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# Diffusion of pseudoscientific discourses in Spanish public radio. The program *Complementarios* by RNE-Radio 5

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## Abstract

**Introduction.** In this research we analyze contents of the radio program *Complementarios* of the public chain Radio 5 as a sample of the concerning pandemic of pseudoscientific discourses broadcast by media. **Methodology.** We used content analysis from the Frame Theory perspective to determine the discourse device with which pseudoscientific contents are promoted in this radio program. **Results.** The public radio chain aims to promote an informational space and of social utility but contributes instead to the diffusion of contents without any scientific validity and puts itself at the disposal of the pseudoscientific discourse. **Discussion.** The so called complementary therapies and pseudoscientific discourses occupy the public space pretending to be useful and scientifically valid. **Conclusions.** These mediatic contents can be quite harmful and derive into serious public health problems, and should be treated from a much more critical and scientifically responsible perspective.

## Keywords

Complementary therapies; alternative therapies; pseudosciences; informative treatment; radio.

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Translation by **Yuhanny Henares**  
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## 1. Introduction

Today there is still debate about what is science from versions more or less evolved of Popperian school that look for a concept of truth from the logical falsifiability (Popper, 1973); or on the other hand, from approaches heirs to the epistemological anarchism of Feyerabend (1978) which deny to a greater or lesser extent the possibility of truth. Other contemporary conceptions of science such as the model of scientific paradigms (Kuhn, 1962) or the proposals that review positivism (Lakatos, 1983) are well accepted by the scientific community and, in one way or another, establish boundaries between what is considered science and what isn't. In any case, to identify and unmask the called 'fake sciences or pseudosciences' is often a complex task that, in the last decades, has been treated by philosophers like Mario Bunge to the renowned mage, Jame Randi, scourge of fraudsters and tricksters and scientific disseminators of the class of Martin Gardner, Michael Shermer or the popularly known Carl Sagan, who have been characterizing those practices considered barely or not scientific at all or that, are simply more or less ingenious hallucinations or clear frauds (vid. López-Cantos, 2017).

The truth is that the concerning contemporary pandemic of pseudoscience that invades networks and media distorts the scientific practice in a very significant way since it usurps its status, manipulating audiences' emotions and causing an increased stupefying and cultural regression (Alonso-Marcos & Cortiñas-Rovira, 2014), and finds its breeding ground in a communicative environment where, as Elias complaints (2013), allows that anyone edits and re-elaborates an expert's information and manipulate it to make it credible. Thus, 'pseudosciences' make an efficient use of rhetorical strategies and contemporary communicative technologies, together with the frequent resource to evidence and credentials that are apparently scientific in the search of legitimacy and moral and epistemological superiority compared to what they call 'official science' and as result thereof, the use of contention mechanisms today destined to limit the expansion of this pandemic of beliefs and swindles, and the determination of the scientific authority becomes a task of great complexity due to its heterogeneity (Fasce, 2017).

One of the fields where pseudosciences are rather harmful and have more prevalence is in healthcare areas in the so-called 'complementary and alternative therapies' which introduce themselves as a "proposal of disease healing, symptoms relief or health improvement, based on criteria without the support of available evidence." (OMC, 2016)

The 'complementary or alternative medicine' includes a group of therapeutical disciplines that introduce themselves as responses to the scarcities of institutions and the conventional healthcare system without there being any epistemic guarantee about its efficacy. Despite that, not only are they still being presented under different denominations in some medical centers but, furthermore, and despite proven therapeutical inefficacy, they continue to be promoted and unconditionally supported

by some media, even those financed with public funds, like the program *Complementarios* by Radio 5. And when pseudosciences are spread with complete normality and without any critics from media whatsoever, they institutionalize and, by extension, acquire legitimacy from the credibility attributed to media (Armentia, 2002) and, as a consequence, a noticeable discursive power to structure reality by using the powerful effects that media have on individuals and the society long term (McQuail, 1985).

