Morality and Cognition: A Hayekian Perspective

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Abstract

This article brings together two strands of literature, based on two distinct contributions of F. A. von Hayek. I argue that Hayek's cognitive writings are the key to an understanding of his theory of cultural evolution.

Hayek's cognitive theory explains how individuals perceive and act in a given environment. Physical stimuli as well as actions of other people undergo a process of classification. Hayek was puzzled by the fact that the same stimulus can evoke a different action at a different time. In short, individuals are inclined to act and perceive in particular ways, given experience and tradition.

This article considers moral rules as rules of perception and action, and explains these as dispositions that induce particular neuronal pathways. Following his fallible method, dispositions are subject to change. Moral rules, deeply embedded in traditional rules, are less prone to be changed since they are a tacit part of human knowledge.

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JEL Classification*: A12; A13; B25; B53; D87*

1 Introduction

Although publicly less known, Hayek has always regarded his own research into the roots of moral behavior as the more important accomplishment in his life, compared to his highly acclaimed business cycle theory. To tackle the questions of moral behavior from a scholarly perspective has led him to investigate into two distinct areas of research. The first has become known as his cognitive theory, which he developed early in his career, the second is his Theory of Cultural Evolution. This paper stresses a viewpoint that sees both theories as complementary to each other. This, at first, may appear counterintuitive since we are commonly used to think of a cognitive perspective being a tool to explain individual perception and individual action, with the cultural viewpoint emphasizing a perspective of group perception and action.

After serving in WWI Hayek returned to Vienna, where he showed a deep desire toward the study of psychology, an interest instilled by his "family background of biology to social and philosophical issues".[1] A law student around 1920, Hayek started to pursue this research that later on led to his monograph "The Sensory Order," a work not accepted for publication until 1952. A series of subsequent articles, such as "Rules, Perception and Intelligibility" (1962), "The Primacy of the Abstract" (1969), and "The Theory of Complex Phenomena" (1964) deepened his impact in the scientific world at this later stage.

Hayek's theory of cognition intertwines aspects of neurobiology with philosophy, which led to an interchangeable usage of the terms 'mind', 'brain', and 'sensory order', which has left many questions open since on how to classify his contribution from a joint perspective.[2]

The present paper has the following task. It backs Hayek's early findings in "The Sensory Order" from a current neuroscience perspective to deliver a new understanding of moral behavior as used in his later writings on cultural evolution. Essentially, humans do not possess ultimate knowledge but typically rely on a subjective form of knowledge. Hayek's central argument in "The Sensory Order" is that human perception and action are purely subjective phenomena. This idea is in line with the general Austrian acceptance of methodological individualism, which as a

[1] Hayek (1982)

[2] See in particular his final chapter of "*The Sensory Order*" in which he refers to 'Philosophical Consequences' of his cognitive findings.

concept is commonly misunderstood when applied to cultural evolution. This paper is set out to clarify these issues and to deliver a new conceptual viewpoint toward a unified Hayekian theory. Hayek's *Sensory Order* is a contribution to cognitive psychology which studies mental activity in the context of information processing. This branch of psychology is built on the assumption that humans do not directly perceive and act in response. Instead, human perceptions, thoughts and actions are the result of internal transformations and of computations that follow in process repeatedly carried out by our mind. Raw information reaches the sense organs, but this information is then recognized and comprehended in the context of our previous experiences. We chose appropriate responses from a complex interplay of processes.[3]

At a physiological plane, the brain and the spinal cord build the central nervous system. Its duty is to take sensory information from the "outside" (e.g. noise, rain) or "inside world" (e.g. feeling of hunger) of the organism and to react to it. Actions following a stimulus are not simply a mechanical answer to this stimulus as proclaimed by behaviorists, the leading psychological school of the 1950s, which emphasized observable behavior and opposed to any method of "introspection" in order to study mental processes.[4] Although not adhering to, Hayek was strongly influenced by Gestalt psychology, which stresses that mental processes of perception and action involve the personality of the individual. Adding this psychological notion to the description of biological events now steers right into the known problem of the existing dichotomy between mind and body. Hayek regards this problem as even more troublesome when asking "what part of our knowledge can properly be described as knowledge of mental events as distinguished from our knowledge of physical events."[5] Essentially, but rarely known is that Hayek's line of argument in all his works follows the insight that knowledge is not absolute nor objective, here distilled directly from *The Sensory Order*.

