CHAPTER 12

EMBODIED ENTREPRENEURSHIP: A SENSORY THEORY OF VALUE

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Abstract

In this chapter, we introduce a *sensory theory of value* (STV) in the context of entrepreneurship. Our theory originates in Friedrich Hayek's seminal work that brought together neurophysiology and political economics. Three main elements will be discussed in light of recent developments in economic, cognitive and brain sciences. First, we argue that STV is a *theory of mind* when applied to the behavior of the entrepreneur on the market. Indeed, as a person the entrepreneur is an innovator. He is therefore imitated by his peers –and by many other actors of the market- because of the intentions and beliefs they attribute to him. To analyze this specific process, we refer to Hayek's views on imitation, more specifically the concepts of "*sensory*" and "*spontaneous*" orders. Second, we show that determining market prices, as a cognitive mechanism, provides information on the behavior of the entrepreneur himself since it results from (1) private information that he is the only one to possess, (2) beliefs that other people think he has and (3) implicit knowledge shared by all actors on the market. Finally, we discuss the relevance of considering (and studying) prices as sensory data through recent advances in the fields of motor cognition, social coordination dynamics and neuroeconomics.

Introduction

"I am drawing the line between outer and inner environment not at the firm's boundary but at the skin of the entrepreneur, so that the factory is part of the external technology; the brain, perhaps assisted by computers, is the internal" (Simon 1996, p.25). One could see in Herbert Simon's words an invitation to consider neuroscientific advances (and the advent of neuroeconomics) in the economy of the firm to, *in fine*, better understand the behavior of the entrepreneur. Simply put, neuroeconomics can be defined as the use of cognitive and brain sciences to uncover the dynamics underlying economic decision making (e.g. Zak 2004). Over the past decade cognitive neuroscientists interested in the neural foundations of the states-of-mind at stake in economic decisions have taken note of and used the strong body of results coming from well controlled empirical and theoretical paradigms that experimental economics has been offering. Combining the concept and methods of (social) neuroscience and experimental economics has therefore provided original insights that could lead to a better understanding of the processes underlying preferences, investments and economic exchanges between two (or more) individuals.

Here, we propose to build on Friedrich Hayek's pioneer book *"The Sensory Order"* (Hayek 1952a), not only to specify Simon's views but also to expand them in order to design neuroeconomic paradigms that would be useful to understand the economy of the firm (see section 4). To do so, we consider the connections between the skin and the brain of the entrepreneur by including the role of his entire body -i.e. not only his brain- in determining the value of the goods he produces. Hence, one of our claims is the following: *to understand the behavior of the entrepreneur on the market, neuroeconomics has to consider a* sensory theory of value (STV; Basso & Oullier 2011).

Of particular interest with STV is to consider the role of the human body as a whole, i.e. by including its shared coordination dynamics occurring at many levels of description between the brain, the body, the individual and collective behaviors as well as the physical and social environments (Kelso 1995). Those embodied aspects have too often been neglected when studying the behavior of the entrepreneur. By taking them into account STV offers means to refine the understanding of the entrepreneur's innovator status on the market in considering the individual as a key component of an *actor~environment system* that cannot be considered separately (Gibson 1979; Herrmann-Pillath 1992). As suggested by Hayek's definition of the entrepreneur, his innovative qualities entice others into copying or mimicking him. Thus, STV offers a novel angle to the theoretical field of entrepreneurship by considering the role played by imitative actions on the market.

In this chapter we therefore explain how STV can be applied to the concept of cost by exploring the links between this theory of value and entrepreneurship. Ultimately, it will arise that the application of STV to the behavior of the entrepreneur lies on the interdependence between innovation and imitation on the market as a discovery procedure.

Individual entrepreneur: Innovation in catallaxy

Many contemporary authors have addressed entrepreneurship and the behavior of the entrepreneur (e.g. Casson et al 2006). Although our approach is deeply rooted in Hayek's work, one should bear in mind that he did not make a systematic study of the entrepreneurship the way other authors of the *Austrian school* did (e.g. Mises or Kirzner). Nevertheless, the topicality of Hayek's views on neurophysiology is a strong motivation to have another appreciation of his contributions, under the scope of social neuroscience and neuroeconomics. In his latest book to date, Nobel laureate Vernon Smith wrote: *"Hayek (1952) was a pioneer in developing a theory of perception, which anticipated recent contributions to the neuroscience of perception and is particularly helpful in understanding why context is important"* (Smith 2008, p.206). Needless to say that we concur with this statement. It is in the context of the market that we approach Hayek's views on perception.

