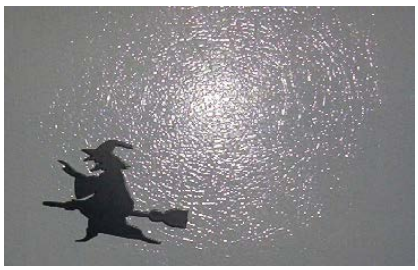
GLOBAL COGNITIVE THEORY

VOL. III
MEMORY, LANGUAGE, AND OTHER BRAIN ABILITIES

Museum of future science

José Tiberius



GLOBAL EDITION

Hobbies: chess, padel and philosophy among others

José Tiberius is the main author of Molwick publisher books.

With over 40 million visitors and two million books downloaded in PDF format, he is undoubtedly one of the most widely read authors in Spanish of scientific essays in the current millennium.

There are more than 10000 links to Jose's website, where his books on theoretical physics, theory of evolution, quantitative genetics, cognitive theory, philosophy of science, metaphysics, and children's stories are showcased in five languages. Many of these links –to all these different fields– come from universities, projects done by university students and blogs created by teaching professionals and Educational Specialists.

Moreover, it is interesting to note that these links are usually together with links to Wikipedia or pages such as National Geographic.

♦

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of pure reason is Love.

Molwickpedia: molwick.com
Tittle: Memory, Language, and other Brain Abilities
eBook: 978-84-15328-16-2
(Book series) Global Cognitive Theory
978-84-15328-73-5 // 978-84-15328-74-2*

Editor: Molwick
6th edition: July 2019
Author: José Tiberius

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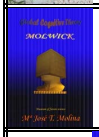	*Global Cognitive Theory (Book series)*	978-84-15328-73-5 978-84-15328-74-2* 978-84-15964-00-1**
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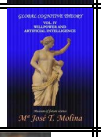	*Willpower and Artificial Intelligence*	978-84-15328-17-9
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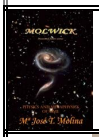	*Physics and Metaphysics of Time*	978-84-15328-84-1 978-84-15328-80-3* 978-84-15964-02-5**
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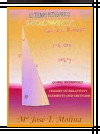	*Theory of Relativity, Elements, and Criticism*	978-84-15328-81-0
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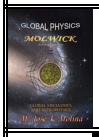
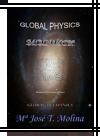
	*Global Mechanics and Astrophysics*	978-84-15328-37-7 978-84-15328-83-4* 978-84-15964-03-2**
	*Global Mechanics*	978-84-15328-35-3
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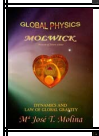	*Dynamics and Law of Global Gravity*	978-84-15328-91-9 978-84-15328-86-5* 978-84-15964-04-9**
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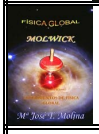	*Global Physics Experiments*	978-84-15328-88-9 978-84-15328-89-6*
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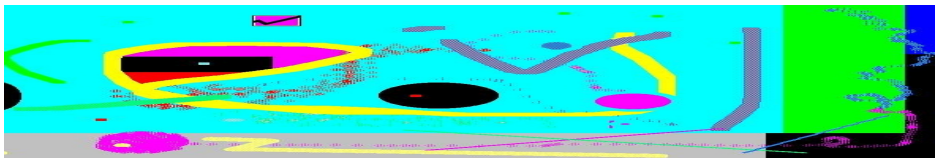

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GLOBAL COGNITIVE THEORY

MEMORY, LANGUAGE, AND OTHER BRAIN ABILITIES

THEORY OF MEMORY

1. Brain memory

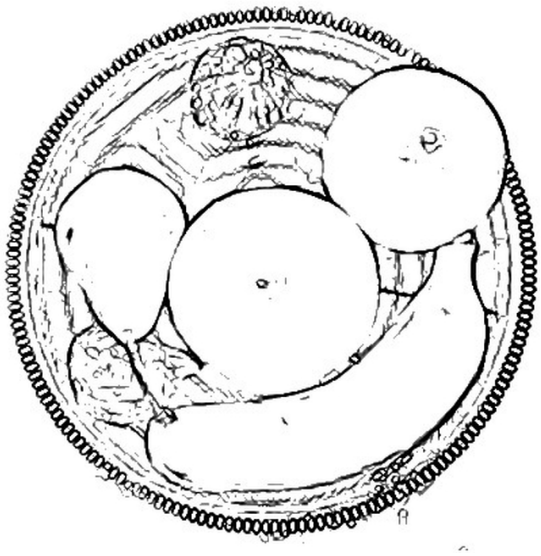
The *Memory, Language, and other Brain Abilities* online book is the third chapter of *The Global Cognitive Theory*. Consequently, it is highly recommended to read the previous two books for a better understanding of the given proposals and concepts.

