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GLOBAL COGNITIVE THEORY

MEMORY, LANGUAGE AND OTHER BRAIN ABILITIES

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THEORY OF MEMORY

1. Brain memory

This online book of the *Global Cognitive Theory* is dedicated to memory. This is the second main brain function or better said, the other side of the same coin that represents human brain. Firstly, the different layers or strata in which we think memory is structured are stated; secondly, some of the ways intelligence (as the memory manager) manages information are analysed.

In another section, the interaction between the capacity for storing information of the brain and the capacity for managing this storage are investigated. Within reason, some **complementary effects** will occur between the two. The overall efficiency in the management of information will therefore be somewhat more complicated to study than that of intelligence.

Consequently, the empirical study of the structural facets and their possible genetic nature will be fairly more complicated, even if we were to have precise methods of evaluation for the power of memory.

The section of **related links**, just above the index, includes the four online books of the **Global Cognitive Theory**

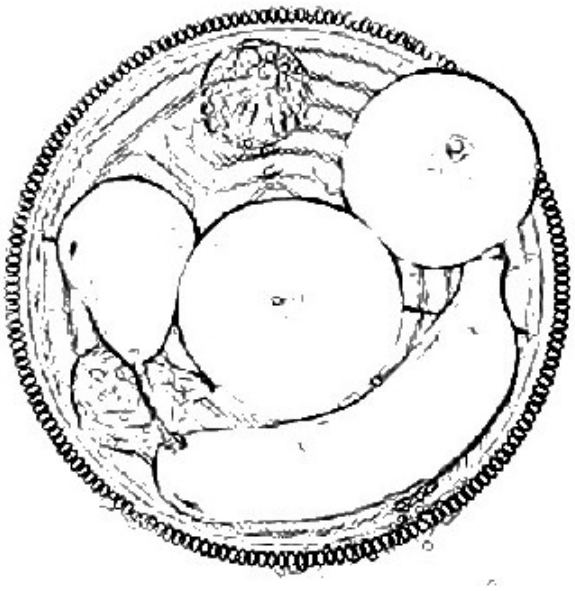
- *The brain and modern computers.*
- *Intelligence, intuition and creativity.*
- *Memory, language and other brain abilities.*
- *The will, decision making process and artificial intelligence.*

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*.

Relational memory



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. How to improve brain memory

What is memory? Memory is a mechanism that records, stores, and classifies information, making its subsequent retrieval possible. Strictly speaking, we can identify it with the capacity to save but we already know that this saving is as important as the contents and structure of the information.

How to improve any intellectual capability is always a recurrent topic. In this case, the first thing to keep in mind is the number of factors that influence the normal functioning of brain memory. Throughout this book we will analyze the different types of memory according to the various perspectives and we will see how each of them has some characteristics that can help improve the performance of memory.

Forest of unicorns

(Public domain image)

A second very important aspect is to understand that improving an intellectual or physical ability does not mean that a human can acquire the ability to fly or anything of the sort. It is to say, we must bear in mind that there are established aspects in the brain configuration due to genetics and the early development that act as limits to the intellectual power.

Instead of *how to improve memory* it would be better to say how to exercise this brain capacity in a way that its natural possibilities of learning are made the most of. From this point of view, the best advice is that an appropriate intellectual exercise

will always be healthy. However, it should be remembered that even if we are not studying the lists of elements, or the Visigoth kings, or the rivers and their tributaries, normally memory is always working because the brain does not tend to cease too often.

For this reason, when I say exercises, I am referring to something other than a memorizing effort but to trying to forcibly remember everything all day. With the **general educational system**, I believe that the **human memory** is sufficiently exercised at least while attending school or university; furthermore, it seems that it is generating a certain accelerated evolution of the human brain capacity from one generation to another.

It should also be pointed out that a great part of brain memory is attained **unconsciously** and we do not have many ways of manipulating it except facilitating the conditions of its performance or, better said, trying not to interrupt its normal functioning.

It maintained that the entire third book of the Global Cognitive Theory deals with **how to improve brain memory**; nevertheless, I want to cite the following aspects here for their special significance:

- An interesting aspect is that memory functions much more efficiently when something is learned in a pleasant and relaxed environment. We all know that **memory is selective** and that we remember pleasant things much better and that we hardly remember the bad times; this effect is accentuated the older the memories are.

- A complementary yet opposite aspect is that, when we are nervous, memory works very poorly, confusing almost everything. It is important that certain topics are discussed with as much calmness as possible, because otherwise, objective information starts to become confused, and there is no **human way to reason or understand the emotions**.

