

BUSINESS NETWORK AS ORGANIZATIONAL MEMORY AND HEURISTIC PROBLEM SOLVING. INSIGHTS FROM A LITERATURE REVIEW¹

Simone Guercini

Full Professor in Marketing

Department of Business Science

Via delle Pandette 9, 50127 Firenze

e-mail: simone.guercini@unifi.it

phone: +39 0554374704

WIP Paper

Abstract

The aims of this paper is to give a base of discussion about the relation between business network and organizational memory and heuristic literature. More precisely, the paper compares different approaches to heuristics and propose an evaluation of the role of heuristic processes in business network. Following an analysis of heuristic based on the ecological rationality approach, a view where business network are a base for activating heuristic processes and problem solving is proposed. On the methodological level, the work presented here is conceptual, based on a wide-ranging literature review. In business networks heuristic rules emerge and are taught and learnt. Business network can give a base for retrieval of information as part of the organizational memory. At the same time, search rule and decision rules are part the base to define heuristic problem solving. In business network memory can be stored in actors, resources and activity. Actors' cognitive activities are central issues in the capability to acquire information, but organizational memory in business network refers to stored information from interaction and actors' history that is brought to bear on present behavior. This

¹ The author wishes to thank two anonymous referees for useful comments and suggestions on previous versions of this paper and Professor Gerd Gigerenzer for suggestions and for giving him the opportunity for a study term at the Max Planck Institute for Human Development, Adaptive Behavior and Cognition Group, in Berlin.

information is stored as a consequence of implementing activities to which they refer, by actors' recollections and through shared interpretations.

Keywords: heuristics, cognitive limits, organizational memory, , business network, entrepreneurial marketing

1. Introduction

A number of works in the literature have underlined how the origins of marketing are, from a theoretical viewpoint, tied to microeconomics (Vargo and Lusch 2004), which has defined marketing in relation to the market for products. Thus, mainstream marketing has long referred to a conception of the enterprise decision-maker (managers and entrepreneurs) as "*homo economicus*" – a rational individual whose behavior is based on logic and the quality of assessments in the abstract (Gigerenzer 2006).

In recent years, experimental psychology has devoted ever-increasing attention to the study of economic behavior (Kahneman 2003). Such study has however focused more on analyzing the behavior of consumers than that of business decision-makers (Bown 2007, Yee et al. 2007, Schmittlein and Peterson 1994, Rubinstein 2003, Hoyer and Brown 1990, Malhotra 1982, Fishburn 1974). The time has probably come to look at economic behavior from a different perspective and apply the study of heuristic processes to the behavior of market decision-makers (Wübben and Wangenheim 2008). To this aim, the hypothesis advanced and sustained herein is that heuristic processes are particularly important for understanding the marketing strategies adopted by entrepreneurial decision-makers in SMEs.

Heuristics help behavior in conditions of limits in computational capabilities and memory. On an organization level, memory because it is not clear if and how information processing ideas derived primarily from works on biological organism can be extended to social and organizational phenomena, following an "anthropomorphic" approach to organizational memory (Walsh and Ungson 1991). Memory has been associated primarily with individuals, but researchers have suggested that memory can reside in groups and supra-individual collectivities as wells. This extension of memory to the organizational level is brimful of ambiguity (Paoli and Prencipe 2003). Some

authors argued that organizational memory is only a metaphor because organizations do not literally remember (Argyris and Schon 1978). To approach this metaphor it can be recalled the method adopted by Turing about the definition of artificial intelligence, which suggested to change the research question, re-defining artificial intelligence in terms of “recognition game” (Turing 1950). Adopting a similar re-definition approach, organizational memory can be defined as every mental and structural artifacts that effects behavior and performance.

In business networks heuristic rules emerge and are taught and learnt. Business network can give a base for retrieval of information as part of the organizational memory. At the same time, search rule and decision rules are part the base to define heuristic problem solving. In business network memory can be stored in actors, resources and activity. Actors’ cognitive activities are central issues in the capability to acquire information, but organizational memory in business network refers to stored information from interaction and actors’ history that is brought to bear on present behavior. This information is stored as a consequence of implementing activities to which they refer, by actors’ recollections and through shared interpretations.

On the methodological level, the work presented here is conceptual, based on a wide-ranging literature review and the results of prior empirical research carried out by the author. The focus is on the role of heuristics in the decision-making processes adopted by entrepreneurs and managers. It thus deals with a topic that is intuitively of particular interest to small enterprises. The various aspects involved are nevertheless addressed in such a way as to be applicable to organizations of any size (Hodgkinson and Healey 2008). The research on which this paper is based has benefited greatly from a study term completed by the author at the Adaptive Behavior and Cognition Center of the Berlin Max Planck Institute for Human Development, above and beyond the extensive empirical research conducted over more than a decade on SMEs in the fashion industry. The study of heuristic processes (Groner et al. 1983, Smith 2003, Einhorn and Hogarth 1975, Goldberg 1968) is associated with the concepts of “bounded rationality” (March 1978) and “cognitive limits” (Hammond and Summers 1965, Miller 1956). The literature review includes a comparison between the conceptions of Herbert Simon

(1967, 1972, 1990), Kahneman and Tversky (1973, 1996) and more recent formulations by Gigerenzer and others (1996, 2007).