Hence, according to Hayek, the entrepreneur is:

- an *individual* since he belongs to the "separate individuals" category, unlike organizations (Hayek 1979, p.96);

- an *innovator* on the market thanks to opportunities that he creates and uses as well as by the innovative features of the products and methods he brings to the competition (Hayek 1988, p.89).

Thus, the entrepreneur carries out experiences that participate to the functioning of the market. He discovers new processes (and/or new products) and allows others to benefit from them. As such, *"the entrepreneur* must *in his activities probe beyond known uses and ends if he is to provide means for producing yet other means which in turn serve still others, and so on – that is, if he is to serve a* multiplicity *of ultimate ends"* (Hayek 1988, p.104).

In the following sections, we will call *"hypothesis"* testable propositions that made after our interpretation of Hayek's writings, and *"proposal"*, conclusions we draw along this line.

Hypothesis #1: Competition is a discovery process

Taking part to the competition that occurs on the market brings the entrepreneurial endeavor to a level that goes beyond the sole selfish interest of separate individuals. It allows the entrepreneur to participate to a discovery process inherent to the market which happens to be a *spontaneous order*, a catallaxy, that cannot be rationally planned as a defined goal (Hayek 1967).

Hypothesis #2: Prices have a cognitive function, they convey information and allow anticipation on the market

It is through the mechanism of prices that information is conveyed on a decentralized market and anticipation for economic actors is allowed (Hayek 1937; Smith 1982).

Hypothesis #3: Rationality is acquired thanks to imitation processes

Competition on the market (and elsewhere) is a trial-and-error process and catallaxy, as a component of praxeology, deals with the *homo agens* rather than the *homo oeconomicus* (Mises 1944, p.534). In other words, heir to both *Scottish Enlightment* and *Austrian Economics* (e.g. Menger or Mises), Hayek refuses to root his analysis of the entrepreneur's behavior on the market in terms of rationality of the actors. To the contrary, according to him, any kind of rationality that could be found on the market is rather a consequence of competition. Therefore, the only form of rationality to be found there is through imitation processes. Similar conclusion can be drawn regarding the behavior of the entrepreneur: When his peers imitate him, they somewhat rationalize his actions.

Proposal #1: The diffusion of an entrepreneurial innovation is conveyed by a form of imitation of the entrepreneur's behavior

Indeed, if one confronts this first quote: *"In a society in which rational behavior confers an advantage on the individual, rational methods will progressively be spread by imitation"* (Hayek 1979, p.75) with this second one: *"[…] in highly developed economies, competition is important primarily as a discovery procedure whereby entrepreneurs constantly search for unexploited opportunities that can also be taken advantage of by others […]"* (Hayek 2002, p.18), one finds even more reasons to support the idea that entrepreneurial innovation is carried out by imitation. In line with Hayek's view, James Gibson stated that: "*Behavior affords behavior* […] *what the buyer affords the seller cannot be separated from what the seller affords the buyer, and so on.*" (Gibson 1979, p.135). We can therefore conclude that the entrepreneur constitutes an *affordance* for the imitator.

Hypothesis #4: The intentions of an individual (as *constitutive opinions*) are not accessible to the other actors on the market

In the context of radical ignorance inherent to the spontaneous order of the market, the *subjectivity* of each individual makes his mental states inaccessible to others. It is here where the *theory of mind* is to be considered. For instance, the only way other actors on the market could have access to the mental states of their peers would be by inferring, guessing, speculating about them (e.g. thoughts, beliefs, feelings; Frith & Singer 2008). In addition, every individual has not only beliefs but also a strong tendency to assume that others share those beliefs.

Proposal #2: The intentions of an actor are deduced from the observation and the interpretation (*speculative opinions*) of his behavior.

Moreover, with the lack of possibility to directly reach reliable and usable information regarding the mental states of our peers, we infer them from the only information that is available: the one that can be observed. From that on, this behavior is interpreted and supposed to reveal the intentions and preferences of the entrepreneur. This interpretation mechanism of the

behavior of others on the market is therefore to be related to the concept of *speculative opinion* and contrasted with that of *constitutive opinion*. Any belief which causes a social phenomenon is to be considered as a constitutive opinion whereas a speculative opinion is a belief formed *about* this phenomenon (Hayek 1952b, p.62).

