

Neurociência valida a Gestalt Terapia

Neuroscience validates Gestalt Therapy

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RESUMO

Gestalt-terapia é validada por importantes descobertas na área de neurociências. Qualquer contacto ou movimento mobiliza o hemisfério direito, diretamente conectada ao cérebro límbico, emocional, através da "via perfurante". Toda a emoção é acompanhada por uma produção de neurotransmissores, que circula no cérebro e em seguida no interior do corpo, mas também no exterior (feromônios). Estes feromônios são analisadas pelo Órgão Vomero-nasal (OVN), que não tem nenhuma ligação com as zonas cortical e, portanto, está totalmente inconsciente. Em 1920, Freud escreveu: Biologia é um domínio com possibilidades ilimitadas, não podemos imaginar a resposta que vai dar dentro de algumas décadas - o que poderia destruir todo o edifício artificial de nossas hipóteses psicanalíticas. "Várias décadas" passaram: onde estamos hoje? Sabemos, por exemplo, que a mielinização dos lobos frontais (permitindo a tomada de decisão) não é alcançado antes de 25 anos - o que poderia explicar o comportamento de adolescentes e personalidades incertas. Psicoterapia é uma "quimioterapia" insuspeita? Não há mais oposição entre a quimioterapia e a psicoterapia, nem associação complementar, mas uma identidade de um processo com duas faces. A bioquímica sutil e personalizado: um micrograma de ocitocina induz a um comportamento maternal. A testosterona é responsável tanto pela agressividade e desejo sexual (também em mulheres). Nós conduzimos uma entrevista terapêutica como dirigimos um carro: constantemente pisando no freio e os pedais do acelerador (serotonina e dopamina). A matéria age sobre a mente ea mente age sobre o assunto. Herdadas e adquiridas: não nascemos como iguais. Nosso caráter é 1/3 herdada, 1/3 congênita (gravidez) e 1/3 adquirida após o nascimento. As predisposições genéticas podem ser desenvolvidos ou inibidos pela educação ou psicoterapia (expressão de gene). A plasticidade cerebral perdura toda a nossa vida. O sonho permite a individualização da personalidade, que é a soma do (programa genético) inato e o adquirido: é uma integração de minha memória individual com a nossa memória coletiva da espécie. O cérebro da mulher é preparado, através da seleção natural, para o intercâmbio verbal, comunicação e empatia, enquanto os homens estão focados na ação e da concorrência. A produção de espermatozoides foi reduzido a metade em 30 anos.

Palavras-chave: Neurociência; neurotransmissores; ocitocina; serotonina; testosterona; expressão do gene; plasticidade cerebral; sonho.

ABSTRACT

Gestalt therapy is validated by important discoveries in the area of neurosciences. All contact or movement mobilizes the right hemisphere, directly connected to the limbic emotional brain, through the "perforant pathway". All emotion is accompanied by a production of neurotransmitters, circulating *inside* the brain and then body, but also *outside* (pheromones). These pheromones are

analyzed by the *Vomero-Nasal Organ* (VNO), which has no connection with the cortical zones and therefore is totally unconscious.

In 1920, Freud wrote: *Biology* is a domain with unlimited possibilities; we cannot imagine the answers it will give within a few decades – which could destroy the whole artificial building of our psychoanalytical hypotheses. “Several decades” have passed: where are we today?

We know, for instance, that the *myelination* of the frontal lobes (allowing decision making) is not achieved before 25 years – which could explain the behavior of adolescents and borderline personalities.

Is psychotherapy an unsuspected “chemotherapy”? No more opposition between chemotherapy and psychotherapy, neither complementary association, but an *identity* of a process with two faces.

A subtle and *personalized biochemistry*: a microgram of *oxytocin* induces a maternal behavior. *Testosterone* is responsible for both aggressiveness and sexual desire (also in women). We lead a therapeutic interview like we drive a car: constantly stepping the brake and the accelerator pedals (*serotonin* and *dopamine*).

The matter acts over the mind and the mind acts over the matter.

Inherited and acquired: we are not born as equals.