The introduction of the first one, Brain and Modern Computers, elucidates the Global Cognitive Theory is a consequence of the application of the General Theory of Conditional Evolution of Life to evolutionary psychology.

It also contains a small summary of the Global Cognitive Theory.

Still life

Global Cognitive Theory



Besides describing a general scheme of the cognitive functions of the brain, the *Brain and Computers book* states the concept of intelligence needs the memory and vice versa.

The interrelation between intelligence and memory suggests an additional reason for the suitability of reading the Intelligence, Intuition, and Creativity book.

The essay about intelligence has two sections with direct repercussions on the memory and language theory. On the

one hand, the knowledge management model with the elegant intelligence help to classify the memory from the perspectives of the reliability and reaction time, and the temporal horizon. The other substantial section refers to the genetic character of the cognitive functions, like intelligence and memory.

The second chapter of the *Memory, Language, and other Brain Abilities* book relates to the exciting topic of how to improve memory from a realistic perspective of the non-existence of miracles or supernatural improvements. However, it roughly points out how to help the natural brain working; which would be more efficient the better the functional structure is known, or the evolutionary psychology understood.

The next chapter discusses the types of memory, analyzing the conscious processes and the temporal horizon separately. Among the first types would be the instantaneous memory and the specialized ones, which have particular characteristics, like the visual, semantic, or emotional memory. Concerning the temporal horizon, it discusses the traditional distinction of the short, medium, and long-term.

It also expresses two subjects about the reliability and integrity of memory. Whereas the second book of *Cognitive Global Theory* debates the consistency of the answers given by the memory manager, which is the intelligence; regarding the integrity of information, one must analyze the unconscious mechanisms of compression, degradation, and reconstruction of the data.

The fourth chapter studies the mechanisms of conscious optimization curry out by the brain and the influence of the environmental conditions. It uses the expressions *guided memory* and *automatic memory* to emphasize the possibilities of affecting the cited mechanisms of optimization.

Moreover, it describes strategies used by the brain to improve the management of the information, like the dynamic memory or pre-established packages, and to memorize only the opposite to the logic.

The last section refers to evolutionary genetics and neuroscience; it comments the limitations of conceivable statistical research similar to the EDI Study but on memory.

In particular, the problems of the statistical analysis on genetics and memory are due to the different types of memory, the lack of quality indicators and the effects of complementariness, owed to the interaction between the intelligence as the information manager and the cognitive ability to store the information.

Once we have an overall view of the cognitive function of the memory, we go further and try to explain the extreme power of the language, the semantic memory, and verbal reasoning.

Finally, we add some considerations on the genetics of the language and its evolution.

2. How to improve brain memory

What is memory? A mechanism 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 substantial as the contents and structure of the information.

Forest of unicorns

(Public domain image)

How to improve any intellectual capability is a recurrent topic. In this case, the first thing to keep in mind is the number of factors that influence regular working. This book analyzes the different types of memory according to several perspectives and shows how some characteristics can help to improve its performance.

Improving an intellectual or physical ability does not mean that a human can acquire the ability to fly or anything of the

sort - which is to say; there are aspects in the brain configuration due to genetics and the early development that act as limits to intellectual power.

Instead of how to improve memory, it would be better to say how to exercise this brain capacity to achieve all its inherent possibilities. From this point of view, the best advice is that an appropriate intellectual exercise will always be healthy. However, even if we are not studying a list of elements, the Visigoth kings, or the rivers and their tributaries, memory is always working because the brain does not tend to cease so often.

Exercising does not mean a memorizing effort to remember everything all day. With the general educational system, human memory works enough while attending school or university.

A significant part of brain memory labor is unconscious; there are not many ways of manipulating it, except facilitating the conditions of its performance or, better said, trying not to interrupt its natural working.

The entire third book of the Global Cognitive Theory deals with how to improve brain memory; nevertheless, the following aspects have a special significance.

- Memory works much more efficiently within a pleasant and relaxed environment. It is selective and remembers pleasant things much better; likewise, it hardly remembers the bad times; this effect is weightier the older the memories are.
- A complementary yet opposite aspect is that, when a person is nervous, memory works poorly, confusing almost everything. It is imperative to discuss specific topics

with as much calmness as possible; otherwise, if objective information becomes confusing, there is no way to reason or understand the emotions.

It seems as if the resources of the memory manager were not free; it would not work adequately.

3. Brain memory types

There are various classifications according to different criteria.

The presentation does not have an exhaustive nor exclusive character. Some varieties do not appear, and those mentioned may appear in several categories to keep the exposition as simple as possible.

The memory has several degrees of temporal retention of data. Over time, some data disappear. Other information is harder to find, and it is not as exact as it was previously. Sometimes, not only it is inexact, but instead, it is reconstructing the data.

