

Is There an Information Field in the Life World? An empirical approach using electrophotonic analysis.

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ABSTRACT

This article will present a brief review of biological communication phenomena within microorganisms, the human energetic phenomena explained as a transduction of information without energy displacement, as well as experimental requirements for testing this hypothesis between human beings using electrophotonic analysis. Finally, the authors present experimental results and future work on this new field of physical research.

Keywords: semantic fields, electrophotonic analysis, quantum biocommunication.

1. INTRODUCTION

The study of energetic phenomena in the life world is an argument of interest in several applied and theoretical fields. Its roots have positivistic connections with biology, medicine and applied physical sciences, such as biomedical engineering, resulting in the development of a myriad of diagnostic and treatment instruments, but also, in a more humanistic approach, the appearance of an environment for theoretical speculations and reflections, where there have been proposed theories such as Sheldrake's morphic resonance (2009), Meneghetti's semantic fields (1983), Backster's primary perception (2003), and more recently, all research relating consciousness and the modern quantum physics (Radin, 2006; Wolf, 1986; Goswami, 1995).

In the biophotonic field, researchers showed that communication between cells does not necessarily depend on chemical or electrical schemes, and this opened the way to study the role of electromagnetic waves (Han, Yang & Chen, 2011; Scholkman, Fels & Cifra, 2013; Farhadi *et al.*, 2014). However, what a few researchers started to ask is how such communication could be possible via electromagnetic waves considering significant distances and barriers. In other words: how is it possible that a very low intensity signal, subject to noise and decay, might enable such precise communications in the life world? For some scientists, this might lead us to the suspicion that this kind of communication could be based in quantum phenomena (Cifra & Kučera, 2013; Chaban *et al.*, 2013).

What seems to be really important is the fact that science for a long time is trying to codify and quantify this category of phenomena with different approaches and, no matter how complex the situation might look like, it is quite reasonable that, in fact, there should be something analogous to the quantum entanglement of physics in the life world, that is, the possibility of transducing information without displacement of energy, and this would imply entirely the hypothesis of an information field, with which some modern theoretical physicists would agree.

Two kinds of difficulties arise immediately: the acceptance that such information fields might exist and, of course, how to quantify and model them. Both problems might derive from the experimental design used to approach the problem, since hypotheses are formulated using epistemological premises that are not necessarily aligned with the logic that nature uses within itself, as used to affirm Bernardino Telesio (1570), but also because of millenary scientific pre-judgments, as taught us Edmund Husserl in his "Crisis of European Sciences" (1936), that force us to analyze nature with "lenses" that really help us in a first moment, but then limit by definition the possibilities of our scientific knowledge. As important thinkers have pointed out, it seems that a complete new epistemological turn around is needed and, only after the moment our scientific community achieves this goal, the apparently unsolvable might be solved, such as the causality-finality and subject-object paradoxes (Bohr, 1965; Schrödinger, 1955; Krylov, 2001; Husserl, 1976).

Table 1, reproduced from Han *et al.* (2011), with some additional articles reviewed by the authors, give a historical perspective of some studies conducted in this area.

Researcher	Year	Organism	Method	What was detected
Gurwitsch	1923	Onion root cells	Quartz or normal glass separation	The number of mitoses increased
Kaznacheev et al.	1980	Fibroblasts (human & chicken), monkey kidney tissue	Various separator materials tested (e.g. quartz and glass)	Transfer of effect of high dose UV irradiation
Grasso et al.	1991	Yeast cells	Air separation	The growth rate increased
Galle et al.	1991	<i>Daphnia magna</i>	Organisms in water environment	The intensity of electromagnetic radiation had a non-linear dependence on the population density
Galantsev et al.	1993	Mammary explants of lactating mice	Quartz glass separator	The level of TBARS changed
Albrecht-Buehler	1995	BHK, CV1 and 3T3 cells	Various separator materials tested	Orientation to detector
Kuzin et al.	1995	<i>Raphanus sativus</i> seeds	Quartz glass separator	Seed germination and development
Musumeci et al.	1999	Yeast cells	Quartz glass separator	The growth rate increased
Maxim V. Trushin	2003	Escherichia coli MC1061	Quartz glass separator	The growth rate increased
Yang et al.	2004	Palm and back hand of healthy people and stroke patients	Biophoton radiation	The left-right balance of biophoton emission was maintained for normal subjects in contrast to the severe imbalance for stroke patients.
Zhang et al.	2007	Osteoblasts	Copper net separator	Proliferation promotion
Fels	2009	<i>Paramecium caudatum</i>	Quartz or normal glass separation	Cell division and energy uptake
Farhadi et al.	2010	Colon cancer CaCo-2 cells	Kept in a distant laboratory with separation by walls and doors	A significant reduction in total protein content, an increase in nuclear NFκB activation, and structural damage
Montangnier et. al.	2011	<i>Mycoplasma pirum</i>	High dilution of microorganisms DNA in aqueous solution, followed by filtering and Rnase, Dnase, Protease and specific detergent application.	After capturing electromagnetic signals present in the aqueous solution with copper coils, it was possible to replicate the original DNA sequences.
Chaban et. al.	2013	Dorsal ganglia of rat neurons (DRG)	Exposition to the presence of apoptotic DRF or neuroblastomic cells	Induction of abnormal ATP fluxes mediated by capsaicine in normal DRG, supporting the hypothesis of a cell signaling not diffusible and physically disconnected.
Tamulis A., Grigalavicius M.	2014	Photoactive prebiotic systems	Computational simulation	Theoretical study
Hameroff et. al.	2014	Litterature review	Litterature review	Theoretical study
Bandyopadhyay, A.	2014	Neuron microtubules of human neuron cells	Empirical research	Identification of quantum vibrations inside the microtubules