It seems as if the large quantity of resources that the memory manager was consuming were not found free, that it would not function adequately.

3. Brain memory types

Below, various classifications or types of memory are presented according to the different criteria.

The aforementioned presentation does not have an exhaustive nor exclusive character. Some *brain memory types* do not appear and those mentioned may appear in various categories, for I have tried to keep the exposition as clear as possible.

We all know that brain memory has diverse degrees of temporal retention of data. Over time, the information that our memory provides us with disappears. Other information is harder for us to find in our memory and it is not as exact as it was previously. Other information is not only inexact, but rather we can tell that, in reality, we are reconstructing the data from little information, etc.

We will examine each of these categories and their **brain memory types** in greater detail:

3.a) Conscious cognitive processes

3.a.1. Instantaneous memory

It is formed by all information that is accessible in real time, immediately. Although it may seem otherwise, this brain memory is very large; all the information that we constantly use in our daily life is found here. We will look at some of its main components:

- **Normal information** such as where things are located, pending tasks, routines, etc.
- The **preconceptions** that make up a part of our character or personality.
- **Automatic response programs** that are loaded in a short period of time when we wake up. Linguistic memory and other special brain memories also form a part of this instantaneous memory when they have been activated.
- **Special automatic response programs** like driving or those that correspond to dangerous situations that are loaded when considered useful.
- **Working memory** associated with the operation of logic or intelligence. This memory is very limited and its optimum operation implies the use of 3 or 4 variables simultaneously; when thinking about a concept and performing logical operations with more than 5 variables, it takes a long time to advance.

- **The auxiliary working memory** corresponds to all the variables that are available to be located in the operative working memory cited in the previous paragraph. All the information known about the subject we are working with pertains to this category.

Brain memory types

Driving program

This configuration's automatism allows for the simultaneous performance of various tasks; the human consciousness could be assimilated to the computer's interface and the unconsciousness with programs residing in the instantaneous memory. Therefore, the more the cerebral processes or the computer programs are automated, the freer the human consciousness, or the simpler and more intuitive the program's interface will be.

However, this simplicity is accompanied by a disadvantage that is good to keep in mind; computer's automatism sometimes does not let us know exactly what it has done or why. It is always necessary to have general knowledge of how computers work, and the only way to have this is with practice and time.

3.a.2. Specialized memory

In this category we can include the types of special brain memory for automatic loading in instantaneous memory that also form part of long-term memory;

although they are not as compressed as this memory, and have their own multidimensional systems of reference.

The following are examples of special memories: **linguistic memory**, certain **visual memory**, the archive of the preconceptions, and pre-established quick response programs such as **emotions**.

I would say that emotions are not directly recalled, rather that they are directly felt. People can remember that they felt a certain emotion and reproduce it by recalling the original factors. Of course, it is quite possible that the same feelings will not be produced.

3.b) Persistence of brain memory

3.b.1. Short-term memory

All the information that has been dealt with since the last time the system was cleaned or maintenance was performed will be found in this memory, that is, since the last time a person slept enough time to perform this task.

The degree of conservation or state of the information will depend on the mentioned time and, of course, on the physiological or genetic capacity of each individual.

This memory will be fed mainly on the data that has gone through the auxiliary working memory, both from medium and long-term memory, and the experience and reasoning during normal life through our perception.

Due to historical evolution, this memory is most efficient for **approximately 16 hours**, reserving **8 hours daily** for its maintenance. Probably not all the time that we sleep is used to clean short-term memory; a significant amount of time is also dedicated to the transfer of information from medium-term to long-term memory (to state it simply), and other diverse maintenance functions.

There are short-term memory cleaning systems that are highly recommended and others that are strongly advised against. Just say the first will not be easy to obtain if there are elements in the short-term memory that generate tensions and demand the individual's attention. In regards to the latter, the effects of abusive ingestion of alcohol can be used as an example; this can in turn give us an idea of the effects of non-abusive but counterproductive ingestion, especially for the information contained in this memory.

3.b.2. Medium-term memory

Maintaining information as organised as possible is a way of optimising the information contained in short-term memory; this will probably make us take in a lot of information that we cannot organize immediately but that we can store to deal with and order afterwards. This eliminates duplicated information and permanently saves information, or similar concepts for reference, and, in this way, saves a large quantity of the memory's capacity or information archive.

In the future, it is very likely that computers will always be functioning, whether by running requested programs or by reorganizing themselves.

We can already cite programs that can be run automatically: defragmenting and

maintenance of the hard drive, cleaning of the Windows system log, search for and downloading of news or any type of program, information compression, anti-virus, etc.

