

Economics Department
Economics Working Papers

The University of Auckland

Year 2003

Modern Theories of Entrepreneurial
Behavior: An Appraisal

Anthony Endres*

Christine Woods†

*University of Auckland, a.endres@auckland.ac.nz

†University of Auckland, cr.wood@auckland.ac.nz

This paper is posted at ResearchSpace@Auckland.

<http://researchspace.auckland.ac.nz/ecwp/244>

Modern Theories of Entrepreneurial Behavior: An Appraisal

Anthony M Endres

Department of Economics
University of Auckland

Christine R Woods

Department of Management and Employment Relations
University of Auckland

Abstract

This paper compares three principal, contemporary theories of entrepreneurial decision making - neoclassical, Austrian and behavioral. We employ theory appraisal criteria made available in Fritz Machlup's (1967) celebrated article on alternative theories of the firm. The paper considers theories that treat sequences of behavior by which individual entrepreneurs reach decisions on two levels: the discovery of profit opportunities and their exploitation. We also consider how each theory characterizes the entrepreneur's decision making process by contrast with the posited behavior of other economic agents. Austrian theory is suited to explaining novel, adventurous behavior at the discovery stage. The algorithm for opportunity exploitation in both the neoclassical and Austrian approaches is a single-repertoire, optimization rule. Neoclassical theory is situated in frictionless, atomistic Walrasian markets and emphasizes mathematical tractability. Austrian and behavioral theories conceive entrepreneurial acts taking place in market processes understood as complex institutional phenomena. There are strong theoretical complementarities between Austrian and behavioral approaches; both approaches value descriptive accuracy, though the behavioralists place more weight on operational tractability. Austrians and behavioralists share an interest in heuristics; they emphasize the role of prior micro-level knowledge at the discovery stage. Currently there is no possibility of an all-encompassing theory of entrepreneurial behavior emerging in the literature.

JEL categories: M13, M21, D21, B41

Key Words: entrepreneurial behavior, optimization, alertness, heuristics, theory appraisal

I Introduction

In a now classic paper lamenting the elusiveness of the entrepreneur in formal economic analysis William Baumol (1968: 64) was convinced that economic “theory ... fails to provide a rigorous analysis of the behavior of the entrepreneur”. Later Harold Demsetz (1983: 277) maintained that the “analytical treatment” of the entrepreneur, as opposed to purely descriptive case-study work, must rely on the standard postulate of maximizing behavior, for there was no defensible alternative.¹ Benjamin Gilad (1986: 189) repeated the claim that economic theory “has not made any progress in the area of entrepreneurial behavior”. It was quite acceptable, at least until the mid 1970s, to assert that little intellectual effort had been made by economists to formulate a coherent theory of entrepreneurial behavior as distinct from the behavior of the generic ‘economic agent’.

In the last quarter of the twentieth century, more than Baumol and Demsetz expected and more than Gilad supposed, economists together with researchers on the borders of economic analysis, behavioral science and management science, have come to offer quite different though not necessarily competing conceptualizations of entrepreneurial behavior. To be sure, research on entrepreneurship in the late twentieth century has expatiated on the distinctive functions of entrepreneurs in modern, market-based economic systems (e.g. Baumol 1990, 1993a, 1993b). This work has not departed

¹ In dismissing Schumpeter’s innovating entrepreneur and Kirzner’s alert entrepreneur as serious challenges to maximizing behavior, Demsetz submitted that “[e]ntrepreneurship is little more than profit maximization in a context in which knowledge is costly and imitation is not instantaneous” (1983: 277).

significantly from previous well-known theories of Schumpeter (1934) and Knight (1921) that underscore the role of the entrepreneur as heroic innovator or uncertainty-bearer respectively. Yet precise delineation and discussion of different branches of literature on entrepreneurial behavior - including consideration of well-defined sequences of behavior by which decisions are supposedly reached by entrepreneurs - together with a review and an assessment of these branches, has not been undertaken. The purpose of this paper is to offer such an assessment. We consider various attempts to characterize entrepreneurial acts and decisions in the broad literature of economics.²

Alternative theories of consumer behavior have attracted much attention and been the subject of extensive literature surveys (e.g. Blundell 1988). Similarly, alternative theories of the firm or “firm behavior”(Machlup 1967, Carter 1971, and Cyert and March 1975, Baumol 1993b) and “business behavior” (Baumol 1967, Harper and Earl 1996) have received due attention. By contrast the theory of individual entrepreneurial behavior has been neglected. In particular, theoretical points of separation or points of complementarity as the case may be, between different theories of entrepreneurial behavior have not been closely examined. Recent partial exceptions deserve acknowledgement. First, Shane and Venkataraman (2000: 2) distinguish between “equilibrium” and “disequilibrium” approaches to entrepreneurial decisions that are made when discovering and pursuing opportunities for gain in market processes. This simple distinction is useful for some purposes but does not adequately capture the full range and

² Obviously we cannot agree with Gaglio (1997a: 139) who alleges that “[e]conomics, the theoretical foundation for the study of market actors and their behaviors, essentially ignores entrepreneurial activity”.

richness of different perspectives available in recent literature on this subject.³ Secondly, a tripartite division between neoclassical, psychological and Austrian theories is briefly outlined in Shane (2000: 449-51) - a highly empirical contribution that is located expressly in the Austrian tradition. Although this division is an advance on previous work, the distinction between “psychological” and “Austrian” theories in the article is not fully explicated. The outline provided of “psychological” theories is deficient since, on the author’s own terms, there is some overlap between Austrian and “psychological” approaches. Moreover, all theories of entrepreneurial behavior have psychological aspects either stated explicitly in the initial assumptions or embedded by default in the theoretical framework.

For our purposes, at the most general level the individual entrepreneur “must be a decision maker” who constructs and, where possible, exploits opportunities to enter a new market (Blaug 1998: 217). We also concur with Mark Casson (1982: 23; 1987: 151-2) that the “entrepreneur specializes in judgmental decision making” about resource coordination and allocation in markets where the costs of information acquisition are “different for different people”.⁴ Nonetheless, the entrepreneurial decision process under consideration has for a long time remained opaque; is it, for instance, distinguishable from the process used by other economic agents? Section III, IV and IV below discuss this issue by surveying neoclassical, Austrian and behavioral approaches to entrepreneurial behavior - approaches that conceptualize the manner in which

³ Shane and Venkataraman aimed to offer “an integrating” (2002: 1) or single conceptual framework for the whole field. Their framework was intended to have a strong empirical orientation from the outset. In the event, they deny a place for economists’ equilibrium theories altogether.

⁴ Similarly, Ricketts (1987: 72) concludes his book chapter survey entitled “The Entrepreneur” with the statement that “entrepreneurs are concerned with the process of coordination”.

entrepreneurs construct and exploit profit opportunities in markets. Section VI provides a concise summary comparison of the main differences and similarities between these theories.

The theories under review allow for entrepreneurial success or failure and they share a common definition of the entrepreneur as a gain seeking individual making coordination decisions under uncertainty.⁵ At a more fundamental level, the neoclassical, Austrian and behavioral approaches outlined below possess significantly different features. Before proceeding to review, compare and contrast these theories, the next section establishes a method of theory assessment used to guide our exposition.

II Issues in Theory Appraisal

The growing literature on theory appraisal in economics assessing the way economists construct and evaluate economic theories has been the select domain of economic methodologists with an interest in the philosophy of science. A popular, though still controversial approach in economics has been to rely directly on a framework from the philosophy of science when assessing the relative strengths and weaknesses of alternative theories (Latsis 1976; also the papers in de Marchi and Blaug 1991: Part I: 35-104 and Backhouse 1994).

⁵ By comparison we accept the following definition of the noun entrepreneurship; it is “a process of first discovering and second, acting on a disequilibrium opportunity” in various market contexts (Kaish and Gilad 1991: 46). On the etymology of the term ‘entrepreneur’ see Fraser (1937: 317-29; 355-69).

Instead, we propose to proceed using a straightforward method of assessment offered in a celebrated article with a purpose similar to our own: “Theories of the Firm: Marginalist, Behavioral and Managerial” (Machlup 1967). Like Machlup we wish to compare three major traditions in recent literature with a view to assessing the applicability and delimiting the usefulness of different theories (in this case, of entrepreneurial behavior). According to Machlup (1967: 8-9) three pitfalls in theory appraisal must be avoided:

1. *Confusion of purposes.* It is only acceptable to reject models if they are “not equipped to answer” questions for which they have been designed.
2. *Mistaking the function of postulates.* For example, postulates about entrepreneurship and entrepreneurial behavior usually form part of a network of logical connections in an all-embracing theory. That is, their precise function in a logical formulation must be understood.
3. *Misplaced Concreteness.* There are dangers in falling prey to the fallacy of “misplaced concreteness” when assessing the strengths and weaknesses of a particular approach. That is, for all the models considered in the following paper we cannot expect that the proponents adopt the same methodological preconceptions so that their theorizing is standardized and pitched at identical levels of abstraction.