Table 1: Evidence for electromagnetic or quantum biological communication.

2. THEORETICAL ASPECTS REGARDING THE KNOWLEDGE OF HUMAN ENERGETIC STATES

In the early 70's the first results of clinical activities conducted by Meneghetti started to be published, which gave birth to his practical approach to the critical problem of knowledge. According to his clinical evidence, he was able to describe a phenomenon he called “semantic field: informational transducer without energy displacement”. In this theory, living individuations are seen as force-points in the interior of a continuous energetic dynamism. He used the physical language to describe the steps of this phenomenon, as follows:

- (1) Subatomic level: polarization and vectorialization. There is no perception, but only a wave with its own signal;
- (2) The new induction polarizes the interested molecular complexes. A very trained consciousness is able to locate it;
- (3) The first emotional resonances and specific variations of feelings start to take place. A not careful man, for not having this knowledge, retains them as endogenous. An *expert* individuates its allogenic source: reads a variable, but still does not identifies it;
- (4) An emotion is formalized and, in a complete and compact way, polarizes the attention of the ego and produces a distinct excitement. At this point, an *expert* might choose and decide whether or not to accept or reject, but recognizes the motivational cause anyways. In the case one does not recognize the situation, might decide without exactitude. In this fourth step, there is the internal forum of the moral sphere, since the consciousness is responsible and conscious;
- (5) Possibility of objective and concrete externalization, that might be effectuated psychosomatically or, in anyway, *ad extra*. (Meneghetti, 2012, p.93)

With the correct knowledge of the semantic field information, a human being is able to know either one's own concrete situation, or that from other realities with which he might be entering impact:

The form, or vector, translocates from an energetic content to another (...), the semantic field is an information transducer, transfers a code, an image that, when arrives, structures in emotion any living thing and implies an emotional-organic variable. It does not transfer energy, but is *with* energy. Information transduction means that its module gives the form of the energy passage, but not the passage *of* energy. It is an information that happens before all senses, emotions, before consciousness and before any symbol. (Meneghetti, 2001, pp.32-33).

As a consequence, everything that we know is the result of entropathic¹ processes, that is, actions and reactions that are continuously processed inside our “living body”, and these actions and reactions give place to the process of image in its levels: sensorial, decisional, intuitive etc. (Meneghetti, 1991). In order to understand this basic language, to use the living body as a knowledge channel, the human being needs first to recover his capacity of reading the organismic variations, original knowledge experiences that typically do not become conscious as a result of the primacy of our sensorial perceptions, considered to be superior, such as vision and hearing, (Vidor, 1997:2013), but also owing to the influence of judgment heuristics that alter our elementary perceptions (Stanovich & West, 1999; Chaiken & Trope, 1999; Kahneman & Tversky, 2002, Kahneman & Frederick, 2002).

In the reeducation process to a integral perception, the Enteric Nervous System (ENS) plays a central role (Meneghetti, 2000). Its worth saying that our gastrointestinal, in two extracts, myenteric and submucosal plexus, are covered by specific neurons, which synthesize and transmit – by muscles and mucosa – signals that provide the organismic position of a subject: danger, safety, eroticism, hunger, vampirism, grace, infection etc. (Hogarth, 2000; Myers, 2002; Fourness, 2006). The ENS works as an autonomous circuit, colligated by the vagus nerve to the central nervous system, which centralizes multiple afferences – not exclusively, however – from the viscerotonic to the central brain (Sonneburg & Sonnenburg, 2015). Neurotransmitters, specific proteins and cells, like those from the autoimmune system, benzodiazepines production e millions of neurons, superior in number to those of the spinal cord, guarantee a global autonomy of this brain (Gershon, 1998; Meneghetti, 2000; Dander, 2001; Fourness, 2006; Sonneburg & Sonnenburg, 2015). The ENS might be the main responsible for the exactness in the reading of the elementary interactions between human beings. Also the head brain would be exact in that if it had not suffered from the manipulation caused by the cultural stereotypes. The connection of all this with the knowledge theory is straight: the human being knows the reality through the mediation of the body and, in spite of this mediation being exact, at the conscious reflection moment, our set of stereotypes might alter the original perception (Meneghetti, 2000). Besides that, these two systems live in a continuous interaction, particularly, during sleeping and dreaming, and this fact could justify the millenary hypothesis that dreams really have a vital content that represents the present state of the dreamer (Artemidorus, Aristotle, Groddeck, Freud, Jung, Bonime, Gutheil, Meneghetti, Solms *et. al.*).

