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A theory of entrepreneurial opportunity identification and development

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Abstract

This paper builds on existing theoretical and empirical studies in the area of entrepreneurial opportunity identification and development. It utilizes Dubin's [Theory Building, (second ed.). Free Press, New York, 1978.] theory building framework to propose a theory of the opportunity identification process. It identifies entrepreneur's personality traits, social networks, and prior knowledge as antecedents of entrepreneurial alertness to business opportunities. Entrepreneurial alertness, in its turn, is a necessary condition for the success of the opportunity identification triad: recognition, development, and evaluation. A theoretical model, laws of interaction, a set of propositions, and suggestions for further research are provided.

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1. Executive summary

Identifying and selecting right opportunities for new businesses are among the most important abilities of a successful entrepreneur (Stevenson et al., 1985). Consequently,

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explaining the discovery and development of opportunities is a key part of entrepreneurship research (Venkataraman, 1997). This paper builds on existing theoretical and empirical studies in the area of entrepreneurial opportunity identification and development, and utilizes Dubin's (1978) theory building framework. We focus on serial entrepreneurs, those who have participated in the formation of multiple businesses.

Entrepreneurs identify business opportunities to create and deliver value for stakeholders in prospective ventures. While elements of opportunities may be "recognized," opportunities are made, not found. Careful investigation of and sensitivity to market needs and as well as an ability to spot suboptimal deployment of resources may help an entrepreneur begin to develop an opportunity (which may or may not result in the formation of a business). But opportunity development also involves entrepreneurs' creative work. Therefore, "opportunity development" rather than "opportunity recognition," should be our focus. The need or resource "recognized" or "perceived" cannot become a viable business without this "development."

The creation of successful businesses follows a successful opportunity development process. This includes recognition of an opportunity, its evaluation, and development per se. The development process is cyclical and iterative: an entrepreneur is likely to conduct evaluations several times at different stages of development; evaluation could also lead to recognition of additional opportunities or adjustments to the initial vision.

Major factors that influence this core process of opportunity recognition and development leading to business formation include:

1. entrepreneurial alertness;
2. information asymmetry and prior knowledge;
3. social networks;
4. personality traits, including optimism and self-efficacy, and creativity; and
5. type of opportunity itself.

The development process begins when entrepreneurial alertness exceeds a threshold level. Alertness is likely to be heightened when there is a coincidence of several factors: certain personality traits (creativity and optimism); relevant prior knowledge and experience; and social networks. The particular activities within the process are also affected by the degree of specificity of knowledge about market needs and resources.

This theoretical structure (diagrammed in Fig. 3) enables us to set forth numerous propositions about the process of opportunity recognition and development. These propositions provide a basis for furthering research into and understanding of the process.

2. Introduction

Identifying and selecting the right opportunities for new businesses are among the most important abilities of a successful entrepreneur (Stevenson et al., 1985). Consequently, explaining the discovery and development of opportunities is a key part of entrepreneurship research (Venkataraman, 1997). Numerous models of opportunity recognition and/or devel-

opment have been presented in recent years (Bhave, 1994; Schwartz and Teach, 1999; Singh et al., 1999; De Koning, 1999; Sigrist, 1999). These models are based on different, often conflicting, assumptions borrowed from a range of disciplines, ranging from cognitive psychology to Austrian economics.

While these attempts have contributed greatly to our understanding of opportunity identification, they fall short of offering a comprehensive understanding of the process for two major reasons. First, each of these perspectives primarily concentrates on only one of the various aspects of the process. For example, Sigrist (1999) looks at the cognitive processes involved in opportunity recognition; De Koning (1999) and Hills et al. (1997) on the social study network context; while Shane (1999) focuses on the prior knowledge and experience necessary for successful recognition. However, this focus on specific factors results in the in depth study of individual factors at the expense of other equally important casualties in the same study. There is also no agreement among entrepreneurship researchers on major concepts used to define and operationalize the processes in question. In short, we are still far from developing a comprehensive theory of opportunity identification and development. Such a theory is critical if we want to successfully bridge research and practice: a sound theory provides a means of identifying and defining applied problems; it provides a means of prescribing or evaluating solutions to applied problems; and it provides a means of responding to new problems that have no previously identified solutions.

This paper builds on existing theoretical and empirical studies in the area of entrepreneurial opportunity identification and development, and utilizes Dubin's (1978) theory building framework to propose a theory of the opportunity identification process. The phenomenon of opportunity identification is highly complex, and existing studies in the area cut across a broad swathe of disciplines including management, organization theory, marketing, and entrepreneurship. In proposing our theory therefore we draw from this rich and cross-disciplinary theoretical base.