It is not obvious that theoretical symbols in all models “must have a directly observable

concrete meaning”(1967: 9).⁶ Those symbols may perform other functions. We consider different conceptualizations of entrepreneurial behavior “in formal models” (to use Baumol’s (1968:66) expression) always making due allowance for the fact that the degree of intended formalization is not uniform across the three traditions of theorizing under review.

As an extension to (3) above we add a parallel danger for those undertaking comparative research of the kind prosecuted here: it is unacceptable to overlook differences in the substantive content of identical or similar terminology used in different theories. Terms used in opposing theories may bear superficial resemblances only. For example, the unit of analysis in neoclassical, Austrian and behavioral theories of entrepreneurial behavior is not, on careful examination, exactly the same even though all refer to individual entrepreneurs. Rather than a team, firm or organization, the entrepreneur in each theory is considered an individual with a comparative advantage in making particular kinds of decisions. While methodological individualism is adhered to in each case it is manifested in different ways; individual decisions are not analyzed uniformly with a view to predicting or explaining the behavior of aggregates such as large numbers of individuals, firms, or market-level price-quantity outcomes. While one theoretical tradition, namely the neoclassical approach, may rely on the conjectured behavior of a representative, hypothetical entrepreneur, the contrasting behavioral approach may wish to generate hypotheses and proffer explanations for the actions or decisions of an actual, individual

⁶ Machlup uses the example of the “household” in neoclassical price theory. “The ‘household’ in price theory is not an object of study; it serves only as a theoretical link between changes in prices and changes in labor services supplied and in consumer goods demanded. The hypothetical reactions of an imaginary decision-maker on the basis of assumed, internally consistent preference functions serve as the simplest and heuristically satisfactory explanation of empirical relationships between changes in prices and changes in quantities. In other words, the household in price theory is not an object of study.”(1967: 9).

entrepreneur. Here the substantive content of the concept ‘individual entrepreneur’ diverges.

III On the Neoclassical Theory of Entrepreneurial Behavior

Invariably since the mid-twentieth century neoclassical formulations of entrepreneurial behavior have been embodied in more comprehensive theories of production, of the firm in perfectly competitive market structures, or of firm formation in a competitive equilibrium context. It was sheer hyperbole for Baumol (1968: 66 - 67) to claim that in the “neoclassical model” the “theoretical firm is entrepreneurless - the Prince of Denmark has been expunged from the discussion of Hamlet”.⁷ Baumol’s position was motivated by the neoclassical conception of the entrepreneur as a functionary and as another factor of production separate from the standard triumvirate: land, labor and capital. The traditional production function describes an engineering relationship between inputs and outputs rather than a behavioral phenomenon. Entrepreneurship, like other inputs, is a deployable scarce resource. Some writers in the neoclassical tradition refer to specific entrepreneurial inputs as a type of human capital viz. “entrepreneurial ability” or “business acumen”(Evans and Jovanovic 1989: 810).

One of the more common criticisms of the mechanistic approach expressed in ‘the firm as a production function’ framework has been well taken: that the entrepreneur is considered an indivisible and non-replicable input in most simple neoclassical models tends to

⁷ See also Barreto (1989) for repetition of a similar sentiment.

marginalize the entrepreneurial role (Baumol 1968: 66 note 2). And as Blaug (1996: 440-41) argued, “the strange disappearance of the entrepreneur from the center stage of economic theory” may be attributed to intractable analytical difficulties with the marginal product of the entrepreneurial input given its indivisibility and its nonstandardized, heterogeneous character. Altogether, according to Blaug,

... if the entrepreneur is a person, a firm has room for only so many entrepreneurs and it is straining language to speak of entrepreneurs as members of a homogeneous group; if entrepreneurship is a function, it cannot be finely divided in terms of something like entrepreneur man hours as the fundamental unit of supply. In short, entrepreneurship is a function that fails to satisfy the condition required to define a ‘a factor of production’. (441)

The doctrinal origins of entrepreneurship in neoclassical theory may be traced to Léon Walras’s general equilibrium analysis that treated the entrepreneur as a depersonalized agent - a factor of production (Hébert and Link 1988: 73; Fontaine 1998: 279). Since the late nineteenth century an overarching conception of end-state equilibrium has circumscribed the notion of the entrepreneur as a decision maker within the ‘firm as production function’ approach. In a world of uncertainty (understood as calculable risk), and given the entrepreneur’s decisions take place with optimally imperfect information (following Stigler 1961), a theory of profit has been appended to the neoclassical model of the firm as a production function that sustains a minimalist entrepreneurial role. Furthermore, that model does not distinguish the entrepreneur’s decision process (or

behavior) as being significantly different from other agents. In this scenario entrepreneurs are only distinguished from other factor inputs by assuming they act as residual profit claimants given their special risk-bearing appetite (Gunning 1993; Blaug 1996: 444). Risk averse agents remaining in the firm are designated as administrators, employees or laborers.

Central neoclassical assumptions specific to entrepreneurship are posited as follows: entrepreneurs have free access to information so that all gainful opportunities are recognized by agents in the model and the attributes of particular agents - namely their attitude to risk - determines whether or not they take on an entrepreneurial role. Now the implications of these two assumptions for an account of the behavior of entrepreneurs are clear: they are in fact compatible with virtually any possible conceptualization of decision making so long as the number of decision variables relate to market oriented phenomena such as input combinations, financing issues, price, advertising expenditure and so forth. In more sophisticated models sourced from the neoclassical tradition such as the Khilstrom and Laffont (1979: 720) general equilibrium model of firm formation, entrepreneurs contribute managerial and organizational skills (“entrepreneurial ability”). Unlike risk averse laborers, entrepreneurs bear the risks associated with production. We now list concisely those features of this perfectly competitive model that turn in one way or another on the behavior of entrepreneurs.⁸

⁸ We draw heavily on the following sources for this material: Evans and Jovanovic (1989); Kanbur (1979); Khilstrom and Laffont (1979) and Ronen (1983).

1. Entrepreneurs have equal access to the same risky ideas or technology and receive all the profits of risk-taking.
2. All entrepreneurs are risk neutral, so that a unit of entrepreneurial labor is homogeneous in respect of risk attitude.
3. While entrepreneurial labor inputs are deployable they are not deployable in infinitesimal amounts.
4. Entrepreneurs are the firm's principal decision makers and enjoy free entry to the industry concerned.
5. Since risk attitude is potentially affected by firm size, the model's range of applicability is to entrepreneurial behavior in "small businesses and farms"(Khilstrom and Laffont 1979: 749); in short it is restricted to an atomistically competitive economy.
6. Entrepreneurs are always and everywhere maximizers (or optimizers in that they may act as cost minimizers as well).

In elaborating on the dynamics of firm entry and exit this neoclassical approach identifies an equilibrium outcome. When an inefficient equilibrium outcome is investigated "it takes three forms: risks are maldistributed, firms are operated at the wrong levels and there is an inappropriate number of firms"(ibid: 721). Institutional impediments such as a dearth of risk-sharing opportunities can lead to an inefficient allocation of risks. Stock market institutions and venture capital financing arrangements are not incorporated in these models. Crucially, the referents used for theory construction and evaluation are the existence, stability and efficiency of competitive equilibrium. It is against these outcomes

that the neoclassical theory of entrepreneurial decision making must be judged.

So far we can be sure of one thing: the growing popularity of general equilibrium theory has not, with all due deference to Blaug (1996: 444), completely “set the seal on the possibility of theorizing about entrepreneurs”.⁹ Khilstrom and Laffont (1979: 720) explicitly address entrepreneurs’ decision styles, a matter taken for granted in most other work in the neoclassical tradition where individual behavior is set in the form of “expected utility maximizing”. By this postulate it is proposed that the entrepreneur will maximize the subjective expected utility of profits derived from risk bearing. Moreover, neoclassical entrepreneurs obey the standard von Neuman-Morgenstern axioms of decision making under uncertainty (preference completeness, consistency, independence). They are idealized, representative entrepreneurs rather than real entrepreneurs, just as the firms in which they behave are hypothetical and representative. And entrepreneurs have a systematic response to uncertainty, use probabilistic calculating procedures and, as the case demands, could easily be turned into good Bayesian learners, and act comfortably in strategic decision making contexts by calculating their actions according to their competitors’ possibilities (Laville 2000b: 421). Whatever nuance may have been appended to the model in the later twentieth century there is no escaping Baumol’s (1968: 68) original observation that neoclassical entrepreneurs are “automaton maximizers” and automaton maximizers they have remained.¹⁰

⁹ See also Blaug (1998:334): “there is no room for entrepreneurship in the neoclassical theory of the firm” and Kirzner (1997: 69): “In standard neoclassical equilibrium theory there is ... no role for the entrepreneur”.