The expression of medium-term memory is useful but does not precisely reflect the nature of its content.

The information that is retained for a rather long time is found in this memory. But this period of time is larger because the information is more relational and contains less concrete information. That is, the information can be obtained not only directly, but rather by its relation to other information also saved in the memory.

In this respect, independently from whether certain information is saved in the memory in its original state, (like the birthday of someone you are close to) medium-term memory tends to be more fixed as the information is transformed into concepts and these are defined by the base of a system of multi-dimensional references.

Over time, concepts will only remain in the indicated form; precise information usually ceases being useful or, if relevant, becomes a part of instantaneous memory and the memorized relations tend to be incorporated into the cited multidimensional system. And if required, a new dimension will be added in the system.

All of these processes are not free from errors; the mechanisms that are good in the majority of cases can turn out to be totally inadequate for others.

One of the circumstances that concerns me the most occurs when an act or an idea is repeated many times during a certain period, and especially when it appears or is proposed as a hypothesis that develops in various ways. In accordance with normal mechanisms in the brain, this act or idea will be saved in layers that go deeper and deeper into our brain memory.

Afterwards, when our memory accesses this information, it will be likely to interpret this as its own already accepted information because it is found in a deep layer.

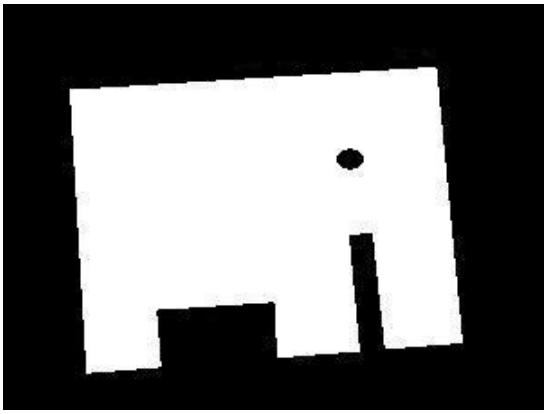
The error can be significant -*a strange idea is supplanting our true knowledge or feelings*!

It is called **brainwashing** and it is likely to occur, for example, when we read a book that repeats something thousands of times. Each time we read it, the brain has enough time to memorize the idea or transfer it to a deeper layer. Of course, this effect depends on the ideas and the individuals.

3.b.3. Long-term memory

This expression is more correct than the previous one in that it clearly implies long-term, but also needs some clarification as far as its nature.

Long-term memory



If medium-term memory is configured like a multidimensional system, long-term memory is formed independently of the famous 'birthday' by an exclusively multidimensional system in which there are less dimensions than in medium-term memory, and these are the base of the essential character of a person, not of their knowledge. We are referring to what is commonly known as general personalized principles such as justice, equality, liberty, respect, education, benefit of the doubt, etc.

Knowledge or concepts are found ordered in the deepest medium-term memory layers, or otherwise stated, in the most superficial layers of long-term memory.

The necessity to re-adapt these principles to a greater or lesser extent is an interesting effect that occurs in personality growth and development. Obviously, the unconsciousness does not like the idea; changing these principles supposes, to some extent, the recognition of some errors in them; this is a large task because all of the remaining memory will be changed and will need to be readjusted. These will probably be periods in which the person will sleep more than he/she is used to.

In line with the question, this vision is coherent with the fact that people sleep less as they get older in normal conditions.

3.b.4. Vital memory

Here, we are not referring to a visual or emotional memory but rather a very special type of memory of visual-emotional nature that can be compared to **extra-fast movies** when a person thinks there is a certain probability that he/she will die

in a matter of seconds. The content varies from person to person but usually tends to be a sequence of very symbolic emotive images in chronological order.

Another type of super special and super persistant memory could be the **genetic memory** which contains all of the genetic information transmitted to the descendents.

3.c) Reliability of the memory information system

By speaking about intelligence we have already anticipated the conceptual relations between logic and math memory, intuition, and normal memory, and between language and linguistic memory, dealing with the different operational forms of intelligence as a relational capacity and of intelligence as a manager of *memory information system*, and **ways of transmitting** such information.

Math memory, which demands certainty in responses from **the biological information system**, should behave just like logical math intelligence in that it demands reliability. However, it would not be surprising if other types of memory, such as normal memory or the capacity related to language -that characteristically admit errors and approximation- were a consequence of the same genetic information that acts to create math memory, yet under the assumption contrary to that of external verification of the information.

Castle in Irland - Visual memory

(Public domain image)

That is, our brain constructs genetic codes from both parents and when operating certain processes like normal memory, it does not require the certainty of responses.