3. Dubin's methodology for theory building

Dubin (1978) provides a comprehensive methodology for theory building that is particularly relevant for applied fields such as management, marketing, and organization theory. The eight phases of Dubin's theory building are: (1) units (i.e., concepts) of the theory, (2) laws of interaction (among the concepts), (3) boundaries of the theory (the boundaries within which the theory is expected to apply), (4) system states of the theory (conditions under which the theory is operative), (5) propositions of the theory (logical deductions about the theory in operation), (6) empirical indicators (empirical measures used to make the propositions testable), (7) hypotheses (statements about the predicted values and relationships among the units), and (8) research (the empirical test of the predicted values and relationships). The first five phases of the methodology represent the structural components of Dubin's model, and the last three phases represent the process of empirical validation. Although theorists must consider the entire scope of Dubin's model for effective theory building, theory building and empirical research are often separated, and each of these is conducted as a distinct research effort.

4. Elements of a theory of opportunity identification

This section describes the development of the theory of opportunity identification using the first five phases of Dubin's methodology for theory building.

4.1. Units of the theory

The units of the theory are the concepts, the building blocks, from which the theory is constructed. To determine the concepts to be included in our theory, we reviewed literature on opportunity identification and other relevant literature published in 25 leading academic journals and annual conference proceedings in such disciplines as marketing, entrepreneurship, management, social psychology, economics, organization behavior, and organization theory.

Our review indicates that the literature includes several related concepts, which are often confounded with one another — opportunity development, opportunity recognition, and opportunity evaluation. These concepts correspond to the principal activities that take place before a business is formed or restructured. While division into these three processes may facilitate explanation and analysis, in practice these three processes often overlap and interact with each other. For example, some development activity may occur before an opportunity is perceived (recognized) by others not involved in the initial development, though logically we would expect recognition to precede development. Opportunities may also be evaluated several times during the development process.

4.1.1. Units of the theory: the development process

4.1.1.1. Opportunity. In broad terms, an opportunity may be the chance to meet a market need (or interest or want) through a creative combination of resources to deliver superior value (Schumpeter, 1934; Kirzner, 1973; Casson, 1982). But “opportunities” describe a range of phenomena that begin unformed and become more developed through time.

In its most elemental form, what may later be called an “opportunity” may appear as an “imprecisely-defined market need, or un- or under-employed resources or capabilities” (Kirzner, 1997). The latter may include basic technologies, inventions for which no market has been defined, or ideas for products and services. Prospective customers may or may not be able to articulate their needs, interests, or problems (Von Hippel, 1994). Even if prospective customers cannot do so, they may still be able to recognize the value to them in something new when they are presented with it and have its operation and benefits explained. Opportunities seen from the perspective of prospective customers represent *value sought*.

Underutilized or unemployed resources, as well as new capabilities or technologies may offer possibilities to create and deliver new value for prospective customers, even though the precise forms that new value will take may be undefined. For example, the technology to make a material combining properties of both metal and glass may be developed before there are known applications; new medicinal compounds may be created without knowledge of the conditions for which the applications might be efficacious. Opportunities arising from

underutilized or unemployed resources, from technology or other types of proprietary knowledge or abilities, may be labeled *value creation capability* (Schroeder et al., 1996).

As the market need becomes more precisely defined in terms of benefits and value sought by particular users, and resources become more precisely defined in terms of potential uses, the “opportunity” progresses from its elemental form and a *business concept* begins to emerge. This concept contains the core notions of how the market need might be served or the resources deployed. As this business concept itself develops, it becomes more complex, including product/service concept (what is to be offered), market concept (to whom it will be offered), supply chain/marketing/operations concept (how the product/service will be delivered to the market) (Cardozo, 1986).

As this more precise and differentiated business concept matures, it grows into a *business model*, which juxtaposes market needs and resources. If the concept originated as a market need (value sought), the type and amount of resources required to address that need will be identified. If the concept arose from underemployed resources (value creation capability), the benefits and value that the capability brings to particular users and uses will become more explicitly detailed.

A complete business model includes not only the detailed and differentiated business concept, but also a financial model, which estimates the value created and how that value might be distributed among stakeholders. As development progresses, that financial model gradually increases in detail and precision, laying the foundation for later cash flow statements and for identifying the major risk factors that could affect cash flow.

As an opportunity develops into its most elaborated form, formal cash flows, schedules of activities, and resource requirements are added. These additions enable the business concept to metamorphose into a full *business plan*. Some businesses may be started with incomplete or unarticulated business plans; others, only after plans are explicit and detailed.

The process described in the preceding paragraphs is presented as an orderly sequence and may be fully articulated by participants. But in practice, the process is seldom either orderly or fully articulated (Nelson, 1987).

4.1.1.2. Opportunity development. Opportunities begin as simple concepts that become more elaborate as entrepreneurs develop them. This process involves proactive efforts much like that of new product development, but the developmental process here gives rise to an entire business, not just a product (Pavia, 1991). Our position here departs from earlier literature (e.g., Kirzner, 1973) that considers opportunity recognition largely a process of discovering something already formed. We regard opportunity development as a continuous, proactive process essential to the formation of a business.