Hypothesis #5: The producer is a price-maker

Applied to price determining, Hayek deducted from this distinction that: "*The changes in the* [constitutive] *opinions which people hold about a particular commodity and which we recognize as the cause of a change in the price of that commodity stand clearly in a different class from the ideas which the same people may have formed about the 'nature of value' in general* [speculative opinions]*"* (Hayek 1952b, p.63)

Applied to the cost of a good, a speculative opinion justifies that another participant on the market could not determine objectively the difference between the price of this good set by the entrepreneur and its actual *opportunity cost*. The cost illustrates the entrepreneur's opinion on the renunciation (or not) of awaited events on the market: *"It is, therefore, generally also not possible for an outsider to establish objectively whether a large excess of price over costs, manifesting itself in high profits and due to some improvement in technique or organization, is merely an 'adequate' return on investment. 'Adequate' in this connection must mean a return the expectation of which was sufficient to justify the risk incurred. In technologically advanced production the cost of a particular product will quite generally not be an objective ascertainable fact, but will in large measure depend on the opinion of the producer about probable future developments. The success of an individual enterprise and its long-run efficiency will depend on the degree of correctness of the expectations which are reflected in the entrepreneur's estimate costs."* (Hayek 1979, pp.70-71).

Proposal #3: The price determined by the entrepreneur reflects his constitutive opinion about the value of a good he produces according to the anticipations on the market (*opportunity cost*).

The opinion of the producer is constitutive of the future value of the good he produces. This way of reasoning implies to break with the model of the producer as a *price taker*. The entrepreneur has the capacity to fix the price or the quality of the product thanks to private property rights (Hayek 1979, p.72). The constitutive opinion of the value of the good, as determined by an entrepreneur, is therefore a function of information that he is the only one to possess. Insofar as entrepreneurship is based on experimenting new processes, the entrepreneur himself is an innovator on the market. Such private information can be sustained by the process of innovation *per se* or by the "mysteries of the trades" as Hayek put it (Hayek 1988, p.91). The other players intervening on the market do not have access to this information. They are only able to make inferences about it, their opinion being purely speculative, inductive at the most. This step is built-in any form of competition because the market is, at the same time, a discovery process and one that allows subjective opinion formation: *"Competition is essentially a process of the formation of opinion* […]*"*(Hayek 1946, p.106).

Hypothesis #6: The reasons why the entrepreneur is innovative cannot be verbalized and rely on the mysteries of trade

In other words, some of the actors of the market (including entrepreneurs themselves) have access to information that others do not have. Those who are in possession of this information will never be able to explain how they managed to acquire such a knowledge because *"*[…] *so much knowledge of particular circumstances is unarticulated, and hardly even articulable (for example, an entrepreneur's hunch that a new product will be successful) that it would prove impossible to make it 'public' quite apart from considerations of motivation."* (Hayek 1988, p.89). The entrepreneur has a tacit knowledge of the market. When he changes his behavior with respect to a given good, he provides the other actors of the market with information that they did not have access to because of what Hayek (1988, p.89) refers to as *"the mysterious world of trade"*. According to him, this information about the good of interest is specific to the competition and any modification of the good (e.g. its quality) is reflected in its price (Hayek 1940, p.192). As such the price is also a clear indicator of the entrepreneur's behavior.

The hypotheses and proposals previously introduced lead to a particular model of reasoning. The entrepreneur is an individual innovator who owns information and a knowledge that are different from the ones of the other actors (Hypothesis #6). He is often imitated (Proposal #1).

Given that the market over-informs every person involved (Hypotheses #1 & 2), the genuine information that the entrepreneur is the only one to own forms his constitutive opinion (Proposal #3). This constitutive opinion and the information it conveys are inaccessible to the other actors who therefore speculate on his behavior to find the reasons motivating the entrepreneur's acts (speculative opinion; Hypothesis #4 & proposal #2). Hence, others rationalize the behavior of the entrepreneur and, from there, tend to imitate it (Hypothesis #3). His competitors will also imitate his *modus operandi* whereas his customers will adopt the value he has allotted the goods he produced (Proposal #1 & hypothesis #5). As such, imitation is a form of rationality (or rather a rationalization of the entrepreneur's behavior by his peers) on the market. The opinion of the other actors regarding the value of the good determined by the entrepreneur is of speculative nature. Actors on market concur with the judgment of the entrepreneur by finding reasons to explain (rationally) his choices, strategies and moves. This rationalization process entice them into revising their own beliefs and leads to an imitation of the behavior of the entrepreneur on the market. The imitation on the market can thus be explained by the recourse to a subjective theory of value (Hypothesis #4).