On the other hand, memory proposes additional problems given its own nature of storing information and the problems or characteristics of the information system manager.

It is also clear that very special memories exist with equally special managers, whose internal functioning is presently practically unknown in neuroscience. We

are not referring to the parts of the brain that are activated or not in specific activities but rather the biological mechanisms that are developed from a functional point of view. We can cite linguistic, visual, and musical memory among others.

Although we have been using the term math memory, I think that the term **secure mode** memory in the transmission of information is more precise. Likewise, but without trying to create a closed typology, we could refer to **probable mode** when the required reliability is high but not at its maximum, and **possible** mode when this reliability is relatively low.

3.d) Data integrity

3.d.1. Compression of information

Now that we have commented on the types of memory, as you get further into the layers of brain memory, the **nature of the information** changes into a multidimensional system, or similarly, the information being compressed.

This process takes time and the memory manager needs to use a lot of its power. Normally, it not only deals with information compression, but rather with its decompression, its analysis, and comparison with new information. Then it deals with its re-compression after having looked for more appropriate dimensional references for information saving and future localization.

When you think about something that you have not thought about for a while, you may feel like the information is appearing out of nowhere, as if you were putting two and two together for the first time.

When you retrieve or become conscious of information or a concept, it seems as if the brain were continuing to retrieve elements associated with the stated information or concept at the same time. At certain times you can even visualize information and concepts like an explosion of data that are more and more precise in relation to what you were speaking or thinking about. Obviously, this retrieval depends on the length of time that has gone by since the last time that you thought about the specific subject and your necessity to continue thinking about it.

New computers, with their best techniques, keep becoming more and more similar to the brain. With their current processing speed they can start to automatically compress information that is not habitually used; before, decompression of a **source of compressed information**, if needed, would have been too slow.

Below we will analyse an illustrative example of elderly people who, often say the following sentences:

- I don't remember what I said five minutes ago.
- I don't remember what I ate yesterday.
- Strange, but I always remember perfectly when twenty years ago…

A reasonable explanation could be the following:

- Over time it becomes more difficult to compress more information that has already been compressed previously. This larger compression is considered necessary to free space in the brain memory given that throughout a person's

life, it is assumed that he/she has used all available memory.

- Also, the gradual loss of an organism's vital energy with age, or any other problem, makes the compression mechanism less powerful.
- Logically, there comes a time when a part of the stored information needs to be erased in order to save news or a recent act.
- When in this situation, if someone decides to save new information, compressed information from during a lifetime will never be erased, unless the new information is very important. Normally information contained in the first or second superficial memory layers will be erased first.
- Another related aspect that we have already commented on is that older people do not need as much sleep.

We are talking about normal problems that come with age, but obviously in some cases the symptoms are much more serious and produce memory loss that can lead to dementia or diseases such as **Alzheimer**.

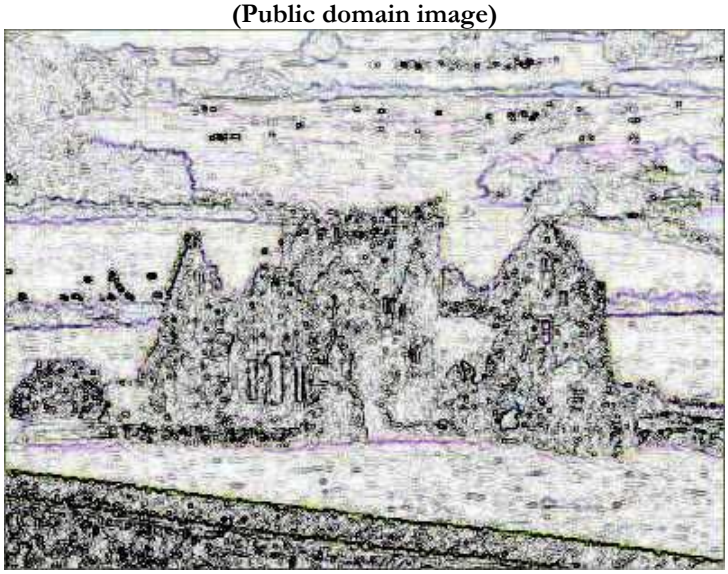
Of course, like in all complex processes, having little memory or not exercising specific *sources of compressed information* properly is positively correlated to Alzheimer.

3.d.2. Degradation of information storage

Another already known method in our culture is the degradation of information when it is compressed.