Our character is 1/3 inherited, 1/3 congenital (during pregnancy) and 1/3 acquired after birth. The genetic predispositions can be developed or inhibited by education or psychotherapy (*gene's expression*). The brain *plasticity* endures our whole life.

The *dream* allow the individuation of the personality, which is the sum of the innate (genetic program) and the acquired: it's an integration of my individual memory with our collective memory of the species.

The *woman brain* is prepared, through natural selection, to verbal interchange, communication and empathy, while men are focused in action and competition.

The spermatozoid production has been reduced one half in 30 years.

Keywords: Neuroscience; Neurotransmitters; Oxytocin; Testosterone; Serotonin; Gene's expression; Brain plasticity; Dream.

Introduction

I have one hour to convince you that the brilliant intuitions of the founders of body therapies – and particularly **Gestalt Therapy** – are currently **confirmed and validated by important discoveries** in the area of the **neurosciences** over that past twenty years. Usually, I teach **neurosciences applied to psychotherapy** during 32 hours, but one hour (representing 3 % of my usual course) is enough time to develop this evidence – even though it is still often unknown!¹

We will see **why** the body therapies are found to be **more profound, faster and more efficient** than psychotherapies which are essentially **verbal** – such as psychoanalysis, traditional transactional analysis, or NLP...

In fact, **all contact or movement** of the body mobilizes **the right hemisphere** of the brain, which is directly connected to **the profound limbic zones** of the emotional brain – through the “*perforant pathway*”, an original synaptic connection — which has no equivalent in the left brain (which is verbal and rational).

All emotion is accompanied by the production of specific **neurotransmitters** which modulate mood and thought. Most of the neurotransmitters circulate **within** the brain and **inside** the body of each person, but some of them are diffused **outside, into the environment** of the organism, and thus they “touch” those nearby, especially the psychotherapist: I am speaking about the famous **pheromones** – which constitute our very real “**6th sense**,” the **chemical** sense – one of the elements of what we so often call “*intuition*”.

Our 6th sensory organ, the **VNO (VomeroNasal Organ)** is invisible to the naked eye; it is situated deep within the nose; it is responsible for receiving these pheromones (which translate our deep moods); it is totally *separate from the olfactory channels*, it is odorless, and has **no direct connection with the cortical zones** of our conscious brain. Its information is therefore **totally unconscious** and directly touches our profound non-verbal sensitivities.

I will also stress the importance and the role of the **a posteriori verbalization** of the senses – which allows the cerebral registration (« **engramming** ») of the lived experiences, and therefore their later opportunity to make the most of them. It's a bit similar to the importance of giving a **title** to a document, once we have finished working on our computer, in order to keep a trace and to be able to **find it again** to continue working on it. In the same way, **verbal work** is not *in itself* a therapeutic work, but a point of reference, a type of *labeling*.

Certainly, speech may trigger an emotion, and therefore the neuronal modifications: the *sprouting* of dendrites, new synaptic connections, production of neurotransmitters or hormones...

In this case, we may say that “**The Word was made Flesh**”: the

¹

This lecture has been given in Madrid, on May 1st, 2009 (in English and Spanish), at the *International Congress of Gestalt Therapy* (700 participants from 25 countries).

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word has been *incarnated* and has produced an effect which is potentially lasting. But most of the time, in everyday experience, the process is *opposite*: it's the emotion which appears spontaneously *first*; this becomes conscious and is verbally expressed only *later*.

In fact, in our body and consciousness functioning, everything is **circular** and systemic; **biological, psychological and social** interrelationships are permanent, and operate **in both directions**: appetite makes me salivate... and the saliva sharpens my appetite; a caress or a massage stimulates the production of **oxytocin...** and oxytocin develops my need for attachment, tenderness, trust and love.

Freud himself wrote, as early as 1920:

Biology is truly a domain with unlimited possibilities: we can expect to receive the most surprising information from it, and we cannot imagine all the answers it will give **within a few decades** to the questions we ask. It is possible that these answers will totally **destroy the whole artificial building of our psychoanalytical hypotheses!**" (Freud 1920).

We should remember, in passing, that the first psychoanalysts were mostly *medical doctors*, trained in *biology*.

Several decades have passed: where are we today?