In summary, economic actors not having directly access to the mental states of their peers on the market (*subjectivism*) are inclined to interpret directly the behavior they observe (*revealed preferences*). This means that each and every one of them has speculative opinions on the constitutive opinions of others and revises his own beliefs by imitating the behavior of the entrepreneur as illustrated on Figure 1. This applies also to customers and shows how entrepreneur's private information becomes common knowledge thanks to prices and through imitation by the revision process of constitutive opinions.

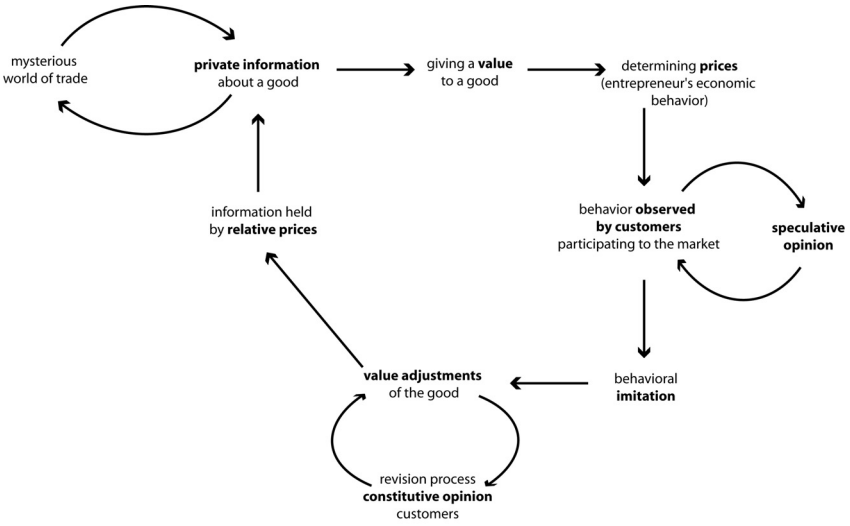

Figure 1. ***Reciprocal imitation dynamics of entrepreneurs on the market*** (adapted from Basso & Oullier 2011)

Embodied value in spontaneous order

In the previous section we discussed how discoveries and innovation resulting from entrepreneurship are spread throughout the market thanks to imitation. In order to start building a (social) neuroscience approach of the imitation of the entrepreneur's behavior on the market, we transform the usual subjective theory of value into our STV. Ultimately, we will be able to provide hypotheses regarding a "neuroeconomic" analysis of the entrepreneur's behavior by bringing together studies addressing bodily information, sensorimotor coordination dynamics and studies on prices dynamics.

As the reader must have noticed, our approach is firmly rooted in a novel reading of Friedrich Hayek's writings. Our goal is to gather the neurophysiological developments of the *"The Sensory Order"* (Hayek 1952a) with another side of his work devoted to the spontaneous order of the market. Of particular interest to us are the links between the concepts of *map* and *model* introduced in *"The sensory order with"* those of *speculative* and *constitutive opinion* from *"The Counter Revolution of Science"* (Hayek 1952b). Connecting the sensory order of the mind and the spontaneous order of the market enables to consider the subjective theory of value in sensory terms as depicted on Figure 2.

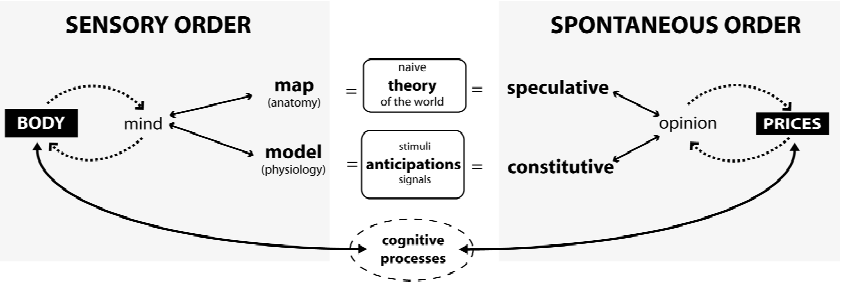

Figure 2. ***Connections between sensory and spontaneous orders*** (adapted from Basso & Oullier 2011)