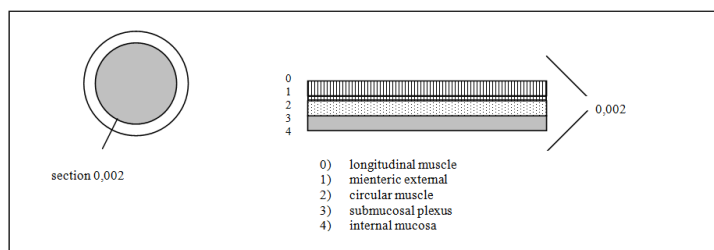


Figure 1: Transversal section: (a) intestinal channel; (b) intestinal wall.

¹ Husserl uses two German words to express the concrete human knowledge experience: *Einfühlen* and *Leib*. The word *empathy* describes the experience of *feeling like someone feels*, while with the word *endopathy* (or *entropathy*) Husserl intends to name our originary perception experience in the Life world. The world becomes a phenomenon to a subject for it causes variations in the living body (*Leib*). It indicates a deeper level in the constitution of our everyday experience, in which our living body interacts in the intentional level, thanks to unitary form or the world as such.

From a functional perspective, the dream performs important tasks in the human superior metabolism, such as: (a) unloading affective energy, even if in the form of emotional storms; (b) preventing emotional shocks; (c) warning the dreamer of problems and mistakes; (d) revealing desires; (e) revealing solutions of current problems (Gutheil, 1951).

Loomis², Harvey³ e Hobart⁴ have created a theory, based in a vast study with electroencephalograms⁵, where they describe five typical states of brain activity during the time between falling asleep and the awakening, as follows:

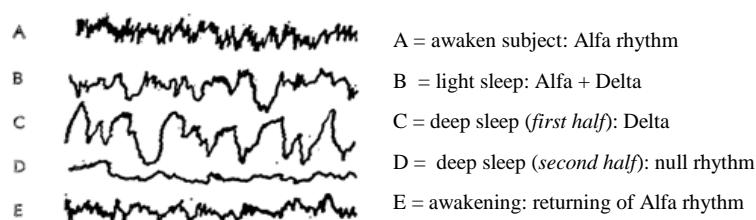


Figure 2: Brain activity during sleeping (reproduced from Gutheil, 1951)

The sleeping, for this authors, deprives the individual of the feeling of being a “self”, of being different from anyone else. The more the conscious thinking disintegrates, more images come to the foreground, becoming experiences. In the dream, our judgments processes suffer a change, a translation from a conceptual sphere to another, from general to specific. To make an analogy, dreams could represent the equivalent of a “symmetry breaking” in the laws of thought.

However, it is after Meneghetti's clinical studies about the dream (1994) that the argument returns to the scientific spotlight. According to his knowledge theory, humans have knowledge experiences thanks to the interactions of pure information waves, called semantic fields and, through them, have direct access to the present energetic state and its variations. These variations remain as emotional resonances in the body, especially in the ENS, and, in the moment of dreaming, the ENS signals do arrive at a reflection level by means of images. For Meneghetti (1988), these are three ways of seeing the information field: 1) when it is a pure wave, before any measurable external phenomenology (before the wave collapse); 2) when this information creates the organismic resonance, that is, produces emotional variations and its respective image projections (fantasies, intuitions, dreams etc.); and 3) when the information produces measurable external effects (Meneghetti, 1988), and that's why the GDV-kirlian technique can be of great help, since it captures subtle energetic variations (Korotkov, 2011).

In terms of physical and mathematical modeling, the semantic field (or informational field) could correspond to associated waves with zero ponderability relevance (Meneghetti, 2005), what some authors has been calling in a general way of “zero point field” (McTaggart, 2008). This means, if we suppose the space-time structure is a quantum fluid, that semantic (or information) field waves could be understood as vibrations in this fluid: we do not see it because we are totally inside the field itself, but our living body is modified by its variations. Another interesting model analogy regards the situation of resonance between an emitting and a receiving subject without energy displacement: the resonance happens inside an energetic uterus, the universe, it happens within energy, but there is no transfer of energy. That's a form-energy or intentional-energy, since its variations can be known as the real intentionality of an emitting subject correlates with that of the receiving one.