These ‘therapeutical discourses’ promoted by the booming ‘industry of happiness’ and that are more and more present in all media, boost a new cultural ideology that impregnates all public and private fields and that delves even more in the current model of contemporary postcapitalist society in network and hedonist and of high systemic risk described by Bauman (2013), Illouz (2008), Beck (2002), Castells (1997), Giddens (1994) or Lipovetsky (1986, 2007). And thus, these new discursive trends about promises of improvement and happiness are constituting what has been called ‘psychotherapeutical culture’ (Rieff, 1966; Furedi, 2004; Illouz, 2007), which origins are found in *NewAge* movements of the years 60 and 70. The contemporary ‘pseudotherapies of happiness’ are based, to a great extent, in disputable proposals of the new trend of positive psychology promoted by Seligman (1991, 2002) and Csikszentmihalyi (1990) and that have Fredrickson (2009) among its most reputable gurus. And, even though the debate about the definition of happiness and what it can be considered as a good life has its origins in the tradition of the Greek thought, these new psychotherapeutical discourses not only omit the deep philosophical reflection done about it, but additionally have null scientific evidence.

Regarding the diffusion made about these kinds of pseudoscientific discourses on media, which is this paper’s purpose, we need to consider the different nuances with which objectivity is defined on journalistic and scientific practice, in the sense that “journalists think objectivity demands ‘trying to let the facts speak for themselves’, and academics think it requires systematic methods and transparent accounts” (Post, 2015: 731). But the fact that the journalistic practice is submitted to specific time guidelines and contents production rate (Resnik, 1998), it does not exempt media professionals from their ethics responsibility.

In this paper we will determine the features and discursive strategies of the program *Complementarios* starting from the main hypothesis (H1) that in the public radio program there is barely a professional and irresponsible treatment of disseminated contents. And, for this, we are going to analyze the origin of its sources and the discursive strategy used in the program’s elaboration for the construction of veracity and credibility from the communicative and journalistic perspective.

## 2. Methodology

Firstly, we analyze in detail the academic and professional background of collaborators participating in the program *Complementarios* to contextualize the scientific validity of their statements and contributions. And, from this, we analyze the discursive content of a sample of three programs that have been selected in a randomized manner.

Programs broadcast up to the moment of writing this paper, show in their titles, the type of contents disseminated, aligned with the pseudotherapeutical discourse we have been talking about and promote in the Spanish radio, and with complete impunity, practices that have been cataloged as pseudotherapies by Spain’s Medical College Organization (OMC, 2016), such as acupuncture or NLP,

and some other more ludicrous such as dental decoding or Vedic chants, among the techniques related to different ways of coaching and promises of happiness, so typical of the psychotherapeutic culture we have been complaining about and with null scientific and therapeutic validity:

- Vedic chants and Christmas family meetings
- Educate to love life
- Acupuncture and family relationships
- To be happy at work
- Looking for happiness with Elsa Punset
- Joe Dispenza
- "Beyond matter", by Félix Torán
- Awareness gymnastics and how to manage fears
- Financial intelligence and body therapy
- Enneagram and techniques to talk and listen better
- Nutritional coaching and communication
- Ikigai method and *Pallapupas*
- Christian Beyer and dental decoding
- Therapeutical sounds and family coaching
- The emotional brain and the art of educating with love
- *Hospital de Tarrasa* and Demián Bucay

Contents selected for analysis correspond to the following programs broadcast in Radio5:

- *Hospital de Tarrasa* and Demián Bucay. September 10, 2017.
- Ikigai method and *Pallapupas*. October 8, 2017.
- Enneagram and techniques to talk and listen better. October 22, 2017.

The analysis is performed from the perspective of linguistic pragmatics and speech act theory suggested by Austin (1962) and completed by Searle (1969) who distinguishes between the following statements: *representatives* (engage the speaker with the veracity of the expressed proposition); *directives* (attempt to intervene in the listener's behavior); *Commissives* (engage the speaker in performing a future action); *expressives* (express a psychological status that is specified in the condition of honesty); and *declarations* (cause immediate changes in the institutional situation). In this sense, the statements present in events analyzed are framed in what we could call 'representative and commissive speech acts', in the sense that they enunciate and consider valid a preexisting truth and influence in the future consequences of stated acts.