Simon (1967) argues that human beings rely on heuristics not only due to cognitive limits (Miller 1956), but because of the task environment. In the seventies, research by Kahneman and Tversky brought the term “heuristic” to the forefront, associating it to that of “bias”. Heuristics, at first described as a means to make computers “smarter”, began to be used as a way to explain the reason why people are “not smart”. The result was that heuristics were to be avoided as far as possible because they led to systematic errors (Tversky and Kahneman 1974). Such a view has also had a good deal of influence on the literature on entrepreneurial behavior (Minimala 1992, Simon and Houghton 2000, Haley and Stumpf 1989, Schwenk 1984). Kahneman and Tversky recognize the effectiveness of heuristic principals (representativeness, availability, anchoring) in formulating judgments (Tversky and Kahneman 1974, 1129). However, in their view, although people tend to adopt such “intuitive statistics” spontaneously, they are considered inferior to other rational methods for arriving at proper judgments (such as regression toward the mean).

Gigerenzer’s research studies (Gigerenzer et al. 1999) have led to a different perspective on heuristic processes. In this view, heuristics constitute a means for “fast and frugal” decision-making, in that they enable reaching effective solutions without requiring much information or computation. Gigerenzer has criticized Kahneman and Tversky’s “heuristics and biases program” from a number of different perspectives. In particular, he has suggested that instead of “labels”, such as representativeness or availability², we should adopt “computational models of heuristics” defined on more rigorous bases (building blocks for heuristics). Tests conducted on such models have revealed their accuracy and have thus redeemed heuristics as a valid tool of human cognition, to the point that heuristic processes can be framed in a perspective of an “ecological rationality” specific to “homo heuristicus”, which can be not only successful, but also more realistic than the “logical rationality” of “homo economicus” (Gigerenzer and Brighton 2009).

² The researchers of the adaptive-behavior-and-cognition approach indicate as computational models of heuristics both the elimination-by-aspect rule (Tversky 1972) and the lexicographic rule (Fishburn 1974), but not availability, representativeness, and anchoring (Gigerenzer and Brighton 2009).

Based on in-depth review of the literature, this paper develops the idea that this evolution of heuristics studies is of interest for understanding the specific features of entrepreneurial marketing content. The term entrepreneurial marketing is used to refer to the marketing content of the entrepreneurial role (Hills et al. 2008). This is a specific sense of entrepreneurial marketing that is however closely tied to other senses of the term, such as those regarding marketing in small enterprises (Carson et al. 1995) and the relations between marketing and innovation (Chaston 2000). The hypothesis is that entrepreneurial marketing (Marchini 1995) – intended as the marketing content of an enterprise’s top management rather than the relation between marketing and innovation or small-enterprise marketing (Guercini and Runfola 2011) – utilizes heuristic processes differently from managerial marketing. Managers operate by delegation and may need to follow widely-acceptable, more highly codified procedures that use – or at least ostensibly allow the use of – a great amount of information, because this conforms to the dominant view that “the more the information, the better the decision”. In entrepreneurial marketing, on the other hand, “gut feelings” can support an individual’s choices (Gigerenzer 2007).

As mentioned, apart from the literature review, the following discussion of heuristics will also present and discuss the results of an over ten-year long empirical study focusing on fashion SMEs, with particular reference to textiles and attire.

2. Advances in the study of cognitive limits on heuristic processes

The topic of heuristics has long been an object of attention in the literature relevant to business economics and management. First Simon’s and then Kahneman and the Tversky’s contributions were both awarded Nobel prizes. However, the following shall deal especially with the more recent work of Gigerenzer. The main reason for the attention afforded herein to the German researcher’s heuristics studies lies in the particular relevance and usefulness of his approach to studying enterprise decision-makers. Gigerenzer’s proposed approach to studying heuristic processes begins with observation of the ways in which judgments and decisions regarding complex problems, such as making future forecasts or defining a course of action under rigid time

constraints, are formulated in real settings where both time and information are however limited. In such circumstances the mind can resort to: (1) logic; (2) statistics; (3) heuristic rules. These three tools at the disposal of cognition have not however been considered on an equal footing, despite the fact that each of them can be useful under particular circumstances. In fact, the rules of logic and statistics have been linked to rational reasoning, while heuristic rules have instead been associated with intuitions viewed as mechanisms subject to errors and even irrationality. This lack of recognition of the positive contribution of heuristics to cognition has been severely criticized in the research conducted within the framework of the “adaptive-behavior-and-cognition program” (Gigerenzer and Goldstein 1996, Gigerenzer 2006, Gigerenzer and Gaissmaier 2011).

In his masterful address on the occasion of the Nobel Prize in economics, David Kahneman underlined that his research program has tried to construct “a map of bounded rationality” by exploring the “systematic biases” that “separate the beliefs that people have and the choices they make from the optimal beliefs and choices assumed in rational-agent models” (Kahneman 2003, p. 1449). Tversky and Kahneman’s “heuristics-and-biases program”, which began in the 1970s, provides a good example of this largely negative perception of the role of heuristic processes in the quality of judgments and individuals’ choices. Such approach differs substantially from that proposed by Simon, the father of “bounded rationality” who won the Nobel Prize in economics over twenty years earlier (Simon 1979). In his “Nobel Memorial Lecture”, Simon emphasizes how the classical model of rationality calls for knowledge not only of all relevant alternatives, their probability and consequences, but also of a world whose future can be foreseen unerringly (Simon 1979, p. 500). However, such conditions are hardly common in the real world, where actors generally have: (1) limited information; (2) limited time and computational resources; (3) a sole “memory” that is valid only for the past and not for the future (to recall the paradox presented in the renowned fictional work by the nineteenth-century English mathematician Lewis Carroll (2004)). Such conditions are surly familiar to entrepreneurs and managers, who often encounter great difficulties when faced with making forecasts and evaluations in

order to formulate judgments and make choices (Åstebro and Elhedhli 2006, Baker and Albaum 1986).

Even before Simon's contribution, Savage recognized that rational models do not automatically furnish the right answer in settings where some of the relevant information is unknown or must be estimated based on only small samples; such settings have been defined as "large-world", in distinction to "small-world" situations³ to which neoclassical economics is applied (Savage 1954).