² Alfred Lee Loomis, 1887-1975, was a North American lawyer, banker, philanthrope and scientist, pioneer in electroencephalogram techniques and, along with Edmund Newton Harvey, discovered the K-complex brain waves.

³ Edmund Newton Harvey, 1887-1959.

⁴ Manette Hobart, chief researcher from the Alfred Lee Loomis Lab.

⁵ Loomis, A. L.; Harvey, E. N.; Hobart, G. A. *Cerebral states during sleep, as studied by human brain potentials* in Journal of Experimental Psychology, Vol. 21(2), Aug 1937, 127-144. (see: <http://www.sleepresearchsociety.org/PDFs/ResearchPapers/Loomis1937.pdf>)

As it is widely known in physics from the quantum entanglement experiments, semantic fields act at any distance and practically instantaneously, what could serve as a physical basis to explain many human phenomena still considered to be extraordinary ones, but merely ordinary if seen with this new approach (Meneghetti, 1988).

In the last instance, the semantic field theory leads us to a fundamental principle of equivalence between information (image) and energy, and in turn, this could mean that the last constituent part of the universe is information, and not a particle (Meneghetti, 1991:2011), a hypothesis also shared by many theoretical physicists of our time (Wolf, 1986; Goswami, 1995; Yuzvishin, 1996; Susskind, & Lindesay, 2005).

3. BUILDING THE EXPERIMENTAL DESIGN

For the purpose of this experimental design, three elements of Aspect's work (1983) for the demonstration of the physical entanglement were considered by analogy: (1) eliminating the hidden variable possibilities, understood as the ability of the emitter to give instructions to the receptor; (2) randomness in relation to the interference between emitter and receptor; and (3) ability to use a content akin to communicate the energetic state of a human being.

The first requirement, in practice, means avoiding confusions with other kinds of communication – chemical, electrical, magnetic, written, verbal or non-verbal etc.⁶ The second element implies that the interference between emitter and receptor need to happen in a random way and, third, maybe the most complex one, choose in the human level an information capable to establish such communication.

Although theoretical and clinical experience could support the usage of dreams for implementing the test, authors decided to verify it empirically with a suit of alternatives. The first verification was done between a couple. The husband went inside a Faraday cage and the wife performed outside, in another room, simple activities which, theoretically, imply intentional change between the person outside a faraday cage and another person inside the faraday cage. After that, they inverted the roles, and the wife went inside, while the husband performed the actions outside the faraday cage.

The actions were designed on purpose so as they implied different forms of intentional interactions (if any) between the person outside, performing them, and the person inside the faraday cage, just sitting at rest with ear protections. The person outside should write down the start and end time for each action and wait 30 seconds before following with the next action, as follow: (1) reading a book; (2) calling by cell phone the person inside; (4) browsing photos in the social networks; (5) reading silently a recent dream of the person inside the faraday cage; (6) walking to an extreme part of the room; and finally, (7) opening an envelope with the order to open the cage. Although the dream reading outside the faraday cage presented the highest standard variation, the first results were not convincing, as shown by Figure 3.

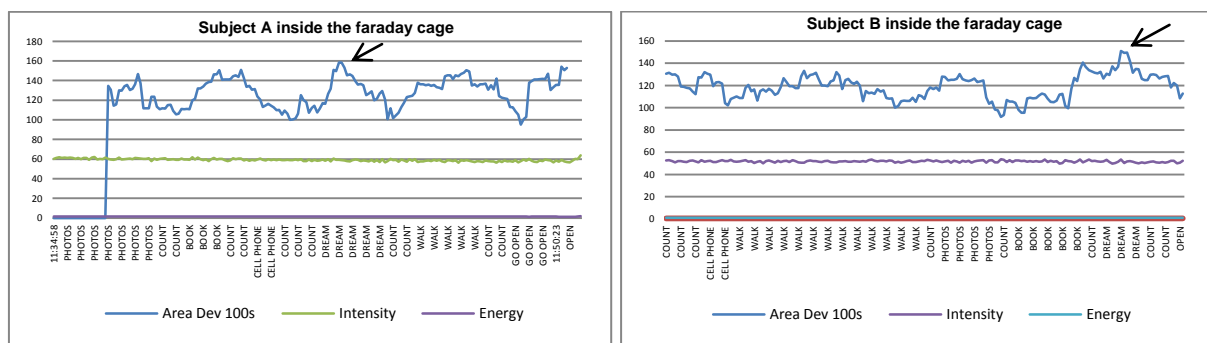


Figure 3: Area Standard Variation in 100 seconds for subjects A and B with different forms of interactions.