3.a) Conscious cognitive processes

3.a.1. Instantaneous memory

It contains all the accessible information in real time, immediately. Although it may seem otherwise, this brain memory is extensive; all the information constantly used in daily life is here. Some of its main elements are:

- **Normal information** such as where things are located, pending tasks, routines.
- The preconceptions making up a part of the character or personality
- Automatic response programs loaded in a short period when waking up. Semantic memory and other special memories also are instantaneous when they are active.
- **Special automatic response programs** like driving or other dangerous situations that load when needed
- **The working memory** operates with logic or intelligence. This memory is limited, and its optimum operation implies the use of three or four variables simultaneously. When thinking and performing logical operations with more than five variables, it takes a long time to advance.
- **The auxiliary working memory** corresponds to all the variables that are available to load in the working memory. The information about the subject the brain is working pertains to this category.

The automatism of this configuration allows for the simultaneous performance of various tasks; the conscious is similar to the computer's interface and the unconscious to programs residing in the instantaneous memory. Therefore, the more automatic the cerebral processes or the computer programs are, the freer the conscious, or the more straightforward the program's interface will be.

Driving program

However, this simplicity has a disadvantage; computer's automatism sometimes does not let the user know what it has done or why. It is always necessary to have a general knowledge of how computers work, and the only way to achieve it is with practice and time.

A related issue is communication between the unconscious and the conscious through dreams. It usually uses images about preconceptions that both understand, but also it uses images of recent events that are still in short-term memory.

3.a.2. Specialized memory

This category includes the types of special long-term memories for automatic loading in instantaneous memory; although they are not very compressed and have their multidimensional systems of reference.

Examples of special memories are semantic memory, specific visual memory, the archive of the preconceptions, and pre-established quick response programs such as emotions.

3.b) Persistence of brain memory

3.b.1. Short-term memory

All the information the brain has used since the last time the system performed its maintenance will be in this memory; usually, since the person slept enough time.

The degree of the info conservation will depend on the mentioned time and, of course, on the physiological and genetic capacity of each.

The memory will feed mainly on the data that has gone through the auxiliary working memory from both medium and long-term memory, the experience, and reasoning during life through the perception.

Due to historical evolution, this memory is most efficient for **approximately 16 hours,** reserving **8 hours daily** for its maintenance. Admittedly, a person does not use all the sleeping time to clean short-term memory; a significant amount of time will devote to the transfer of information from medium-term to long-term memory and other diverse maintenance functions.

There are short-term memory cleaning systems highly recommended, and others advise against strongly. Just say the first will not be easy to obtain if there are elements in the short-term memory generating tensions and demanding the individual's attention. The effects of abusive ingestion of alcohol can be an example; in turn, this can give an idea of the effects of non-abusive but counterproductive ingestion, especially for the data contained in this memory.

3.b.2. Medium-term memory

Maintaining data as organized as possible increases optimization in the medium-term memory, it will probably allow grabbing some info not organized immediately to do it afterward. Therefore, it eliminates duplications and permanently saves the information by reference to previous data, freeing a large quantity of the memory's capacity.

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

There are already programs running automatically: defragmenting and maintenance of the hard drive, cleaning the Windows system log, search for and downloading of news or installing programs updates, compression tasks, and anti-virus.

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

In this memory, the information will last for quite some time. However, the time will be longer the relational and less concrete the data is. That is, if the information can be obtained not only directly, but also by its internal relationships.

Regardless of whether specific information goes in its original state, like the birthday of a friend, medium-term memory tends to be more fixed as the data transforms into concepts defined by a system of multi-dimensional references.

Over time, concepts will remain in memory by reference because precise info usually ceases being useful. If relevant, it becomes a part of instantaneous memory or math memory,

and the relations will tend to incorporate into the multi-dimensional reference system. Moreover, if required, the system will add a new dimension.

Not all these processes are free from errors; the appropriate mechanisms in the majority of cases can turn out to be inadequate for others.

One of the most delicate circumstances occurs when an idea repeats many times during a specific period, and especially when it appears as a hypothesis that develops in convoluted ways. By the mechanisms in the brain, the data will save in deeper layers corresponding to more permanent concepts or ideas of the memory.

Afterward, when our memory manager accesses this material, it will likely interpret it as already accepted, just because it is in a deep layer.

The error can be significant –an external idea is supplanting our real knowledge or feelings!