4.1.1.3. Opportunity recognition. Opportunities develop as individuals shape elemental ideas into full-blown business plans. But the process of opportunity development is conceptually distinct from opportunity recognition or identification. What most literature in entrepreneurship calls “opportunity recognition” appears to include three distinct processes: (1) sensing or perceiving market needs and/or underemployed resources, (2) recognizing or discovering a “fit” between particular market needs and specified resources, and (3) creating

a new “fit” between heretofore separate needs and resources in the form of a business concept (Hills, 1995; De Koning, 1999). These processes represent, respectively, *perception*, *discovery*, and *creation* — not simply “recognition” (Christensen et al., 1989; Conway and McGuinness, 1986; Singh et al., 1999).

Perception. Either kind of opportunity — market need or underemployed resources — may be identified or recognized by some individuals and not others. We believe that these differences are due to the heterogeneity in individuals’ sensitivity to opportunities for creation and delivery of new value. Customers may differ in their abilities to articulate or to recognize underserved or unmet interests. Individuals who develop new capabilities for creating and delivering value may differ in the ways in which they think about the new capability and its potential applications. These individual differences may come from variations in individuals’ genetic makeup, background and experience, and/or in the amount and type of information they possess about a particular opportunity.

Some individuals are so sensitive to market needs or problems that they perceive possibilities for new products (or solutions) continuously in any environment in which they find themselves (Endsley, 1995). They can identify possibilities simply by observing such phenomena as parents’ trying to make dinner while managing small children, or as senior citizens trying to turn a doorknob. This sensitivity to problems or possibilities does not necessarily extend to generation of ideas for solutions to the problems; not everyone who is good at asking questions is equally adept at creating answers.

Other individuals may be particularly sensitive to identifying un- or underemployed resources, such as unused land, idle production facilities, unexploited technology or inventions, underperforming financial assets, and the like. Having identified such resources however, these individuals may not be able to define particular uses or users for which the resources could create value. Inventors, scientists, or individuals may generate ideas for new products and services without regard to the market acceptance or commercial viability of inventions or new technology.

The more fully developed opportunities for value sought or value creation are, the more likely they are to become perceptible to a wider array of individuals. The more precise and complete the description, the more readily identified the uncertainties (risks) associated with the opportunity (Ray and Cardozo, 1996).

Discovery. Perception of a “fit” between market needs and resources presupposes that the needs and resources were already matched, as might be the case with an underperforming business. Perception of an existing “match” of market needs and resources represents discovery of the type that might follow exploration of a particular geographic area or product-market space.

The most comprehensive treatment of opportunity discovery in entrepreneurial behavior is found in Kirzner’s (1973, 1979) work. The starting point of Kirzner’s theory is the resource utilization perspective. According to this perspective, entrepreneurs decide to start a new business or expand in a new product-market when they think that there is an opportunity to redeploy the resources away from present, suboptimal configurations, to more promising opportunities (McGrath and Venkataraman, 1994). Kirzner (1973, p. 137) argues that “At any given time market participants are engaged in a set of activities which is likely to be a

disequilibrium set.” In Kirzner’s conceptualization, the maladjustment occurs when a set of resources available to an entrepreneur is being used to produce units of a product A when the same resources could be used to produce units of product B, which will fetch a higher price because it delivers greater value to customers. Therefore, the available resources are underutilized. Due to imperfect information entrepreneurs continue to sell their resources to customers at prices that are lower than they would command if they switched to production of good B. Kirzner’s elaboration suggests that entrepreneurs are selling not just products, but, rather, their knowledge, the ability to assemble resources, and the resources already available to them. This perspective allows entrepreneurs to move away from analyzing *what is* to discussion of *what is possible*, and opens an opportunity for entrepreneurial discovery. However, the choice is not just between products A and B, or A and C. It is also a choice among different levels of quality and product characteristics. Kirzner (1973, p. 138) argues that “just as a spectrum of prices (for a single product) can be expected to give way, under the pressure of the market process, to an equilibrium price, so may a spectrum of various qualities of product give way, under competitive pressures, to a single set of product specifications.” The decision about which product with what specifications to produce is not about economizing with given resources, but rather about recognizing kinds of products customers will be willing to buy, the kinds of goods available technology and resources can produce, and resources that can be assembled by the entrepreneur. “It is the successful identification of relevant ends and means (rather than the efficient utilization of means to achieve ends) which makes the ‘right’ decision on product quality” (Kirzner, 1973, p.139).

Creation of a business concept that matches market needs with resources must logically follow perception of both the needs and the resources. But business concept creation is more than perception and discovery. Concept creation involves redirecting or recombining resources in order to create and deliver value superior to that currently available. Concept creation may go well beyond adjustment of current matches of resources and needs and may even lead to dramatic restructuring of an existing business or “radical innovation.”

4.1.1.4. Opportunity evaluation. Opportunities are evaluated at each stage of their development, although the evaluation may be informal or even unarticulated (Timmons, Muzyka, Stevenson and Bygrave, 1987). Individuals may informally pursue investigations of presumed market needs or resources (including inventions) until concluding either that these warrant no further consideration, or that more formal pursuit of the possibility is appropriate. This “evaluation” may not be communicated to others until a request is made for resources to mount further investigation.