From this theoretical perspective, using the 'Frame Analysis' methodology (Goffman, 1974) and understanding that the 'framing process' "essentially involves selection and salience" (Entman, 1993: 52), we elaborated a keywords map, slangs and symbols within interpretative frames, or 'frame devices', and of reasoning, or 'reasoning devices' (Gamson & Modigliani, 1989), to determine the type of interpretation promoted among listeners in the program *Complementarios* and confirm the level

of compliance of our starting hypothesis (H1), that is, the unprofessional and irresponsible treatment of contents due to their null scientific validity.

### 3. Results

The radio program *Complementarios* has been broadcast by Radio 5 since September 10, 2017 and is transmitted every Sunday from 10:35 to 11 in the morning in the Spanish public chain. As stated in the presentation of said program: “*Complementarios* is a new proposal of Radio 5 with which we aim to provide ideas to live better. With less stress. More serenity. More sense. Therefore, we introduce professionals of techniques such as meditation, mindfulness, yoga, acupuncture, coaching or NLP, among many others.” [1]

And week after week, hosts and also, directors of the program, Luisa Segura Albert, Soraya Rodríguez Contreras and Cristina Serrat, talk about a therapy of pseudoscientific nature, highlighting from the start of the first episode that “they are tools that in no case aim to replace nor contradict medicine nor science, but instead, in their case, to complement them.” All of them are Journalism graduates and, moreover, both Soraya Rodríguez and Cristina Serrat have educated in *Instituto Gestalt de Barcelona* on pseudoscientific specialties such as *Neurolinguistic Programming (PNL)*, *Coaching Wingwawe* and *Ericksonian Hypnosis*, among other ‘academic degrees’ [2].

#### 3.1. Setting strategy and participation of experts

Usual collaborators and experts invited to the program show a discursive positioning grounded clearly in the systematic attempt of legitimating these kinds of treatments called ‘alternative’ or as the title of the program says, ‘Complementary’. The argumentative model is based on the scientific contributions of professionals and experts with a certain prestige due to their position or their activity who, additionally, dedicate to promote the most diverse pseudotherapies which are sometimes, illustrated with testimonies, like in the case of the doctor of *Hospital de Tarrasa* and her patient treated with nutritional coaching and energetic medicine [3]:

CRISTINA ABADÍA	Doctor of the integrative medical unit of <i>Hospital de Tarrasa</i> .	Complementary and alternative therapies do not heal; they simply improve the patient’s quality of life. Even though she admits they are NOT science, she wants to demonstrate these therapies functioning with scientific procedures.
MARIONA TAPIONA	Patient of the integrative medicine unit of <i>Hospital de Tarrasa</i> .	The complementary and alternative therapies she has undergone (energetic medicine and nutritional coaching) have been helpful in eliminating chemotherapies’ maladies. She recommends these therapies to other individuals with her same situation.

Source: authors’ own creation

In the same program there intervenes the director and press responsible of TEDx talks Barcelona that doesn't do anything different than promoting his event with the argument of the subsequent snack (the discursive device and marketing strategies of TEDTalks, as well as its scientific/ educative validity, can be reviewed, López-Cantos, 2018). Finally, an interview to Demián Bucay is included in the program, Argentinean psychiatrist, son of the renown Jorge that, as couldn't be any other way, continues his simplistic discourse of motivational character with null pedagogic validity:

Demián Bucay	Psychiatrist (Argentinean)	To educate entails generating autonomy, not enforcing rules. Therefore, motivation is necessary as key element to education.
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Source: authors' own creation

In another one of the programs analyzed there is information provided about a fashionable method, *Ikigai* [4], which of course! comes from the East, and this is the way an author introduces himself with his book talking about a philosophical pastiche that will convey ancestral wisdom to occidentals so that we can live happier and longer lives.