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

3.b.3. Long-term memory

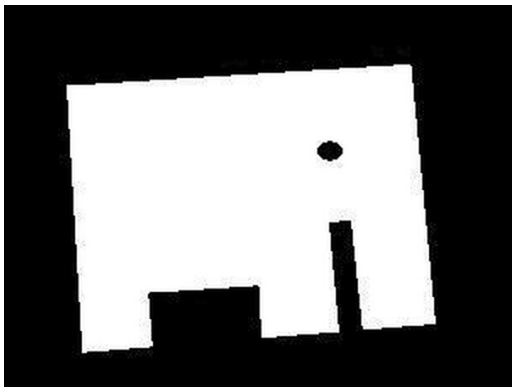
This expression is more descriptive than the previous one, but it also needs some elucidation as far as its nature.

If medium-term memory configures as a multidimensional system, long-term memory has fewer dimensions than the

medium-term and constitute the essential character of a person, not of its knowledge. In other words, the commonly known as general personalized principles such as justice, equality, liberty, respect, education, the benefit of the doubt, and many more.

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

Elephant



The necessity to re-adapt these principles to a greater or lesser extent produces a stimulating effect on personal growth and development. The unconscious does not like the idea; changing its beliefs supposes the recognition of some errors in them; it is also a massive task because all the remaining memory will need to readjust. In periods of quick development of the character, the person will probably sleep more.

Following the thread, this vision is coherent with people sleeping less with age.

3.b.4. Vital memory

It is not about visual or emotional memory, but a special type of a visual-emotional nature like the **extra-fast movie** a person sees when thinks there is a probability of dying 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 unique and super persistent memory could be the **genetic memory,** which contains all of the genetic load transmitted to the descendants.

3.c) Reliability of the memory information system

While speaking about intelligence, we have anticipated the conceptual relations between logic and math memory, intuition, and standard memory, and between language and semantic memory, dealing with both the diverse operational forms of intelligence as a relational capacity and the manager of memory information system.

Castle in Ireland
Visual memory
(Public domain image)

Math memory, which demands certainty in responses from the biological information system, should behave like logical math intelligence concerning reliability. However, it would not be surprising if other types of memory, such as standard and semantic memories –admitting errors and approximation–, were a consequence of the same genetic load creating math memory; yet under the opposite assumption to external verification of the info.

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

On the other hand, with memory, there are additional problems given its nature of storing information and the

issues or characteristics of the data system manager.

It is also clear that astonishing memories exist with equally amazing managers, whose internal functioning is practically unknown in neuroscience. We are not discussing the active parts of the brain in specific activities but rather the biological mechanisms developed from a functional point of view. We can cite semantic, visual, and musical memory, among others.

Although we use the term math memory, we think **secure mode** memory could be more precise. Likewise, without trying to create a closed typology, we could denote the **probable mode** when the required reliability is high but not at its maximum, and **possible** when this reliability is relatively low.

3.d) Data integrity

3.d.1. Compression of information

The deeper the layers of brain memory are, the information is more depending on a multidimensional system; in other words, it is more compressed.

The process takes time, and the memory manager needs to use a lot of its power. Typically, it not only deals with information compression, but also 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 future localization.

When trying to remember something that happened a long time ago; it may feel like the information is appearing out of nowhere as if we were pulling a thread from the skein.

When one recovers information, the brain continues retrieving elements associated with the stated information. Sometimes, we can even visualize information and concepts like an explosion of data more and more precise. Of course, it depends on the length of time that has gone by since the last time we thought about the specific subject.

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

Below we will analyze an illustrative example of older adults

who, often say the following sentences:

- I do not remember what I said five minutes ago.
- I do not remember what I ate yesterday.
- Strange, but I always remember when twenty years ago.

A reasonable explanation could be:

- Over time, it becomes more challenging to compress information already compressed. The stronger compression is necessary to free space in the brain memory given that throughout a person's life, we assume it uses all available memory.
- The gradual loss of an organism's vital energy with age, or any other problem, makes the compression mechanism less powerful.
- There comes a time when a part of the stored information needs to reduce to save new or recent acts.
- If someone decides to save new information, it will never erase compressed information from a lifetime unless it is essential. Usually, it will try to delete data contained in the first or second superficial memory layers.
- Another related aspect that we have already commented on is that older people do not need as much sleep.

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

Like in all intricate processes, having little memory or not

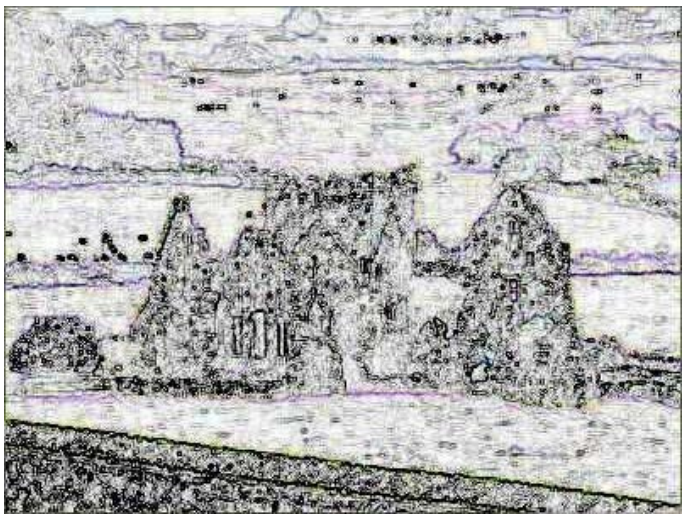
exercising specific sources of compressed information correlates positively to Alzheimer.