Once resources beyond the time of an individual have been committed to the development process, evaluation becomes more formal. In the case of inventions, prospective new products or services, the first formal evaluation may involve a feasibility analysis, which addresses the question of whether the proposed combination of resources can, in fact, deliver specified value. A feasibility analysis will likely also assess whether the value that a particular combination of resources can deliver will translate into economic success. A feasibility analysis useful for prospective stakeholders implies the existence of a business concept, even one rudimentary in form. If a business concept has yet to be developed, a feasibility analysis

based on either market needs (value sought) or resources (value creation capability) can specify the business concept(s) that would be feasible.

Evaluation of a full-blown business plan for a new business or for acquiring and restructuring an existing business is often referred to as “due diligence,” meaning that individuals involved in decisions to commit resources for further development, investment or acquisition will exercise (or have exercised) “due diligence” in their evaluation.

A popular evaluation procedure that may be adapted to a wide range of circumstances is the “stage-gate” procedure, which explicitly calls for evaluation at each of several levels of development. Whether or not an opportunity will pass through each of the “gates” depends, to a large extent, on a number of constraints or limitations commonly experienced by entrepreneurs, such as their return objectives, risk preferences, financial resources, individual responsibilities, and personal objectives. Similar to [Ronstadt’s \(1988\)](#) “knowledge corridor,” this “corridor of constraints” is actually screening criteria to isolate inappropriate prospective opportunities. While one entrepreneur may dismiss a given opportunity based in these criteria, it might appeal to another individual or team.

An “opportunity” that does not successfully pass through a “gate” to the subsequent stage of development or implementation may be revised or even aborted. Evaluation of resources, and markets often leads to useful revisions of business concepts. At the same time, evaluation procedures have the effect of aborting many opportunities at each of several levels of development. The number of market needs and un- or underemployed resources perceived greatly exceeds the number of successful businesses formed (see [Fig. 1](#)).

The term “evaluation” typically communicates a judgment, which determines whether a developing opportunity will receive the resources to mature to its next stage. In the program development literature this is called “summative” evaluation ([Phillips, 1991](#)). There is,

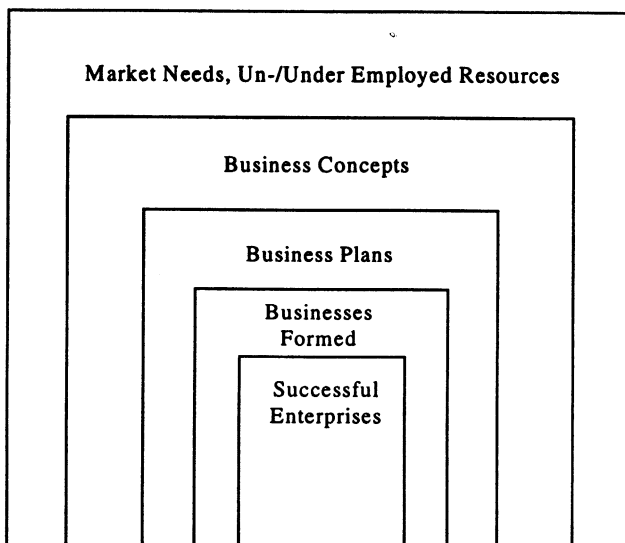


Fig. 1. From a market need to a successful enterprise.

however, a second type of evaluation, “formative” evaluation (Phillips, 1991), which helps to redirect the development process, so that it promises a higher probability of success. This is akin to a process of real time evaluation and adjustment, termed “emergent strategy” by Mintzberg (1998).

The earlier discussion suggests that entrepreneurs develop business opportunities to create and deliver value for stakeholders in prospective ventures. While elements of opportunities may be “recognized,” opportunities are made, not found. Careful investigation of and sensitivity to market needs and suboptimally deployed resources may help an entrepreneur begin to develop an opportunity (which may or may not result in formation of a business), but opportunity development also involves creative input by the entrepreneur. Therefore, “opportunity development” is perhaps a more accurate term for the process than “opportunity recognition.” The need or resource “recognized” cannot become a viable business without this “development.”

Now we can identify the major concepts to be included in our theory: opportunity, and opportunity recognition, development, and evaluation.

Next, we need to agree on a measure of success in opportunity recognition/development, which should allow us to arrive at possible dependent variables. Here we follow MacMillan (1986), who proposed that in order to eliminate the possibility that the ability to select or develop good opportunities is not simply due to luck, researchers concentrate on *serial* entrepreneurs, each of whom have a series of successful ventures.

4.1.2. Units of the theory: factors affecting the process

Further, we need to identify major factors influencing the processes in question. Our literature review indicates that researchers have hypothesized a number of factors that influence the way opportunities are identified and developed by entrepreneurs. Among the major factors discussed in the literature are:

1. entrepreneurial alertness;
2. information asymmetry and prior knowledge;
3. discovery versus purposeful search;
4. social networks;
5. personality traits, including risk-taking, optimism and self efficacy, and creativity.