Despite this distinction between small and large world situations, Kahneman and Tversky's "heuristics-and-biases program" takes optimized behavior as a reference for comparing the performance of decision-makers, with respect to which heuristics produces biases. The same, previously proposed heuristics (representativeness, availability, adjustment and anchoring) are now presented as "labels" for the causes of individuals' errors in judgment (biases) identified in their experimental research (Kahneman and Tversky 1972, Tversky and Kahneman 1971). Thus, the role of heuristics in human cognition is condemned to take on a non-rational, negative quality, despite Kahneman and Tversky's recognition of the import of heuristic processes. Indeed, the two American researchers state that "many decisions are based on beliefs concerning the likelihood of uncertain events such as the outcome of an election, the guilt of a defendant or the future value of the dollar... people rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations. In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors" (Tversky and Kahneman 1974, p. 1124). The emphasis placed on heuristics is common to both Gigerenzer's and Kahneman and Tversky's programs, where the topic is addressed in conflicting, or perhaps complementary, terms. In Gigerenzer's words, the relation between their two programs can be summed up in the question "are we rational or

³ The expression "small worlds" refers to situations in which all relevant alternatives, their probabilities and their consequences are known, and where the future is certain, so that the optimal solution to a problem can be determined. It can in fact be resolved by solving a problem that, as "complicated" as it may be, is nevertheless not "complex" (Paoli 2006). "Large worlds" instead refer to those situations in which at least some portion of the relevant information is unknown, or must be estimated through sampling, and the future is uncertain (difficult to forecast), hence the conditions introduced by the theory of rational decisions are violated.

irrational? The debate between Kahneman and Tversky and myself...”. (Gigerenzer 1996, Kahneman and Tversky 1996) “...has been sometimes misunderstood as concerning the question of how much rationality or irrationality people have. In this view, rationality is like a glass of water, and Kahneman and Tversky see the glass as half empty, whereas I see it as half full” (Gigerenzer 2006).

By comparing their stances, it can be seen that in both the process of formulating heuristics represents an important step in arriving at judgments and making choices, which enables people to function in the “large world”. With Gigerenzer, however, the attention devoted to heuristics does not stem from the finding of errors of judgment or mechanisms of irrationality, but rather from the fact that “in a number of large worlds, simple heuristics were more accurate than standard statistical methods that have the same or more information” (Gigerenzer and Gaissmeier 2011, p. 453). Such outcome has been defined as the “less-is-more effect”, based on which “there is an inverse-U-shaped relation between level of accuracy and amount of information, computation or time” (ibid.). In other words, according to such a formulation, there is a point beyond which greater information, computation capacity or time availability are not beneficial, but are, to the contrary, detrimental to the ability to reach successful decisions. This is an observation that had already been well-documented in the managerial literature (Drucker 1966). Heuristics are therefore strategies that lead people to ignore certain information in order to make quicker, more frugal and/or more accurate decisions than those attainable through more complex methods. In distinction to Kahneman and Tversky’s conception, Gigerenzer views heuristics not only as strategies frequently, albeit not always consciously, adopted by individuals in the “large world”, but also as effective and sometimes even more accurate strategies than those based on the use of greater information and computational capacity. Gigerenzer came to this conclusion following the results of experimental trials involving the formalization of heuristic models, which led him to claim the existence of the “less-is-more effect”, by which less information or computation can, in certain specific cases, furnish more accurate judgments than those possible even when greater computational capacity and/or information are available.

In explaining his thoughts, Simon (1990, p. 7) defines rational human behavior as “shaped by a scissors whose two blades are the structure of task environments and the computational capability of the actor”. Assuming this viewpoint, heuristics are no longer viewed as more efficient simply because the costs of lower accuracy are counterbalanced by the savings in the effort exerted in searching for and analyzing information, as already sustained by Payne et al. (1993). Indeed, heuristics-based cognition can be rational because the costs “saving [on] information search and computation” can actually be greater than the gains in terms of accuracy, especially if the decision in question is not that important. This “accuracy / effort trade-off” has been used to provide a “rational” explanation of why people use heuristics rules, which does not depend solely on the existence of “cognitive limits”. However, according to the “adaptive behavior and cognition program” such explanation does not exhaust the field of “rational” application of heuristic rules. This, because heuristic rules-based cognition may not only turn out to be less onerous in terms of cost-benefits to the cognitive processes, but may even lead to better results (Gigerenzer and Goldstein 1996, Holte 1993).

One important contribution of the “adaptive-behavior-and-cognition program” to the study of heuristic processes in behavior and cognition is represented by the definition it provides of formal models of heuristic. A heuristic is thus defined as a strategy that ignores some information, which enables taking decisions more quickly, more frugally and/or more accurately than when resorting to methods based on greater information and computation (Gigerenzer and Gaissmeier 2011, p. 454). In order to verify the effectiveness of heuristics, the “adaptive behavior and cognition program” thus proposed to test the effectiveness of formalized heuristic models, considered not in the absolute, but through comparison with the effectiveness of alternative strategy models. The translation of heuristics into formal models that can be tested represents in some aspects Gigerenzer’s main scientific contribution to the evolution of heuristics research. The approach stemmed from his criticism of Kahneman and Tversky’s analyses, which he viewed as aimed at producing “labels” starting with the study of cognitive biases, without however identifying the component processes involved in the recognition heuristic on a general plane. Gigerenzer therefore proposed breaking the large number

of heuristics into a smaller number of components, which are represented as three “building blocks” (Gigerenzer et al. 1999): (1) “search rules”, which specify the way individuals look for information in the form of “cues” (that is, when faced with the question: what information to look for?); (2) “stopping rules”, which specify when any given search is to be interrupted (when should information gathering be interrupted? or equivalently, how to judge when enough information has been collected to reach a decision?); (3) “decision rules”, which specify how the final decision can be made based on the information gathered (given the information that has been judged sufficient to make a decision, how is this translated into a judgment or choice?, what algorithm is to be applied?)⁴.