Francesc Miralles	Journalist and specialist in psychology. Coauthor of the book <i>The Ikigai Method</i>	The inhabitants of the Japanese region where the Ikigai method comes from, have a longer life due to their life habits based on happiness, friendship and motivation towards living.
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Source: authors' own creation

This program continues with another pseudotherapy of more prestige, 'laughter therapy', perfect candidate to TEDx [5] and in line with this pandemic of positive psychology based on aforementioned works of Seligman and is ending up consolidating its academic institutionalization as a teaching of dubious scientific quality in some of our universities and colonizing mediatic discourses:

Angie Rosales	Founder of <i>Pallapupas</i> and participant in TEDxBarcelona [6] talks	Laughter offers benefits for the brain, making it possible even to laugh under complicated situations.  Death as human and natural fact.
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Source: authors' own creation

The third program analyzed is almost completely dedicated to one of the craziest fashionable pseudotherapies, the enneagram [7] with the expert contribution of whom defines himself as 'therapist', continuing with another contribution of one of the latest alternative techniques its promoters are trying to implement, and they are doing so quite successfully for their pockets, in different areas that include from the business sector, to educational and family.

Javier Muro	Therapist specialist in Enneagram	Enneagram is helpful in knowing ourselves better and improve by being aware of those characters we lack of.
Sonia Ferrer	Expert in Family coaching	Knowing how to communicate kindly with our closest relatives and listening to them will make us happier.

Source: authors' own creation

### 3.2. Promoted interpretative and reasoning frames.

To determine the interpretative frames offered to listeners of the program *Complementarios* we have examined and identified, using the deductive analysis method suggested by Entman, "the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information and sentences that provide thematically reinforcing clusters of facts or judgments" (Entman, 1993: 52). Afterwards, we grouped the terms using interpretative categories of 'frame devices' in Gamson and Modigliani's terminology "that condense information and offer a 'media package' of an issue" (Gamson & Modigliani, 1989), and that we call (Fn) hereinafter.

In the program *Complementarios*, the discourse clearly promotes an interpretative frame, or 'frame-setting' using the words of De Vreese (2005:52), of complementary and alternative therapies as 'healing sciences' (F1):

- Mariona Tapiona: "After two sessions of energetic medicine, my maladies disappeared"
- M.D. Abadía: "We want to demonstrate its functioning using scientific procedures, to generate scientific evidence."
- Angie Rosales: "Laughing offers benefits for the brain. It is said that it reduces a lot of stress, releases endorphins, it predisposes you to a more positive attitude and stimulates sexuality. [...] There is a lot of bibliography that talks about the issue."

In isolated cases the healing effects of these pseudotherapies are limited, but refer to improvement in wellbeing and the promotion of moods of greater 'happiness' (F2).

- M.D. Abadía: "Complementary and alternative therapies do not heal; they simply improve the patient's quality of life."
- Program's hosts: "ACT are tools that in no case replace nor contradict medicine nor science, they are helpful for living better."
- Francesc Miralles: "Life habits based on happiness, friendship and motivation for living increase life expectancy."

The use of parables as rhetorical resource is usual, that is, stories with moralist objectives, with clear reminiscences of pseudo religious nature and associated to New Age proposals about discovering and inner reflection as solution to health or mood status:

- *A very special sanctuary* (tale): we people elaborate big lies out of nowhere due to the simple fact of imitating the neighbors' actions and not delving into the origins of the matter instead.
- *The scholars* (tale): one can say many things, but might not be what is showing off.
- M.D. Abadía: “We accompany in the suffering”, “We try they have a good disease”, “The disease is an invitation to reflect about our life model.”
- Mariona Tapiona: “I felt very well accompanied and pampered.”
- Francesc Miralles: “Ikigai is something that motivates you to wake up in the morning.”

