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GLOBAL COGNITIVE THEORY

**WILLPOWER AND DECISION-MAKING PROCESS
ARTIFICIAL INTELLIGENCE**





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WILLPOWER AND THE DECISION-MAKING PROCESS

1. Evolutionary psychology and willpower

The fourth online book of the *Global Cognitive Theory* is dedicated to the ***will, decision-making process, and artificial intelligence***.

This *decision-making process of willpower* does not appear in the functional flow-chart of the brain because it has been studied with a different focus. From this point, I thought it would be interesting to take a much more philosophical approach than taken with previous cognitive aspects of the brain.

The most relevant aspects analyzed in this book about willpower are the following:

- The origin of ideas and thoughts.
- The brain intervenes in decision-making processes but our body's cells surely get involved as well; it is as if it were autonomous expression of willpower by means of a system of decision like a real **political system**.
- This vision of the decision-making model together with its sensitivity offers reasonable explanations as to the changes observed in personal decisions without an apparent cause, and to a certain extent, to problems that arise, such as **schizophrenia**.
- This philosophical perspective has allowed me to perform entertaining and curious analyses about the very **existence** in the sense of existing as a unique individual, like a system of **vital impulse** from more elemental individuals, such as the vital impulse of a more global collectivity or the mentioned alternating existences throughout time. All of this according to the expression of willpower or the existence of an emotion.
- Using the discussion about the *active subject of will* in decision-making processes, a definition of **artificial intelligence** is proposed; it takes a little from all the ideas considered about '*natural*' cerebral functions.

The section of **related links** includes the four online books of the **Global Cognitive Theory**:

- *The brain and modern computers.*
- *Intelligence, intuition and creativity.*
- *Memory, language and other brain abilities.*
- *The will, decision making process and artificial intelligence.*

Another related link is referred to the online book of the *Global Theory of the Conditional Evolution of Life*.

There is also a link to the on-line book of the *Global Scientific Method* and the philosophy of science. It includes the design of **new scientific methods** and the classification of the stages and steps of the scientific method; understanding the scientific method in the broad sense as the application of logic to the generation of common knowledge with a high level of reliability.

The **scientific method** works fine in general, but it works much better in its developmental phase than in its phase of general acceptance. All types of social interests affect the last phase, from the realm of sociology as in the case of *Darwin's theory*, to the technician nature as in the case of the *Theory of Relativity*.

The last item of the *related links* is *The EDI Study* about **Evolution and Design of Intelligence**, a complete **statistical survey on the heritability of intelligence** performed on the fieldwork database of the *Young Adulthood Study, 1939-1967*

This statistical study is an **empirical research** about some considerations of the *Global Cognitive Theory* related with the brain and evolution, in particular the *definition of intelligence*.

The results of the statistical survey *The EDI Study* regarding an **elegant intelligence** show some important considerations:

- The hereditary nature of **relational intelligence** is confirmed.
- The genetic information with less intellectual potential is the significant one, as the GTCEL states regarding the concept of conditional intelligence.
- Likewise, it seems that the main functions of intelligence, or those evolving faster, are fairly concentrated in only one chromosome.
- The most innovative element of this work on cognitive psychology is undoubtedly the section relating to simulation. This section contains the explanation of how the **artificial intelligence quotient vectors** are generated by using the previsions of the new theory of evolution; they practically behave

like the variables that were actually observed, in despite of the intrinsic complexity involved.

- As if that were not enough, with the due caution this subject deserves, the existence of a **finalistic or teleological evolution** is scientifically proven to agree with that indicated by the *General Theory of Conditional Evolution of Life*.

Given that the current results in this book suggest a **fairly radical change** from the common opinions held by the majority of the scientific community and society, the logical deduction is that more extensive studies on cognitive psychology using the same methodology need to be performed.

An example of further exploration of this study is found in the section that has been added subsequently, which is related to **partner choice and intelligence**. In this section a hypothesis regarding a concrete requisite of the *acceptable limit of the difference in intelligence when forming a couple*, is confirmed and simultaneously reinforces the model's overall coherence. In fact, the requirement refers to the unconscious choice of an unknown intelligence for current cognitive psychology.

2. The decision-making process

A dictionary defines will as "*f: the potential of the soul in whose virtue we tend to have a positive or negative sense towards the goals proposed by the intellectual knowledge*" or the "*Free will or determination*".