The results of Gigerenzer’s heuristics research program have recently begun to be applied in the marketing and management literature. For instance, a recent article published in the *Journal of Marketing* (Wübben and Wangenheim 2008) hypothesized the existence of a “hiatus heuristic”, which is applied by marketing decision-makers when they need to distinguish between clients that can be considered “active clients” from those to be considered “inactive”. It turns out that such a heuristic is in widespread use, despite the availability of a great deal of relevant information and sophisticated statistical approaches based on Bayesian analysis, regression analysis or some other optimized strategy for predicting the probability that a client with a certain purchase history match the profile of “active” or “inactive” client. This “hiatus heuristic” has been formulated as follows: if a client has not made a purchase within a certain number of months (the hiatus is represented by this timeframe), then the client should be classified as inactive, otherwise the client is classified as active. It is a relatively simple, intuitive rule based on a limited dataset, but which is nonetheless frequently applied in practice (Parikh 1994). Marketing researchers (Wübben and Wangenheim 2008) have

⁴ By way of example, the “satisficing heuristic” described by Simon (1955) searches through options of some type (search rule), stops as soon as a certain option exceeds a level of aspiration (stopping rule), chooses this option and translates it into a decision (decision rule). Gigerenzer et al. (1999) define a set of heuristics and building blocks, together with their “core capacities” and their exploitation, in terms of an “adaptive toolbox”, which includes three components: (a) “cognitive heuristics”; (b) their “building blocks”; (c) the core capacities and their exploitation. This system represents the basis for exercising an “ecological rationality”, whose study aims to determine the settings in which a given strategy is better than another. In this case, “better” does not mean “optimal”, because in a setting that does not start out with any simplifying hypotheses, the optimal strategy will remain unknown.

compared this “hiatus heuristic” to more statistically sophisticated rules based on greater information and processing, in particular with the so-called “Pareto / negative binomial distribution (NBD) model”. Using customer lists of enterprises operating in various market sectors, these researchers found that the heuristic rule based on consideration of a “hiatus” of 40 weeks is more accurate than the Pareto NBD model in predicting the status of “active” or “inactive”. Gigerenzer and Gaissmeier (2011) emphasize the importance of formalizing heuristics in such a way as to be able to test their predictive power, and in this sense their accuracy, in comparison to alternative, competing models.

The research on heuristic processes conducted within the “adaptive-behavior-and-cognition program” sheds new light on the rules arising from intuition and experience, which have been extensively used in the field of marketing and management. Viewed in Gigerenzer’s formulation of heuristic models, the practices developed by business decision-makers, which are based on the experience and intuition of these same business decision-makers, are amenable to testing and can eventually be grasped and utilized fruitfully, if and when they reveal to be accurate in comparison to alternative models based on greater information and computation.

Although heuristics are as relevant to managerial decision-makers as they are to entrepreneurs, in that intuition and experience may prove useful in decision-making for both, entrepreneurial decision-makers leverage their own heuristic processes in a more evident fashion than managerial marketers. Indeed, managers are more oriented to information management and more highly codified, less intuitive approaches to the enterprise-market relation, as they are considered more “scientific”. However, while managerial decision-makers’ recourse to information and computational capacity is quite evident, in the case of entrepreneurial decision-makers the role of heuristics may also be quite large, given their greater autonomy over the decisions they are faced with. Indeed, although managerial decision-makers enjoy broad decisional powers, they are however held accountable for such decisions and the outcomes thereof. Thus, given the uncertainty of the outcome, their decisions are more easily justified if based on procedures underpinned by extensive recourse to information and computational capacity. In other words, the application of more elaborate, optimized models provides

managers with the means to defend their actions, regardless of the outcome. The possibility that application of heuristics, despite their being founded on limited information and computation, could provide more accurate results than more complex cognitive models highlights the potential of an instrument adopted by entrepreneurial decision-makers more often than managers, and which thus takes on particular meaning in entrepreneurial and small-enterprise marketing, in so far as the two overlap.

3. The relation between heuristic rules and the business network

In business networks heuristic rules emerge and are taught and learnt. Business network can give a base for retrieval of information as part of the organizational memory (Håkansson and Östberg 1975). At the same time, search rule and decision rules are part the base to define heuristic problem solving. In business network memory can be stored in actors, resources and activity (Håkansson et al. 2009). Actors' cognitive activities are central issues in the capability to acquire information, but organizational memory in business network refers to stored information from interaction and actors' history that is brought to bear on present behavior. This information is stored as a consequence of implementing activities to which they refer, by actors' recollections and through shared interpretations.

Investigation of the gap between marketing theory and practice has in recent years turned to the specific circumstances of the Italian market. The special features of the marketing strategies adopted (or lacking) in Italian enterprises have been well illustrated by a number of researchers who have set out to identify the characteristics of Italian SMEs beginning with in-depth analyses on the national level (Varaldo et al. 2006).

The figure of the entrepreneurial marketer is particularly important in Italian enterprises, which are often small in size and dominated by family owners. The gap between marketing theory and practice will be considered herein through an attempt to revisit it in light of recent research in experimental psychology. For once, current psychological approaches have been applied, not to the consumer side of behavior, but rather to the entrepreneurial side, that is to say, the behavior of business decision-makers, particularly in SMEs. Studying marketing decision-makers and their psychology may enable us to shed some light on the reasons for the current gap between marketing

theory and practice in our enterprises. To this end, recent advances in experimental psychology research may prove enabling. As mentioned, mainstream marketing begins with the notion of “homo economicus”, that is, a rational entity whose behavior is based on logic, in that it is governed by assessments carried out in the abstract. Instead, the adopting of behaviors based on ecological quality, that is, the caliber of the assessments made in the concrete setting in which individuals act, has prompted some authors to speak of “homo heuristicus” (Gigerenzer and Brighton 2009).