We have already discussed the right part of Figure 2 by exposing the role of speculative and constitutive opinions in determining prices of a good in the spontaneous order of the market (Proposal #3). Let us now address the sensory order, i.e. an apparatus of classification of the environmental signals that are perceived (Hayek 1952a, p.167). These signals (referred to as *impulses* by Hayek) are conveyed by the model as a representation of the physical world (*physical order*) and make sense according to their position within the map, the latter summarizing our past experiences: *"The pattern of impulses which is traced at any moment within the given network of semi-permanent channels* [map] *may be regarded as a kind of model of the particular environment in which the organism finds itself at the moment and which will enable to take account of that environment in all its movements."* (Hayek 1952a, pp.114-115). Simply put, the map is structural, static, and refers to fixed anatomical structures of the brain. It forms *"[…] a theory of how the world works rather than a picture of it"* (Hayek 1952a, p.131) whereas the model is functional and dynamic. On the other hand, the model refers to the topicality of the world and relies on physiological process (Hayek 1952a, p.51).

Hypothesis #7: Anticipations are carried out as a function of the position of the model in the map.

Hayek gives an account of the anticipations carried out by each individual by the position of the model within the map. The sensory order, as a classification process, carries out anticipations according to the stimuli from the physical order that reach it (Hayek 1952a, pp.130-131).

Proposal #4: Prices allow anticipations to be achieved and are thus processed like sensory data

Applied to the case of the entrepreneur, these stimuli/impulses originate in the market. They allow for the anticipations of the entrepreneur to become effective: *"In some sense, what entrepreneurs do is to deploy smaller, more localized, versions of Hayek's 'map' and 'model' in anticipating future constellations of prices (concretized in the budget) and allowing them to make changes as their economic 'sensory data', in the form of profits and losses, illustrate their degree of accuracy"* (Horwitz 2000, p.33). When the brain of the entrepreneur (his sensory order) processes and coordinates signals resulting from the spontaneous order of the market, anticipations can be achieved.

Thus, these price signals become, *de facto*, sensory data processed by the model.

For the understanding of the entrepreneur in the *marginalist theory*, one should keep in mind that prices are the reverse of costs. Subjective in nature, costs are *opportunity costs* relying on a subtle trade-off between profits and losses. Moreover, in his distinction between a firm's internal and external environments, Herbert Simon points that: *"The goal (maximizing the difference between income and expenditure) fully defines the firm's inner environment"* (Simon 1996, p.25). It therefore makes sense to consider the cerebral level to understand how prices are determined in the firm.

The computation of opportunity costs results from brain activity: the determination of the value is the product of a choice which depends on the subjective preferences of each one and of (his) anticipations on the market (Proposal #3). When an entrepreneur decides the value of goods he has produced, the sensory order is at stake: the map refers to his subjective preferences and the model to the anticipations he carried out.

Hypothesis #8: The body modulates the sensory order

At this point in our development, Simon's views meet Hayek's and neuroscience can be brought into the discussion. Considering the influences of the body in economic decision making is therefore not vain: the sensory order deals with the body because the body and his components are constitutive elements of the sensory order: *"The higher centres will in consequence at any one time receive reports not only of given external stimuli but also of the body's spontaneous reaction to those stimuli. […] it is true that the sensory order with which we are concerned is both a result and a cause of the motor activities of the body. Behavior has to be seen in a double role: it is both the input and output of the activities of the high nervous centres"* (Hayek 1952a, pp.89-90)

Thus, according to Hayek, our perceptions of the environment are mediated by our body. Furthermore, Hayek supports the idea that our perception of the environment is built with respect to our body: *"Our tendency to personify (to interpret in anthropomorphic or animistic terms) the events we observe is probably the result of such applications of schemata which our own bodily movements provide. It is they which make, though not yet intelligible, at least perceivable (comprehensible or meaningful) complexes of events which without such perceptual schemata would have no coherence or character as wholes"* (Hayek 1962, p.52).