We live in two worlds, a physical one and a phenomenal one, both being closely related but not identical to the individual. [6] Some events occur in both worlds, some don't. Illusions and

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[3] See Gazzaniga et al. (1997).
[4] Hayek (1952:25-30) and ([1952a]1979:78). For a thorough exposition about Hayek's affinity to Gestalt psychology see De Vecchi (2003).
[5] Hayek (1952:1). De Vecchi (2003) discovered that Hayek articulated the problem already in an early unpublished manuscript of the Sensory Order in the year 1920.
[6] Hayek (1952:4) He distinguishes two orders or two worlds, a "subjective, sensory, sensible, perceptual, familiar, behavioural or phenomenal world on the one hand, and …the objective, scientific, 'geographical', physical, or sometimes 'constructional' on the other".

imagination pertain to the phenomenal world only, but not to the physical. Current cognitive psychology stresses that human behavior takes part in both worlds, putting more emphasis on the importance of the sensory (phenomenal) world. Hayek's early findings are similar. He recognizes that the same stimuli, when reaching our mind at different times are usually perceived in the same way but typically lead to different responses. This is not a matter of reality and appearance as he points out, but it follows the relation that one particular object has relative to a different object of the same order. Human behavior cannot be explained with methods used in science. Social sciences do not follow the laws of physics, and Hayek's rejection to use the same tools or methods both in physical science and in social science follows this argument. In *The Counterrevolution of Science* he further explains his concerns. A related issue is his position in the Lange-Hayek debate against the possibility of central planning.

2 The two worlds

Our device to connect the physical and the phenomenal world is the brain. Humans are endowed with more than 100 billion neuronal cells, most densely concentrated in the brain. These neurons communicate sensory information and control body functions. A neuron consists of a body cell, of extensions that receive information, called dendrites, and of extensions that send messages, called axons. Many neuronal functions are based on electrochemical processes. We know today that information is carried along dendrites and axons through changes of their electrical properties. Such a change is induced by a chemical messenger that attaches on the dendrite and excites the neuron. This messenger triggers an electrical signal inside the neuron, causing it to "fire." When the electrical signal reaches the end of the axon, another chemical neurotransmitter is released that triggers an electrical signal at another neuron. This process occurs repeatedly, causing a chain reaction that excites many neurons. Neurons are carriers of information; the way the process is carried out now depends on which neurons connect to neuronal pathways, and infer specific responses of the human body.

At this point it is useful to speak of a "phenomenal world." Behaviorists would argue that the same stimuli would always excite the same neurons and therefore build the same pathways. This viewpoint essentially reduces the differences between physical world and phenomenal world to

zero. Hayek disagrees with this view, so does modern neuroscience. It is not the same stimulus that always evokes the same pattern of reaction; it is not the same stimulus that travels every time the same neuronal pathways. Different or similar stimuli can evoke the same impulses and travel the same pathway. Importantly, stimuli that occur simultaneously will thus be perceived as related, which establishes a connection with the corresponding neurons. Not similarity of a stimulus leads to its perception as such; it is the position of the neuron excited in the neuronal pathway. Even if stimuli differ from each they are typically perceived as similar or even identical when found on the same neuronal pathway.[7]

3 The map as tool to interpret the environment

Pathways and connections among neurons now form a map, which provides the individual with an "inventory of the kind of things of which the world is built up, a theory of how the world works rather than a picture of it."[8] The essential question that emerges is how the relations between stimuli are determined. Hayek refers to a phylogenetic and ontogenetic development of these relations. Some stimuli are seen as connected when this proves to be useful to the species. The phylogenetic aspect can be seen as the "hard wired" part of the map. It refers to stimuli that tell us things such as "darkness is dangerous" or "fire is dangerous", or "red fruit is good". The ontogenetic component of the map is determined by subjective experiences of the organism at a time, and is therefore prone to be altered.[9]

Such map provides a tool for classifying incoming stimuli. It is build upon categories which bear similarities to the Kantian categories, differing insofar from Kant as Hayek's categories are not static but modifiable. Because of their characteristics the map displays semi-permanent properties. These change in the course individual development and are modified through individual experience. We can conclude that the map as the neuronal connection of an individual is a product of past 'experiences.' Although categories have genetic and racial-