Degradation of information storage

(Public domain image)



When computers compress an image in Bmp format to Jpg format, either no information is lost or a certain degree of information is lost, but nonetheless the new file has been significantly reduced.

Sensory memory, in particular, requires the actions of degradation in order to reduce the enormous amount of information that is received, such as when we think about music and songs, films, videos, etc.

3.d.3 Reconstruction of information

Corresponding to the phenomenon of the information degradation, there is also reconstruction of compressed or degraded information storage when required by the memory manager.

As we know, this phenomenon may convince a person of the existence of an act or a specific aspect because his/her memory says it exists when it actually does not. *It may seem as if this person were lying, but, in fact, he/she is confused even though he/she may not be aware of this confusion.*

4. Human brain memory

The memory manager, intelligence, uses a lot of methods and processes to classify, organize, and rationalize the information contained in the brain memory. Below we are going to state the most important ones among the many that should exist.

4.a) Automatic memory and directed memory

Up until now we have talked about the memory's automatic operation mechanisms; indubitably, you can influence which information is saved and which is not.

The fact that the more someone studies a subject the more he/she retains is nothing new. However the operation of the transfer from short-term to medium-term memory is unconscious, **the brain detects interest** according to the number of times it has dealt with a subject.

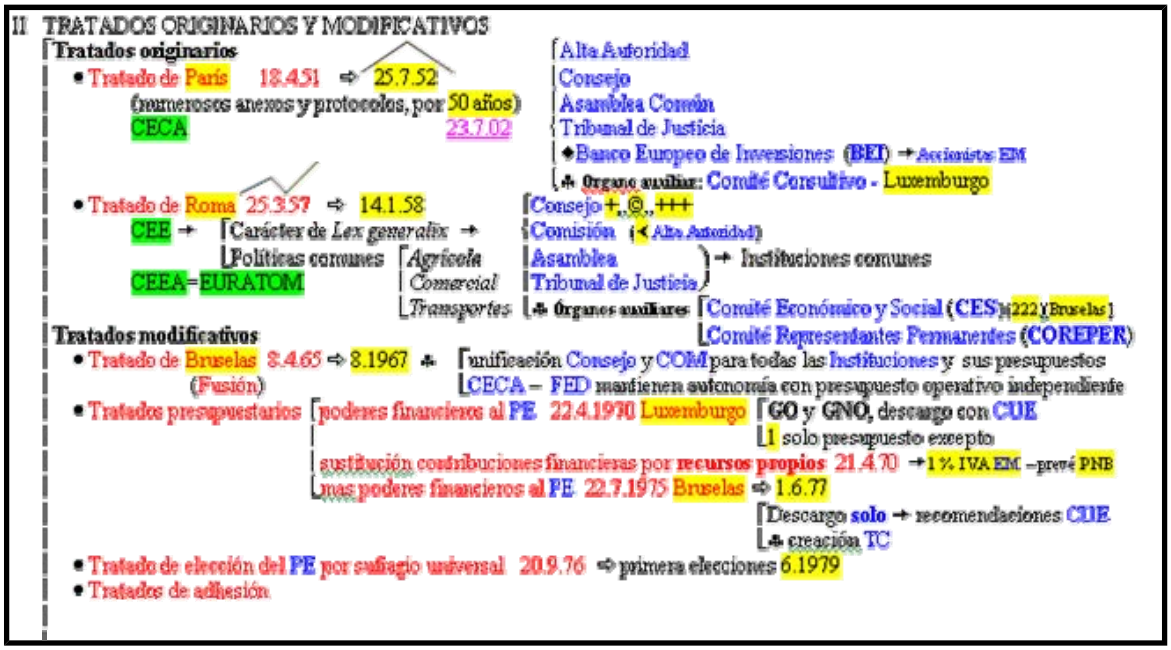
An important leap occurs when a subject has been dealt with on **different days** in order to memorize certain information. The memory manager will then find references to the subject in the most superficial layers of *medium-term memory*, and there will automatically exist a tendency to save more securely, or, in other words, in the next layers of medium-term memory.

Another important leap will be made when the memory manager requires the saved information and the brain **realises the limitations** of the information, understanding that better availability of the information would be convenient, therefore tending to improve the availability in the medium-term memory. It will also start to establish the information in the multidimensional system, creating the needed references.

When trying to pass an exam, the provision of some artificial references for better information retention could significantly help medium-term memory. Specifically, we are referring to certain **mnemonic devices.**

Useful examples are marking dates, figures, percentages, and similar information that are very mathematical with a special **colour**, authors with another colour, definitions with another, etc., *but without using too many colours or other mnemonic devices*! Maximum four or five.