¹⁰ Teece and Winter (1984:119) summarize all this by concluding that “neoclassical models” reduce entrepreneurial “decision making to the mechanical application of mathematical rules for optimization”. This conclusion perhaps advances too far in asserting that the neoclassical approach necessarily “trivializes decision making”.

No claims are made in the neoclassical approach for real case applicability beyond the hypothetical end-state equilibrium in an atomistic, frictionless economy. Following our Machlupian method of theory appraisal, criticisms leveled at such models are only valid if they refer to internal logical coherence - incompleteness or inconsistency. Criticisms of the assumptions will be misdirected and have no bearing on the general theoretical purpose of the model in which the entrepreneur's maximizing behavior facilitates the design of formal equilibrium models of firm formation. What matters to the neoclassical theorist is thorough incorporation of the von Neuman-Morgenstern choice axioms in a theoretical framework that correctly reasons toward a stable, efficient equilibrium outcome at the level of the market as a whole. Within this tightly circumscribed domain for theorizing, entrepreneurial behavior considered as maximizing under uncertainty forms an auxiliary link helping to explain the effects of particular classes of conditions, or the effects of the absence of particular conditions (such as risk maldistribution), on equilibrium outcomes.¹¹ The entrepreneur is part of a homogeneous class of agents capable of surviving (and learning) in the market by bearing a disproportionate share of risk relative to other classes of agents. In the event that some entrepreneurs failed to employ maximizing behavior they would be eliminated from the equilibrium state.

Notwithstanding the oft-discussed status of the von Neuman-Morgenstern axioms (e.g. Schoemaker 1982), the specific (often tacit) neoclassical behavioral assumptions in respect of entrepreneurial behavior have not hitherto been widely appreciated in the

¹¹ Thus Machlup (1967:9): "we ought not to confuse the explanans with the explanandum". On methodological issues, especially misguided criticisms of the neoclassical maximization postulate see Boland (1981) and Laville's (2000b) important response.

literature. Several critical implications follow for those seeking to understand the neoclassical vision of the entrepreneur - an agent who:

1. lists all alternative opportunities for allocating resources in an equilibrating manner in existing markets;
2. finds opportunities evenly (randomly) distributed in the market and these have the same value for all who search for them;
3. determines all the possible consequences of acting upon an opportunity;
4. makes comprehensive comparative evaluations of each set of consequences and selects between different opportunities and
5. has access to information required initially to perceive alternative opportunities and their consequences, though the standard marginalist tools are applied to information as with other commodities.

Overall, as a result of applying (1) through (5), entrepreneurs will arrive at optimally imperfect decisions when considering whether or not to exploit a profit opportunity.

There is nothing in the five foregoing implications suggesting that what has been constructed is a separate theory of the entrepreneurial decision process in which opportunities are generated and then exploited, not to mention a theory that may directly be tested empirically. It is one thing to postulate a certain human decision algorithm coextensive with firm formation in a competitive equilibrium context, and quite another to assume that entrepreneurial decisions, as an empirical matter, are coordinated in an equilibrium pattern. For the core behavioral assumption (maximizing) cannot be tested

independently against standards and purposes not germane to the neoclassical model.

On further reflection, what is being asserted in the neoclassical approach to entrepreneurial behavior is a tendency for certain representative individuals to engage in a kind of behavior distinct from other kinds associated with say, laborers or consumers. Neoclassical entrepreneurial behavior is differentiated by an enduring characteristic of a class of individuals with a stable attitude to risk. All individuals in this class are equally and instantly capable of exploiting known profit opportunities. In an important sense not only is instantaneity asserted; the entrepreneurial class is always preserved in neoclassical models. No particular individual stands out.

The idealized decision processes of entrepreneurs are imagined to be exactly the same as the other maximizing agents and the theory of optimization establishes precisely what objective function is to be computed. Entrepreneur's special attitude to risk is simply incorporated in specified constraints in a preference-representing function. Any kind of economic behavior can thus be rationalized including entrepreneurial behavior so long as the theorist is inclined to modify constraints as required. While the neoclassical treatment of the costs of information search, information acquisition and specifically opportunity identification is just another application of marginalist analysis, the burden of computation itself is usually set aside (Mongin and Walliser 1988; Conlisk 1996: 686-90). So, too, is "the question of why maximizing ... is the appropriate computation"(Laville 2000s: 127); it is a question which is never posed in the limited, modern neoclassical literature on entrepreneurship. This should be scarcely surprising

given the cameo role played by entrepreneurial behavior in the general equilibrium theory of firm formation.

IV Austrian Explanations of Entrepreneurial Behavior

Since von Mises (1949) and later extensions by Kirzner (1973,1979,1997), modern Austrian explanations have been sharply differentiated from the neoclassical approach. Originally von Mises (1949:253) proposed that entrepreneurs were not part of a homogeneous class of deployable inputs and entrepreneurial action was an all-pervasive potentiality in all market participants. Entrepreneurs seek opportunities for gainful exchange over time; they are not conceived as part of a unique class of risk bearers distinguishable from laborers, consumers or managers. It is the entrepreneurial act that is distinctive - an act involving the purposeful pursuit of opportunities Kirzner (1973) was later to dub 'alertness'. Von Mises's ideas on entrepreneurship emerged as part of an attempt to articulate why the neoclassical theory of general competitive equilibrium, if simulated by central planners, could not be reconciled with a dynamic entrepreneurially driven market process (Boettke 1998).¹² Entrepreneurs make decisions about resource allocation in an economy where activities such as production and consumption take time, where monetary calculation predominates and where property rights are well defined and enforceable (Caldwell 1997: 1863-4).

From von Mises's work onwards in the Austrian tradition, perennial optimality in

¹² The socialist calculation or planning problem is not simply one of computing optimal quantities to produce given tastes and technological possibilities, because all opportunity costs of production are not fully known in an economy where information is dispersed (Lavoie 1995). This insight was later to affect the way Austrian theorists conceived of the entrepreneur's problem situation.

competitive markets is not assumed at the outset. In an oblique remark directed at standard neoclassical models incorporating entrepreneurial behavior, Kirzner (1999:4) railed against theories which require that “every opportunity for mutually net-beneficial exchange between each and every pair of individuals must be taken advantage of at the very instant where such an opportunity emerges into existence” (emphasis in the original; see also Kirzner 1997: 45). For Kirzner, the attainment of market equilibrium requires entrepreneurial action. Theorizing about competitive market processes leading to equilibrium provides fertile ground for building a theory of entrepreneurial behavior by contrast with theories about the behavior of other agents in the economy such as consumers. The market process is said to be “driven” by entrepreneurs “alert” to unnoticed, unexploited gains from exchange. Alertness “refers to an attitude of receptiveness” or preparedness to recognise existing, overlooked opportunities; it also implicitly contains a propensity to coordinate resources used in market processes (Kirzner 1997: 12; also Kaish and Gilad 1991: 48). Following the many contributions of Israel Kirzner we may characterize profit opportunities that form the subject matter of entrepreneurs’ problem situations as follows. Profit opportunities are:

1. latent in, or created by existing market circumstances;
2. not all discovered and exploited instantly;
3. not likely to be recognized by all entrepreneurs even if they are furnished with the same market information;
4. sometimes known to particular entrepreneurs and not others due to information dispersion in markets and to localized, tacit knowledge which is not always

- directly communicable;
5. non deliberately or spontaneously discovered though not normally as a complete set (à la neoclassical models);
 6. not known probabilistically before entrepreneurs start their discovery (search) process;
 7. not all forthcoming as a result of finely calibrated, mechanical, optimizing search though they may be found as a result of coordination errors committed by other entrepreneurs (the information content of existing relative prices is vital here);
 8. not discovered simply as a result of pure luck but by activating the ubiquitous attribute of alertness;
 9. only opportunities if they are in fact exploited;¹³
 10. gradually eliminated by individuals who “switch on” their alertness save that errors in the face of exogenously created new opportunities provide “continual interference” to this trend (Kirzner 1997:71;1999:6) and
 11. discovered (under 4 above) and subsequently exploited by entrepreneurs in an optimizing fashion (Kirzner 1995:107).

Characteristics 10 and 11 deserve further elaboration in the light of our exposition of the neoclassical approach in Section III. First, in respect of 10 above, Kirzner (1997: 72) maintains that entrepreneurs are active in conditions of less than full market coordination:

[M]istaken actions by entrepreneurs mean that they have misread the market,

¹³ Thus Shane (2000: 450) “Austrian economics considers opportunity exploitation to be endogenous to opportunity discovery”. See also Gaglio (1997a: 161-63).

possibly pushing price and output constellations in directions not equilibrative.

The entrepreneurial market process may indeed reflect a systematically equilibrative tendency, but this by no means constitutes a guaranteed, unidirectional, flawless converging trajectory.

Convergence is not necessary in the Austrian approach; it is just one of many possible market outcomes (ibid: 82).