The empirical research conducted during over a decade on enterprises within the Italian fashion sector (textiles and attire, in particular) has led to our compiling about ten business case studies, many of which have formed the bases for various papers published in both Italian and international journals. While conducting this research, time and time again we have observed how heuristics are commonly applied by decision-makers in arriving at their judgments and choices (Jacoby and Dallas 1981, Thorngate 1980). The development of a system of heuristic rules applicable to this setting is the subject of an ongoing research project, which is however well enough along the way to completion to enable presenting some examples here.

For various reasons, our focus has been more on entrepreneurial than managerial marketing. Indeed, in the latter: (1) managers operate by delegation and may need to adopt more codified, well-established methods that utilize (or at least allow utilizing) large amounts of information, because this conforms to the prevailing perception that “the more the information, the better the decision”; (2) since the powers delegated regard the results obtained more than the methods adopted, managers must account for the outcome of their decisions, which necessitates that they be able to explain and justify their judgments and choices, and demonstrate, if not the soundness of their decisions, at least their own professionalism.

The study of marketing heuristics represents a new approach to entrepreneurial marketing. The nature of the subject of analysis calls for an approach to the role of marketing centered on the ways in which judgments and choices are made. Various types of heuristic rules can be invoked to satisfy the requirements for formulating a judgment or making a choice; they may be (a) neurobiological in origin, in that they are inherent in cognitive processes, which are bound by the brain’s structure and

functioning; (b) cultural in origin, or in any event, the product of learning (Piattelli Palmarini 2005).

Regarding the development of heuristics rules, the entrepreneurial marketer does not formulate or adopt heuristics in isolation (Humphrey 1976), but rather within the framework of a *personal contact network*, which significantly influences entrepreneurial marketing activities (Carson 1985, Birley 1985, Carson et al. 1995). Thus, the relations between heuristics and personal contact network provide a means to study other aspects of the evolution of the relationship between enterprise and market environment. In fact, the network of relationships through which entrepreneurs represent the market, and earlier still, their images of the relationships to be cultivated with the precise aim of formulating an effective representation of the market, enable other phenomena to be examined, not so much in their qualitative aspects, but rather as regards their importance as perceived by business decision-makers. In light of these relations between heuristics and setting, the essential properties of heuristics that we propose to examine herein are: (1) specificity, intended as the field of application and setting in which any heuristic rule is generated and routinely applied; (2) convergence, which concerns how widespread, at least in appearance, any given heuristic rule is amongst actors in a given market setting. In other terms, the heuristics of entrepreneurial marketing can be considered specific to this particular setting, in that they concern the degrees to which such rules are generated, are successful, and are confined to the specific setting or context.

Looking more closely at the two above-mentioned properties, specificity is high when, for instance, a heuristic refers to a specific, circumscribed matter (for example assessing the opportune moment to purchase certain semi-finished goods) and finds no application in any other setting. Conversely, a rule's degree of specificity is low when its field of application is broad: a rule may, since its inception, be applicable to many different fields, or it may be initially applicable only to a limited range of decisions, but subsequently find fruitful application in other, broader matters. The degree of convergence instead regards the frequency with which a given heuristic rule is adopted within a population, a community or, in our case, by entrepreneurs. Such adoption may only be apparent, in the sense that what seems to be a single rule may actually represent

various, subtly different rules for each individual, given the supremely personal, individual nature of fine mental processes. Evaluating the degree of convergence of a given heuristic within a population obviously involves measuring its dissemination in terms that are recognized as such by the researcher. Convergence is high for rules adopted by everyone, or at least by a large segment of the population in question. Other heuristic rules are instead developed by individuals in forming their personal judgments and seem to be unique to such individuals, in that they do not arise in others. This implies that heuristic rules may be the source of a relative advantage for the entrepreneur, in so far as the heuristic in question proves itself successful, that is, an element that determines a good choice when other methods are ineffective or may even produce negative effects. Specificity and convergence are thus general properties of the heuristics adopted by entrepreneurial marketers, and are strongly tied to the interpersonal relationships and consequent interactions within business decision-makers' personal contact networks.

Heuristic procedures are easily detectable in the descriptions of enterprise top management of the processes they utilize in assessing possibilities and forming judgments. Some of these procedures are highly abstract and applicable to various different settings, for instance, regarding problems typically facing firms as well as purchase decision-makers. In the following we shall briefly present some of the heuristics encountered in our research; a more detailed description and more rigorous modeling of their characteristics will be addressed in future work.

Let us consider the situation in which the decision-maker of a fashion firm is tasked with formulating a judgment regarding the best choice of colors to keep up with the fashion trends of coming seasons. From interviews with representatives of styling divisions, what repeatedly emerged was their conviction that "strong" colors periodically and forcefully come back in fashion. Some even went so far as to specify the duration of this cycle: seven years – that is, the same as the number of strong colors –, which also turns out to be coherent with long-standing observations on the limits of human cognitive function (Miller 1956). No clearly defined explanation was offered of the reasons for, or origins of, this rule, although some hypotheses were advanced:

simply that a sort of “law” was first noticed and then became consolidated as its predictions were repeatedly verified over time.