[7] Hayek (1952:10) "Impulses in a particular sensory nerve fibre may thus be set up by any one of a group of stimuli which physically may be similar or altogether different. But if a given fibre responds to any of those stimuli, the character of the impulse transmitted will always be the same, irrespective of the nature of the stimulus."
[8] Hayek (1952:131)
[9] Hayek (1952:53) "That this system of connexions is acquired in the course of the development of the species and the individual by a kind of 'experience' or 'learning'; and that it reproduces therefore at every stage of its development certain relationships existing in the physical environment between the stimuli evoking the impulses."

specific roots, they change with individual experience. At a point in time categories represent the accumulation of individual experience. Experience is therefore an important factor in perception, that is: perception is based on past experience. New impulses are compared, brought into relation with past experience and then perceived as such. Categories build a framework within which individuals interpret their own world.[10]

Hayek speaks of a railway map, of grids or filters that channel stimuli into relation with other ones that occurred in the past. This map is a reproduction of the relations in the physical world that happened in the past, whereby the past refers to the experience of the species and of the single individual living right now. The map exists independently of the environment of the organism; it does represent the "kind of events which the organism has met during its whole past"[11].

A system of connections which registers when certain impulses occurred simultaneously is formed by experience.[12] We know that perception is connected with memories: we recognize stimuli in bringing them in connection with stimuli perceived in the past. People who have suffered a brain damage and could still perceive objects and their features are typically unable to recognize an object when it lacks a connection to their memory.[13] In turn, slightly changing incoming impulses that permits us to now bring them into relation to past experience now builds up neuronal connections. The sensory order of an older individual is more sophisticated for this reason than the sensory order of a newborn.[14] This implies that an impulse per se can never be perceived but only a bundle of impulses; any single impulse will immediately be brought into relation to other similar impulses that occurred in the past. Impulses and combinations of impulses are identified to belong to a certain group of impulses. [15] New impulses can be classified as long as they share something with the perception of past impulses. If no such

[10] Hayek (1952:166) "It is only insofar as the nervous system has learnt…to treat a particular stimulus as a member of a certain class of events…, that an event can be perceived at all…"
[11] Hayek (1952:115)
[12] Hayek (1952:64)
[13] Gazzaniga (2002:193) "Object recognition is more than linking features to form a coherent whole. That whole triggers memories."
[14] Hayek ([1969] 1978: 44)
[15] Hayek (1952: 64) "Each individual impulse or group of impulses will on its occurrence evoke other impulses which correspond to the other stimuli which in the past have usually accompanied its occurrence."

similarity can be established, the new impulse cannot be perceived by the individual.[16] Even if those impulses would occur regularly they would not be relevant for the neuronal system; they will not alter the map of neuronal connections.

4 Categorization of incoming stimuli

The nervous system pictured by Hayek is a hierarchical order. Stimuli that evoke always the same response are usually categorized at a lower level. Instinctive reactions or reflexes are good examples for such a predictable categorization. With the gradual evolution of the species on the hand and a gradual accumulation of experience of a lifetime of a single individual, "the original direct connexions between particular stimuli and particular responses are being preserved, but … control mechanism are being superimposed capable of inhibiting or modifying theses direct responses when they are inappropriate in view of other simultaneously acting stimuli."[17] As a result, a more complex categorization, in Hayek's words "multiple classification," is to be expected when stimuli can be connected in many ways and responses will be less predictable.

The same happens when stimuli pass from one level to higher levels within the nervous system. In this case not only the stimuli but also the reactions of the body to those stimuli are transferred to higher levels.[18] Essentially, the higher the level, the less predictable a response will be since such an impulse "will send out more and more branches which will potentially be capable of reinforcing or inhibiting an ever-increasing range of other impulses."[19]

At the lowest level of the nervous system we have a classification[20] that is simple, fast, and basic. Hayek illustrates multiple classification with a machine that sorts different balls