The Hayekian analysis of the body goes beyond the interoceptive influences. It precedes contemporary work on the metaphor and considers the anthropomorphism in the language of economic actors: *"All people, whether primitive or civilised, organise what they perceive partly by means of attributes that language has taught them to attach to groups of sensory characteristics"* (Hayek 1988, p.106). Our body influences both our perception and our reasoning (Frith & Singer, 2008). Decision making and imitation of peers cannot escape the influence of the body (Hayek 1962, pp.47-48; Oullier & Basso, 2010). To some extent one can see an anticipation of the concepts of *perception-action cycle* (Gibson 1979; Herrmann-Pillath 1992) and of *mirror system* (Rizzolatti & Craighero 2004).

Proposal #5: The map is a translation, in the sensory order, of our speculative opinion. The model is the translation, in the sensory order, of our constitutive opinion

This sensory reading of the behavior of the entrepreneur enables us to consider differently his behavior on the market. Indeed, the map, as defined by Hayek, is to be seen as a pre-sensory experience and mostly the product of our genetic evolution, contrary to the model that integrates environmental stimuli. For this reason, the map provides an account for the similarity of the mind of the individuals given that we tend to attribute beliefs and intentions to other actors on the market (*mentalizing*). This is known as the principle of *similarity of the mind* (Hayek 1952a, p.23; p.110), a consequence of the pre-sensory experience represented by the map (Hayek 1952a p.165). The map, as an anatomical substrate of our individual theories on how the world functions (Hayek 1952a, p.131) is to be considered together with the concept of speculative opinion. The model, on the other hand, is more of a physiological process that underlies the achievement of our actions and is therefore related to the constitutive opinions of the actors. Thus, both speculative and constitutive opinions in the spontaneous order of the market have their counterparts in the sensory order (Hypothesis #7). The map and the model are the neurophysiological underpinning of the behavioral mechanisms involved on the market (Proposal #5).

This approach is revived by neuroeconomic studies since this new field offers opportunity of considering the role of the body (and its movements as far as we are concerned) in economic analysis by taking into account its influences in decision making (Hypothesis #8; Basso & Oullier 2011; Oullier & Basso 2010; Oullier et al. 2008b). Furthermore, there is now the possibility to complement the analysis of prices on the market with neuroeconomic games that considers the bodily aspects (emotional contagion and movement dynamics for example) of interpersonal coordination (Oullier et al. 2008a). In such a context, prices would be considered (and processed) as sensory data (Proposal #4). For Hayek, the (human) body and the prices are both cognitive mechanisms: they are useful to convey a tacit knowledge, not verbalizable between the individuals (Basso & Oullier 2011).

Given that the body and the prices illustrate a kind of behavior (a social one for the body and an economic one for the prices), and that both consider imitation in Hayekian theory, one should consider a neuroeconomic game where the analysis of physical interactions and the process of imitation would make it possible to describe the revision of beliefs taking place on the market.

Physical influences: Imitation and bodily dimension in the marketplace

We argue that prices are sensory data, neuroscientific measuring tools should come handy to better understand the role of imitation in their dynamics. However, even when neuroscientific paradigms are used, the analysis of the behavior of economic actors on the market has, to date, essentially been confined to situations in which individuals are not influenced by the physical presence of their partners (or competitors). This leaves few “observable behaviors” to feed the imagination of the peers and allow them to speculate about the intentions of the entrepreneur. Thus, interactions should be

considered not only as a mental process but also as one involving exchanges and influences through sensory/physical signals.

Some might argue that this need for giving a sensorimotor dimension to economic studies is fulfilled by the involvement of brain sciences. This is partly true. A brain is not an entire body and what a body does is a lot more than just being the structure that is moved by the brain (Oullier & Basso 2010).

So why physical presence and movement of self and others -as well as their influence on economic decision- have so far, received such little treatment in the field of economics? Maybe because of the belief that the way we move does not influence the way we make economic decisions. What about the strong unintended responses to people's actions such as adopting a similar posture, speech rhythm during a conversation, a common gait pace when walking next to someone or even yawning (Barsalou et al. 2003)? Imitation and mimicry are facilitators of social interactions as demonstrated by the works of illustrated Chartand and Bargh (1999; see also Sommerville & Decety 2006). They showed that the more gestures and posture were matching the more people tend to like each other and exhibit better social cooperation. Given recent developments in motor cognition (Jeannerod 2006), there is no reason why economic decision should be immune from sensorimotor influences, at the individual and/or social levels (see Oullier & Basso 2010 for an extensive treatment).

