theory & Practice* 27(2 [Winter]).
- Mitchell, R. K., L. Busenitz, T. Lant, P. P. McDougall, E. A. Morse, and J. B. Smith. 2002b. Are entrepreneurial cognitions universal? Assessing entrepreneurial cognitions across cultures. *Entrepreneurship Theory & Practice* 26(4 [Summer]): 9–32.
- Nelson, R. R., and S. Winter. 1973. Toward an evolutionary theory of economic capabilities. *American Economic Review Proceedings* 63: 440–449.
- Rawls, J. 1971. *A theory of justice*. Cambridge, Mass.: Harvard University Press.
- Scott, W. R. 1987. *Organizations: Rational, Natural, and Open Systems*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.
- Simon, H. A. 1979. Rational decision making in business organizations. *The American Economic Review* 69 (September): 493–513.
- Venkataraman, S. 1997. The distinctive domain of entrepreneurship research. In *Advances in entrepreneurship, firm emergence and growth*, ed. J. Katz. Greenwich, Conn.: JAI Press: 119–138.
- _____. 2002. Stakeholder value equilibration and the entrepreneurial process. *Business Ethics Quarterly: The Ruffin Series* 3: 45–58.
- Venkataraman, S., A. H. Van de Ven, J. Buckeye, and R. Hudson. 1990. Starting up in a turbulent environment: A process model of failure among firms with high customer dependence. *Journal of Business Venturing* 5(5): 277–295.
- Vesper, K. H. 1996. *New Venture Experience*. Seattle: Vector Books.
- Watson, J. 2002. *Strategy: An introduction to game theory*. New York: W. W. Norton & Company.
- Weber, M. 1985 (1930). *The Protestant Ethic and the Spirit of Capitalism*. Boston: Irwin.

- Williamson, O. E. 1975. *Markets and Hierarchies*. New York: The Free Press.
- _____. 1985. *The Economic Institutions of Capitalism*. New York: The Free Press.
- _____. 1991. Strategizing, economizing, and economic organization. *Strategic Management Journal* 12(S): 75–94.
- Wortman, M. S. J. 1987. Entrepreneurship: An integrating typology and evaluation of the empirical research in the field. *Journal of Management* 13(2): 259–279.