4.1.2.1. *Entrepreneurial alertness.* Kirzner (1973) was the first to use the term “alertness” to explain entrepreneurial recognition of opportunities. Ray and Cardozo (1996) argue that any recognition of opportunity by a prospective entrepreneur is preceded by a state of heightened alertness to information. They called this state entrepreneurial awareness (EA), and defined EA as “a propensity to notice and be sensitive to information about objects, incidents, and patterns of behavior in the environment, with special sensitivity to maker and user problems, unmet needs and interests, and novel combinations of resources.” Further, in keeping with several authors, they claimed that personality characteristics and the environment interact to create conditions that foster higher EA (cf. Shapero, 1975; Sathe, 1989; Hisrich, 1990; Gaglio and Taub, 1992). Embedded in this line of thought is the notion that

higher alertness increases the likelihood of an opportunity being recognized. There are, however, reports of studies that testify to the contrary. For example, [Buzenitz \(1996\)](#) conducted an empirical test of [Kaish and Gilad's \(1991\)](#) proposition that entrepreneurs are more alert to new opportunities and use information differently from managers. Busenitz found little empirical support for the Kaish and Gilad theoretical framework, but indicated that the measures of entrepreneurial alertness need further development.

4.1.2.2. Information asymmetry and prior knowledge. People tend to notice information that is related to information they already know ([Von Hippel, 1994](#)). Therefore, [Shane \(1999\)](#) postulated that entrepreneurs will discover opportunities because prior knowledge triggers recognition of the value of the new information. Drawing on the Austrian economics argument that entrepreneurship exists because of information asymmetry between different actors ([Hayek, 1945](#)), Shane maintains that any given entrepreneur will discover only those opportunities related to his or her prior knowledge. In his three-stage study of opportunity recognition processes, [Shane \(1999\)](#) tested and confirmed a number of hypotheses, which could be summarized as follows:

- Any given entrepreneurial opportunity is not obvious to all potential entrepreneurs (the rationale being that all people do not possess the same information at the same time; [Kirzner, 1997](#)).
- Each person's idiosyncratic prior knowledge creates a "knowledge corridor" that allows him/her to recognize certain opportunities, but not others ([Hayek, 1945](#); [Ronstadt, 1988](#)). Three major dimensions of prior knowledge are important to the process of entrepreneurial discovery: prior knowledge of markets, prior knowledge of ways to serve markets, and prior knowledge of customer problems.

[Sigrist \(1999\)](#), in her qualitative study employing conceptual mapping of entrepreneurial opportunity identification process, postulates that there are two types of prior knowledge relevant to this identification process. The first is knowledge in an area or domain of special interest to an entrepreneur, an area that can be described in terms of fascination and fun (Domain 1). Driven by this special interest, an entrepreneur spends a lot of effort and time to engage in autodidactic learning that advances and deepens her/his capabilities, thereby gaining profound knowledge about this topic of interest. The second type of knowledge refers to a different domain, Domain 2. Knowledge about this domain is accumulated over the years, while working in a certain job. This job is, in most cases, not associated with the first domain of fun and fascination. It is, rather, a result of a rational choice, often made on advice of other people (parents, mentors, friends). After a number of years of experience in an industry associated with Domain 2, the entrepreneurs bring the two capabilities together. The integration of the two domains leads to the discovery of a new opportunity, a new market, or a new solution to customer's problems.

4.1.2.3. Accidental discovery versus systematic search. A large part of the erstwhile literature on entrepreneurship implicitly assumed that recognition of opportunity is preceded

by a systematic search for available opportunities. In recent years, many researchers have challenged this approach, arguing that people do not search for opportunities, but, rather, happen to recognize the value of new information, which they happen to receive. Kirzner (1997, pp. 71–72) explains that: “What distinguishes discovery (relevant to hitherto unknown profit opportunities) from successful search (relevant to the deliberate production of information which one knew one had lacked) is that the former (unlike the latter) involves the surprise that accompanies the realization that one had overlooked something in fact readily available.” Koller (1988) reported that most entrepreneurs recognized, rather than sought the opportunities for their firms. Teach et al. (1989) found that firms founded on “accidentally” discovered venture ideas and which had not been subjected to formal screening achieved break-even sales faster than those firms that had undergone more formal search. Teach et al. (1989) also found different styles of opportunity recognition among the subject group software firm presidents. Only about half-favored systematic approaches to searching for opportunities.

“Accidental” discovery may result from heightened entrepreneurial alertness while the entrepreneur is in a mode we call “passive search.” In that mode, the entrepreneur is receptive, though not engaged in a formal, systematic search process. One might hypothesize that, in a state of “passive search,” entrepreneurs with higher EA would be more likely than those with lower EA to experience an “accidental” discovery of an opportunity. EA appears to be a more powerful determinant of discovery — accidental or purposive — than level of activeness of search. Therefore, we include entrepreneurial alertness rather than search in our model.