⁶ Saussure, 1916; Kretschmer, 1921; Sheldon, 1940; Watson, 1970; Hinde, 1972; Argyle, 1975; Lowen, 1981.

After that, we decided to make a new trial, this time only with the dream reading in a random time, chosen by the reader outside the faraday cage, in a total experimental time of 15 minutes. With this extremely simple design, results were quite more clear, as shown in Figure 4, with a visible and stable variation in the area signal after the subject B, outside the faraday cage, started to read the dream of subject A, inside the faraday cage. The second great variation happens in the opening of the faraday cage, as obviously expected.

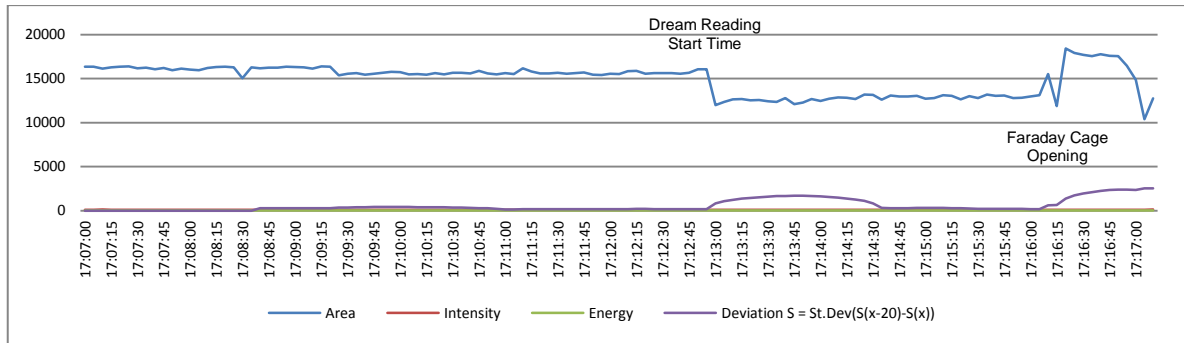


Figure 4: Area, Intensity, Energy and Area Standard Variation (100 sec.) for subject inside a faraday cage while another subject reads his dream outside the faraday cage in a random time.

The faraday cage used to perform the experiments is an ETS Lindgren Series 81, designed for medical, industrial and governmental applications. It is located in lab in a different floor of ours, in the electrical engineering faculty building, at Unicamp, about two minutes walk from our laboratory, so that, during the experiments, one subject can stay in our lab, while the other stays inside the faraday cage, physically distant and electromagnetically isolated.

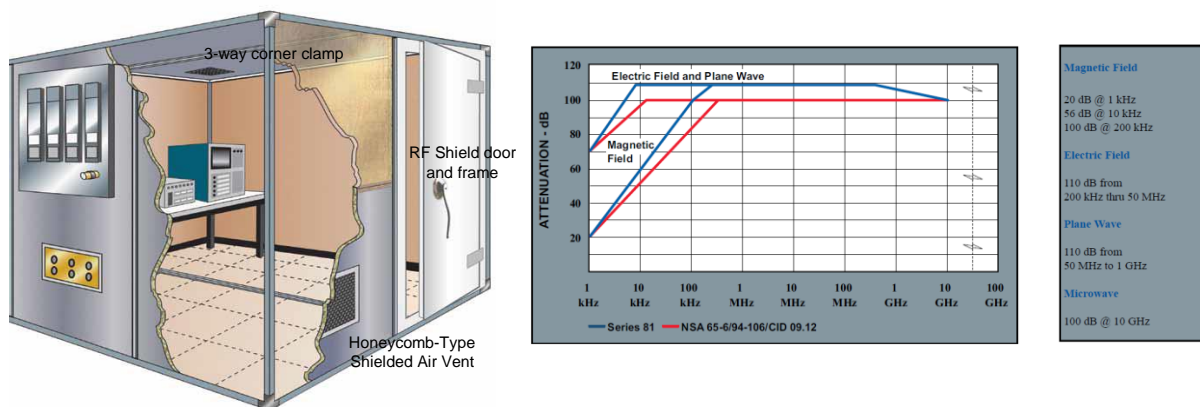


Figure 5: Faraday cage specifications reproduced from ETS Lindgren manufacturer's user manual.