[16] Hayek (1952: 64) "An event of an entirely new kind which has never occurred before, and which sets up impulses which arrive at the brain for the first time, could not be perceived at all."
[17] Hayek (1952:85). This line of thought will be further developed and applied in Hayek's theory of cultural evolution.
[18] Hayek (1952:92) "While it is on the whole more likely that responses *via* the lowest centers will be innate for the individual, that is, acquired by the race in the course of evolution, while the responses effected by the higher centres will be largely based on individual experience, this cannot be regarded as a universal rule. Probably some learned responses are effected on fairly high levels, while some learned responses may, after sufficient repetition, become almost completely automatic and be effected at low levels."
[19] Hayek (1952:112)
[20] Other terms used by Hayek for 'classification' are 'categorization', 'discrimination', 'sorting', 'sorting-out', or 'grouping'. (see Hayek 1952:48)

according to their size.[21] When applying the concept of multiple classification to this concept, we need to show that the machine needs accomplishes clearly more than sorting out. In a thought experiment, the machine can be connected to two lights, say a green and a red one that will show up when certain balls are placed into the machine. The machine will sort the balls into classes of balls that evoke a green light and into classes that evoke a red light.[22]

Multiple classification as a process is carried out differently if the machine say has to classify balls that first trigger a green light and after a different event may trigger a, say, blue light. The third type of multiple classification operates at a different level of the neural system. Classified stimuli of one level will become the object of a new classification at a different level. The resulting response to stimuli classified in so many ways may not be predictable the same way as stimuli that are classified at lower levels and do not "travel" to higher levels.

That stimuli undergo a multiple classification has been proven by Michael Posner in an experiment in 1986. Posner shows that all individual perception will undergo a hierarchical categorization process, a multiple representation of stimuli.[23]

We thus can understand the process of classification as one with filters sorting out stimuli and channeling information. Categories are operating like filters between an impulse and a particular action. Because of those filters, the original stimulus can never be perceived by the individual in its pure form but in a categorized, classified, or abstract form only.[24] Categories interpret stimuli and give those values or importance, and bring them into relation to other stimuli that have already occurred.

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[21] Balls with a diameter of 16,18,28,31,32 and 40 mm will be placed in a receptacle marked A, the balls with a diameter of 17,22,30, and 35 are placed into a receptacle marked B. The balls in receptacle A belong to one class and all the balls of receptacle B belong to another class. (see Hayek 1952:49)

[22] Hayek (1952:50)

[23] Gazzaniga et al. (2002:97-99) A test person was given two letters simultaneously. The task was to press the 'SAME' button if the two letters represented both vowels or both consonants. If the presented letters were from a different category such as one vowel and one consonant, the individual had to press the 'DIFFERENT' button. Posner measured the reaction time as an indicator for the categories the test person uses. He discovered four categories: a) physical identity such as AA; b) phonetic identity such as Aa; c) same category such as SC or AU; and d) different category such as AS. The test person responded fastest when encountering the physical identity, than the phonetic identity, followed by the different category and slowest to the same category. Posner implied that the different response times reflect the degree of processing required to the task. In other words, individuals have no problems in categorizing a stimulus when presented in a certain form but need to find another category when presented differently. Gazzaniga et al. (2002:98) stresses "This experiment provides a powerful demonstration that even with simple stimuli, the mind derives multiple representations."

[24] Hayek ([1969] 1978)

Note that since perception is abstract, only aspects of an event will be perceived that fit into the categories or aspects that can be brought in connection with past experience. Abstract perception may not be accurate but resembles the relevant aspects of an impulse. In modern cognitive science this aspect is called object constancy. People are able to recognize a bicycle when seen from above or people are able to discern the essential features of objects that are otherwise strange such as pink elephants or striped apples.[25]

5 Perception and action: the role of dispositions

Humans are very complex unpredictable creatures. When responding to a stimulus, they do by no means react all in the same way. Some do not react at all. And even the same individual shows different behavior at different times. Why is it that the same stimulus can be categorized differently at different times? The answer lies in the 'dispositions.' In his short article "The Sensory Order After 25 Years" Hayek regrets[26] not having used this term continuously already in his book *The Sensory Order*, admitting that this could have made his work far easier to understand. In fact, he used this term not before his article "The Primacy of the Abstract" in 1969.