I will now enter a bit more into detail regarding **contemporary research**, using especially the resources of **MRI (Magnetic Resonance Imaging)**, which permits us to see in the *scanner* the activity of different regions of the brain, in real time; and I will quote several concrete **examples** to illustrate the value of the study of the neuroscience for an optimal exploitation of *psychotherapeutic* techniques.

These research studies have revealed a number of aspects regarding the functioning of the brain, which were hardly known before, although often **intuited** by several forerunners, such as Freud, Fenichel, Ferenczi, Reich, Navarro or **Perls** – who proposed a global, *holistic* approach, integrating the **five main dimensions** of the human being: physical, emotional, cognitive, social and spiritual.

I will mention, for example, the fact that the **myelination** of the connecting circuits of the **frontal lobes** – which allows the integration of information about the **internal** state of the organism and of its **environment**, and therefore, an appropriate **decision-making**, is not completely developed before around **25 years**, contrary to what we had previously supposed. This would explain the somewhat impulsive behavior of **adolescents**, whose (*limbic*) emotions are not sufficiently controlled by the cortical-frontal level (*conscious* and voluntary).

We encounter the same type of *immaturity or neuronal dysfunction* in **autistics**, and even in cases of **borderline** personalities: their **amygdala** is hypersensitive to all

stress, while their **frontal** connections are, on the other hand, *inhibited* – not allowing for a healthy management of mood, and leading to *acting-out* behavior.

Psychocorporal treatment, which *directly* mobilizes the limbic sub-cortical structures, has proven to be particularly effective, especially with these categories of clients (adolescent and *borderline*).

Is Psychotherapy an unsuspected « chemical-therapy »?

Recent studies in the *neurosciences* allow us to realize that in fact, **all learning – or all psychotherapy – acts directly on the synaptic circuits and modifies the internal biochemistry of the brain**: the production of *hormones* and **neurotransmitters** (especially dopamine, serotonin, adrenalin, noradrenalin, melatonin, endorphins, testosterone, estrogens...). This is particularly true for psychotherapy *using body and emotion-based* techniques – such as Gestalt Therapy... but this is *under the condition* that they are *followed* by a period of **verbal integration** – without which, the *misplaced* activation of emotions, or a strong **catharsis** triggered by *clumsy* “*debriefing*” techniques, on the contrary, could *maintain or even increase* previous remnants of trauma, through a negative neuronal conditioning.

Three historical stages

Several years ago, we **opposed** *chemotherapy* and *psychotherapy*: traditional psychiatrists smiled condescendingly at the claims of psychoanalysts and psychotherapists, and considered their methods to be “popular distractions”; they trusted only *medicines*, which had been properly authorized by the laboratories after “double-blind” tests, and comparison to *placebos*.

After the revolution of *antibiotics* in infectious medicine, came the **neuroleptic revolution** in brain medicine: finally, a series of molecules, which act *directly on the brain* and affect behavior (tranquilizers, antidepressants, antipsychotic or neuroleptics), were discovered. In **1952**, the French Pr Henri **Laborit** introduced a new **psychotropic** product: **largactil (chlorpromazine)**, which permitted the progressive suppression of the straightjacket in psychiatric hospitals, replacing it with what is called (not without some exaggeration) “the chemical straightjacket.”

We know that **France** now holds the very sad **world record** for the use of **psychotropic** medicine (we currently consume *3 times more* than our close neighbors: Germany, England, Italy or Spain): 1.5 million of our fellow citizens today consume **Prozac**. These new drugs, as efficient as they may be, are not free from regrettable **secondary effects**: drowsiness, loss of initiative, memory lapses, important lowering of the libido... even **suicide** – notably in the case of *unplanned interruption* of a treatment by a *young person* (whose frontal circuits of control are still immature.)

In a **second stage**, instead of *opposing* chemotherapy and psychotherapy, they were

associated: psychotherapy in fact allows for a *lengthening and expanding* effect of a medical treatment and a progressive diminishing of the dosage; on the other hand, chemotherapy allows for a *preparation, accompaniment or lengthening* of a psychological approach, by calming the anxiety or stopping the delirium.