A second example is that of the textile firm entrepreneurial marketer called on to provide a forecast of the fabrics that will be most widely utilized in the market over the next few seasons. From the marketer’s perspective, the price of natural fibers is one element on which to base any judgment regarding future fabric usage trends. Clearly, there are technical time constraints on the purchasing of fibers for spinning, which must naturally precede the sale of the fabric, and may even take place already in the stage of drafting the fabric sample book. Thus, a specific assessment rule is applied: those fibers whose price increases during certain periods of the year are deemed to be those that will be in most widespread use the following season. However, for some years now this rule has begun to seem less reliable than in the past. Workers in the sector speak of greater complexity in the wool market, where supply factors, such as international manufacturers’ policy of stepping up fiber tops production, have had the effect of upsetting traditional market dynamics.

A third example concerns the problem of identifying those overseas markets presenting the greatest prospects for exploitation. Accepted business practice, as well international marketing manuals, reveal some very widespread heuristics in use for responding to this question: (a) gather information on the behavior of successful competitors; (b) identify the countries where prior experience has been acquired by your own organization or individuals in it; (c) gather information on the countries that exceed a certain threshold for a key factor or criterion (number of inhabitants, GDP, etc.).

The fourth example regards the question of how to reduce the commercial risks associated with a presence in physically and culturally far-removed overseas markets. A similar heuristic has been revealed in a number of firms, even some with great involvement in international markets. It calls for determining a proportion of total sales revenues that should not be exceeded in any given overseas market, so as to limit company exposure there. For example, in the case of one specific enterprise studied, the entrepreneurial marketer follows a rule dictated by his father (and the company founder), which stipulates that no further large-sized contracts be taken on with any US concern when the firm’s activities in the US account for over 10% of their overall revenues. The

entrepreneurial marketer views application of this rule as a valid response to the need to limit risk exposure, while taking into account the characteristics of both that market and his own firm.

A fifth case in which we encountered a heuristic rule adopted by an entrepreneurial marketer concerns the selection of new ideas within the creative process. A famous Italian design firm determines which new design proposals to accept into the business innovation process by applying a formula based on only a few indicators (e.g., number of randomly selected employees in certain departments who liked the proposal, certain assessments emerging during product tests, etc.).

The sixth and last example of a heuristic rule applied by entrepreneurial marketers regards the ways a clothing firm chooses textiles suppliers. The rule calls for defining and then ranking prospective suppliers according to a series of cues, such as “the supplier with the least expensive base product”, “the supplier with the fastest delivery times amongst those already tried”, etc.

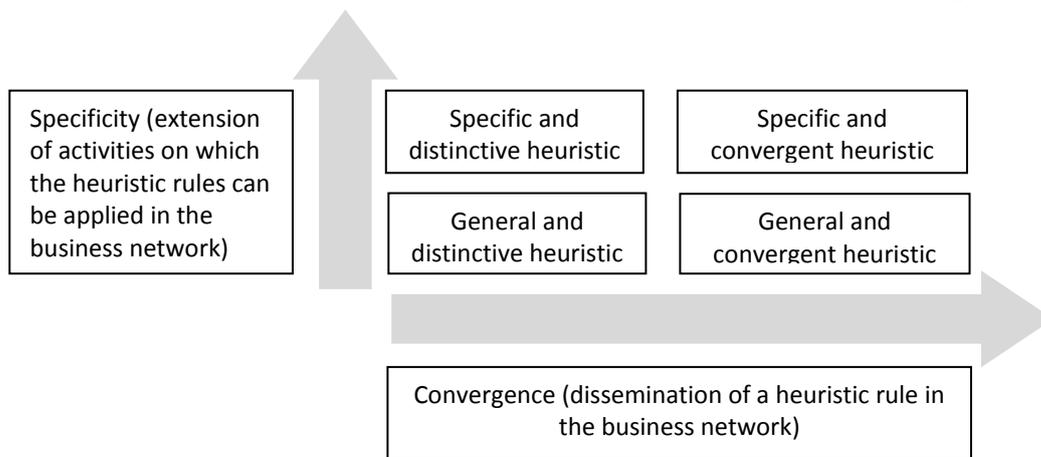
The heuristic rules in these examples can be regarded in the perspective of the attributes they present, in particular, their “specificity” (or field of application) and their “convergence” (or degree of dissemination). A rule that is highly specific to a certain application setting loses much of its value when applied to judgments other than the one for which it has been developed. On the other hand, a rule that is in widespread use in many firms can hardly become a distinctive resource for entrepreneurial marketers. The widespread dissemination of a given heuristic rule amongst the rules “in stock” or the “adaptive toolbox” of firms may influence its effectiveness. Indeed, the fact that a rule is shared by many may justify its adoption in light of the validity that the decision-makers seem to attribute it, even if it is less probable that its use impart a distinctive competitive advantage.

The six examples of heuristic processes presented in the foregoing seem to enjoy different degrees of specificity and convergence. The association of certain heuristics to specific settings takes on the significance attributed to them by Simon (1967; 1979), as rules bound by the task environment and not clearly referable to relatively abstract mechanisms or endowed with autonomy. Mechanisms applicable to less specific settings are instead referable to the heuristics described by Tversky and Kahneman

(1974), including representativeness, availability and adjustment/anchoring, identified in relation to the possible distortions and errors associated to them. The heuristics modeled by “building blocks” by Gigerenzer et al. are seemingly cannot be captured by a few categories, given the variety of formal models identified ⁵.

Figure 1 shows a classification of heuristic rules that may be employed by enterprise heads in formulating judgments on market prospects.

Figure 1- The relation between heuristics and business network: convergence and specificity



4. Some conclusions

In the approach proposed by Gigerenzer and his “adaptive behavior and cognition program”, formal models are necessary to evaluate the real contribution of heuristics to cognition, decision-making and behavior.

Organizations seem ideally oriented to applying heuristic rules, due to both the conditions of uncertainty in which they operate and the pressure on them to act quickly.