In some cases, the metaphor resources are used, which are well known in the field of pseudotherapies, and pseudosciences in general, and they provide a specific structuring interpretative frame, as defined by Lakoff and Johnson (1980), like in this example where the light is associated with intelligence and with improvements in the general status of the being:

- Javier Muro: “Enneagram is a method for individuals who want to enlighten”, “It helps us to develop superior states of the being, essence and enlightenment.”

Also, often guests exemplify with their own experiences the benefits of the therapies they are about to introduce, which does not indicate further validity beyond the personal testimony of supposed authority attributed to anyone, being expert or not, just out of the mere fact of being the protagonist of a program in media (Armentia, 2002):

- Mariona Tapiona, for instance, explains how, after two sessions of energetic medicine, she no longer has the maladies of chemotherapy. She talks about her positive experience stating that she felt very well accompanied, pampered and her quality of life improved.

The detailed analysis of significant terms show that the interpretative frames are conditioned by the ‘subjectivation of the being’ (F3) both of ‘symptoms of his or her illness’ as well as the ‘way of improvement’, following an argumentative strategy that, as we said, implements in speech acts of representative and commissive nature, using terms like “nausea”, “lack of appetite” “maladies”, “anxiety”, “depression”, “fatigue”, “death”, “illness”, etc. and providing as solution and result to said diagnosis “effectiveness”, “essence”, “therapy”, “happiness”, “friendship” and “motivation.”

Sometimes benefits obtained aim to a scientific basis, although this is unknown and not recognized by any scientific community’s research whatsoever, or that are simply indicated as remedies for all ills based on the mere belief that they work or on that false authority mentioned by those who say they work.

- M.D. Cristina Abadía: “100% of patients have reduced anxiety, depression, nausea, fatigue and have increased their appetite.”
- Angie Rosales: “laughing has several benefits for the brain. It is said that it reduces stress a lot, releases endorphins, predisposes to a more positive attitude and stimulates sexuality... There is a lot of bibliography that talks about the issue.”
- Demián Bucay: (and after having doubts and stuttering when it comes to defend his education theory with proof) includes in his discourse statements such as “I think it works.”

- Francesc Miralles: at the same time the Ikigai wisdom is promoted due to its ancestral origin, he mentions statements such as “the horoscope can be good if done deeply, like the enneagram.”

### 3.3. Communicative device and discursive rhetoric

Regarding the communicative device of sound, the program *Complementarios* usually uses parables, as we said and always ends with the reading of a tale of orientalist nature by Cristina Serrat. These stories are always accompanied by background sound effects (flowing water and gongs), with the evident objective that those communicate resources invite to submerge in that orientalist atmosphere that supposedly promotes meditation and reflection and that, for that purpose, still extend more than a minute and a half after the story ended. Likewise, Cristina Serrat’s voice, with a soft and paused tone, tries to captivate the listener and immerse him or her into the tale.

One of the tales told, for instance is a ‘*Very special sanctuary*’, belonging to the *Nasreddin* stories, a character of the Sufi tradition which tales are helpful for illustrating teachings from that religious doctrine [8], and this rhetorical strategy based on parables is also repeated in the story of ‘*The scholars*’. Paradoxically, the teachings of these tales could result into a tough critic to the contents of the program since they invite the radio listener to investigate on his or her own about the issue and to mistrust everything that is not well known. However, the rhetorical device works, instead of destined to the promotion of a sceptic and critical attitude towards knowledge in general, characteristic of the philosophical tradition, it simply invites embracing the new alternative and complementary proposals promoted by the program. To do this, there is use of the rhetorical pirouette, and we can consider it close to the philosophical proposals of Feyerabem, destined to question all discourse as such and promote an individual and personalist critic, that is, an individual opinion as result of discoveries. And through this rhetorical operation the complete infringement of scientific validation of knowledge is promoted, such as data contrast, reproducibility, and the consensus of results and conclusions, thus equating the validity of pseudoscientific with scientific discourses.