But today, we are entering into a **third phase:** no longer *opposition*, nor a simple *complementary association*, but the **identity** of a process with *two faces*: we are realizing that finally **certain psychotherapies are unsuspected “chemotherapies”**. In fact, their action stimulates neurophysiologic and biochemical modifications, both **rapid and lasting**. With the major advantage that they are strictly **personalized and dosed** spontaneously by the organism – and this, sometimes within a **microgram**, just as our organism endlessly controls the level of sugar in the blood, vitamins or Omega 3, or even iron or zinc (without which we would have no sense of smell).

A subtle and personalized biochemistry

Thus, for example, the injection of a *microgram* of **oxytocin** (the hormone that helps the milk arise, which has been baptized as *the hormone of attachment – even, of love*) is enough to *instantly* induce a *maternal behavior* in a female (rat or sheep)². We know today that this oxytocin is produced not only during childbirth, but also **at each physical contact**, and especially during a **psycho-corporal** session, a *massage*, during the caress of a baby, or of course, during a *love relationship*.

No administration of an **external** drug can possibly adapt to **the subtle and permanent variations** of hormone doses of each patient: each meal, and even each emotion, modifies this balance. Let us remember, for example, that **all success** (love, sports, social or intellectual) may instantly *double* the amount of **testosterone** in the blood; whereas an *orgasm* multiplies... *by four times* the amount of testosterone and endorphin³! This sudden influx of testosterone explains the behavior – sometimes quite surprising – of **football players** who score a goal, and who “jump” upon each other, in a spontaneous, erotic burst of enthusiasm, or even more, the winners of the **Formula 1 automobile** race, who, in their sexual excitement, open a bottle of Champagne... to “ejaculate” it rather than to drink!

Let’s remember that **testosterone** is the responsible for both **aggressiveness** and **sexual** desire – also in women. That is why I call it the “**conquest** hormone” in both senses, *love conquest* and *military conquest*. These two basic **life** impulses (survival of the *individual* and survival of the *species*) are very *linked*, they brush each other at the hypothalamus; they are just separated by some millimeters... between the aggressiveness area and the sexuality area is the area where **pleasure** is managed! In Gestalt Therapy this proximity is sometimes used, for instance, to develop a weakened sexuality through ludic aggressiveness – easier to manage within the respect to professional ethics!

²

But if a sheep gives birth under the influence of an *epidural*, it will not be interested in its offspring (Michel Odent, 2008) — which is not the case for a *woman*, who compensates for the anesthesia by her mental interest.

³

Neurotransmitters of well-being and self-anesthesia.

And now, two little experiments...

And now, we can do a little bit of practice: ...

I invite you to **elevate my testosterone rate!**...

(... *Silence... expecting applause*)... Thank You!

Now is my turn to propose you a **self-injection (painless) of dopamine...**
(*Silence*)... Now it is done!

My silence — unexpected — has stimulated your curiosity, and during this fraction of a second of waiting and surprise, you have produced dopamine, the wake up, **awareness**, and awakening neurotransmitter.

But now, we reach the moment to be calm!

Actually I just gave you a new shot; but this time is about **serotonin**, the neurotransmitter which give back **the order** – lead by the rational explanations that I am giving you.

In conclusion, we lead a therapeutic interview **like we drive a car**: constantly stepping the *brake* and the *accelerator* pedals (serotonin and dopamine).

Today there have been isolated around one hundred of these neurotransmitters and neuromodulators; for example, **every desire** (hunger, thirst, sex) and every **pleasure** (artistic or intellectual included) is related with three neurotransmitters:

- the *dopamine*, associated to the desire's tension;
- the *noradrenaline*, related to the stimulation of the shared pleasure;
- the *endorphins*, that entails wellbeing and rest.

If we do two blood tests — one of them **after 5 minutes** of optimistic fantasy (positive visualization) — we check an average **elevation of... 53%** of the immune system!

Recently in the United States, they have succeeded to film, with different techniques of brain imagery, modifications – visible and lasting – of the neural circuits trough the repeated stimulation of the neural network (the “sprouting”) caused by a *psychotherapy* with patients with obsessive-compulsive disorder.

We see a similar effect after a *chemotherapeutic* treatment.