This paper has advanced some preliminary reflections on a research project studying entrepreneurial marketing and small enterprises. In the near future the project plan calls

⁵ Briefly, these include (1) recognition heuristic; (2) fluency heuristic; (3) take-the-best; (4) tallying; (5) satisficing; (6) 1/N equality heuristic; (7) default heuristic; (8) tit-for-tat; (9) imitate the majority; (10) imitate the successful; (11) hiatus heuristic; (12) fast and frugal trees; (13) mapping models; (14) averaging the judgment; (15) social circle; (16) moral behavior (Gigerenzer and Gaissmaier 2011, Gigerenzer and Brighton 2009). For details, refer to the publications of the adaptive-behavior-and-cognition program.

for identifying and modeling the heuristic processes adopted by entrepreneurial marketers in their market dealings. The ultimate aim is to contribute to filling the gap between marketing theory and practice by drawing on the cited literature in experimental psychology and the results of the 10-year long research conducted on entrepreneurial marketers in the fashion industry. Such setting should not be viewed simply as a random choice (*selector*), but as an environment in which heuristic processes are widely adopted. The spread of heuristics offers a further example of current trends towards ever greater collaboration between individuals⁶. In fact, heuristic rules are in the process of being shared within the environment of entrepreneurial communities. The continued validity (or lack thereof) of the heuristics adopted by single entrepreneurs or spread throughout entrepreneurial communities provides a means for interpreting the current loss of competitiveness in terms of the loss of competitive advantage consequent to the inability to adapt to changes in the environment.

References

- Argyris C., Schon D.A. (1978) *Organisational learning: A theory of action perspective*, Addison-Wesley, Reading, MA
- Åstebro T., Elhedhli S. (2006) The effectiveness of simple decision heuristics: forecasting commercial success for early-stage ventures, *Management Science*, 52, 395-409
- Baker K.G., Albaum G.S. (1986) Modeling new product screening decisions, *Journal of Product Innovation Management*, 3(1), 32-39
- Birley S. (1985) The role of networks in the entrepreneurial process, *Journal of Business Venturing*, 1, 107-117
- Bown N.J. (2007) The relevance of judgment and decision making research for marketing, *Marketing Theory*, 7, 1, 5-11.
- Carroll L. (2004) *Alice in Wonderland*, CRW Publishing Ltd (orig. edition 1865)
- Carson D. (1985) The evolution of marketing in small firms, *European Journal of Marketing*, 19(5), 7-16
- Carson D., Cromie S., McGowan P., Hill J. (1995) *Marketing and entrepreneurship in SMEs. An innovative approach*, Prentice-Hall, London
- Chaston I. (2000) *Entrepreneurial marketing: competing by challenging convention*, Macmillan, Basingstoke
- Drucker P.F. (1966) *The effective executive*, Heinemann, London
- Einhorn H.J., Hogarth R.M. (1975) Unit weighting scheme for decision making, *Organizational Behavior Human Decision Process*, 13, 171-192

⁶ In this regard, see Tomasello (2009).

- Fishburn P.C. (1974) Lexicographic orders, utilities and decision rules: a survey, *Management Science*, 20, 1442-1471
- Gigerenzer G. (2006) Bounded and rational, in *Contemporary debates in cognitive science*, ed. R.J. Stainton, Blackwell, Oxford
- Gigerenzer G. (1996) On narrow norms and vague heuristics: A reply to Kahneman and Tversky, *Psychological Review*, 103, 592-596.
- Gigerenzer G. (2007) *Gut feelings. The intelligence of the unconscious*, Penguin Books, New York
- Gigerenzer G., Brighton H. (2009) Homo heuristicus: why biased minds make better inferences, *Topics in Cognitive Science*, 1, 107-143
- Gigerenzer G., Gaissmaier W. (2011) Heuristic decision making, *Annual Review of Psychology*, 62, pp. 451-482.
- Gigerenzer G., Goldstein D.G. (1996) Reasoning the fast and frugal way: models of bounded rationality, *Psychological Review*, 103, 650-669
- Gigerenzer G., Todd P.M., & the ABC Research Group (1999) *Simple heuristics that make us smart*, New York, Oxford University Press
- Goldberg L.R. (1968) Simple models or simple processes? Some research on clinical judgments, *American Psychologist*, 23, 483-496
- Groner M., Groner R., Bischof W.F. (1983) Approaches to heuristics: a historical review, in *Methods of Heuristics*, ed. R. Groner, 1-18, Hillsdale, NH, Erlbaum
- Guercini S., Runfola A. (2011) Marketing cooperation and public policies in Italian networks of fashion firms, in Johanson M., Lundberg E. (eds.) *Network strategies for regional growth*, Palgrave MacMillan, Basingstoke, England, pp. 163-184
- Håkansson H., Östberg C. (1975) Industrial marketing: An organizational problem? *Industrial Marketing Management*, vol. 4, 113-123
- Håkansson H., Ford D., Gadde L.-E., Snehota I., Waluszewski A. (2009) *Business in networks*, Wiley
- Haley U.C., Stumpf S.A. (1989) Cognitive trails in strategic decision-making: linking theories of personalities and cognitions, *Journal of Management Studies*, 26(5), 477-497
- Hammond K.R., Summers D.A. (1965) Cognitive dependence on linear and nonlinear cues, *Psychology Review*, 72(3), 215-224
- Hills G.E., Hultman C.M., Miles M.P. (2008) The evolution and development of entrepreneurial marketing, *Journal of Small Business Management*, 46(1), 99-112
- Hodgkinson G.P., Healey M.P. (2008) Cognition in organizations, *Annual Review Psychology*, 55, 394-401
- Holte R.C. (1993) Very simple classification rules perform well on most commonly used datasets, *Machine Learning*, 3(11), 63-91
- Hoyer W.D., Brown S.P. (1990) Effects of brand awareness on choice for a common, repeat purchase product, *Journal of Consumer Research*, 17, 141-148
- Humphrey N. (1976) The social function of intellect, in *Machiavellian Intelligence*, ed. R. Byrne, A. Whiten, 13-26, Oxford, UK, Clarendon
- Jacoby L.L., Dallas M. (1981) On the relationship between autobiographical memory and perceptual learning, *Journal of Experiential Psychology*, 110, 306-340
- Kahneman D. (2003) Maps of bounded rationality: a perspective on intuitive judgment and choice, in *Les Prix Nobel: The Nobel Prizes 2002*, ed. T. Frangmyr, 449-489, Nobel Found, Stockholm
- Kahneman D., Tversky A. (1973) On the psychology of prediction, *Psychological Review*, 80(4), 237-251