There are other meanings for the term "*will*", but the previous ones are those that interest us because they show its essential nature; this is a quality that clearly supposes the expression or the exercising of the internal liberty of all living beings. Some authors such as **Schopenhauer ascribe will to human beings, animals, plants, and even objects**.

Remember that for the GTCEL "***The essential characteristic of Life is Liberty***". Although, normally, I have talked about human beings for reasons of convenience, the GTCEL also attributes liberty provided by the autonomy of will to objects, even if humans are not capable of detecting it. It is no more than a topic of the philosophy of Life.

In the *decision-making* or will-forming processes, internal and external elements influence the individual. The present commentaries refer to the internal factors of the decision-making process, without trying to propose a detailed study at any time.

In reality, it deals with extending the line of argument about the functioning of human intelligence and brain memory to the processes of creation of will with the goal of obtaining a better characterization of our own nature.

In the first place, we will broadly examine the **phases of the decision-making process**. Afterwards, we will make a few points about the complexity of the decision-making system that will allow us to deal more easily with the difficult subject of the active self-directed person.

2.a) Origin of desires, ideas, and thoughts

On many occasions, we do not know the origin of our desires, **ideas**, or our own **thoughts**. *Not to mention our feelings!*

Independently of what we commented on about thoughts in the second plane, it seems as if there were a retrieval system of ideas and the brain selects that which receives more votes or is presented with greater intensity to study and develop.

Let's suppose that a cell would like to or needs to have more water; the body will provide it with more water with the appropriate mechanisms. But when many ask for water, the water will start to become scarce and the **desire** to drink water will appear little by little. This desire will be made conscious at a particular time, depending on the consciousness' other priorities. For us, *all of this process has remained hidden!*

As is typical, the subject is more complicated than what it seems at first glance; for example, when faced with the same initial sensation, smokers may want to smoke instead of drinking water.

In the world of ideas, the same thing happens. All of sudden we find that we have initiated a series of reflections about a subject but we do not know exactly when or why. If we think about it at length, and if we are lucky, we will manage to figure out why.

Something similar, but not the same, happens in the trickier realm of feelings; for example, laughter and tears normally appear without direct control on our behalf. We can try or manage to laugh and cry, but only indirectly, by reproducing the conditions that provoke them.

2.b) Reasoning and thoughts

A second stage of the decision-making models, or of a generation of will, is the evaluation of the goal that requires a decision by means of *reasoning and thoughts*.

There will be a combination of logical processes and utilization of memory.

As we have commented on in previous sections, the information verification method is one of the methods used in decision-making processes; the functionality of the **neuronal networks** allows for a great flexibility in the application of the different variants of this method.

Normally, **billions of neurons** are involved in carrying out the decision-making process and they are located in different parts of the human brain.

Although strictly speaking we are separating this phase of decision-making for expository reasons, nothing prevents it from being produced simultaneously in certain cases. If something is providing neuroscience with flatness it is that the cerebral cognitive and mixed processes, such as emotions, are very flexible and variable in their structure and specific development.

Likewise, the cognitive processes and emotions are parallelly produced and affect each other; furthermore, they can decisively influence the situation, especially through emotions. Therefore, some contextual elements such as alcohol or other drugs are considered vices of will.

Particular emotions can also act as vices of will that are produced in the face of situations, at first independently, but due to past experiences certain automatic reactions have been saved.

It is very possible that our brain never ceases, at least while we are conscious. It seems to have a **line of pending reasoning and thoughts** so that when one is dealt with, another is immediately selected according to its urgency or any other criteria.

In other sections, we have also cited the work that the human brain performs, and its importance, while we are sleeping.

2.c) System development and political decision-making

It seems as if there is no exclusive decision-making centre in the human brain. In fact, there are acts called reflexes that are carried out by our entire body. Also, modern biology teaches us how the body's different organs and cells emit signals and communicate between one another.

If there were a decision-making centre, you could say that this is where life is

found, and the rest would be nothing more than a type of somewhat complicated machine. Of course, we would have to ask how many cells are in this centre and which of them have the power of decision. More so, *what part of this hypothetical cell would really be the part that makes the final decision?*

An interesting characteristic of the decisions that we make is the degree of confidence we give them, in other words, how convinced we are of the decision and the stability of a specific decision.