Exogenous disturbances may well upset equilibration. However, it is not clear in Kirzner's work what constitutes genuine exogenous change. Technical advances and changes in preferences seem obvious candidates for disequilibration and these are standard exogenous factors in neoclassical analysis. Nevertheless, entrepreneurial behavior could be endogenously induced in response to latent consumer preferences; or price signals could in fact reflect a profit opportunity that induces innovation (Harper 1994: 74-5; Ricketts 1996: 73). Only out-of-the-sky technical change seems strictly to fit the exogenous change criterion. Generally we may accept that in the Austrian approach exogenous forces whatever their specific nature, create disequilibrating events; this presumption is consistent with the way neoclassical theories proceed.

Secondly, in respect of the precise behavioral activity undertaken by the Kirznerian entrepreneur at the opportunity exploitation stage it is notable that maximizing is central. Kirzner (1995) is careful to reserve non deliberativeness for the discovery stage where mechanical computation seems inappropriate because all possible existing opportunities

in the market cannot be perceived at once, calculated over or selected among. In other words, purposefully establishing the means and ends of entrepreneurial behavior - often in an iterative feedback process - is a prerequisite for eventual maximizing behavior. In Austrian theorizing alertness is critical because a pre-ordained means-ends framework (where the 'ends' are available profit opportunity sets) does not function as an initial postulate. The Austrian theory of entrepreneurial behavior is concerned with matters that are positioned outside, yet is complementary with, the neoclassical treatment outlined in Section III. It is also complementary because the Austrians establish preconditions for maximizing behavior. Whether maximizing takes place at all in the opportunity discovery stage is unimportant for Austrians since, usually, discovery is a "routine- resisting" behavior (Kirzner 1997: 71). The Austrian tradition is not monolithic when it comes to the matter of opportunity exploitation; exploitation could follow a neoclassical maximizing rule (as Kirzner insists it should) or other decision routines, conventions or heuristics. All these responses are apparently compatible with the operation of entrepreneurial alertness. For example, O'Driscoll and Rizzo (1986: 256) conclude: "[e]ntrepreneurial alertness ... may be the source of the perception of an opportunity, but rule following may be the only feasible way of exploiting it in an uncertain world". Yet rule following precisely by whom - a hypothetical individual? We turn next to one of the implicit judgments Austrians make about theory construction. For these theorists descriptive accuracy is conferred a higher ranking than robust, formal, parsimonious modeling.

While, like the neoclassicalists, Austrians adhere to the principle of reducing market

aggregates and outcomes to the individual decisions that cause them, the Austrians stand out for reducing their theoretical statements to individual action in market contexts rather than to slightly aggregated organizations or firms (which may act ‘as if’ they were individuals). At first glance, this Austrian reduction would appear innocuous. Not until very recently in a contribution by Kirzner (1997) have the theoretical objectives of the Austrian approach been fully explicated. Kirzner explains that

Austrian theory is able to recognise the speculative element in all individual decision making, and to incorporate the activity of the real world business man into a theoretical framework that provides understanding of the market process (67-70, emphasis added).

Immediately it should be noticed that Kirzner’s theoretical purpose is to conceive of the behavior of real entrepreneurs - a purpose diametrically opposed to the neoclassical model discussed in Section III that only deals with hypothetical, representative entrepreneurs. Further, consistent with our presentation so far, Kirzner submits that Austrian theorizing “diverges sharply from the notion of individual decisions that constitutes the building block of neoclassical microtheory” (ibid: 70). For the individual decision maker is now bifurcated: there is behavior associated with opportunity discovery (or recognition) and behavior associated with opportunity exploitation (or pursuit). And it is only when theorizing about behavior in the discovery realm that Austrians claim to have forged a unique contribution. A subsidiary claim relating to the location of the Austrian unit of analysis might be added: that disequilibrium in competitive market

processes can only be properly understood by reducing the level of abstraction from that which would obtain in more deterministic neoclassical treatments. In this view it is essential to theorize about essential, contextual, time-and-place contingencies where profit opportunities appear. The objective is to consider the nature, existence and exploitation of profit opportunities in real market contexts with a view to offering a more empirically grounded perspective on entrepreneurial behavior. This orientation has given rise to studies of arbitrage, innovation and speculation as species of the Austrian entrepreneurial discovery process (Harper 1994, 1996, 1998; Harper and Earl 1996). The contextual or situational elements associated with entrepreneurial alertness are often represented as unique and have given rise to a range of widely different empirical investigations linked to the Austrian tradition.¹⁴

There is no presumption in Austrian studies that entrepreneurial behavior must be considered as part of analysis of market equilibrium end-states and the determinants of those states. In this the Austrians have posited a theoretical referent for all work on entrepreneurship different from neoclassical approaches. They are interested in explaining and understanding features of market process that only tend in an “equilibrative direction”(Kirzner 1997:73; 1999: 7-8).

From the foregoing exposition of the Austrian perspective, alertness - that capacity to recognise unexploited opportunities - has not been, and indeed cannot be, presented as a theory of decision making. Firstly, alertness is an asserted behavioral mode. Secondly, it

¹⁴ See for example Kaish and Gilad (1991); Gaglio (1997a: 170-91; 1997b); Gaglio and Katz (2001); Shane (2000); Woods (2002). For a recent model inspired by Austrian ideas and constructed with clear operational suggestions see Minniti and Bygrave (2001).

functions in theorizing as a metaphor indicating an aspect of behavior. The entrepreneurial ‘aspect’ is a decision making process beginning with “shrewd and wise assessment of realities (both present and future)” (Kirzner 1980: 7). Thirdly, ‘alertness’ as a psychological phenomenon begs many questions that might be posed at the interface of economics and other behavioral sciences (Gilad 1986: 195-8; Gaglio 1997a: 164 - 69).¹⁵ To propose in a Kirznerian vein that “entrepreneurial alertness is embedded in the decisions of individuals so that their actions simply reflect their entrepreneurial hunches”(Harper 1998: 246) seems to border on circular reasoning. It would be far more apposite for Austrian-inspired theorists and their critics to be clear on the place of alertness in the network of postulates and auxiliary statements forming part of Austrian theory construction. Alertness is part of the very core structure of Austrian theory - an asserted ability to notice gainful opportunities in the market without deliberate, planned search. We suggest that the alertness assumption be specified in two parts: (i) entrepreneurs are alert individuals (unlike other market participants they unwittingly possess a “gift” (Kirzner 1979: 148)) with a capacity not to overlook existing opportunities and (ii) entrepreneurial alertness is activated by price signals of potential gain at the microlevel (in a specific temporal and local situation where market pricing prevails).

If alertness is employed by the theorist as a core axiom about entrepreneurial behavior it does not require direct testing. It is applicable only in the disequilibrium market process and is neither necessary nor sufficient to generate propositions about market equilibrium.

¹⁵ Harper (1998:248-51) investigates possible psychological determinants of alertness drawing on notions of “locus of control” and “need for achievement” contributed by psychologists Rotter and McClelland respectively.

Subsequent, mostly literary and narrative Austrian explanations therefore have an utterly different character from neoclassical theorizing on entrepreneurs. The Austrian perspective attempts to understand entrepreneurial behavior at another level that is incommensurable with the neoclassical preoccupation turning on prediction from formal models. Whereas the neoclassical entrepreneur acts mechanically in a clockwork equilibrium state, the Austrian entrepreneur, at least in the opportunity discovery realm, is crafted as part of a vision of the continuity of the market process.

V Behavioral Theories of Entrepreneurial Decision making

Overall, literature in the behavioral field, even on the specific subject of the entrepreneur, is vast.¹⁶ In this section we draw together common elements in a range of modern approaches to individual choice that have applications either explicitly made, or indirectly indicated, to entrepreneurs. We are interested in research on entrepreneurial behavior which “is preceded and determined by some form of cognitive information processing which serves as an intervening variable between changes in circumstances and behavior” (Earl 1990: 925). The relevant literature has moved well beyond studies from the 1960’s to the 1980s that concentrated on the personality traits of entrepreneurs (on this subject see Earl 1990: 738-9 and Gilad 1986: 195-201). Modern behavioral theories offer alternative conceptualizations of profit opportunity identification and depart significantly from neoclassical and Austrian views on opportunity exploitation. Decision heuristics form the centerpiece of behavioral research on choice in general and individual

¹⁶ For example, entrepreneurial behavior has been differentiated from organizational behavior (Gartner et. al. 1992); managerial behavior (Busenitz and Barney 1997) and bankers’ behavior (Sarasvathy et. al. 1998).

entrepreneurial behavior in particular.