A first reason could be the historical dichotomy between "high-level" cognitive processes that are distinguished from "low-level" motor ones in neuroscience. However, this tendency has been challenged in the past decade with the discovery of the mirror system (e.g. Rizzolatti & Craighero 2004). A second, and more pragmatic, reason might lie at the technical level given that methods used to record brain activity usually require subjects' immobility. Such a methodological constraint logically precludes further investigation of how physical interactions between individuals affect social decisions in their daily lives. However, recent findings in the context of *social coordination dynamics* might offer new directions (Oullier & Kelso 2009). Methods to quantify online formation (and dissolution) of physical bonds between humans have been developed at the behavioral (Oullier et al. 2005) and neural levels (Tognoli et al. 2007). It is now possible to measure the impact of mutual bodily influences during and even after a social encounter to quantify social motor memory and correlate it with economic decisions (Oullier et al. 2008a, b). These methods can now be used to make neuroeconomics more genuinely social, and by extension "human". Findings such as the neuromarkers of social coordination (Tognoli et al. 2007) could lead to a better and more realistic understanding of why decisions to like/trust or imitate someone on the market are not based solely on mental processes but also on the way bodies interact with each other at the sensorimotor level (Oullier et al. 2008b).

Entrepreneurship and the coordination dynamics of decision making in a virtual neuroeconomic game

One problem still remains. How does one manage to connect the multiple levels of analysis (and interest) and their nonlinear coordination dynamics when behavioral and brain processes are to be investigated jointly? In light of the shared dynamics that have been revealed between the brain and the

behavioral levels, one good candidate would be metastable coordination dynamics (Kelso 1995; Oullier & Kelso 2006). In that conceptual and empirical framework, one could propose a new game to address the issues discussed in sections 1 and 2.

Hayek considered the game as a metaphor of the market: *"The practices that led to the formation of the spontaneous order have much in common with rules observed in playing a game"* (Hayek 1988, p.154). We therefore introduce a new game to test for our hypotheses and proposals in the context of entrepreneurship. The so-called *"Innovator Game"* (IG; Basso & Oullier 2011) allows to measure the extent to which the entrepreneur is imitated and what kind of factors participate (or not) to this process. In order to concur with the theoretical framework depicted in Figure 1, the IG offers a novel way to investigate how consumers revise their constitutive opinion when they are exposed to innovation on the market. This revision process illustrates the dynamics of imitation by which a player~consumer adopts the value defined by the entrepreneur for a good he produced and launched on the market. Throughout multiple rounds, two players (a consumer and an innovator) have to carry out anticipations on a virtual market. The innovator's behavior is driven by an algorithm –materialized by a computer-generated (CG) avatar (see Schilbach et al. 2006)- against which the consumer plays. The task of the consumer is to predict better than the innovator evolutions of market, given a slight twist: the innovation provided by the entrepreneur is actually his faculty to anticipate! In other words, the good of interest that is evolving is the actual propensity to anticipate well *per se*. The only feedback given to the consumer is through facial expressions displayed on the face of the avatar following Ekman and Friesen's (1978) typology. The IG offers insights on how speculative opinions of the consumer regarding the behavior of the innovator are generated. This speculative opinion is modulated by information that is available to everyone on the market: the evolution of prices. If this game is crossed with the social coordination dynamics paradigm (Oullier et al. 2008a), one could replace the computer generated innovator with a real human and measure what signals in his bodily actions influence the behavior of the consumer. Therefore, we can find out to what extent the mirror system and neuromarkers of social coordination are at stake during the game.

Conclusions

Henry Greely (2007, p. 533) recently reminded *"Human society is the society of human brains. Of course those brains are encased in, affected by, and dependent on the rest of the body, but our most important interactions are with other people's brains, as manifested through their bodies."* Decades later, these words somewhat echoed Hayek and Simon's pioneer views on the role of the body and sensorimotor processes in the behavior of the entrepreneur. Tacit knowledge in innovation needs physical interactions between entrepreneurs, as elegantly put by Alfred Marshall: *"the secrets of industry are in the air"* (cited in Madiès & Prager 2008, p.38). Our sensory theory of value intends to follow in their footsteps.

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