Sometimes we are obviously convinced, other times we are not completely sure about everything, and other times we feel very insecure about the decisions we make.

This effect can be clearly observed in decision-making processes that are made recurrently. It seems reasonable that decisions made with total security are maintained over time by means of predetermined **systems of development**; however, this is not the case. Sometimes people change their mind, even in the short-term, in spite of their initial confidence in the stability of the decision adopted. An interesting topic for the **theory of decision**.

Our will can change in spite of the fact that the information has not been altered and the same logic has been employed; this deals, in some form, with the slightly schizophrenic side in all of us.

A model of the decision-making processes (that can explain and integrate the possibilities stated in the previous paragraphs) should count on expert systems and systems of control. That is, it may be something like development of dynamic systems similar to a country's political system.

In normal situations we can find decision-making processes such as:

- **Automatic decisions.**

A multitude of small decision-making processes are made unconsciously due to the development of systems of information having been produced that identify necessary and sufficient parameters. Using our example, these would be all of those decisions that do not follow parliamentary procedures or are not dealt with by the government because they lack sufficient organization or the existence of previous laws on the subject.

- **Reflexive and semi-reflexive acts.**

In dangerous or emergency situations decisions are made immediately; they are then evaluated afterwards, and if needed, the guidelines for future behaviour are changed or adjusted with the development of dynamic systems.

It is easy to observe the parallelism with the functioning of a modern state,

although the danger or urgency would be slightly fictitious at times.

- **Overall immediate consultation.**

It is something like if each and every one of our cells voted on a particular subject. A priori, it is one of the best systems and supposes a direct democracy without any type of filter.

It would be the equivalent of a referendum. A large power of information transmission is required to carry this out, especially if we are speaking about billions of cells, and the transmission occurs often. The dynamics of complex systems will surely limit the use of this type more than necessary.

- **Representation.**

- Simple majority.

- Reinforced majority

It is assumed that nature has resolved, or tries to reasonably resolve, the problem in regards to the minorities in the theory of decision.

- Organic - territorial - functional

Other problems that are still considered normal situations can be resolved with these types of representation. They not only deal with respecting the minorities but rather recognizing their special relevance in particular subjects.

- **Other channels that take in specific situations.**

The equivalent of a political system could be called factual powers.

However, certain behaviour does not seem to follow the indicated guidelines of the theory of decision; the model needs to integrate more elements that help to explain some decisions that, in some fashion, express important alterations of a person's character.

We are referring to **vices of will** that alter expert systems or systems of control that make up the system of dynamic equilibrium of will such as:

- Sicknesses.
- Drugs.
- Other internal chemical processes.

Unfortunately, although it cannot be in any other way, this type of example is also found in conventional political systems.

3. Dynamic systems with multiple equilibrium

3.a) Expert systems

The human decision-making process' configuration is one of the most complex existing systems; it is influenced by innumerable variables that are by nature both structural and short-term or environmental.

Just like countries do not all have the same political system; each person has his or her own **system of dynamic equilibrium** for decision-making.

Within the structural variables we can cite:

- Differences in the **systems of information** and the perception of the external physical reality.
- Different endowments of capacities that influence the making of abstract constructions, in other words, in the development of **expert systems and systems of control**.
- Alternative evolutive ways regarding the pondering of elements in the diverse decision-making processes.
- Resistance or response to pain or other changes.

The most relevant aspect of interest here is the direct executive nature of the decisions made. Depending on the circumstances or the context, the decision-making system uses one process or another -even if the change of process implies a change in the decision, although a person is conscious of the change, the new decision will normally be carried out. After all, this is why he/she made the decision.

It is worth pointing out that the change of operative in the process of decision-making occurs automatically, that is, without the control of the conscious person. In fact, the functioning of **global dynamic system** is probably too complex.

However, what we can do is control the main determining factors of the *dynamic system* so as to guarantee the appropriate functioning of the systems of control and to provide it the desired stability without overlooking the fact that flexibility is a good characteristic. This explains its existence and that the exceptions are necessary such as those that provoke the manifestation of emotions.

Among these determining factors we can point out the water and food the body has available. *These are obvious, but are no less important for this reason!* Everyone knows the beneficial effect of vitamins in fruit, and therefore... Maybe they have not been explained clearly enough.