While Herbert Simon has not discussed entrepreneurial behavior at great length, his work from the late 1950s emphasized cognitive limitations of decision makers: both limitations on knowledge and computational capacity have applications to entrepreneurship.¹⁷ Like the Austrian economists, Simon (1958: 393) argued that economic theory must address “situations where the alternatives of choice are not given in advance, but must be discovered; where the means-ends connection between choices and consequences are imperfectly known.” Whether it is a problem of discovery or selection among alternatives already discovered, “only in exceptional cases” is human decision making concerned with discovery and selection of “optimal alternatives”(March and Simon 1958: 140-41). At the discovery stage constraints external to the decision maker are pre-eminent. A fully known, fixed set of existing profit-making opportunities is not available in most complex market circumstances - not even, as in the Austrian approach, potentially available. This should not be taken to mean that “searching for possible courses of action” and the “lengthy and crucial process of generating alternatives” should be left out-of-account (Simon 1987: 726-7). In this connection, Simon expresses dissatisfaction with pretensions of comprehensiveness advanced by neoclassical search theories. For example, in this view, the computational complexities are too great for entrepreneurs to generate the most profitable opportunities from an exhaustive set. Only better opportunities than have been previously available, or aspired to, become relevant and part of the ambit of the decision which of necessity is embedded in a unique, ever-changing situation. Optimal search theory has little to offer with one exception: in transparent

¹⁷ This and the following paragraph draw heavily on Simon (1958, 1986, 1987).

“simple, slow-moving situations” where the decision maker already has a “single operational goal” may this neoclassical theory be applicable (Simon 1984: 47; 1987: 267). Otherwise it is invalid for neoclassicalists to take internal cognitive limitation as a scarce resource, that is, by assimilating it as just a constraint on optimal search. That would be tantamount to knowing how to specify the constraint (putting a bound on information will not do). It would also be equivalent to conferring on the decisionmaker power to allocate scarce computational capacity optimally to find the most profitable opportunity in an exhaustive set of alternatives.

At the post-discovery stage the neoclassical postulate which posits maximum subjective expected utility (or profit) implies that decision makers have complete knowledge of probability distributions for estimating the consequences of decisions executed over discovered opportunities. Instead, an internal cognitive constraint, a human inability to fully compute, is posited by behavioralists. This postulate functions in a more substantive way than merely specifying an information constraint. The decision maker is nevertheless ‘idealized’ and representative in a very special sense. This time, unlike the representative entrepreneur in neoclassical theory, the decision maker in behavioral theory is considered to have “an ordinary human mind” (Simon 1987: 267). On average the entrepreneur’s mode of calculation and of behavior in general is bounded by a cognitive capability different from, through not necessarily inferior to, the neoclassical optimizing entrepreneur.¹⁸

¹⁸ Bounded cognitive capacity has been likened to an elephant in the living room – impossible to ignore (Conlisk 1996: 691). Behavioralists do not see the elephant as a handicap; in their research on entrepreneurial behavior they have sought more accurate depictions of subsequent activities in the living room.

Before reviewing some of the theoretical and empirical work in the behavioral tradition that elaborates on entrepreneur's activities, we should as in previous sections enumerate key dimensions of the theory under review. Entrepreneurs' profit opportunities:

- 1) are not straightforwardly and objectively representable - they must be distinguished from entrepreneurs' perception or construction of them (so that the attributes of a failed or successful entrepreneurial decision process can be analyzed by an observer). As Simon (1986: S211) averred:
"if we accept the proposition that both the knowledge and computational power of the decision maker are severely limited, then we must distinguish between the real world and the actor's perception of it and reasoning about it";
- 2) are generated by boundedly rational individuals using heuristics;
- 3) are deliberated upon in a non optimizing serial cognitive process involving mental construction both of the opportunities and aspiration levels associated with them;¹⁹
- 4) normally appear to the entrepreneur in complex, uncertain, rapidly changing environments;
- 5) are never available in an exhaustive set - some may remain to be generated or constructed;

¹⁹ As for the origins of these aspirations levels and changes in them, Simon (1958) proposes that they are formed because they remove the necessity for detailed evaluation of alternative rules, routines or heuristics. If a heuristic fails to engender satisfactory opportunities then some innovation is indicated. Aspiration levels are sustained or reframed the easier or more difficult it is respectively, to discover satisfactory opportunities. It has been noted that modern behavioral literature on "framing effects" is "consistent with the conception of bounded rationality originally presented by Herbert Simon". (Kahnemann and Tversky 1986: S272-3). For criticisms of the aspiration level concept see Bianchi (1990:160 -61) and Thomsen (1992: 70 - 71).

- 6) are exploited using heuristic strategies that give scant clues on what outcomes would have been forthcoming if a different heuristic had been employed and
- 7) are usually exploited (a) in unique environments or (b) in opaque, highly variable environments that render learning (i.e. feedback between situation and response) difficult.

Crucial for understanding theory construction in the behavioral tradition is the axiomatic status of points 2 and 3 above. The behavioralists, following Simon, take as core, untestable propositions, that entrepreneurs are non optimizers who use heuristics (such as satisficing strategies) which violate the standard von Neumann-Morgenstern axioms forming the basis of neoclassical theorizing. The behavioral model has one clear purpose: to open the way for a wide range of empirical studies of actual entrepreneurial behavior. Behavioral research has used the seven dimensions above in varying degrees to direct empirical work and draw generalizations about typical entrepreneurs.

Let us take the propensity for risk taking so commonly highlighted in theories surveyed in Section III above. Behavioralists have demonstrated that entrepreneurs construct mental representations of market opportunities that had not occurred to other market participants. More crucially entrepreneurs may in fact create riskiness: “they turn the commonplace into the unique and unexpected”(Mitton 1989: 12). Once constructed, the opportunity is exploited with less than the normally expected caution and risk is perceived rather differently from the way it is assessed by the neoclassical entrepreneur. First, there is a strong tendency to see the opportunity as unique in that no other person

will possess all the specialized market information a particular entrepreneur will hold. Second, the possibility of updating riskiness ('learning') is discounted because it is usually considered that the decision situation will not be repeated or replicated. Third, as a consequence of the foregoing factors entrepreneurs are susceptible to what neoclassicalists term a decision 'bias' though behavioralists accept the phenomenon as typical. In fact, expectations of future outcomes from opportunity exploitation are not formed by careful consideration of past results such as success-failure rates in the industry concerned. In empirical studies of highly competitive market situations, entrepreneurs exude optimism in their self-assessments without referring to base rates for success in similar enterprises (Cooper et. al 1988; Camerer and Lovallo 1999). As well, the attraction of chosen opportunities tends to be exaggerated; information about them is consistently framed more positively than it would be by non-entrepreneurs (Palich and Bagby 1992: 113). Entrepreneurs also overgeneralize from limited information and small or non random samples such as limited personal experience and specialized prior knowledge (Shane 2000). In the absence of these 'biases' many entrepreneurial actions would never have occurred (Busenitz and Barney 1997: 10).²⁰

Fourthly, the inherent complexity, novelty and fluidity of the context in which perceived opportunities are embedded, rather than render entrepreneurs' behavior more cautious, serves to spur them on. At the very least when sufficient data is lacking on the structure

²⁰ Optimism serves "to convince other potential stakeholders (such as investors, suppliers, customers, key employees) of the opportunity that affords them if they get in on the ground floor of the venture. Put differently, if entrepreneurs wait until all the "facts" are in to start convincing others that their venture is indeed legitimate, the opportunity they are seeking to exploit will most likely be gone by the time more complete data becomes available"(ibid: 15). Or as Richardson (1960: 57) wryly observed: "a general profit opportunity which is both known to everyone and equally capable of being exploited by everyone is ... a profit opportunity for no one in particular".

of the context in which an opportunity is discovered or constructed, a high degree of ambiguity is not enough to halt the decision to pursue the opportunity (Timmons et.al 1985).

The list of conjectured and confirmed operations used by entrepreneurs to evaluate gainful opportunities can include a repertoire of actions or rules behavioralists have classified as "cognitive heuristics" - availability, representativeness and anchoring. Shaver and Scott (1991: 33) provide an illustration of each:

A person who just read about another restaurant's closing in the morning will give a higher estimate of failures than will a person who has not seen such a story in a long time (the availability heuristic). A person for whom Restaurant X is typical of successful establishments will make a lower guess about failure than will a person for whom the Restaurant X resembles failures (the representativeness heuristic). Finally, a perceiver who knows that three local restaurants have failed will make a smaller estimate than a perceiver who has been told that 10,000 restaurants have failed nationally (the anchoring heuristic).