So, both of these approaches aren't concurrent but *complementary*; so to say *interchangeable*, **the matter acts over the mind, and the mind acts over the matter**, in a systemic and circular way.

Now, I have **20 minutes left** to say some words about three topics:

- inherited and acquired (the part of **heredity**);

- neurophysiology of **dreams**;
- **sex** and the brain (gender identity).

Inherited and acquired (genetics and plasticity)

It happens the same with the eternal *false problem* of the *innate* and the *acquired* — that is directly concerned to us, as psychotherapists: what is the sense in making efforts in order to develop aptitudes or to modify behaviors or feelings, if everything is predetermined by our hereditary aptitudes?

In spite of all the *democratic ideologies*, it is unquestionable that **we are not born as equals**: there are tall and shorts, blondes and dark haired, blacks and whites, and persons more intelligent than others, for mathematics, sports or music.

So then, ***is everything determined in birth?***

Fortunately, **No!** We are neither prisoners of our genes... nor completely free!

Approximately, the researchers actually consider that our personality can be divided in three thirds basically:

- **1/3 inherited**: chromosomes from the cell's nucleus (our **DNA**);
- **1/3 acquired**: cultural immersion, education, exercise or training, fortuitous events... or psychotherapy;
- **1/3 congenital**, so to say, acquired during the first weeks or months of the intrauterine live; so as an example, the embryo is *feminine* during the first days⁴, and masculinity is a slow hormonal conquest, continued through educative and social action. In reality, **the girl is not a boy that has lost his penis** (as Freud had supposed), but **the boy is a girl that has obtained a penis**. (the "penis envy" is a hypothesis not verified by the experience: so, among *transsexuals*, are found today... **three more times men** desiring to become women, than women desiring to become men! The "envy of an uterus" is much higher than the envy of a penis!).

During a war, the rate of masculine homosexuality doubles itself (due to the mother's stress that perturbs her hormone's balance during pregnancy)⁵.

The inherited and congenital parts seem quite **important**: so as an example, in the real twin children (homocigotics), if one of them is homosexual, the other twin also is homosexual in 60 % of the cases, in the false twin children (heterocigotics), it only happens in 30 % of the cases, so it is half as frequent (although 5 more times than in general population).

4

MAGRE S. et VIGIER B. (2001) MAGRE S. et VIGIER B. (2001) Développement et différenciation sexuelle de l'appareil génital, in *La reproduction chez les mammifères et l'homme*. Paris : Ellipses. L'émergence du mâle débute vers la 7^e semaine.

« La forme fondamentale de l'espèce, c'est la femelle » in DURDEN-SMITH J. & DESIMONE D. (1983). *Sex and the Brain*.

5

DURDEEN (1983) y LE VAY (1994).

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For many aptitudes or predispositions – as intelligence, talents for music, sports, and even optimism⁶ – we again find this three thirds (inherited, acquired in the uterus, and acquired during life), in slightly different proportions. So, in a same event, each one of us “sees the bottle half full or half empty”...

In any case, they are only **predispositions**, that can be either **developed or inhibited** by education or by psychotherapy – which favor or neutralize the **gene's expression** (as Eric Kandel discovered, being a Nobel Prize, professor of the New York University; at his eighty, he is still researching... as I am doing, too!... but without a Nobel Prize!). Therefore, heredity is not a fate!

It is important to highlight that a growth of 20 % would eventually transform a normal size man (1,85 m) in to a giant (2,20 m), or a good runner into a real champion. Psychotherapy can also help to transform a deep depressive person into a slightly depressive... or even, into a happy man!

This fundamental **plasticity** of the brain endures our whole life, until an advanced age: it has been recently confirmed throughout brain image techniques, that the cortex' surface representative of the left hand usually keeps on growing in the violinist, and special orientation areas grow twice as big in the London's taxi drivers. (London is famous for the complexity of its traffic).

Among the new therapies, the EMDR, exploits directly this plasticity, modifying very fast certain neural networks and the neurotransmitters' production.

Neurophysiology of the dream

The psychoanalytic approach was the dominant one between 1900 and 1960, but it is no longer that way actually, most of all after the research of the French Professor Michel Jouvet.