### 4. Discussion and conclusions

In short and in synthesis, the results of our research allow us to conclude that the program *Complementarios* by Radio 5 aims to create an informational space and of social utility, however, it promotes pseudosciences instead, some of them considered quite dangerous and used “with the purpose of manipulating thought in movements of sectarian nature” such as Gestalt therapy (OMC, 2016), or without any therapeutical value [9].

With the purpose of providing “ideas to live better. With less stress. With more serenity. More sense”, pseudotherapies such as meditation, mindfulness, yoga, acupuncture, coaching or NLP, all these with null scientific rigor, are broadcast through the waves of *Radio Nacional de España - Radio 5*. Program contents are not analyzed nor contrasted critically in any case whatsoever and, quite on the contrary, attempt to justify the validity of presented therapies through the mere resource of experiences and statements, without any scientific basis, of collaborators and guests that keep coming to this indescribable program as it progresses.

Program hosts' academic education and their contrasted and excellent professional background, as well as the hard years of medicine education from the M.D. Abadía, don't seem to exempt, or even mitigate, the 'magic' appeal complementary and alternative therapies have in all kinds of individuals, even those whom are supposed to have a more than enough scientific education to treat this kind of pseudoknowledge with property and critically, as Michael Shermer (1997) states in his famous book *Why people believe weird things* [10]. One of the latest programs broadcast by *Complementarios* is dedicated to Bach Flowers [11], a pseudotherapy grounded on chemical principles that cannot be other than laughable for any high school student of our country.

The rest of individuals that take part in analyzed programs are satisfied patients or having also specific training as experts in different techniques and pseudoscientific approaches. It is quite concerning that in public radio, hosts promote a presumably journalistic discourse that, violating good professional practices, is elaborated from the only perspective of the studies they have done in *Instituto Gestalt de Barcelona*, and which members are usual program guests [12], despite Gestalt therapy is considered a psychotherapy "widely used with purposes of manipulating thought in sectarian risk movements" (OMC, 2016), the rest of educational programs in pseudotherapies taught by said and similar centers distributed in the country do not have any scientific validity [13].

Regarding the interpretative frame on which the discursive device unfolds, we have identified three essential frames that present pseudotherapies as healing sciences (F1), helpful to improve wellbeing and happiness (F2) and are applicable through the subjectivation of the being (F3) as an individual needing treatment and from symptoms identification, so to promote the therapeutical benefits of pseudosciences presented.

From the communicative perspective, the rhetorical discourse the program *Complementarios* shows, use sound resources that collaborate in elaborating a sound story of orientalist cut that ends with parables which moral aim is teaching audiences that it is adequate to determine the validity of discourse, despite its kind, but specially the discourse pretending to resemble the scientific discourse and which we call pseudoscientific, through personal experience and the mere individual research, thus omitting the most basic premises accepted by the scientific community for the validation of knowledge and, by extension, pretending that the knowledge generated with rigor and industriously by the researchers' community is as valid as the fancies and opinions of any of the guests invited to the program and the techniques they present.

In conclusion, just as shown by our analysis results, the starting hypothesis (H1) with which we approached this research is fulfilled and demonstrate that the public radio chain aims to promote an informational space and of social utility but, instead of that, the discursive device and public resources are at the disposal of pseudoscience and the only thing the public chain does is to contribute, in a completely irresponsible manner, with the diffusion of pseudoscientific contents that, in some cases, might even be dangerous.

The conclusions of our research coincide with the critics to the model of society and the prevailing therapeutical culture (Illouz, 2008) and it was already made evident in other previous researches about it (Elías, 2013; Alonso-Marcos & Cortiñas-Rovira, 2014; Cano-Orón, 2016; López-Cantos, 2017) which, similarly, show the communicative strategies with which the so-called complementary

therapies and pseudoscientific discourses occupy the public space pretending to be useful and scientifically valid. However, they are contents that can become rather toxic and a problem for public health and, given the case they have a space on media, especially public media, at least they should be treated from a much more critical and scientifically responsible perspective.