A disposition, as Hayek stresses in his later article, describes an inclination of an organism to react in a certain way when being exposed to certain stimuli.[27] The organism is not only prepared to react to a perceived stimulus in a certain way but it is also prepared to receive a certain stimulus. The key to understand this term is to remember that categories are shaped by experience, and they in turn shape future perception. The organism thus expects to perceive impulses that match impulses perceived earlier. The preparedness of an organism, or its disposition, can be observed at the level of perception and of action.[28]

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[25] See also Gazzaniga et al. (2002:205)
[26] Hayek (1982:290)
[27] Hayek ([1969] 1978:40)
[28] Hayek (1952: 98) "This means that a great variety of external events, and also some conditions of the organism itself, may evoke one of several patterns of attitudes or dispositions which, while they last, will affect or 'colour' the perception of, and the responses to, any external event."

It is the dispositions that attribute a sensory quality to stimuli. "Classification is the process of channeling of the nervous impulses so as to produce a particular disposition."[29] Any interpretation of perceived stimuli – the classification of a perceived stimulus – is based upon *individual subjective* inclinations to do so. Dispositions are partially inborn (in the sense of genetic material) and in part they are the product of individual experience, but they are also built on experience made by the species.[30] The use of specific categories hence cannot be predicted; the subjective element of individual experience makes any prediction impossible. This impossibility is counteracted by the phylogenetic component of the dispositions. The species acquired some hard-wired dispositions during human evolution, such as to help your kin, to help old or sick people.[31] Some dispositions have developed during the cultural evolution of a society. These dispositions can be seen as rules and values that this society embodied in the past millennia; they enabled the society to survive. Keeping a promise, honoring a contract and especially *moral rules and values* are examples of such dispositions that refer to cultural uniqueness. [32] This leads Hayek to the conclusion that members of a group are able to predict *certain patterns of action but never the exact action of an individual*.[33]

6 The model: interpreting the environment

The categories that add up to the map are the framework that determines how the individual reacts to a stimulus. Hayek calls the map a "frame of reference" [34] for perceiving the world and acting accordingly to the needs of the organism in a particular situation. The map can be seen as a stable framework of how to perceive and act; the stimuli passing certain categories show the

[29] Hayek ([1962] 1967:51)
[30] See Rizzello (1999:28) and Hayek (1952:42)
[31] Rubin (2002:chapter 3)
[32] See Gazzaniga et al (2002:547) "Choosing how to act does not simply require discriminating between incoming stimuli. When choosing how to act, we must integrate incoming stimuli with our values, current goals, emotional state, and social situation….The orbitofrontal cortex seems to be especially important for processing, evauating, and filtering social and emotional information. The result is that damage to this region impairs the ability to make decisions that require feedback from social or emotional cues."
[33] See Gazzaniga et al (2002:547) "Choosing how to act does not simply require discriminating between incoming stimuli. When choosing how to act, we must integrate incoming stimuli with our values, current goals, emotional state, and social situation….The orbitofrontal cortex seems to be especially important for processing, evauating, and filtering social and emotional information. The result is that damage to this region impairs the ability to make decisions that require feedback from social or emotional cues."
[34] Hayek (1952:169)

current 'model' of the world. The activated neuronal pathways form the model. It is the process of multiple classification that is resembled in the current model, in the representation of the world in this particular situation. As such, the model is built up by elements that the map is able provide.[35]

The individual's action follows the model that he possesses at this given point in time. Every action triggers a feedback. If the result of the action corresponds with the expectation of the individual, this action will most probably be shown in future situations when stimuli of the same class will be perceived. This positive feedback reinforces certain dispositions to perceive and to act.[36] There is always a chance that completely new dispositions are developed. Hayek adheres to the idea that they are developed by accident and survive or die through natural selection.[37] These error and trial processes are physiological processes; insofar "corresponding structures of the nervous system … will first appear experimentally and then either be retained or abandoned."[38]

Consequently, some specific categories need to be updated by the positive or negative experience that the individual makes in certain environments. There are two possible models that occur on a biological level. The first one is build when the organism tries to find the right decision. The brain is able to forecast the result of an action, meaning that the brain "can produce a representative model on which the alternative actions and their consequences can be tried out

[35] Hayek (1952:131) "Model building means adaptation: it selects some elements from a complex environment as relevant for the prediction of events which are important for the persistence of the structure, and it treats them as instances of classes of events."