4. EXPERIMENTAL DESIGN

Based on the first trials, other measurements were made to confirm and refine the experimental design and, after that, we arrived at three different experiments to test hypothesis connected to: (1) the existence of semantic (or information) fields; (2) their behaviour; and (3) their connection to the ENS, designed as follows:

- **Experiment 1:** performed in pairs consisting of two individual that preferably do not know each other, with total average time of 20 (twenty) minutes. During the experiment, Subject A comfortably sits in a chair in one room while measurements are taken with two instruments: (1) a pulse oximeter, which gives as outputs pulse rate and the oxygen blood saturation; and (2) a GDV-Kirlian system, that gives as raw outputs: area of the captured

image, intensity and energy level in Joules. Subject B, instead, sits comfortably inside the faraday cage, being measured with the same instruments. Before entering the faraday cage, Subject B writes down in a piece of paper the most recent dream he/she remembers, preferably from the night before the experiment. No information other than the description of the dream should be written. Subject A receives orientation to read the dream in silence in a random time between the 5th and 15th minute after the experiment starts. This interval allows to ignore, in the analysis, the initial and final minutes of measurements, since they might contain excitement reactions of both subjects to the beginning and conclusion of the experiment. At the chosen time, Subject A must only do a silent reading of the dream, being as open as possible to anything those images might provoke: emotions, fantasies, thoughts etc. The reading time should be about a minute, however, variations should be allowed, owing to the variable lengths of dreams brought by participants. Finished the first measure, subject A and B invert their roles. For the control group, instead of reading the dream, the subject outside the cage read a technical text.

- **Experiment 2:** performed in groups of four, three subjects inside the faraday cage and one outside. The three subjects write down their dreams before entering the faraday cage, but the subject outside will pick out from an urn just one of the dreams, being all four subjects under measurement. With this second experiment, an important property of communication can be tested, that is, whether this kind of communication happens in a broadcasting format or if a some kind of virtual "one-to-one" channel – be it quantum or classic – is established.
- **Experiment 3:** this third design was thought in order to understand whether the ENS participates or not in the process, since it is known from previous clinical knowledge that it might have a crucial importance in the constitution of dreams and, besides that, as the first organismic zone to present variations of any kind. In this design, subject A should read several dreams under fMRI - Functional Magnetic Resonance Imaging. This should allow us to understand whether the cerebral zones that will appear active during the reflexive and silent dream reading are related to those that would be lightened owing to ENS activity.

For the purpose of this article, we will present only the results obtained so far, regarding exclusively the first experiment. With this first experiment, we expected to understand basic conditions and variables involved in the study, but mainly understanding if there would be statistical significance, that is, confirming the existence of a communication phenomenon between human beings electromagnetically independent. As we acquire a deeper understanding of the underlying phenomenon and its rules, other experiments will be conducted and other designs might eventually emerge.

5. EMPIRICAL RESULTS

The phenomenon to be analysed should look like a communication process between two systems, subjects A and B, and, as such, a correlation analysis could help to demonstrate its existence. In the case we are dealing with quantum amplitudes, the word entanglement could be used as a synonym of correlation (EPR, 1935; Aczel, 2001; Zeilinger, 2010).

So far, 38 measurements were made, of which 35 are in the experimental group with the Dream reading, and 3 in the control group. A correlation analysis of signals from subject A and B was done for the following variables: Area, Intensity, Energy, Standard Variation of Area (100 seconds, 30 seconds and 60 seconds), Standard Variation of Intensity (100, 30 and 60 seconds), Standard Variation of Energy (100, 30 and 60 seconds), Pulse Rate, Oxygen Blood Saturation, Standard Variation of Pulse Rate (100, 30 and 60 seconds), Standard Variation of Oxygen Blood Saturation (100, 30 and 60 seconds), as well as compounded correlations for Area x Intensity x Energy, Pulse Rate x Oxygen Blood Saturation.

In order to standartize analysis, the duration of dream reading – typically variable – was called "T" and two analysis were done: the first, with total duration equals to 3T, being the first third called "Before", the second third called "Dream" and the last third called "After". A second analysis was conducted with total duration equals to 5T. In this case, the first fifth was called "T-2", the second "Before", the third "Dream", the fourth "After" and the fifth, "T+2". Correlations, for the 3T standard, can be organized in two main clusters according to their visual pattern, as shown in Figure 6. The first cluster contains the "A" and "V" patterns; the second one, the ascending and descending patterns.

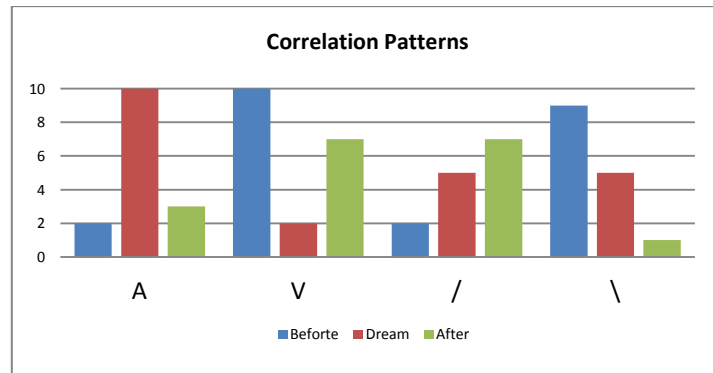


Figure 6: Correlation visual patterns. The first two patterns were the most frequent.