4.1.2.4. Social networks. Hills et al. (1997) indicate that entrepreneurs’ networks are important to opportunity recognition. They base their argument on Granovetter’s (1973) classic article on the strength of weak ties, which argues that weak ties (including casual acquaintances) are “bridges” to information sources not necessarily contained within an individual’s strong-tie network (including friends and family). Granovetter (1973) argues that the casual acquaintance is more likely to provide unique information than are close friends, because most people have more weak ties than strong. A test of this hypothesis in a survey-based study allowed Hills et al. (1997) to assert “that entrepreneurs who have extended networks identify significantly more opportunities” than solo entrepreneurs. Hills et al. also hypothesized that the quality of network contacts can affect other characteristics, such as alertness and creativity.

De Koning (1999) proposed a sociocognitive framework of opportunity recognition. Her framework shows that entrepreneurs evolve opportunities by pursuing three cognitive activities (information gathering, thinking through talking, and resource assessing) through active interaction with an extensive network of people. This network includes the entrepreneur’s inner circle (the set of people with whom an entrepreneur has long-term, stable relationships, they are not partners in the venture), “action set” (people recruited by the entrepreneur to provide necessary resources for the opportunity), partnerships (start-up team members), and a network of weak ties (a network used to gather general information that could lead to identifying an opportunity or to answering a general question).

4.1.2.5. Personality traits. Some cognitive studies have focused on personality traits of entrepreneurs and their contribution to the success of entrepreneurial ventures. However, Shaver and Scott (1991) in their summary of these research attempts point out that psychometric tests searching for distinctive “entrepreneurial” traits have been unable to find differences in most personality traits between entrepreneurs and other groups (managers or the general public).

Two personality traits have, however, been shown to be related to successful opportunity recognition. First, the connection between optimism and higher opportunity recognition has been observed by a number of researchers. Studies by Krueger and Dickson (1994) and Krueger and Brazeal (1994) show that entrepreneurial optimism is related to self-efficacy beliefs. It is important to point out that optimism about one’s ability to achieve specific, difficult goals (self-efficacy) is not related to optimism in the sense of higher risk taking. Guth et al. (1991) found that the entrepreneurs’ optimism was an “inside view” of the potential success of the venture, largely based on the entrepreneurs’ evaluations of their abilities and knowledge. When forced to take an outside view, entrepreneurs were much more realistic in judging probable outcomes. Research in organizational contexts also show that perceived self-efficacy leads to optimism and a higher propensity to see opportunities rather than threats in any given situation (Neck and Manz, 1992, 1996).

The second personality trait is that of creativity. Schumpeter (1934) was the first to introduce the notion that successful entrepreneurs discover opportunities that others do not see. Winslow and Solomon (1993) seem to take for granted that creativity and entrepreneurship are similar, if not the same. Kay (1986) concluded that creative factors play a great role in entrepreneurial decision making. Hills et al. (1997) have found that 90% of those surveyed by them find creativity very important for opportunity identification. However, solo entrepreneurs found it significantly more important than did the networked entrepreneurs. They also viewed themselves as being more creative, and were more likely to set aside time specifically to be creative. Hills et al. conclude that entrepreneurs who are networked to opportunity sources may not need to be as creative as those who are not networked.

Based on the review, we conclude that the literature provides support for the role of five key factors in the opportunity identification and development process: alertness, creativity, optimism (related to self-efficacy), social networks, and prior knowledge. While the evidence regarding the role of formal search is, in general, negative, entrepreneurial alertness appears to be a more powerful concept. The relationship between opportunity identification and personality traits other than creativity and optimism seems to be weak. Therefore, we will include from the literature only those first five factors.

4.1.2.6. Type of opportunity. In addition to the five factors identified in the literature, we believe that the process of opportunity development may differ among four types of “opportunities” defined by the matrix in Fig. 2. This matrix, adapted from the literature on creativity (Getzels, 1962), differentiates between “opportunities” based on their origin and degree of development. Market needs or value sought may be identified (known) or unidentified (unknown). Value creation capability may be defined or undefined. Defined value creation capability includes general specifications of intellectual, human, financial and/

		VALUE SOUGHT	
		Unidentified	Identified
VALUE CREATION CAPABILITY	Undefined	“Dreams” I	Problem solving II
	Defined	Technology Transfer III	Business Formation IV

Fig. 2. Types of opportunities.

or physical resources (e.g., general specifications for a product/service). In this matrix value sought may represent problems and value creation capability may represent solutions.

The upper left cell — where value sought is unidentified and value creation capability undefined (problems and solutions both unknown) — may represent the kind of creativity we associate with artists, “dreamers,” some designers, and inventors interested in moving proprietary knowledge in a new direction or pushing technology past its current limits.

The upper right cell — where value sought is identified but capability undefined (problems are known but solutions are not) — describes situations in which structured problem solving, including information search, occur. The goal of opportunity development in this situation is usually design of a specific product/service to address an expressed market need.

The lower left cell — where value sought is unidentified but capability is defined (problems are unknown but solutions are available) — includes what we usually identify as “technology transfer” challenges, i.e., capabilities in search of an application; and idle capacity. Opportunity development here emphasizes search for applications more than product/service development.

In the lower right cell — where value sought is identified and capability defined (both problems and solutions are known) — opportunity development involves matching known resources and needs to form businesses that can create and deliver value.