Mnemonic devices



However, sometimes, in spite of our effort and the knowledge that we are capable of doing so, it seems that human memory does not respond - that it refuses to work. The most common reasons could be:

- Not **sleeping** enough.
- Excessive consumption of **alcohol**, and to a lesser extent, tobacco.
- A true lack of **interest**.
- Being very **tense** when studying, which notably limits the capacity used by the memory manager either when awake or when sleeping.
- The information will not be used in the future or at least not in the way it is being memorized. A typical example is the **learning of languages** that are not going to be used or attempt to learn them in math memory because languages are normally developed in linguistic memory.

The tensions mentioned in the previous paragraphs should not be confused with the situation of a student who has various **exams** very close together or an exam of a very lengthy subject.

Before the exam students are very nervous, excessively nervous, and they also feel like they do not know anything. These **nerves** are caused when short-term memory is overloaded for its normal state -a lot of effort is demanded, and *nervous tension is probably the only way to allow this overload* in these circumstances. Along with the mentioned feeling of not knowing anything, people also become more nervous when they cannot stop thinking about the exam's subject.

However, once the questions are known, nervousness disappears -a multitude of concepts vanish from the mind and it begins to fill with information related to the questions. The more some of the questions are thought about, the more information continues to appear, always if and when a person is really familiar with the subject, otherwise…

Red points - Kandinsky

(Public domain image)

It is worth pointing out the existing connection between the previously cited reasons behind a possible malfunctioning of the human brain memory with the reasons that could provoke dysfunctions in the **decision-making system,** which we comment on in another section independent from this book.

This coincidence can be explained by thinking about the effect that can be had on brain memory if every time we study or think about a subject, we try to save it, consciously or unconsciously, in a different group of references.

4.b) Pre-established logic blocks or structures

In the study of rapid response development of intelligence, we stated that brain power notably increments with its automation. One of its causes was that entry information is placed directly in the prepared fields of the subprograms or functions, and once all the information has been received the specific operation was automatically launched.

In short, this development implies the development of structures or fields pre-established for information treatment. In the system of global information, these same structures would be used, if needed, for the storage or saving of information.

The development and improvement of these brain information structures can also

be directed at actively involving the individual in the system's efficiency process.

Computer programs continually use this technique, organizing the information in groups of personalized fields that, in the final analysis, are information matrixes.

4.c) Memorise only what it is not logic

One of the memory manager's most efficient methods is a consequence of the rule of not memorizing that which can easily be deduced using logic. But in this case, logic has to be understood as a **specific personal logic** associated with the event or information which you make yourself think that you know.

Actually, the **trick** is not to know, but rather to know what you know; which is not the same.

I hope to explain myself better with a simple example in which I can answer one question without having any specific related information in my memory. The one exception is that I have to know what I know and what I do not know. (*Always the same simple reference in long-term memory. And a very simple reference.)*

- Question: *Who has longer hair, Susana or Julio*?
  - Supposition 1: I have no link, no reference to this in my memory.
    - - Answer: I don't know, I could imagine that…but I don't know.
  - Supposition 2: I know that I know because, in some way, this question (not the answer) has an associated reference in my medium-term memory.
    - -Answer: Susana. (It is assumed to be correct).

I went through the following process: as I know that I know because my memory has told me so, I look for the specific logic that I would have applied to save this information.

In this case it would be "*normally women have longer hair than men.*" Therefore, the answer is Susana.

The advantages of this method are, on one hand that the reference is very simple and already exists in medium-term memory; the only thing that needs to be done is to activate it for a specific case. And, on the other hand, in the majority of cases, by applying logic for the most common cases, there is no need to change the point of reference, which is what we would have done if Julio had longer hair.

Here is one more implication of this method: if we know what we know and do not remember the reference's sign, by default we will assume that this is the normal

sign of specific logic. (*It is not necessary to remember the normal one.*)

If it were necessary to remember the different possibilities within math memory, it would require more work and more resources in the brain. This method admits variants but is especially indicated to be used in the memory manager's intuitive fashion.