The following figures present the Absolute Correlation for Area, then the Correlation Variation divided by the Total Correlation of each sample, in log scale. For both graphs, the Before Correlation Value was considered to be the "zero".

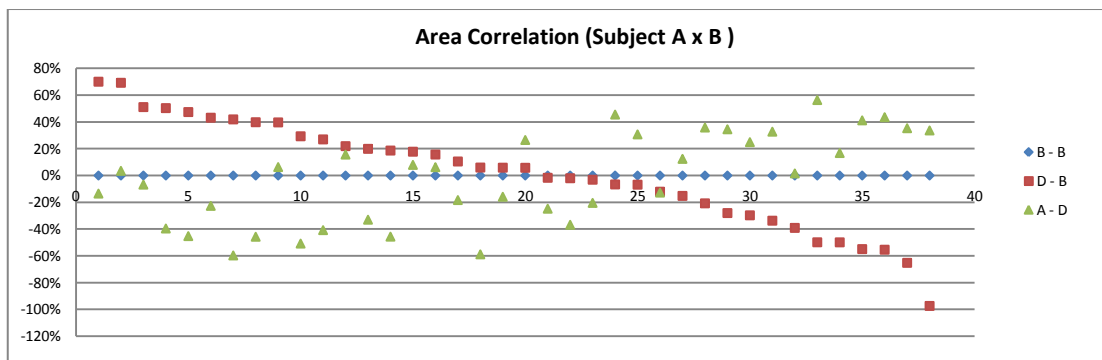


Figure 7: Area Correlation between subjects A and B - Before, Dream and After - considering the Before Value as zero.

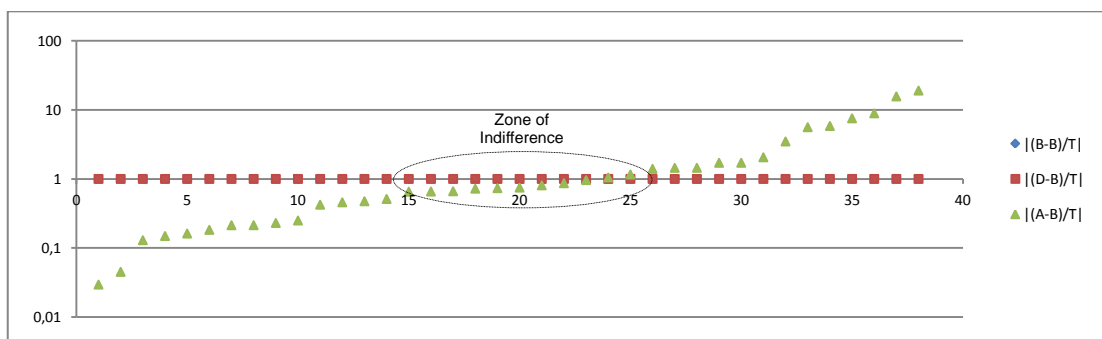


Figure 8: Log of Area Relative Correlation. Control group: 15th, 19th and 24th points, all within the circled area.

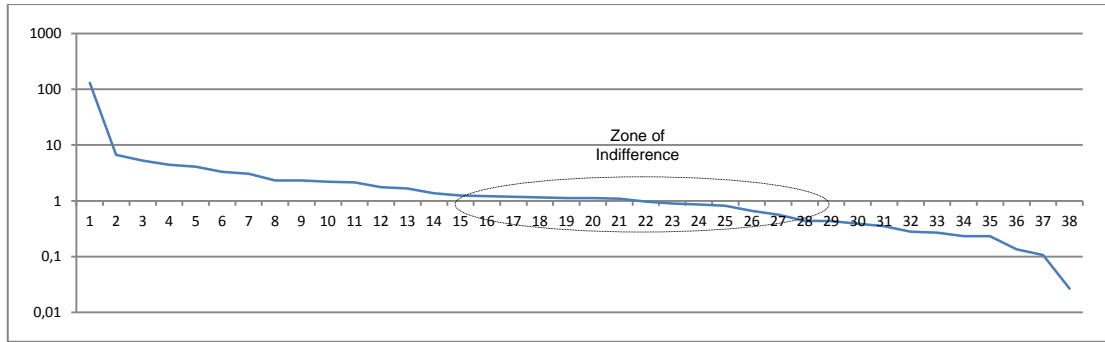


Figure 9: $\text{Log} \{ \text{Correlation}(\text{Dream}) / \text{Correlation}(\text{Before}) \}$. Control group: 17th, 24th and 29th points, within the circled area.