[36] Hayek (1952:95) "In the first instance, the sensory representation of the environment, and of the possible goal to be achieved in his environment, will evoke a movement pattern generally aimed at the achievement of the goal. But at first the pattern of movement initiated will not be fully successful. The current sensory reports about what is happening will be checked against expectations, and the difference between the two will act as a further stimulus indicating the required corrections. The result of every step in the course of actions will, as it were, be evaluated against the expected results, and any difference will serve as an indicator of the corrections required."

[37] Hayek ([1969] 1978:42) "It seems to me that the organism first develops new potentialities for actions and that only afterwards does experience select and confirm those which are useful as adaptations to typical characteristics of its environment. There will thus be gradually developed by natural selection a repertory of action types adapted to standard features of the environment."

[38] Hayek ([1969] 1978:43) and Hayek (1952:145) "We have seen that the classification of the stimuli performed by our senses will be based on a system of acquired connexions which reproduce, in a partial and imperfect manner, relations existing between the corresponding physical stimuli. The 'model' of the physical world which is thus formed will give only a very distorted reproduction of the relationships existing in that world…; and the classification of these events by our senses will often proof to be false, that is, give the rise to expectations which will not be borne out by events.

beforehand."[39] We know from neuroscience that imagery and actual perception are closely connected; perceptual memory reactivates perceptual pathways.[40] The thought of the use of a train ride taken in the past may trigger different memories connected with experienced emotions and reactivate other neuronal pathways. This representations of the world is a very useful tool: if the brain "had to take that action before it was tried out on a model, it might discover its harmful effects only when it was too late and it might be destroyed as a result."[41]

We can see that the map will change through negative feedback that tells that stimuli were classified in the wrong way. Inconsistencies with the expectations, inconsistencies in the model "can be eliminated only if what formerly were treated as elements of the same class are now treated as elements of different classes."[42]

7 Knowledge and morality: the tacit dimension

Given the subjectivity of the dispositions and the categories we may argue that all impulses or information an individual perceives are subjective phenomena. Knowledge is therefore the result of subjective interpretation of the environment (Rizzello, 1999).[43] Put it differently: knowledge is the knowledge about the environment perceived by the individual. Since impulses can be put into different categories, which in turn trigger a set of possible dispositions of action, we may argue that knowledge manifests itself in rules or schemata of perception and action.[44] Rules of perception[45] and action influence each other: experience tells us that certain perceived stimuli will evoke a certain pattern of action. Experience tells us that this stimulus will evoke certain neuronal pathways on the neuronal map. We may perceive rules of perception and action when

[39] Hayek ([1967a] 1967:73)
[40] Gazzaniga et al. (2002:239)
[41] Hayek ([1967a] 1967:73) and Hayek (1952:121) "We must therefore conceive of the model as constantly trying out possible developments and determining action in the light of the consequences which from the representations of such actions would appear o follow from it."
[42] Hayek (1952:169) and see Edelman (1987) "Perceptual categorization must both precede and accompany learning."
[43] See also Loasby (2004:103) who stresses that the Austrian subjectivity has a psychological or even biological basis.
[44] Hayek ([1969] 1978:41) "What this amounts to is that all the 'knowledge' of the external world which such an organism possesses consists in the action patterns which the stimuli tend to evoke, or, with special reference to the human mind, that what we call knowledge is primarily a system of rules of action assisted and modified by rules indicating equivalences or differences or various combinations of stimuli."
[45] Hayek ([1962] 1967:56) suggests to substitute the term 'rule perception' with 'regularity perception'.

observing other people. From this observation follows that certain rules belong to certain classes that other people perceive; they react in a certain way by following those rules. That is, when perceiving other people's rules we mainly perceive their dispositions and therefore the mental structure of other people. Since such an interpretation is the result of our own mental model, we perceive other people's behavior by using our own classificatory system and apply it to explain their behavior.[46]

This capacity of individuals to perceive the behavior of other people as a result of certain rules comes close to Gestalt perception.[47] We expect people to respond in a certain way to certain stimuli not only because we explain behavior using our mental tools but also because we learned in the past that certain rules of action are prevalent in the environment we know. It is therefore easier to expect a certain behavior in our own social environment than in one we are unfamiliar with. There exist a set of behavioral rules that are interpreted by everybody correctly in every society such as when a mother is rocking her baby to soothe it; but there exist many rules that are understood by members of a certain society only. Take for example the custom of Inuits in the 18th century regarding senilicide. The fact that we may easy explain human behavior in our own known environment is recognized by Hayek when he emphasizes "…that the capacity to respond to signs of which we are not conscious decreases as we move from members of our own culture to those of different cultures…"[48] Rules that are prevailing in a society are not necessarily perceived consciously or acted upon. As already stressed above, the mind is not a blank slate. Past experience accumulated by generations is a component of every mind.[49] It builds the basis for understanding and acting in a certain environment, but most important, it is the starting point of social evolution. Traditional rules can and will be changed by adapting them to new environmental necessities, a process through which some will be abandoned completely.