Lack of sleep, sports, or physical exercise is also found within this category although they have a slower and more accumulative effect.

3.b) Emotions and control system design

The awareness of our own emotional states and their influence on these decision-making processes will help us, if needed, to understand why there are changes in previously made decisions.

It is especially worth identifying states of anxiety and irritability because it is very possible that, the decision-making process is then found among what we have called forced systems due to vices of will.

One of the characteristics of the systems of dynamic equilibrium is that they are often systems with multiple equilibriums. That is, even with all their equal parameters, the equilibriums can be different according to the path followed to reach the equilibrium; in our case the equilibrium will be indicated by the decision made.

This characteristic is of considerable importance because it can produce **emotions** that can cause very dangerous situations when trying to leave a forced system; this could be the typical example of uncontrolled reactions produced by someone trying to stop consuming hard drugs.

A less dangerous but more common example is when someone tries to quit smoking tobacco, and a marked state of anxiety and irritability is produced with the emotional instability that accompanies it for many types of emotions.

In all of these examples, trying to control emotions by means of the main determining factors mentioned is the least that can be done to return the dynamic system to a normal path and to avoid producing emotions not planned or so artificially.

On the other hand, what seems dangerous is **managing emotions** which can alter its natural function.

3.c) Schizophrenia and genetics

Schizophrenia is probably the most well-known and common disorder of the decision-making system.

To some extent, all of us have a *certain degree of schizophrenia*, which, in my opinion, is good and natural. The problem appears when the degree of schizophrenia reaches the point in which it becomes serious and uncontrollable.

I would like to include a brief commentary in the sense that the main causes of

schizophrenia in this type of the decision-making behaviour could be, independently of **genetic or hereditary predisposition**, wanting to understand things or aspects of life that are truly impossible to understand because they do not depend on logic, but rather wanting to understand one's own emotions, and especially those of others, or even more serious, wanting to understand the personal logic of another person.

Furthermore, on many occasions, the error consists in trying to solve a problem that is not a problem and that also does not depend on us. To give a simple and somewhat childlike example that is nonetheless repeated throughout life in a thousand and one forms:

"I have my hands behind my back and ask: which hand is the candy in? Then, the only thing I have to do is put the candy in the opposite hand than that stated in the answer".

That is, it's a brain game in which the person who thinks and responds never wins, it is a **false dilemma**, and we can force the intelligence as much as we want, but we will not obtain any satisfactory solution.

In an attempt to understand something that resists us, sometimes it is useful to try to place ourselves in different initial situations, with different prejudices or preconceptions, forcing our intelligence to examine different points of view or perspectives.

If we do so with sufficient intensity and time, what we are doing is damaging the brain's normal decision-making process in the way that we change the development of the system and this does not only become an automatic process beyond our conscious control but it also tends to modify our genetic endowment related to these processes, given that, in my opinion, it is fairly flexible, allowing for the possible transmission of the problem to our descendents.

Logically, a person who is considered fairly intelligent will have the tendency to try to understand the mentioned situations and, therefore, there could be a certain statistical correlation between intelligence and schizophrenia. Perhaps this effect would be greater in people with problems related to dyslexia, given that memory recreates different points of view for its operation, even if it is not flawed, it is limited and also as at least some genetic connotations.

As far as the *genetics of schizophrenia*, it is worth remembering that the concordance between identical or monozygotic twin brothers is 0.69 for schizophrenia, which shows us that they have a marked genetic character while in non identical or dizygotic twin brothers it is 0.10.

This information contributes two ideas, the first that it seems that genetic

information is not concentrated on just one chromosome and the second, that either the presence of various "genes" is necessary for the effective cognitive development of these processes or the carrier genes are not significant in the sense of being "dominant" or both at the same time.

4. The human being, feelings, and willpower

4.a) Non existence

Of all the previous discussion about willpower, a logical implication is slowly emerging: if the decisions we make do not depend on just one being or origin of will, it seems obvious that this is because **this being does not exist**.

In other words, the **human being** as a living being with an individual willpower does not exist. Human willpower is the consequence of the individual wills of a multitude of more elemental beings generated by a system of personal decisions.

In this sense, we could say: "*I think, therefore I am not*".

On the other hand, the idea of being human fits in perfectly with the concept of the vital impulse system.