Considering the entire sample in terms of Area Correlation, there are 7 measurements that look like indifference. However, all measurements of the control group also fall in the indifference zone, what leads us, in spite of the small size of the sample, to an accumulated probability of randomness of $3,25\text{E-}41$. It is also interesting to observe that the correlation After the dream reading is typically in opposition to the correlation during the Dream reading.

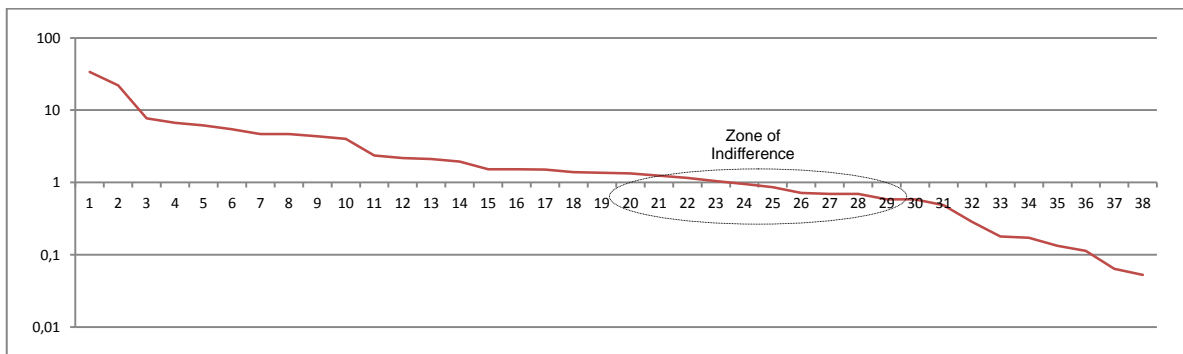


Figure 10: $\text{Log} \{ \text{Correlation}(\text{Dream}) / \text{Correlation}(\text{After}) \}$. Control group: 28th and 29th points, within the circled area.

Similar graphs can be plotted for Intensity, SpO2 and PR variables. However, when it comes to the Energy Correlation, results indicate a different behaviour, showing a zone of indifference of almost 50% of the total sample. This could lead us to the important thought that, in fact, we may be facing a communication process in the life world in which there is only an information transfer, capable of changing the energy state of the receiver, but not an energy transfer.

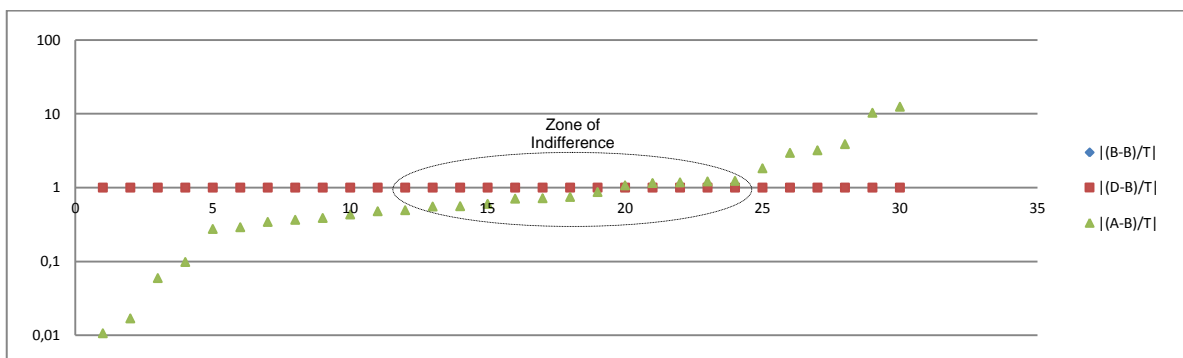


Figure 10: Log of Relative Energy Correlation showing the larger zone of indifference.

6. FUTURE WORK AND FINAL CONSIDERATIONS

Even considering the fact that this first approach is dealing with small samples, the accumulated probability has given good reasons to support further investigations regarding the existence of an pure information field, electromagnetically independent, in the life world. Increasing the sample is necessary, as well as sophisticating data analysis, for instance, with convolution of signals using Matlab tools, such as FFT.

Considering the magnitude of this scientific challenge, it is natural that in the present stage of this research there are more questions to be answered, more experiments to be done, than answers to be given. However, although it is still early to affirm the true nature of this field, whether classic or quantum, its elementary behaviours and properties, it is fair to state that a first step has been given to investigate its existence, as well as the equivalence of image and energy principle.

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