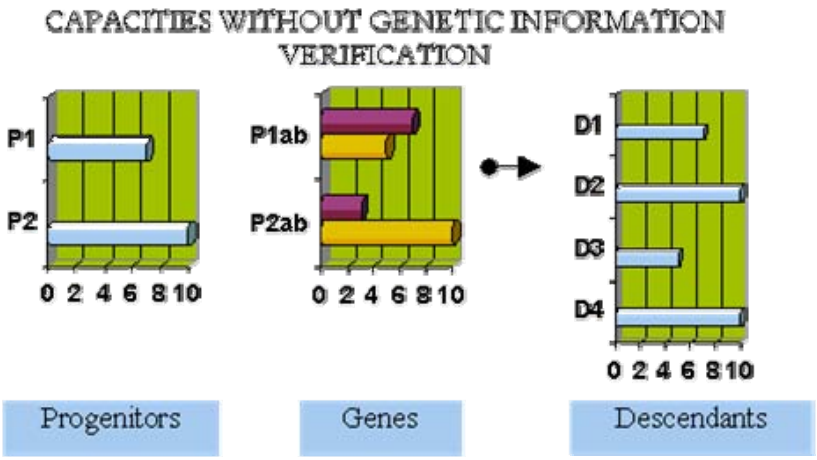
5. Evolutionary genetics and neuroscience

5.a) Brain memory inheritance

The verification of inheritability of memory requires a much more complicated model than that of intelligence unless measurements of partial capacities can be obtained. For example, the ***effect of simple complementariness*** would have to be isolated *between memory and intelligence.* The **effect of complex complementariness** is that which is produced by the intervention of intelligence in the processes of the global information system of the human memory.

Another factor could be the different potentials of the memory's stratum or of special memories. **Neuroscience** should provide models of the brain's functioning that allow analyzing in greater detail, but despite the advances being produced it seems that a concrete model still does not exist.

Genetics and neuroscience



In any case, the model of genetic inheritance for normal memory would be similar to that of intuition in the sense of negatively supposing the hypothesis of the received verification of genetic information.

The following figure shows us the effect on the capacities of possible descendents that are supposedly contrary to the VGI method. The expression of the capacities will follow an additive mathematical law in place of a law of intersection.

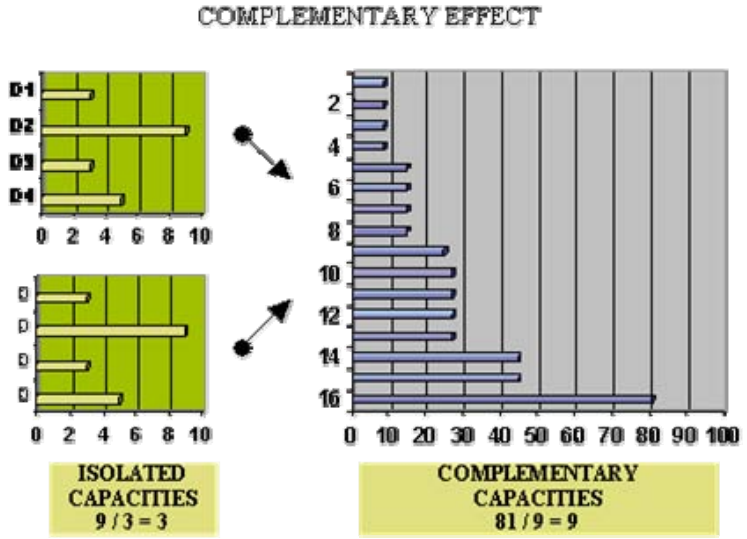
5.b) The simple complementary effect

The verification of heretability of memory requires a much more complicated model than that of intelligence unless measurements of partial capacities can be

obtained. For example, the first effect of complementariness would have to be isolated between memory and intelligence.

Another factor could be the different potentials of the memory's stratum of special memories.

Neuroscience and effects of complementariness



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The figure shows us the effect on the capacities of possible descendents that are supposedly contrary to the VGI method. The expression of the capacities will follow an additive law in place of a law of intersection.

5.c) Genetic foundation and the origin of language

If until now, memory proposes unresolved questions, with language these questions are multiplied.

Nevertheless, some guidelines can be presented about the factors that take part in language, especially in the books on *evolutionary genetics and the origin of language*.

The following can be cited from what has been set out in the book about intelligence and the previous sections on memory of *the Global Cognitive Theory*:

- Linguistic Intelligence

  This type of intelligence operates with a degree of reduced reliability in comparison to logical math intelligence, even with the intuition mode.

  It deals with the type of extra rapid responses of intelligence such as **the origin of language**.

- Linguistic memory

  Regardless of the existence of short, medium, and long-term linguistic memory, linguistic memories with greater or lesser degree of reliability, and memories of subjects or special situations of a linguistic nature, it can be said that the general nature of this memory is that it does not require exact words selected when speaking.

On the other hand, now is not the time to go any deeper into the aspect of written language, although the ideas and arguments would be similar.

It can be observed that the velocity of speaking immediately reduces if we try to express ourselves with greater precision.