- Kahneman D., Tversky A. (1996) On the reality of cognitive illusions. A reply to Gigerenzer's critique, *Psychological Review*, 103, 582-591
- Kahneman D., Tversky A. (1972) Subjective probability: a judgment of representativeness, *Cognitive Psychology*, 3, 430-454
- March J.G. (1978) Bounded rationality, ambiguity, and the engineering of choice, *Bell Journal of Economics*, 9, 587-608
- Marchini I. (1995) L'imprenditorialità manageriale, *Piccola Impresa / Small Business*, 1, 3-12
- Messik D.M. (1993) Equality as decision heuristic, in *Psychological Perspectives on Justice: Theory and Application*, ed. B.S. Mellers, J. Baron, 11-31, Cambridge University Press, New York
- Miller G.A. (1956) The magical number seven, plus or minus two: some limits on our capacity for processing information, *Psychological Review*, 63, 81-97
- Manimala M. (1992) Entrepreneurial heuristics: a comparison between high PI (Pioneering-Innovative) and low PI ventures, *Journal of Business Venturing*, 7(6), 477-504
- Malhotra N.K. (1982) Information load and consumer decision making, *Journal of Consumer Research*, 8, 419-430
- Paoli M., Prencipe A. (2003) Memory of the organization and memories within the organization, *Journal of Management and Governance*, vol. 7, 145-162
- Parikh J. (1994) *Intuition: the new frontier of management*, Blackwell Business, Oxford
- Paoli M. (2006) *Management della complessità, complessità del management*, Franco Angeli, Milano
- Payne J.W., Bettman J.R., Johnson E.J. (1993) *The adaptive decision maker*, Cambridge University Press, New York
- Piattelli Palmarini M. (2005) *Psicologia ed economia delle scelte. Quattro lezioni al Collegio di Francia*, Codice Editore, Torino
- Rubinstein A. (2003) Economics and psychology? The case of the hyperbolic discounting, *International Economic Review*, 44, 1207-1216
- Savage L.J. (1954) *The foundation of statistics*, New York, Dover, 2nd edition
- Schmittlein D.C., Peterson, R.A. (1994) Customer base analysis: an industrial purchase process application, *Marketing Science*, 13, 41-67
- Schwenk C.R. (1984) Cognitive simplification processes in strategic decision making, *Strategic Management Journal*, 5(2), 111-128
- Simon H.A. (1955) A behavioral model of rational choice, *Quarterly Journal of Economics*, 69, 99-118
- Simon H.A. (1967) The logic of heuristic decision making, in *The logic of decision and action*, ed. N. Rescher, Pittsburg, The University of Pittsburg, 1-20
- Simon H.A. (1972) The heuristic compiler, in *Representation and meaning: experiments with information processing systems*, eds. H.A. Simon and L. Siklössy, Prentice-Hall, Englewood Cliffs, 9-43
- Simon H.A. (1979) Information processing models of cognition, *Annual Review of Psychology*, 30, 363-396
- Simon H.A. (1990) Invariants of human behavior, *Annual Review of Psychology*, 41, 1-19
- Simon M., Houghton S.M. (2000) Cognitive biases, risk perception, and venture formation: how individuals decide to start companies, *Journal of Business Venturing*, 15(2), 113-134
- Smith V.L. (2003) Constructivist and ecological rationality in economics, *American Economics Review*, 93, 465-508
- Thorngate W. (1980) Efficient decision heuristics, *Behavioral Science*, 25, 219-225

- Tomasello M. (2009) *Why we cooperate*, Boston Review, The MIT Press, Cambridge, MA
- Turing A. (1950) Computing machinery and intelligence, *Mind*, vol. 59, no. 236, 433-460
- Tversky A. (1972) Elimination by aspects: a theory of choice, *Psychological Review*, 79, 281-299
- Tversky A., Kahneman D. (1974) Judgement under uncertainty: heuristics and biases, *Science*, 185, 1124-1131
- Tversky A., Kahneman D. (1971) Belief in the law of small numbers, *Psychological Bulletin*, 76(2), 105-110
- Varaldo R., Dalli D., Resciniti R. (2006) *Marketing-non-marketing all'italiana: virtù, limiti e prospettive*, Congresso Internazionale "Le Tendenze del Marketing", Università Ca' Foscari, Venezia, 20-21 gennaio
- Vargo S.L., Lusch R.F. (2004) Evolving to a new dominant logic for marketing, *Journal of Marketing*, 68(1), 1-17
- Walsh J.P., Ungson G.R. (1991) Organisational memory, *Academy of Management Review*, vol. 16, no. 1, 57-91
- Wübben M., von Wangenheim F. (2008) Instant customer base analysis: managerial heuristics often "get it right", *Journal of Marketing*, 72, 82-93
- Yee M., Dahan E., Hauser J., Orlin J. (2007) Greedoid-based noncompensatory inference, *Marketing Science*, 26, 532-549