Traditional rules have no visible purpose but embody a knowledge which individuals do not know to have. It is the knowledge about doing things in a way that proves to be best adapted to the environment. Hayek's assumption that individuals constantly use such rules without being

[46] Hayek ([1942] 1948:63) "…In discussing what we regard as other people's conscious actions, we invariably interpret their action on the analogy of our own mind: that is, that we group their actions, and the objects of their actions, into classes or categories which we know solely from the knowledge of our mind."
[47] Hayek ([1962] 1967:46)
[48] Hayek ([1962] 1967:46)
[49] Hayek (1979:157) "The mind is embedded in a traditional impersonal structure of learnt rules, and its capacity to order experience is an acquired replica of cultural patterns which every individual mind finds given."

able to formulate them goes back to Polanyi's definition of tacit knowledge.[50] This kind of knowledge exists in "formulas, symbols, and rules whose meaning we do not understand and through the use of which we avail ourselves of the assistance of knowledge which individually we do not possess."[51] Tacit knowledge is therefore closely connects to traditions. [52]

Traditions refer to a whole complex of rules of perception and action. Those rules embracing the traditions of a society are not supposed to be stable in time due to the fact that dispositions and categories are of semi permanent character. Moral rules may be seen as part of such customary or traditional rules[53] and manifest themselves in the mental models of individuals. Although those rules may usually be used unconsciously, they can be selected consciously as well. Although an individual follows traditional rules, this does not imply that he has no choice about which rule he will obey. Since every individual is 'framed' by the society he was socialized in, there will be a set of possible action patterns he may select in order to respond to a perceived stimulus. In fact, it is the range of choices that is limited. This is why "certain conceivable choices will not appear at all among the possibilities between which he chooses."[54]

Traditional knowledge resembles abstract knowledge about the environment, it is categorized. It is practical knowledge insofar as it is stored in the rules of perception and action. As such, it has not been acquired by individual experience but it facilitates the process of individual decision making. Since traditional knowledge is tacit it is hard to criticize, because people are rarely aware that they are using it. In other words, rules that bear this kind of knowledge cannot be satisfactorily explained because they are linked to cognitive processes such as categorization, which have occurred in the past. The possibility to criticize abstract rules and to revise them as a whole has been rejected by Hayek, who argues that the mind cannot explain complex phenomena at the same level.[55] Abstract rules may be changed; however, such a change cannot be of a sudden nature, as it is more of a piecemeal change, based on the unsatisfactory result of an action. If the individual realizes an inconsistency between patterns of perception and

[50] Polanyi (1966)
[51] Hayek ([1954] 1948:88)
[52] Hayek ([1962] 1967:56) "The unconscious rules which govern our action are often represented as 'customs' or 'habits'."
[53] Hayek (1982)
[54] Hayek ([1962] 1967:56)
[55] Hayek (1952:185) "…the capacity of any explaining agent must be limited to objects with a structure possessing a degree of complexity lower than its own. If this is correct, it means that…the human brain can never fully explain its own operations." See also Sabooglu and Langlois (1995).

action, tension will be the result. Through piecemeal critique, divergences between expected factual results of an action can be detected and eliminated. This does not necessarily occur in a conscious process; many small violations of rules and practices have the same effect. Individuals who change their behavior only slightly, change their dispositions as well, they alter and add knowledge that is stored in their dispositions. At a physiological level, we can expect that new connections between neurons will be established; the map and consequently the model of the world of an individual will change. Because of the subjective limits of the mind, only a marginal discrepancy of the already known can be perceived. The mind, as already explained, cannot perceive completely new stimuli. They cannot be associated with already existing patterns of perceptions. When a slightly different stimulus reaches the organism, the organism becomes able to categorize and thus may reinforce old patterns of behavior or introduce new ones.