In short, the merging of intelligence and linguistic memory produces spectacular results in language.

In the book of *The Global Theory of the Conditioned Evolution of Life*, it is stated:

There is a famous philosophical trend that suggests a strong genetic component of language. The linguist, ***Noam Chomsky****, is the most important representative of this trend known as* ***innateness****, in contrast to the trend of* ***constructivism****. A long time ago Chomsky confirmed having identified common elements in all of the human languages, which implied a genetic predisposition to language development.*

As far as the origin of language, I agree with the idea of a **genetic base of language** but without denying the other side of the coin: not all humans have the same predisposition in quantitive terms. For, otherwise, it would be like the work of divine creation.

The human brain still needs years of development in order to acquire a good control of language and, even so, it cannot be denied that there are vast and obvious differences in the command of language of some humans.

Even if this other aspect seems less attractive at first, the effort of looking for its beauty will surely bring enormous benefits.

In spite of appearances, with the theory of **Natural Selection** as well as with the **GTCEL,** we will analyze how language should have an unidentical genetic base for all individuals.

The *Global Theory of Conditional Evolution of Life* clearly proposes an almost absolute genetic foundation and, consequently, the differences found in individuals are due to genetic differences.

But if we examine the Mendelian genetic evolution with the essential *Darwinist Theory* we also arrive to similar results. Reasonably so, no one in the science community can deny that **Darwin's** great contribution is that **man comes from ape**.

That is, the linguistic capacity has developed from a very primitive stage, let's say that of primates, to more developed stages. Then, if, for example, we standarize the number of words to a variation of one to a thousand, we are left with discovering how this number has been able to evolve throughout history.

One by one we will examine the following aspects that have had an influence and their possible effects.

- Genetic derivation or accumulation.

  Including random mutations due to natural selection, those that produce a comparative advantage will have more descendants. That is, small random increases in the linguistic capacity will tend to establish themselves genetically.

- Rate of increase due to evolutionary genetics.

  Despite recognizing that the rate could have varied due to physiological changes that benefitted language, it cannot be denied that such changes will have required quite a few generations in order to reach the whole human population.

The origin of language

	Miau	Me ow!	Me haces daño
	Guao, guao	Go, go	Vete, ¡fuera!
	Cua, cua	Quois	¡Qué! ¿Qué?
	uea aa iu	Where are you?	¿Dónde estás?
	Hello, how are you?		…
	What are you thinking?		☺

Furthermore, it is unreasonable to believe that the change of **one to a thousand** in our standardized scale could have been produced in the first steps of the Homo Sapiens when in which, it is the contrary; that is, a change of ten in the last one thousand years would mean an increase of one percent while in the first thousand years of the Homo Sapiens would have meant a thousand percent.

Therefore, due to the proportionality and the randomness, it is to be expected that the percentage change have a tendency to balance out despite the possible variations previously mentioned.

- Variability of existing languages

  I do not know the specific calculations for the number of words in the current languages but I imagine they vary quite a bit, and I also suppose that the very concept of a word would pose an significant problem for such calculations.

- Evolutionary advantages

Given that language implies an obvious comparative advantage, it is to be expected that it has increased to its maximum or permited rate due to the established genetics of the produced variations, whatever their theoretical causes may be.

- Exponential growth.

  From all that we have mentioned it can be deduced that growth will have continued an exponential pattern with greater or lesser rate at certain times.

  Subsequently, the greater increases in absolute terms have been produced during the last one or two thousand years, keeping in mind that the current Homo Sapiens have only been in existance during 50,000 years (in rounded figures).

  It is true that the halt of Western civilization of the first five hundred years of the Christian calendar partly contradicts the previous arguments. But it must be understood such as how the Roman and Greek cultures were a very reduced genetic foundation in population and in the process of expansion, they ceased being visible during a long period of time due to reasons relating to this genetic configuration of the operations that maintained the intellectual capacities.

In conclusion, to point out that the language **genetic base is indisputable** and that the relative importance that is attributed to it depends on the temporal and population scale of the analysis, in the long run, it would be absolute either with a theory of evolution or another.

In the short-term, on an indivual level it would be almost complete with the GTCEL and with Darwin's theory rather reduced.

Nevertheless, in my opinion, in the case of the Homo Sapien language, the **Darwinist Theory** fails given that it would need a long-term that has not existed. It has only two thousand generations to produce positive mutations, establish genetics, and it for it to spread to the entire population; and only forty of them in the last thousand years.

In any case, the weakened exponential growth seems contrived; which is explained in the expounded theory.

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