Heuristics are used as simplifying mechanisms in complex situations without which many entrepreneurial actions would be paralyzed (Manimala 1992). As guides to actual entrepreneurial behavior in materially different situations these empirical findings seem unexceptionable. In a recent study located in the Austrian tradition Shane (2000) has inadvertently reinforced one theme in the behavioral literature. A key result is that

opportunity discovery is conditioned by the entrepreneur's "idiosyncratic prior knowledge". Strong evidence is presented in support of the idea that:

Prior information, whether developed from work experience, education, or other means, influences the entrepreneur's ability to comprehend, extrapolate, interpret and apply new information in ways that those lacking prior information cannot replicate. (ibid: 452)

As for the precise content of 'information' here, existing market prices and associated revenue estimates contained only some, though not necessarily enough, generally to allow reasonable, successful behavior to take place. Market pricing patterns were not the sole referent posited in the theoretical background to this study, whereas in pure Austrian studies market price signals are pivotal (Thomsen 1992: 82). While avowedly 'Austrian' in inspiration, Shane's article turns on matters reminiscent of a type of behavior in which entrepreneurs isolate salient, vivid features of a familiar environment according to the availability heuristic. Consistent with behavioralists, Shane (2000: 465) later refers to "[c]ognitive limits and specialization of knowledge"; these limits preclude discovery of "a complete set of entrepreneurial opportunities in a given technology". It is still unresolved whether there are fundamental differences or complementarities between the Austrian and behavioral perspectives. We are inclined to appreciating complementarities. Lavoie (1991: 45) refers to degrees of entrepreneurial alertness: "the very act of paying attention to one aspect of reality inherently involves removing attention from other aspects. Alertness is multidimensional ... There are qualitatively diverse ways of being

alert". Lavoie's contribution in the Austrian tradition thereby allows room for employing a range of possible heuristics.²¹

Unlike Kirzner, instead of assuming that gainful opportunities exist in markets and are awaiting discovery, some behaviorally oriented research has taken the position that opportunities are originated endogenously. Entrepreneurs build mental constructs or theories of their situations and then act on them; they are likened to scientists who generate testable hypotheses from theories. Individual experiences are mediated through a personal mental construct which acts as an interpretative framework and then a range of conceivable methodologies are used in the evaluation process (Loasby 1983; Harper 1996; Harper and Earl 1996; Woods 2002). In addition, behavioralists see opportunity evaluation as a circumscribed process. For instance, the availability heuristic may be employed in which the merits of a discovered opportunity (e.g. a higher potential value) are tested against other known opportunities over a narrow personal domain; opportunities being exploited by entrepreneurs in other diverse domains are ignored possibly because their dimensions are difficult to construct mentally and then contemplate.²² When finally choosing to pursue an opportunity entrepreneurs tend to over exploit opportunities which generated initially superior returns, "thereby exposing themselves to the risks and benefits associated with the properties of path dependence"

²¹ See also in support O'Driscoll and Rizzo (1986: 255-6). Others expressing Austrian influence eschew the possibility that alert entrepreneurs would employ a heuristic of one kind or another at the discovery stage. In this view, "[n]on alert individuals will satisfice; alert individuals will seek objective accuracy" (Gaglio and Katz 2001: 101-2). Empirical work has yet to be presented which tests the proposition that those with entrepreneurial alertness do not need heuristics because of their normally "keen discernment" of profit opportunities (Gaglio 1997a: 165).

²² As recommended by Simon (1978:503), a positive theory of behavior in "complex tasks" situations can only be constructed by accounting for "the fact that the human information processor operates serially, being capable of dealing with only one of a few things at a time".

(Minniti and Bygrave 2001: 7).²³

Generally, a behavioral theory of entrepreneurial behavior starts with questions about an entrepreneur's modes of reasoning through the complete process of opportunity construction, exploitation and interpretation of results. Most of the seven key dimensions of the approach set out earlier form the basis for informal theory-building in this tradition. That entrepreneurs have recourse to heuristics inconsistent with the neoclassical axioms is both a starting point and a corroborated conclusion in behavioral work. The problem for those wishing to develop operational theories of entrepreneurial behavior is not so much one of accounting for risk attitudes, or seeking to formalize how entrepreneurs make subjective probability estimates of future outcomes from decisions to exploit opportunities. Encapsulating the variety of heuristics guiding behavior would lead fruitfully to analyzing the relative effectiveness of different types of behavior in real cases. Modes of opportunity exploitation depend on a wide variety of institutional factors too numerous to recount here (see Shane and Venkataraman 2000: 10 -11).

A single, overarching, formal theory has thus far eluded behavioralists though Simon's supposition of boundedness forms a core concept. Some questions yet to be integrated into work specifically on entrepreneurs include:

- a) What constitutes an effective entrepreneurial decision making procedure - is there a single procedure or a multitude of them?

²³ Rabin (1998: 26-27) refers to associated research on establishing the workings of heuristics emphasizing “belief perseverance” and “confirmation bias”.

- b) How do computational capabilities and heuristics evolve among entrepreneurs?
- c) Does market competition eliminate heuristics and enforce a return to habitual optimization?²⁴

These questions would not occur to those who conflate the costs of computation and boundedness with other decision constraints.

Behavioralists can claim to have produced descriptively accurate accounts or less formal theories viewed as a series of interconnected generalizations that are observationally or case study driven. Results so far are encouraging if building empirical content is considered a desirable criterion of good science. Indubitably, it is now possible to classify a range of typical decision procedures used by entrepreneurs. The problem of explaining the heterogeneity and versatility of entrepreneurial actions has been rendered more tractable than it might have been some thirty years ago. Entrepreneurs' behavior is not nearly so incoherent when decision contexts vary as might have been supposed.

VI Summary and Conclusions

We are now in a position to summarize principal differences between neoclassical, Austrian and behavioral theories of entrepreneurial behavior. The contrast between each

²⁴ Rabin (2002: 678-9) is surely right to complain that even if some heuristics are "wiped out" by competition, there are still good reasons to take account of behavioral phenomena in theoretical work. For it all depends on how institutional contingencies are configured. Only in a frictionless, atomistic Walrasian market must perennial optimization apply. Behavioral researchers are endeavoring to theorize about behavior in persistently non-Walrasian situations.

theory in respect of the different treatment of entrepreneurs as opposed to non-entrepreneurs is summarized in Table 1.

TABLE 1: Entrepreneurs versus Non-Entrepreneurs

	Does the Entrepreneur's Behavior Differ?	
Theory	Opportunity Discovery	Opportunity Exploitation
Neoclassical	Yes: fully deliberative optimizer more favorable to risk	No: optimally allocates means to ends
Austrian	Yes: non deliberative with gift of alertness	No: optimally allocates means to ends
Behavioral	No: limited, deliberative satisficer though context specific cognitive constraints generate opportunities	Yes: employs context specific heuristics

The fundamental difference between behaviorally inspired theory and the neoclassical and Austrian approaches turn on the behavioralists' focus on decision heuristics and the framing of these heuristics in different contexts where entrepreneurs are active. Heuristics are molded out of unique situations and entrepreneurs may be expected to behave differently from non-entrepreneurs precisely in the way they frame a decision. For behavioralists, cognitive limitations are a common feature of all human behavior and framing is a constituent activity of decision making in general (Kahnemann 2000). Neoclassical theorists and Austrians (particularly those following Kirzner's contributions) reject heuristics because they imply systematic 'errors' or 'biases' which are inconsistent with the rational economizing entrepreneur who weighs up the value of profit opportunities against their costs and ultimately chooses the one with highest subjective expected value. To be sure, the Austrian perspective is differentiated by its emphasis on the role of spontaneous, nondeliberative acts at the discovery stage.

Table 2 contains a comparative depiction of various dimensions of each theory classified according to our theory appraisal criteria set out in Section II.

TABLE 2: Dimensions of Theory Construction and Application

Theory of Entrepreneurial Behavior	Purposes of Theorizing	Role of Postulate Concerning Entrepreneurial Behavior	Legitimate Application of Theory	Common Errors in use of Theory
Neoclassical	Parsimony Formal representation Mathematical tractability	Creates typical maximizing class of risk bearers	Explains firm formation in competitive equilibrium Prediction of market-level outcomes Prescribes optimization in atomistically competitive contexts	Assimilating cognitive limitations Invalidating role of cognitive limitations
Austrian	Descriptive accuracy	Creates alert individual with discovery potential	Understanding opportunity discovery in market process Predicting entrepreneurial action when opportunity exploitation has recourse to optimization	Denying role for cognitive limitations in opportunity exploitation Predicting convergence to market equilibrium
Behavioral	Descriptive accuracy Behavioral realism Operational tractability	Creates typical decision maker with limits on cognitive capacity	Investigates impact of cognitive limitations Explains creation of heuristics in complex, changing contexts Provides direction for case studies and surveys	Misplaced concreteness: criticizing unrealisticness of optimization assumption in other theories

As Machlup (1967) observed, the objectives of theorizing should not be confused. Each theory of entrepreneurial behavior outlined here has assumed a different purpose, though the Austrian and behavioral approaches overlap and are more compatible on this score.

By contrast, neoclassical theory has a different theoretical referent, namely generating the determinants of competitive equilibrium end-states; accordingly the individual entrepreneur is incorporated in a class of agents playing a special role in firm formation. The limited usefulness of the optimization hypothesis is underscored in Table 2. As behavioralists have argued, it could well be replaced by a less demanding hypothesis, such as deliberate satisficing about entrepreneurial behavior without loss of explicative power (Viale 1992: 188-89).