The GTCEL book defines the vital impulse systems as those that, for one reason or another behave as if they were living beings, or at least, have a lot of the principal characteristics of living beings.

Likewise we have pointed out that superior animals can be considered as symbiotic macro-societies of more elemental units with their own life, like cells.

The order of intuitive proximity indicates that the first type of vital impulse systems is formed by those whose components are also living beings (nation, state, beehive, ecosystems).

All of the above makes us ask, "*Where do we come from? Where are we going? Who are we?*" These are very difficult to answer, perhaps impossible. It is like asking, "*Where does a state come from? Where is a beehive going?*"

These questions are not very relevant because we are talking about organizational forms. To be able to respond to these questions, first we should answer precisely, "*What are we?*"

From a strictly scientific point of view, we are animals that have evolved from monkeys and it seems as though our existence is only based on a vital impulse

system.

We cannot even continuously guarantee the existence of human beings from a spiritual point of view, given that, as we have seen in discussing the decision-making processes or formation of will, our different components or individual elements are not always in agreement nor do they have the same points of view or morals.

4.b) The being and existence

I do not want to end this section on a cold and negative note. Being a vital impulse system is not derogatory; on the contrary, it is a way of being able to dominate scales that are superior to that of the individual.

At this moment in time, a country is allowed to obtain objectives for each and every one of its citizens who cannot obtain these objectives in any other way.

The spiritual dimension can also have positive aspects; sometimes it seems as though we behave or feel like one individual, as if there were unanimity in the decision-making process...a perfect synchronization of **human emotions**... an enormous bubble of energy.

Human beings function differently in regards to emotions; an emotion is not decided on by the majority, rather it invades us, it takes us over...We could cite many sentences here of a religious nature from diverse religions that are especially relevant when speaking about human emotions and the spiritual nature of living beings.

For example, referring to three people in one could refer to something similar to that commented upon; we could then imagine the feeling of nation or the significance of a billion beings in one with their feelings of love.

One of the greatest difficulties of this subject is that approximation requires the use of metaphors and other poetic devices that, on many occasions are misinterpreted, above all, over time.

So, we can say: "***I feel, therefore I am***".

Anyway, at risk of exceeding my goals in regards to my initial objective, I would say that we have a dual nature (of course, I am not the first to say so). On one hand, we do not exist in the classic sense of expression, and, on the other, we exist in a dimension unknown to our intellect.

Another way to express this idea would be to talk about the **temporary discontinuity of existence**.

With these sentences I am not trying to reveal the mystery of life or the existence of a metaphysical being at all, but rather to note some personal thoughts, adding a little grain of pollen to the fertility of science.

5. Definition of artificial intelligence

I have to acknowledge that I have never known the exact **definition of artificial intelligence**, perhaps because there are different, even contradictory, meanings of this term or expression.

When discussing the *definition of artificial intelligence*, both the term *intelligence* and the adjective *artificial* are problematic. We have dealt with the first previously and we can only accept the second as a conventional term and limit it to that which is performed by human beings. This does not, however, mean that we have to stop thinking; as a last resort, that which is artificial is completely natural because human beings are absolutely included in nature.

Generally speaking, there are two extreme classic stances regarding the **concept of artificial intelligence**: that which postulates the impossibility of its existence for being a characteristic of life and is impossible to transfer to a machine and the definition which accepts any artificial decision-making system as artificial intelligence as simple as it may be.

The famous **Turing Test** is placed in the middle of the definition of artificial intelligence by requiring the machine to behave like a human in its responses. It would obviously be a concept of artificial intelligence derived from the anthropomorphic concept of intelligence.

In sight of the reflections on the decision-making processes, the following is a proposed **definition of artificial intelligence**:

A machine's system of decision-making, created or not by human beings, that demonstrates certain intelligence, at least apparently, and has the characteristics of a vital impulse system.

However, a different stance for recognizing the essence of Life in things and in energy will take us to a more strict definition of artificial intelligence in the sense that this essence would be manifested at a level perceivable to humans.

The question of a definition of artificial intelligence is truly a difficult subject, let's digress and say that the application of the epistemological principles of the optimisation of any complex dynamic system could help develop a first line of empirical approximation, creating an auto-regulated system with a vital

objective...sensitive enough to detect its portion of liberty.



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