3.d.2. Degradation of information storage

Another already known method is the degradation of information while compressing.

When computers compress an image in BMP format to JPG format, either no information or a certain degree of information disappear, but the new file is smaller.

Degradation of memory storage
(Public domain image)



Sensory memory, in particular, requires the actions of degradation to reduce the enormous amount of information received, such as songs, films, or videos.

3.d.3. Reconstruction of information

The opposite phenomenon of degradation is the reconstruction of compressed data 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 its memory says it exists when it does not. It may seem as if this person is

lying, but, in fact, it is confused even though it may not be aware of this confusion.

4. Human brain memory

The memory manager –the intelligence– uses many methods and processes to classify, organize, and rationalize the information contained in the brain memory. We are going to comment on some great techniques.

4.a) Automatic memory and directed memory

Up until now, we have talked about the memory's automatic operation mechanisms; indubitably, we can influence which information to save.

It is nothing new the more someone studies a subject, the more retains. 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.

A significant leap occurs when trying on different days to memorize specific information. The memory manager will then find references to the subject in the most superficial layers of medium-term memory, and there will be a tendency to save them more firmly; in other words, in the subsequent layers of medium-term memory.

Equally, if the memory manager requires information and realizes it is not complete, as better obtainability would be suitable, the brain will tend to improve the availability in the medium-term memory. It will also establish the data in the multidimensional system by creating opportune references.

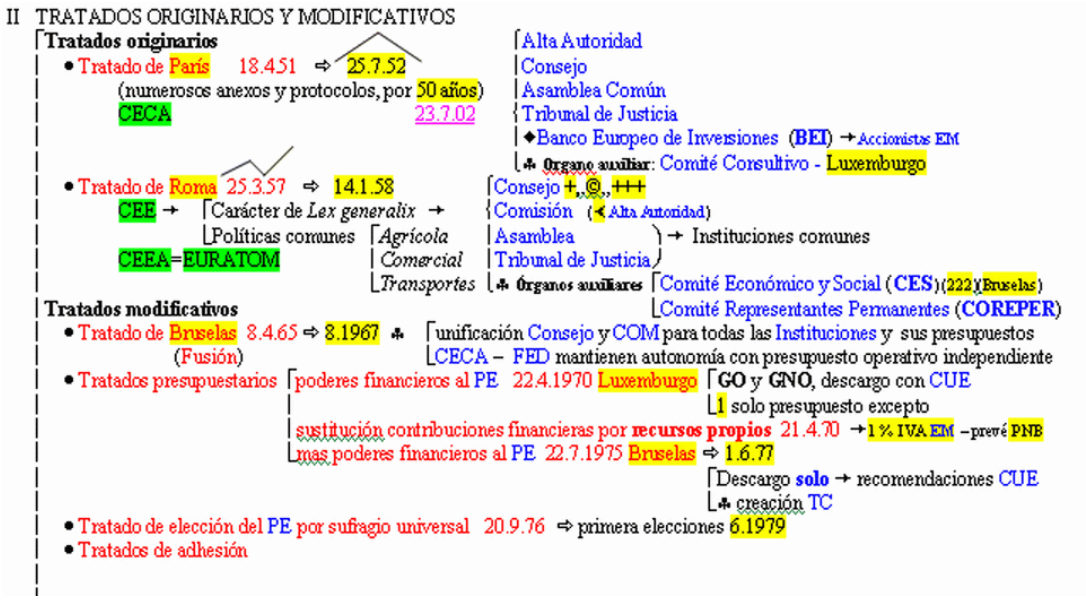
In an exam, some artificial references for better information retention could significantly help medium-term memory.

Specifically, we are referring to mnemonic devices.

Useful examples are marking dates, figures, percentages, and related mathematical info with a particular color; authors, institutions, and entities with another color, and so on, but without using too many colors or other mnemonic devices! Maximum color should be four or five.

In any case, one should never force to remember mnemonic devices; whether they work well or not, they must be neutral and not stressing the memory. An example is a line drawn over the date 25.7.52 in the figure, which should help to retain this date but it should not be a necessary condition to remember it.