One might argue that this matrix describes a developmental progression from situations in which both problem and solution are unknown (upper left), to situations in which either the problem or solution (but not both) is known (upper right, lower left), to the situation in which both problem and solution are known (lower right). We might hypothesize that businesses formed in cells where either problem or solution or both are unknown would be less likely to succeed than those formed where both problem and solution are known.

Each of these units of the theory has several conceptual dimensions of its own. A model that represents the units of the theory and their principal dimensions appears in Fig. 3.

4.2. Laws of interaction

The relationships among the concepts (units) of a theory are described in the theory’s laws of interaction (Dubin, 1978). The laws of interaction show how changes in one or more units of the theory influence the remaining units. We posit the relationships outlined in Fig. 3.

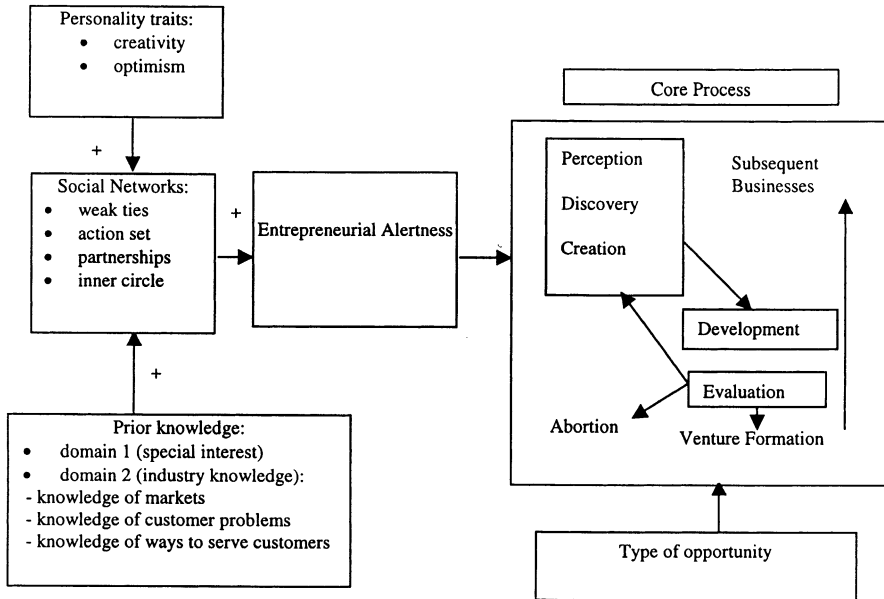


Fig. 3. The model and units for the opportunity identification and development theory.

The outcome in which we are interested is defined as a series of successful businesses created by the entrepreneur. Creation of a successful business results from a successful opportunity development process, which includes recognition of an opportunity, its evaluation, and development per se. The development process is cyclical and iterative: an entrepreneur is likely to conduct evaluations several times at different stages of development; these evaluations could lead to recognition of additional opportunities or to adjustments to the initial vision.

The “core process” outlined in Fig. 3 begins when the entrepreneur has an above-threshold level of entrepreneurial alertness. The level of entrepreneurial alertness is likely to be heightened when there is a coincidence of several factors: certain personality traits, relevant prior knowledge and experience, and social networks. Personality traits like creativity and optimism are critical determinants of this alertness; as are the domains of knowledge: Domain 1 (special interest) and Domain 2 (knowledge and experience in a specific product and customer market). The nature of social networks (including weak ties, action set, partnerships, and inner circle) also determines the level of this entrepreneurial alertness. Finally, the type of opportunity plays an important role in shaping this “core process.”

Developmental processes may differ across individuals, entrepreneurial teams, and institutions (in the case of corporate ventures). Some individuals excel at invention; others, at creating business models. A rare few may excel at both. Within each group work practices and styles differ. Individuals and teams have distinctive personalities; no two institutions follow exactly the same R&D or venture development procedures.

Inventors may develop their inventions into full business concepts, or entrepreneurs who have not participated in the invention process may attempt to expand inventions into full

business concepts if their economic processes are promising. For inventions to become businesses, either the inventor or entrepreneur must *recognize* the opportunity and *evaluate* it positively.

The following interactions between the units are hypothesized:

- There is interaction between social networks and alertness. As Hills et al. (1997) have demonstrated, the denser an entrepreneur's network (the more connected a person is), the higher is his/her alertness to potentially successful entrepreneurial opportunities.
- The stronger an entrepreneur's interest in Domain 1 (specific area of personal interest, hobby, etc.), the higher the alertness (Sigrist, 1999)
- When Domains 1 and 2 converges, it increases alertness (Sigrist, 1999)
- There is a continuous interaction between one's knowledge base, and the opportunity development process. This interaction results in an iterative learning process, described by Argyris and Schoen (1978) as double-loop learning, and in the development of a knowledge corridor, described by Ronstadt (1988), which leads to heightened alertness to new opportunities.