Austrian theory seems well suited to explaining novel behavior, particularly the speculative element so evident in the discovery of profit opportunities. In terms of the algorithm used for opportunity exploitation, the Austrian and neoclassical theories offer a one-dimensional, single-repertoire behavior (i.e. optimizing). Neoclassicalists legitimately apply their theory in atomistic, Walrasian, market-clearing environments whereas Austrians and behavioralists situate entrepreneurs in changing market processes where the market is considered a complex institutional phenomenon. For the Austrians complexity gives rise to unperceived, gainful opportunities carrying potential for discovery by alert entrepreneurs. For the behavioralists, complexity increases entrepreneurs' reliance on a plenitude of heuristics resulting in the transformation of risk perceptions and the endogenous construction of opportunities.

In the development of the literature so far, the spontaneous creation of entrepreneurs' frames leading to opportunity discovery has been accommodated more comfortably in Austrian economics, specifically in Kirzner's extensive contributions. Unlike

behavioralists, Kirzner does not elaborate on the precise reasoning procedures adopted by entrepreneurs in the discovery process. Nevertheless, of significance in our delineation of the purposes underwriting theories of entrepreneurial behavior in Table 2 are the remarkable complementarities between the Austrians and behavioralists over the need to build descriptively accurate, therefore less formal, theories. Of course, behavioralists wish to advance further by incorporating heuristics in a more realistic conception of the entrepreneur as a decision maker; they wish to confer on the entrepreneur less demanding cognitive powers (than optimization) in data-driven theory. As far as applications of each theory are concerned, attempts to assimilate cognitive limitations into neoclassical or Austrian theory have not been effective. The tendency for behavioralists especially to criticize the neoclassical model for their unrealistic depiction of entrepreneurial behavior commits what Machlup called the fallacy of misplaced concreteness. Behavioral theory cannot act as an effective critique of optimizing behavior. Instead behavioralists should celebrate the fact that their theorizing has demonstrated considerable fertility in explaining entrepreneurs' behavior: it has generated many case study applications and directed widespread survey work while the results have had multidisciplinary implications.

In the final analysis, differences in the interests of those working in the three theoretical traditions discussed in this paper do not rest on alternative methods for contemplating 'facts' about the process or outcomes of entrepreneurial behavior. Dominant theoretical objectives and referents are critical differentiating aspects in determining what constitutes good research within each tradition. There is at present no emerging possibility of an all-

encompassing, single theory of entrepreneurial behavior that could make the three approaches commensurable. This conclusion notwithstanding, we have demonstrated that the Austrians and behavioralists start with a common purpose for theoretical work in the field and their subsequent contributions enjoy complementarities not yet fully recognized.

References

- Backhouse, R. (1994). The Lakatosian Legacy in Economic Methodology. In R. Backhouse (Ed.), *New Directions in Economic Methodology* (pp. 173-190). London: Routledge.
- Barreto, H. (1989). *The Entrepreneur in Microeconomic Theory: Disappearance and Explanation*. New York: Routledge.
- Baumol, W. J. (1967). *Business Behavior, Value and Growth*. New York: Harcourt Brace.
- Baumol, W. J. (1968). Entrepreneurship in Economic Theory. *American Economic Review*, 58, 64-71.
- Baumol, W. J. (1990). Entrepreneurship: Productive, Unproductive, and Destructive? *Journal of Political Economy*, 98(5), 893-921.
- Baumol, W. J. (1993a). *Entrepreneurship, Management, and the Structure of Payoffs*. Cambridge, MA: MIT Press.
- Baumol, W. J. (1993b). Formal Entrepreneurship Theory in Economics: Existence and Bounds. *Journal of Business Venturing*, 8, 197-210.
- Bianchi, M. (1990). The Unsatisfactoriness of Satisficing: from Bounded Rationality to Innovative Rationality. *Review of Political Economy*, 2(2), 149-167.
- Blaug, M. (1996). *Economic Theory in Retrospect* (Fifth ed.). Cambridge: Cambridge University Press.
- Blaug, M. (1998). Entrepreneurship in the History of Economic Thought. *Advances in Austrian Economics*, 5, 271-239.
- Blundell, R. (1988). Consumer Behavior: Theory and Empirical Evidence. *Economic Journal*, 98, 16-66.
- Boettke, P. J. (1998). Economic Calculation: The Austrian Contribution to Political Economy. *Advances in Austrian Economics*, 5, 131-158.
- Boland, L. A. (1981). On the Futility of Criticizing the Neoclassical Maximization Hypothesis. *American Economic Review*, 71, 1031-1036.
- Busenitz, L., & Barney, J. (1997). Differences Between Entrepreneurs and Managers in Large Organizations: Biases and Heuristics in Strategic Decision-making. *Journal of Business Venturing*, 12, 9-30.

- Caldwell, B. J. (1997). Hayek and Socialism. *Journal of Economic Literature*, 35(4), 1856-1890.
- Camerer, C., & Lovallo, D. (1999). Overconfidence and Excess Entry: An Experimental Approach. *American Economic Review*, 89(1), 306-318.
- Carter, E. E. (1971). The Behavioral Theory of the Firm and Top-level Corporate Decisions. *Administrative Science Quarterly*, 16, 413-429.
- Casson, M. (1982). *The Entrepreneur*. Totowa: Barnes and Noble Books.
- Casson, M. (1987). Entrepreneur. In J. Eatwell et. al. (Eds.), *The New Palgrave: A Dictionary of Economics* (Vol. 2, pp. 151-153). London: MacMillan.
- Conlisk, J. (1996). Why Bounded Rationality? *Journal of Economic Literature*, 34, 669-700.
- Cooper, A. C., Woo, C. Y., & Dunkelberg, W. C. (1988). Entrepreneurs' Perceived Chances for Success. *Journal of Business Venturing*, 3, 97-108.
- Cyert, R. M., & March, J. G. (1975). *A Behavioral Theory of the Firm* (Second ed.). Englewood Cliffs, NJ: Prentice Hall.
- De Marchi, N., & Blaug, M. (Eds.). (1991). *Appraising Economic Theories: Studies in the Methodology of Research Programs*. Aldershot: Elgar.
- Demsetz, H. (1983). The Neglect of the Entrepreneur. In J. Ronen (Ed.), *Entrepreneurship* (pp. 271-280). Lexington, MA: Lexington Books.
- Earl, P. (1990). Economics and Psychology: A Survey. *The Economic Journal*, 100, 718-755.
- Evans, D. S., & Jovanovic, B. (1989). An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints. *Journal of Political Economy*, 97(4), 808-827.
- Fontaine, P. (1998). The Metaphoric Entrepreneur: A Comment on Coşgel. *History of Political Economy*, 30(2), 277-283.
- Fraser, L. M. (1937). *Economic Thought and Language*. London: A&C Black Ltd.
- Gaglio, C. M. (1997a). Opportunity Identification: Review, Critique and Suggested Research Directions. In J. A. Katz (Ed.), *Advances In Entrepreneurship, Firm Emergence and Growth* (Vol. 3, pp. 139-202). Greenwich: JAI Press.
- Gaglio, C. M. (1997b). *The Entrepreneurial Opportunity Identification Process*.

Unpublished PhD thesis, University of Chicago, Chicago.

Gaglio, C. M., & Katz, J. A. (2001). The Psychological Basis of Opportunity Identification: Entrepreneurial Alertness. *Small Business Economics*, 16, 95-111.

Gartner, W. B., Bird, B. J., & Starr, J. A. (1992). Acting As If: Differentiating Entrepreneurial From Organizational Behavior. *Entrepreneurship Theory and Practice*, 16(3), 13-31.

Gilad, B. (1986). Entrepreneurial Decision making: Some Behavioral Considerations. In B. Gilad & S. Kaish (Eds.), *Handbook of Behavioral Economics* (Vol. B, pp. 189-208). Greenwich, CT: JAI Press.

Gunning, J. P. (1993). Entrepreneurists and Firmists: Knight vs. the Modern Theory of the Firm. *Journal of the History of Economic Thought*, 15(1), 31-53.

Harper, D. (1994). A New Approach to Modeling Endogenous Learning Processes in Economic Theory. *Advances in Austrian Economics*, 1, 49-79.

Harper, D. (1996). *Entrepreneurship and the Market Process: An Enquiry into the Growth of Knowledge*. London: Routledge.

Harper, D. (1998). Institutional Conditions for Entrepreneurship. *Advances in Austrian Economics*, 5, 241-275.

Harper, D., & Earl, P. (1996). 'Growth of Knowledge' Perspectives on Business Decision maker. In P. Earl (Ed.), *Management, Marketing and the Competitive Process* (pp. 306-328). Aldershot: Elgar.