Mnemonic devices



However, sometimes, despite our effort and knowing we are capable of remembering, it seems our memory does not respond. 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, this notably limits the capacity used by the memory manager either when awake or when sleeping.
- One is not going to use the information shortly or adequately. A typical example is the learning of languages we do not use or attempt to learn them in math memory because languages develop in semantic memory.

Do not confuse the tensions mentioned in the previous paragraphs with the situation of a student who has various exams close together or a test of a vast subject.

Before the exam, the students are nervous, excessively nervous, and they feel they know nothing. These nerves appear when short-term memory overworks for its normal state –demanding much effort; the nervous tension is probably the only way to allow this overload in these circumstances.

Consequently, we do not need to worry if the night before a test it takes to fall asleep a long time. The brain does not want to clean the short-term memory because it is full of information regarding the test, and it tries to avoid or reduce the phase of deep sleep.

We believe it is a mistake to study all night before a test because the connection between short-term and medium-term memory would weaken.

We also become more stressed when we cannot stop thinking about the exam's subject along with the feeling of not knowing anything.

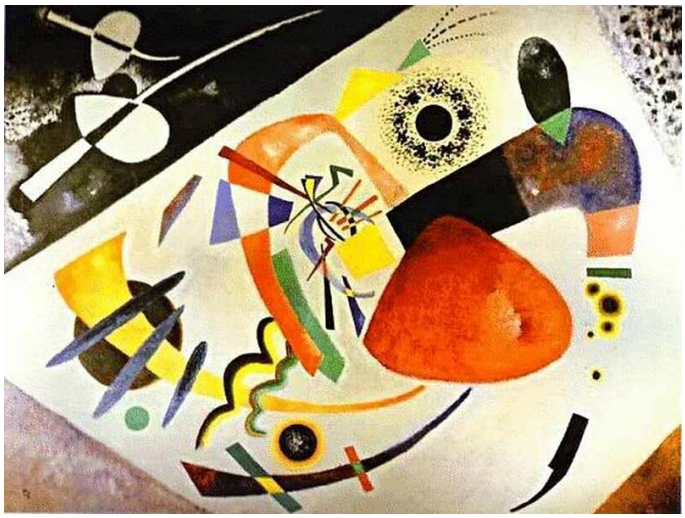
However, once the questions are public, the tension

disappears, and a multitude of concepts vanishes from the mind, filling up with related information. The more we think, the more information continues to appear; of course, if we are familiar with the subject.

It is worth pointing out the existing connection of reasons for the brain memory malfunctioning and dysfunctions in the decision-making system.

Red points - Kandinsky

(Public domain image)



This coincidence could appear if every time we study a subject, we try to save it in a different group of references, consciously or unconsciously.

4.b) Pre-established logic blocks or structures

Talking about the development of fast responses of the intelligence, we stated brainpower notably increments with its automation. A reason was that new info goes directly in the prepared fields of the subprograms or functions, and once all the data arrives, the specific operation launches automatically.

In short, the process implies the creation of pre-established structures or fields for info treatment. These structures could be useful in the global system of information if the brain needs them for the storage.

The development and improvement of these structures can actively involve the person's will. We call this guided memory.

Computer programs continually use this technique, organizing the data in groups of personalized fields to treat them as matrixes.

4.c) Only memorize what it is not logic

One of the memory manager's most efficient methods is a consequence of the rule of not remembering what can easily be deduced using logic. In this case, it means a specific personal idea associated with an event.

The trick is not to know, but rather to know what one knows; which is not the same.

We hope to explain ourselves better with a simple example in which we can answer one question without having any specific related information in our memory. The exception is that one has to know what one knows and what one does not know. (It will always be the same simple reference in long-term memory. Moreover, it will be a straightforward reference).

- Question: Who has longer hair, Susana, or Julio?
  - Supposition 1: I have no link, no reference to this in my memory.
    - Answer: I do not know, I could imagine that, but I do not 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).

Let us see 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 scheme are, on the one hand, that the reference is elemental and already exists in medium-term memory; we only need to activate it for a specific case. On the other hand, when applying logic, there is no need to change the reference for the most common situations, which is what we would have done if Julio had longer hair –pointing to the opposite idea.

Here is another implication of this method: if we know what we know and we do not remember the reference's sign, by default, we will assume that this is the typical sign of the specific logic. (It is not necessary even to remember the typical one).

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

5. Evolutionary genetics and neuroscience

5.a) Brain memory inheritance

Section VI of the Conditional Evolution of Life proposes the EDI Study - Evolution and Design of the Intelligence to its validation.

The statistical research achieved excellent results, and it is available online in the book the *EDI Study*.

While in the analysis of the intelligence, it is possible to speak about a general one; in memory studies, it is not feasible due to its diversity.

Research might also deal with the evolution of mathematical memory, which demands certainty in the answers and should behave like the evolution of intelligence.