Today we know that Freud was partially wrong: the **fetus** starts having dreams *in the uterus*, after the seventh month of pregnancy; therefore, a lot before having any conscious memories to repress, “censured” by the Super Ego, as it was Freud's old hypothesis.

In this way, the newborn continues to construct his brain during 60 % of the time. On the other hand, the pregnant woman *doubles her dreams time* in order to “accompany” the neurogenesis of her child. It is not excluded that one part of these dreams allows the unconscious transmission of her emotional experiences thanks to a precocious registering during the long periods of *shared dreams* (Ginger, 1987).

Not only has the fetus dreamed, but all superior animals too. The cold blooded animals (fishes, reptiles) never dream, but their nervous system regenerates during their life. There is a permanent *neurogenesis*, renewing the neurons, as the other more “vulgar” cells of its organism. This way they remain reduced to the innate

⁶
(Minnesota University).

Cfr. A well known study about twins and the Works of LYKKEN y TELLEGEN

instincts, and aren't able to acquire or accomplish complex learnings.

During the dream time, the animal is particularly vulnerable: it is transitory blind, almost deaf and paralyzed. No wonder then, that dreams first need a sense of **security**: cows dream even *three more times* in the stable than in the fields! And big predators, secure about themselves, allow themselves to dream during 40 % of the time they spend sleeping, while the poor persecuted animals, only dare to consecrate 5 % of its sleep time to dreams.

Men and women dream as an average, during 20 % of the time they remain asleep (which places us *between the predators and the victims!*); so to say, around *100 minutes* each night, and this, whether we remember it or not. It is known that *everybody dreams...* but eight minutes after being awake, 95 % of the dreams content is already forgotten!

Dreaming is different from sleeping and from wakefulness, and implies a **great brain activity**: during dreams, we consume the same amount of glucose than in the wakeness state... what explains that we can lose weight when we dream (as much as when we practice jogging!).

In fact, 2/3 of the right brain is mobilized, at a *hypothalamic* level of needs, *limbic* level of feelings and memory, *cortical* level of images and *frontal* level of synthesis, projects, visions; the communication with the left brain (logical critic) is cutted. On the contrary, the communication between both hemispheres remains while we are asleep *without dreaming*.

The dreams have been baptized as “the umbilical cord of the specie”: it transmits the fundamental behavior that are necessary for our *survival*; they enrich and actualize them by registering the acquisitions of the experience of every day, allowing in this way “the *individuation*” and the construction of the personality, which is the **sum of the innate and the acquired**.

It is during the dream process that **our memories are fixated** — not only the information that I am giving to you now, but most of all the memories that are filled with emotions, the important experiences, positive or negative of our lifes... and specially the therapy sessions.

A rat that is not able to have dreams loses most of its capacity of learning. It happens the same with patients that are treated over long periods of time with neuroleptics or antidepressants, that diminish — and sometimes suppress — the time of dreams.

A long term deprivation of dreams usually helps the apparition of compensatory delirious, with sexual⁷ or aggressive aspects, and bulimic tendencies.

So dreams accomplish *two opposite — while complementary — functions*:

- As an “umbilical cord of the species”, the dreams nourish our origin, examine every night **our genetic program** and evaluate the survival functions (sexuality and

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Actually we know that physiology sexual excitement go before every dream (about 2 minutes) and it any age, both sex and independently of dream content...

aggressiveness): cats dream with hunting and attacks, while mouses dream with escapes and little holes!... And men (and also women) dream with the sexuality.

The dreams therefore play a role of “shield against culture” — while our education is *opposed* to this two vital drives!

- But dreams are, at the same time, an important “*individuation*” factor (what makes me *different* from the others), because they consider my original experience.

As a result, dreams will allow the ***integration of my individual memory with our collective memory***, assuring therefore an essential function of ***synthesis between the innate and the acquired***.

The Sex and the Brain

Social neurosciences have underlined that natural selection progressively “sculpted” our genome, in order to make it sensitive to the contact and relationships with our pairs.

Empathy exists already in the mammals: rats are predisposed since they are born to feel the sadness of their partners, and modulate their behavior in order to protect their congeners. This attention to the other is more developed on the females⁸.