4.3. Boundaries of the theory

Dubin (1978) describes the boundaries of a theory as defining the domain over which the theory is expected to apply. The boundaries of a theory distinguish its theoretical domain from aspects of the world not addressed by the theory. Van de Ven (1996) has demonstrated that significant commonalities exist between the business creation processes of independent start-ups and internal corporate ventures. Therefore, the domain within which our theory is expected to hold is the domain of new business creation and development, both as independent businesses and as new businesses created within existing corporations.

4.4. System states

Dubin (1978) defines a system state as a state in which all the units of the system take on characteristic values that have persistence through time, regardless of the length of the time interval. All units of the system have values that are determinant, that is, are measurable and distinctive for that state of the system. A system state that accurately represents a condition of the system being modeled has three characteristics: (a) inclusiveness (all the units of the system are included in the system state), (b) persistence (the relationship between units persists long enough to allow the goodness of fit between them to be determined), and (c) distinctiveness (all units take on unique values for that system state). We believe that our model satisfies all three requirements, since: (a) it includes all the important units of the system (at least, all the units that have been identified as important in previous research on opportunity identification), (b) the relationships between all the units described in Fig. 3 are long-lasting relationships, and (c) there is no overlap in values between any of the units (i.e., each unit can be assigned a unique value).

4.5. Propositions

Propositions of a theory are logical deductions about the theory in operation. Because they are statements that are logically derived from the theory, propositions can be subjected to empirical testing (Dubin, 1978). We formulated eight propositions from the theory of opportunity identification:

Proposition 1: A high level of entrepreneurial alertness is associated with successful opportunity recognition and development.

Proposition 2: Successful opportunity identification is associated with the existence and use of an extended social network, which includes the following four elements: weak ties, action set, partnerships, and inner circle. The lack of any of these elements reduces the probability of such success.

Proposition 3: For successful opportunity identification, a convergence of both the knowledge domains — special interest knowledge and industry knowledge — is critical. Without this convergence there is a lower probability of such success.

Proposition 4: Prior knowledge of markets increases the likelihood of successful entrepreneurial opportunity recognition.

Proposition 5: Prior knowledge of customer problems increases the likelihood of successful entrepreneurial opportunity recognition.

Proposition 6: Prior knowledge of ways to serve markets increases the likelihood of successful entrepreneurial opportunity recognition.

Proposition 7: High levels of entrepreneurial alertness are related to high levels of entrepreneurial creativity and optimism (based on high self-efficacy).

Proposition 8: The opportunity identification process results in enriching the entrepreneur's knowledge base and increase in alertness, leading to the identification of future business opportunities. Thus the greater the number of previously successful opportunity identification events, the higher the probability of future successful opportunity identification events.

These propositions illustrate, but do not exhaust, those that may be derived from the proposed theory

5. Future research

The last three phases of Dubin's methodology are used to conduct empirical research. For this activity, the researcher specifies empirical indicators to make the propositions testable, states hypotheses about the predicted values and relationships among the units of the theory, and conducts research to test empirically the predicted values and relationships.

Future empirical research is needed to assess the proposed theory in the real world. Propositions 1–7 can be tested in a quantitative study, using an ex-post facto survey design, involving a sample of successful serial entrepreneurs. Proposition 8 concerns longitudinal processes, involving changes in cognitive states and knowledge base. Those phases of ontogenesis that do not involve written documents may occur very quickly and internal to an individual, who may not be able to recount the process perfectly nor be able to offer outsiders all the data they seek to map the process. Nonetheless, approaches such as cognitive mapping and techniques for analyzing “thinking aloud” may offer the most effective insights into the process through which “opportunities” mature, i.e., through which value sought or value creation capability grow into creative combinations of resources to deliver superior value. Therefore, Proposition 8 is best tested through qualitative in-depth case studies, content analysis, and cognitive mapping techniques. This suggests the need for using multiple-method, even a multiparadigm approach, as suggested by Caracelli and Greene (1997).

In this paper, specific indicators and hypotheses will not be formulated. Rather, individual studies could use the propositions presented above to formulate hypotheses and choose methods of testing.

Future research is also needed to assess the domain over which the theory rightfully applies. The concepts (units of the theory) from which the theory was developed are drawn heavily from private-sector and corporate models of organizations. The terms *business*, *industry*, *product*, *customer*, *marketplace*, and other private-sector concepts appear throughout this paper. What about community, government, nonprofit, and other non private-sector organizations whose mission and performance are assessed differently from those of private-sector organizations? These organizations are increasingly under pressure to display entrepreneurial behavior and identify new opportunities for self-financing. And, as Peter Drucker (1985) argues, many nonprofits are displaying a great deal of entrepreneurial savvy. Does the theory of opportunity identification apply in these contexts as well? Testing the theory in non private-sector settings is needed to identify the domains over which the theory applies and does not apply.

6. Conclusion

We have taken a “first cut” at building a theory of opportunity identification, using Dubin’s method of theory development. Our theory conceives of opportunity identification/recognition as a multistage process in which entrepreneurs play proactive roles. We argue that both individual and situational differences influence the process. In its present form the theory appears to offer rich opportunities for research into the process of opportunity identification/recognition and development. We hope that our statement of the theory will encourage others to develop further the theory itself.

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