At the same time, it would not be surprising that other types, like standard and semantic memories with the characteristic of admitting errors, were a consequence of the same genetic load of the math memory, but under different assumptions of the verification of the information.

In other words, for the semantic memory, our brain with the genetics of both ancestors develops a mechanism without requiring the confirmation between them. Likewise, the intuition is compelling, but one cannot be sure about its proposals.

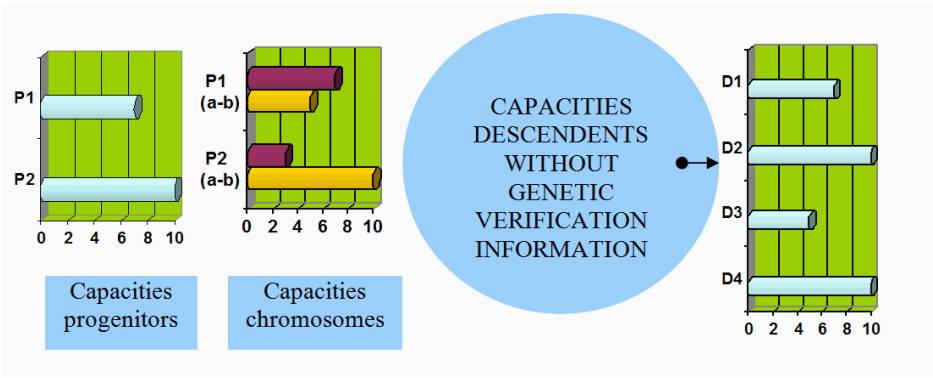
The verification of memory heritability involves a more complicated model than intelligence. It will require measurements of partial capacities for the different potentials of the memory stratum and specific memories.

Neuroscience should provide models allowing studies about memory in depth, but despite the advances produced, it seems that a robust model still does not exist.

The figure shows the effect on the cognitive capacities of the possible descendants within the opposite assumption to the VGI method. The expression will follow a mathematical law of addition instead of the law of intersection in the evolutionary genetics of the intelligence.

The design implies a simplification of the model; it assumes that the addition is equal to the potential of the significant gene.

The capacity of the descendants without the VIG method



The evolution of standard memory would follow the case of the figure.

Evolutionary genetics and cognitive neuroscience models for medium and long-term standard memory need to take into account the following aspects:

- **Reliability of standard memory**

  The potential of this memory will depend on a similar mechanism to the intuition that would imply the opposite hypothesis of the functionality of the method of

verification of the genetic information VIG.

A mistake from the standard memory is not severe and, therefore, it does not require the levels of reliability that guarantees the cited VIG method.

- **The effect of simple complementariness between intelligence and memory**

  The operational complementarity implies that each additional unit, for example of intelligence, will increase the total potential in the quantity of the full memory. In these cases, it might follow a mathematical law of a more or less attenuated multiplication**.**

  The section about Complementary Characters and the Origin of the Species in title IV of the *Conditional Evolution of Life* book comments this effect of complementariness within general evolution.

- **The effect of complex complementariness between intelligence and memory**

  Memory depends on its genetic structure and the power of its manager –intelligence; therefore, its efficiency will vary with the possible effects of complementarity.

  The complex complementariness takes place due to the involvement of the intelligence in the processes of the global information system of the memory; it is to say, as a memory manager, and not of his normal logical operations.

  The brain's reasoning capacity will rest on the logical processor and the available information (simple complementarity effect); at the same time, this data depends on the processor when working both for the classification and storage, and retrieving of the info (complex complementarity effect)

5.b) Language, semantic memory and reasoning

In the specific case of the research in evolutionary genetics and neuroscience of semantic memory, the linguistic intelligence might act choosing a word depending on the first proposals received.

It is opportune to emphasize that, in this occasion, it is a matter neither of the employ of the method of verification of the genetic information VIG, proposed for the evolution of the intelligence nor his contrary but a different one, which would act as intuition, but much faster.

The VIG method expects to receive many proposals of the involved mechanism and needs uniformity to the acceptance. Now it takes place with the first proposals with a minimum threshold.

A numerical example would be to validate the first five words which appear 50 times; this way, it is not necessary to wait for the completion of the work of thousands or million neurons that might be involved.

The global language system will have as primary elements, on the one hand, the semantic memory and linguistic intelligence. On the other hand, a manager of the physiological character of the language itself.

The complementarity power of two characters not demanding the method VIG should be far superior to when applying the VIG. It could be the reason that the capacity of human language and its evolutionary process are surprisingly powerful from the perspective of the neuroscience.

The inheritance and evolution of this combined power might

be a subject of study through statistical analysis because there are methods to measure the variables involved.