The development of a new disposition is not a conscious process and cannot be planned. It is "always a discovery of something which already guides its (the mind's E.G.) operation."[56] The result of the alteration of an existing disposition or the development of a new one goes hand in hand with an alteration of the structure of the brain. New behavior is now subject to natural selection; it has to compete with other rules of perception and action.

The process of developing or altering a disposition or an abstract rule of perception and action includes the production and transmission of new knowledge. This process starts with birth. As acknowledged earlier, an individual's brain is not a blank slate; newborn babies already own a certain amount of pre-constructed neuronal circuits[57] and therefore of genetically fixed dispositions. Babies have neuronal connections that work at a lower level of the neuronal hierarchy, such as the reflex to suck. Babies do not have a thinner net of neuronal connections compared to adults; their brain instead has redundant connections.[58] The human brain needs to mature: this process begins before birth and continues for more than a decade.[59] In this time many neuronal synapses are eliminated (pruning) and the neuronal connectivity will be fine-

[56] Hayek ([1969] 1978:46) and Hayek ([1969] 1978:44) "..the richness of the sensory world in which we live…is…the product of a great range of abstractions which the mind must possess in order to be capable of experiencing that richness of the particular."
[57] Gazzaniga et al. (2002:628)
[58] Gazzaniga et al. (2002:627)
[59] Hayek ([1969] 1978:44) "The baby and the animal certainly do not live in the same sensory world in which we live. But this is so…because of the much thinner net of ordering relations which they possess-because the much smaller number of abstract classes under which they can subsume their impressions makes the qualities which their supposedly elementary sensations possess less rich."

tuned.[60] Children will alter their dispositions with their experience, and therefore they enforce existing neuronal connections, or they build new ones. This occurs primarily by imitating parents. They develop similar patterns of perception and action as their parents and therefore are a good fit to their social environment they were born into. This mental process is one of unconscious learning; only when growing up a conscious learning is added.[61]

Through imitating parents, an individual learns the different practices used in his environment that have proved successful since generations; children acquire tacit knowledge. The main character of abstract cultural rules lies in the survival of the group practicing them. Abstract rules are embedded in patterns of perception of a particular group or society which lead to certain pattern of actions.

Individuals living in the same group or society grew up in the same traditional framework. They were socialized the same way and show because of that, similar – although not identical – patterns of perception and action. Because of this common endowment members of a group are able to communicate easily with each other; that is, members of a group are literally "speaking the same language." Individuals lacking those common cognitive patterns have problems to understand each other and cannot communicate.[62]

This fact becomes important when focusing on deviators of a group and outsiders to the group. Outsiders, not being endowed with the same implicit knowledge do not share the same cognitive patterns. In turn, a deviator with the same cultural background may alter rules but is still able to adhere to most of the rules[63] of a group. Deviants can communicate and explain their deviation since other members possess similar brain structures.

It is essentially the task of the deviator to induce cultural evolution. Opposing to the use of certain rules of action, including moral rules, he is able to alter constantly dispositions that are prominent in a society. Since no disposition is permanent, moral rules cannot be stable in time either. Moral rules evolve in the minds of individuals and should be seen as an adjustment to environmental necessities. This evolutionary approach to ethics follows from Hayek's cognitive underpinning of social evolution. Cultural evolution, including the evolution of our moral system starts in the minds of the members of a society. The result of new mental models prevailing in

[60] Gazzaniga et al. (2002:642)
[61] Rizzello (1999)
[62] As Hayek ([1962] 1967:60) states, communication "rests on a partial similarity of mental structure".
[63] Hayek (1979: 204, fn 48)

the majority of a society is a new stage of cultural evolution. Since moral rules follow the same cognitive process of perception and action it is straightforward to argue that moral rules are deeply connected to a society. "Right" and "wrong" are dispositions that exist in the minds of individuals at a certain time and in a certain society. There is no "objectively valid, self-evident 'good'[64] in a Kantian sense. Hayek's utilitarian perspective of morality is immanent to any evolutionary theory. In stressing rule utilitarianism[65] which emphasizes the efficiency of existing rules, Hayek recommends the adherence to moral rules as bearers of tacit knowledge to form expectations and coordinate actions.[66]

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64 Walker (1986:59)
65 Yaeger (2001)
66 See Gick (2003)

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