## 5. Notes

[1] <http://www.rtve.es/alcarta/audios/complementarios/>

[2] For further detail please check <https://www.linkedin.com/in/soraya-rodriiguez-contreras-17042226/> and <https://es.linkedin.com/in/cristina-serrat-400b451b>

[3] The identification of new pseudotherapies is a difficult task for the researcher considering the fast pace with which new terms are created, thus multiplying the different names with which practices without any scientific validity are promoted. The Association for Protecting the Patient against Pseudoscientific Therapies-APETP gathers a list that is being updated regularly, <http://www.apetp.com/index.php/lista-de-terapias-pseudocientificas/>

[4] The Ikigai method is the latest fashion coming from Japan regarding miraculous recipes to obtain happiness. For further details about its 'magic formula' please check <https://isabelsierra.es/2017/11/05/ikigai-la-filosofia-vida-los-japoneses-llegan-los-100-anos/>

[5] The TEDx talks are the local version of the popular *TEDTalks* and organized through a network of franchise holders and, even though they follow the guidelines set forth by the TED organization, they sometimes tend to present topics and lecturers of dubious credibility, check for instance <http://www.lr21.com.uy/tecnologia/1348309-homeopatia-pseudociencia-tedx-rio-de-la-plata-ciencia>

[6] TEDx talk of Angie Rosales can be checked on [https://youtu.be/JOvMr\\_OxtjA](https://youtu.be/JOvMr_OxtjA)

[7] The *enneagram* is a classification system of the human personality into 9 different types or "enneatypes" that establish predefined relationships of rejection or affinity among them, something we have already known from astrology, and that of course doesn't have any scientific validity as evidenced from analyses carried out in the core of GRECC-Research Group on Scientific Communication of Universitat Pompeu Fabra, <http://infopseudociencia.es/eneagrama-de-la-personalidad/>

[8] Sufism is an ascetic and mystic religious doctrine of Islamism, that defines itself as heterodoxic and pantheist and attempts to connect with Allah through inner actions instead of rituals and traditions.

[9] Among other pseudotherapies considered dangerous there are biodecoding or germanic medicine. Their features can be consulted in the catalog of therapies of the mind and body elaborated by the

Medical College Organization of Spain (OMC) and available in <http://www.cgcom.es/técnicas-de-la-mente-y-el-cuerpo>

[10] The TED talk can be checked on <https://www.youtube.com/watch?v=44aK0n4MiF8>, and also this brief post of the blog *Naukas*, from which a laudable work of quality scientific diffusion is carried and quite advisable by the way, <http://naukas.com/2011/01/26/1996/>

[11] Bach Flowers, as mentioned by the pseudosciences catalogue made by GRECC, is the "name that receive a set of 38 non pharmacological handmade preparations, elaborated from wild or naturalized diverse vegetal species of the Wales region and the adjacent England, diluted in brandy (distilled from wine, used as preservative) destined to alleviate psycho-emotional and character imbalances (such as fear, impatience, anguish, uncertainty, rage, confusion, shyness, among others). The principles of preparation of these remedies are similar to those of homeopathy, although its preparation is based on lower dilutions. Studies demonstrated the absence of active principles from plants used and, hence, their capacity of producing effects is rather null. On the other hand, these preparations have a significant proportion of alcohol, which is used as preservative and may contribute to a certain placebo effect.", <http://infopseudociencia.es/flores-de-bach/>

[12] For instance, in the program of October 22, Javier Muro participates or on November 26, there is Fuensanta García, both now members of what they have called *Instituto Javier Muro* from which they develop their activity as trainers, coaches and therapists and promote pseudotherapies such as the enneagram mentioned before <https://www.linkedin.com/in/fuensantagarcia>

[13] In favor of good journalistic practices and the promotion of a public quality service, it would be desirable that in programs scientists could be invited so that they can provide another perspective, and there are many, for instance regarding this paper's issue the work made by Eparquio Delgado can be reviewed, <http://www.eparquiodelgado.com/> as well as José Miguel Mulet's, <http://jmmulet.naukas.com/>

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