A philosophical trend supports an active constituent of genetics in language. The linguist Noam Chomsky is the most important representative of innatism in contraposition to constructivism. Chomsky affirmed, many years ago, to have identified common elements to all the languages of the human beings, what it meant a genetic predisposition to the language development although it is not clear if he included as humans the Neandertals and Denisovans.

The language genetic nature reinforced with the discovery of a particular gene affecting the creation of phrases without disturbing other personal capacities of an entire family.

5.c) Genetic foundation and the origin of language

If the study of memory presents unresolved questions, now these questions multiply.

From the book about Intelligence, Intuition and Creativity and the previous sections on the memory book of the *Global Cognitive Theory,* there are some guidelines on the factors on its configuration, especially in those on evolutionary genetics and its origin.

- **Linguistic intelligence**

  It operates with low reliability in comparison to logical math intelligence and intuition modes.

  It deals with ultra-fast responses of intelligence seen in the section the origin of language.

- **Semantic memory**

  Regardless of the existence of short, medium, and long-term semantic memory, and with a greater or lesser degree of reliability, its general characteristic does not require exact words for a specific idea.

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

The velocity of speaking reduces when trying to achieve greater precision.

The merging of linguistic intelligence and semantic memory produces spectacular results in language.

In the previous section, "A philosophical trend supports an active constituent of genetics in language. The linguist Noam Chomsky is the most important representative of innatism in contraposition to constructivism. Chomsky affirmed, many years ago, to have identified common elements to all the languages of the human beings, what it meant a genetic predisposition to the language development. Although it is not clear if he included as humans the Neandertals and Denisovans."

It seems correct the idea of the language genetic base but without denying the other side of the coin: not all humans have the same predisposition in quantitative terms. Otherwise, it would be like the work of instant divine creation.

The human brain still needs years of development to acquire a reasonable control of language and, even so, there are vast and noticeable differences in command of the language among humans.

Although it may seem less attractive at first; the effort of looking for its beauty will surely bring benefits.

With both the theory of *Natural Selection* and the *Conditioned Evolution of Life,* the complexity of language should have a non-identical genetic load for all individuals.
The *Conditioned Evolution of Life* proposes a genetic foundation and, consequently, the differences among groups and, to a lesser extent, in individuals are due to genetic differences.

If we examine the Mendelian genetic evolution with the Darwinist Theory, we arrive at similar results. Darwin's most significant contribution is that man comes from an ape.

The semantic capacity has developed from a very primitive stage; from primates to more advanced stages. It would be fantastic to identify how the number of words has evolved

throughout history.

- **Genetic derivation or accumulation**

  Even with random mutations due to natural selection, those producing a comparative advantage will have more descendants. Small increases in the semantic capacity will tend to establish themselves genetically.

- **The rate of the increase due to evolutionary genetics**

  Despite recognizing that it could have varied due to physiological changes that benefitted language, such changes will have required quite a few generations to reach the entire human population.

  Furthermore, it is unreasonable that the total increase in the number of words happened along with the first steps of the Homo Sapiens.

Increase due to evolutionary genetics

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

- **Variability of existing languages**

  It is not known the number of words in the current idioms, but they should vary quite a bit, and the very

concept of a word would pose a significant problem for such calculations.

- **Evolutionary advantages**

  Given that language implies an apparent comparative advantage, it should have taken place at the maximum increasing rate allowed, whatever their general causes may be.

- **Exponential growth**

  Previous arguments infer an exponential growth with a greater or lesser rate at certain times.

  Subsequently, the more significant increases in absolute terms should belong to the last thousands of years, keeping in mind the current Homo Sapiens have only been in existence 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. However, it must be understood such as how the Roman and Greek cultures were a very reduced genetic foundation in population and the process of expansion; they ceased being visible during an extended period due to reasons relating to this genetic configuration of the operations that maintained the intellectual capacities.

In summary, the language genetic evolution is indisputable, and its significance will depend on the temporal and spatial scale of the analysis; in the long term, it would be very high with either the theory of Natural Selection or the Conditional Evolution of Life.

In the short-term, on an individual level, it would be almost

complete with the Conditional Evolution of Life, and with Darwin's theory somewhat reduced.

Nevertheless, the Darwinist theory fails for the Homo Sapiens language, given that it would have needed a long-term that has not existed. It has only two thousand generations to produce favorable mutations and spread to the entire population and only forty human generations in the last thousand years.

The exponential growth seems contrived; whichever theory we use.

* * *

♦

When **Don Magufo** finishes the book,
he happily calls **Einsotro**
to thank him for his collaboration.
Who puts on a pensive face and says:

–*Thanks very mucho.* –

Afterwards, **Don Magufo** happily calls **Mª José.**
She tells him:

–*Thanks very macho.* –

He then thinks:
¡*Thanks God I haven't called Goblin*!