You know, that it has been proven that ***men and monkey*** share a genetic patrimony of ***98 % in common***, what only leaves us 2 % of difference... against approximately ***5 % of genetic difference between woman and men***. So, a human male is psychologically closer to a monkey male, than to a woman!... (and of course, women are closer to monkey females!).

Actually all of the neurosciences researchers agree in considering that:

- The ***left brain*** (which is logic, scientific, and most of all verbal) is more developed in ***women***, as well as the ***hippocampus*** (that allows memorization)
- And the ***right brain*** (analogic, artistic and emotional) is more developed in ***men*** — against what is believed by the general opinion (some of the present therapists included!). And this happens under the direct influence of *testosterone*. In the same way, the amygdala of the males is more important and reactive to strong emotions, like fear and rage.

The right hemisphere deals with the ***space***, the here and now and the group’s membership, so valuable in body therapies; while the left hemisphere deals with linear ***time*** (past and future), the *separation* from the environment and the Ego boundaries, studied more in *verbal* therapies.

So, ***women*** are more prepared to *verbal interchange*, ***communication***, collaboration, and empathy, while ***men*** are focused in ***competition*** and action. This

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A rat presses a pedal to obtain food. When she realizes that it is producing electric shocks in a cell partner, she prefers not to eat, instead of making her partner suffer.

of course is only valid on the *statistic* point of view, because there are some exceptions, even in this room! There are, of course, tall women and short men! But is not a general reality! These differences are related to social education **and to biology**, and they have been developed step by step, over the *two million years of natural selection*, since the prehistoric men ran in silence in hunting, while women remained in the cave, educating children, and talking with them!

At nine years old, girls, represent as an average, 18 months of verbal advantage over boys. In adults, women talk around 20 minutes per telephone call... compared to 6 minutes of men! The woman needs to **share her ideas, her feelings, her emotions**, while man controls and retains them: he transmits information, and is looking for *solutions* very fast... And then woman feels "unheard"!

As a summary, the **woman is less emotional than man**, but **expresses** more each one of her emotions, while the man is really **more emotional**, but **doesn't express** his emotions, and this is very important not to forget about, in private life and in psychotherapy!

- The fashion of the "new fathers", who put on the diapers to the babies, leads them to produce a lot more of *oxitocyn* (which makes them *sweeter* persons... but reduces 33 % their rate of testosterone! Today we are witnessing a fast de-masculinization of men, under the combined influences from biological, ecological, cultural and social factors. On top of that, chemical pollution, and most of all, the invasion of plastic materials, stimulates the estrogens⁹. As a conclusion the spermatozoid production has been reduced... one half in 30 years!

Let us remember, to end this brief explanation, that:

The "engrammation" of a memory (it's inscription in the neural circuits) implies a "*warming-up*" of the *limbic system* trough an *emotion*: therefore the effectiveness of the emotional and body psychotherapies.

- The remembrance of a scene, *real or imaginary*, shows the *same brain location*, and generates the same mental process in both cases. In reality, every memory is *re-build* partially and unconsciously in each one of its evocations, from desires or fears, not always conscious. This leads us to deal with a lot of prudence the **sexual abuse memories** on the first part of childhood, very often awakened by the body approaches that allow a physical contact: today it is estimated around 40 % of false memories!

The end

It is a shame, but I have to finish now: time has come inexorable! So I am going to end with a commercial *advertising*: there have been published more than *two-hundred books about neurosciences*, and hundreds of articles, during the last years,

⁹

(Tsutsumi, 2005 ; Welshons, 2006 ; Lucy Vincent, 2007).

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especially since “the brain decade” (1990-2000).

As you won't have the time, nor the courage, to read them, I have done it for you, and I have summarized, in my books named: “*Gestalt, The Art of Contact*, in 40 pages, 40 000 pages of studies about the brain, (200 books of 200 pages); so, **each page** of my book summarizes around... **1,000 pages** of erudite texts, written in a simple and accessible language, and illustrated with metaphors.

This will allow you to continue and to digest this lecture... at your own rhythm...

And now, time has come for **my second dose of testosterone...**

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