Hébert, R. F., & Link, A. N. (1988). *The Entrepreneur. Mainstream Views and Radical Critiques* (Second ed.). New York: Praeger.

Kahnemann, D. (2000). Preface. In D. Kahneman & A. Tversky (Eds.), *Choices, Values and Frames* (pp. ix-xvii). Cambridge, MA: Russell Page Foundation, Cambridge University Press.

Kaish, S., & Gilad, B. (1991). Characteristics of Opportunities Search of Entrepreneurs verses Executives: Sources, Interests and General Alertness. *Journal of Business Venturing*, 6, 45-61.

Kanbur, S. M. (1979). Of Risk Taking and the Personal Distribution of Income. *Journal of Political Economy*, 87(4), 769-797.

Khilstrom, R., & Laffont, J. (1979). A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion. *Journal of Political Economy*, 87, 719-748.

- Kirzner, I. (1973). *Competition and Entrepreneurship*. Chicago: The University of Chicago Press.
- Kirzner, I. (1979). *Perception, Opportunity, and Profit: Studies in the Theory of Entrepreneurship*. Chicago: University of Chicago Press.
- Kirzner, I. (1980). The Primacy of Entrepreneurial Discovery. In A. Seldon (Ed.), *The Prime Mover of Progress* (pp. 5-30). London: Institute of Economic Affairs.
- Kirzner, I. (1995). Entrepreneurship. In P. J. Boettke (Ed.), *The Elgar Companion to Austrian Economics* (pp. 103-110). Cheltenham: Elgar.
- Kirzner, I. (1997). Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach. *Journal of Economic Literature*, 35, 60-85.
- Kirzner, I. (1999). Rationality, Entrepreneurship and Economic Imperialism. In S. C. Dow & P. E. Earl (Eds.), *Economic Organisation and Economic Knowledge: Essays in Honour of Brian Loasby* (Vol. 1, pp. 1-13). Cheltenham: Elgar.
- Knight, F. (1921). *Risk, Uncertainty and Profit*. New York: Augustus Kelley.
- Latsis, S. J. (Ed.). (1976). *Method and Appraisal in Economics*. Cambridge: Cambridge University Press.
- Laville, F. (2000a). Foundations of Procedural Rationality: Cognitive Limits and Decision Processes. *Economics and Philosophy*, 16, 117-138.
- Laville, F. (2000b). Should We Abandon Optimization Theory? The Need For Bounded Rationality. *Journal of Economic Methodology*, 7(3), 395-426.
- Lavoie, D. (1991). The Discovery and Interpretation of Profit Opportunities: Culture and the Kirznerian Entrepreneur. In B. Berger (Ed.), *The Culture of Entrepreneurship* (pp. 33-51). San Francisco: ICS Press.
- Lavoie, D. (1995). *Rivalry and Central Planning: The Socialist Calculation Debate Reconsidered*. New York: Cambridge University Press.
- Loasby, B. J. (1983). Knowledge, Learning and Enterprise. In J. Wiseman (Ed.), *Beyond Positive Economics?* (pp. 104-121). London: Macmillan.
- Machlup, F. (1967). Theories of the Firm: Marginalist, Behavioral, Managerial. *American Economic Review*, 57(1), 1-33.
- Manimala, M. J. (1992). Entrepreneurial Heuristics: A Comparison Between High PI (pioneering-innovative) and Low PI Ventures. *Journal of Business Venturing*, 7, 477-504.
- March, J. G., & Simon, H. A. (1958). *Organizations*. New York: Wiley.

- Minniti, M., & Bygrave, W. (2001). A Dynamic Model of Entrepreneurial Learning. *Entrepreneurship Theory and Practice*, 25(1), 1-9.
- Mises, L. v. (1949). *Human Action: A Treatise on Economics*. London: Hodge.
- Mitton, D. G. (1987). The Compleat Entrepreneur. *Entrepreneurship Theory and Practice*, 13(3), 9-20.
- Mongin, P., & Walliser, B. (1988). Infinite Regression in the Optimizing Theory of Decision. In B. Munier (Ed.), *Risk, Decision and Rationality* (pp. 435-457). Dordrecht: Reidel.
- O'Driscoll, G. P., & Rizzo, M. J. (1986). Subjectivism, Uncertainty, and Rules. In I. Kirzner (Ed.), *Subjectivism, Intelligibility and Economic Understanding: Essays in Honor of Ludwig M. Lachmann* (pp. 252-267). New York: New York University Press.
- Palich, L. E., & Bagby, D. R. (1992). *Cognitive Processes: Is the Entrepreneur Different?* In Centre for Entrepreneurial Studies, *Frontiers of Entrepreneurship Research: Proceedings of the Twelfth Annual Babson College Entrepreneurship Research Conference*: 106-117, Babson Park MA: Babson College.
- Rabin, M. (1998). Psychology and Economics. *Journal of Economic Literature*, 36, 11-46.
- Rabin, M. (2002). Alfred Marshall Lecture. A Perspective on Psychology and Economics. *European Economic Review*, 46, 657-685.
- Richardson, G. B. (1960). *Information and Investment*. Oxford: Oxford University Press.
- Ricketts, M. (1987). *The Economics of Business Enterprise: New Approaches to the Firm*. Brighton: Wheatsheaf Books.
- Ricketts, M. (1996). Kirzner's Theory of Entrepreneurship - A Critique. In B. J. Caldwell & S. Boehm (Eds.), *Austrian Economics, Tensions and New Directions* (pp. 67-83). Boston: Kluwer Academic Publishers.
- Ronen, J. (1983). Some Insights into the Entrepreneurial Process. In J. Ronen (Ed.), *Entrepreneurship* (pp. 137-174). Lexington, MA: Lexington Books.
- Sarasvathy, D., Simon, H., & Lave, L. (1998). Perceiving and Managing Business Risks: Differences Between Entrepreneurs and Bankers. *Journal of Economic Behavior and Organization*, 33, 207-225.
- Schoemaker, P. J. (1982). The Expected Utility Model: Its Variants, Purposes, Evidence and Limitations. *Journal of Economic Literature*, 20, 529-563.

- Schumpeter, J. A. (1934). *Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Shane, S. (2000). Prior Knowledge and the Discovery of Entrepreneurial Opportunities. *Organization Science*, 11(4), 448-469.
- Shane, S., & Venkataraman. (2000). The Promise of Entrepreneurship as a Field of Research. *Academy of Management Review*, 25(1), 217-226.
- Shaver, K. G., & Scott, L. R. (1991). Person, Process and Choice: The Psychology of New Venture Creation. *Entrepreneurship Theory and Practice*, Winter, 23-42.
- Simon, H. A. (1958). The Role of Expectations in an Adaptive or Behavioristic Model. Reprinted in H. A. Simon, *Models of Bounded Rationality* (Vol. 2, pp.380-400). Cambridge, MA: MIT Press.
- Simon, H. A. (1978). On How To Decide What To Do. *The Bell Journal of Economics*, 9(2), 494-507.
- Simon, H. A. (1984). On the Behavioral and Rational Foundations of Economic Dynamics. *Journal of Economic Behavior and Organization*, 5(1), 35-55.
- Simon, H. A. (1986). Rationality in Psychology and Economics. *Journal of Business*, 59(4), S209-S224.
- Simon, H. A. (1987). Bounded Rationality. In J. Eatwell et. al. (Eds.), *The New Palgrave: A Dictionary of Economics* (Vol. 1, pp. 266-268). London: Macmillan.
- Stigler, G. (1961). The Economics of Information. *Journal of Political Economy*, 69(3), 213-225.
- Teece, D. J., & Winter, S. G. (1984). The Limits of Neoclassical Theory in Management Education. *American Economic Review Papers and Proceedings*, 74(2), 116-121.
- Thomsen, E. F. (1992). *Prices and Knowledge: A Market Process Perspective*. New York: Routledge.
- Timmons, J. A., Smollen, L. E., & Dingee, A. (1985). *New Venture Creation* (Second ed.). Homewood IL: Irwin.
- Tversky, A., & Kahneman, D. (1986). Rational Choice and the Framing of Decisions. *Journal of Business*, 54(4), S251-S278.
- Venkataraman, S. (1997). The Distinctive Domain of Entrepreneurship Research: An Editor's Perspective. In J. Katz & R. Brockhaus (Eds.), *Advances in Entrepreneurship*,

Firm Emergence, and Growth (Vol. 3, pp. 119-138). Greenwich, CT: JAI Press.

Viale, R. (1992). Constraints on Economic Rationality. In H. Simon et. al. (Eds.), *Economics Bounded Rationality and the Cognitive Revolution* (pp. 174-193). Aldershot: Elgar.

Woods, C. R. (2002). *Entrepreneurial Action: Casting the Entrepreneur in the Market Process*. Unpublished Ph.D thesis, University of Auckland, Auckland.