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Synthesis of the HOMEOCSS Project – the influence of representations in a controversial debate about homeopathy

Introduction

The main objective of the HOMEOCSS project is to promote a dialogue between science and society, so that citizens can form an informed opinion on a scientific subject that is the subject of debate in our society, namely homeopathy. This research work is in line with the theory of the new sociology of science which emerged in the 1970s and argues that sociology has *“the right to take over the field of scientific knowledge and to challenge philosophy and epistemology’s monopoly on the analysis of scientific knowledge and scholarly knowledge”* (Bloor, 1976). This new field of sociology, studying communication and information between science and society, developed notably with the work of Callon and Latour (Callon & Latour, 1979). The HOMEOCSS project draws on the contributions of this scientific field to examine the controversy surrounding homeopathy. The researchers involved in this project establish a link between the representations of the actors in the controversy, the circulation of controversial knowledge produced and its appropriation, and the paradigmatic positioning of each individual in the face of this controversy.

Homeopathy has been and still is very controversial in the public sphere. Indeed, through its history, “homeopathy has always oscillated between contestation and integration. Homeopathy was discovered between the 18th and 19th centuries by a German physician Samuel Hahnemann. From the first half of the 19th century, the success of this non-conventional medicine was controversial and limited. Homeopathy developed throughout Europe and in France mainly in Paris and the major provincial cities [...]” (Faure, 2002). On the other hand, “Homeopathy is surrounded by mysticism and beliefs, which discredits it in the eyes of some and makes it a success with others. Indeed, homeopathy goes far beyond simple medical issues” (Bariety, 1970).

Homeopathy is based on the principle of similitude, stated by Hahnemann in 1810: “In order to cure in a gentle, prompt, certain and lasting manner, it is necessary to choose in each case of illness a medicine, which can of itself cause suffering similar to that which it is intended to cure” (Poitevin & Sarembaud, 2011). Following a specific and thorough examination, including a long interrogation as well as a clinical examination of his patient, the homeopathic doctor must theoretically identify the globality of the clinical picture to enable him to prescribe the appropriate homeopathic treatment or treatments. To avoid the toxicity of the products used, the second principle of homeopathy is the infinitesimal dilution and dynamisation of these medicines. These are prepared through a succession of dilutions/dynamisations of a given substance. However, the principle of dynamisation, which consists of a strong agitation of each new dilution and which would have the objective of conveying information, is questioned by the detractors of homeopathy who consider that it is without scientific basis. Furthermore, the term “medicine” seems to be questioned in this context by the detractors of homeopathy, in view of the absence of active substances. Hahnemann was accused by his peers (“profiteer”, “swindler”). The new therapy was accused of “many shocking contradictions” and “many palpable absurdities” and the report stated that “reason and experience are therefore united in rejecting such a system with all the forces of intelligence” (Bariety, 1970). The scandal of the water memory affair or Benveniste affair in the late 1980s and 1990s discredited the work of the immunologist Jacques Benveniste and his team at INSERM. In 2004, the Académie de Médecine once again condemned a “method devised 200 years ago, based on non-scientific foundations”. This affair, which began with the publication of a series of articles in the journal *Nature*, has made it possible to analyse the dynamics of the controversy process, ‘namely the succession of three phases of confinement, deconfinement and reconfinement of the debate’ (Ragouet, 2014).

The scientific controversy has continued in this context from 2009 to the present day involving different teams in favour of high dilutions, notably Professor Luc Montagnier and his collaborators (Montagnier et al., 2009; Henry et al., 2016), Nobel Prize winner for the discovery of HIV. However, other studies have pointed to the lack of effectiveness of homeopathy (Lauche et al., 2015; Hawke et al., 2018) and the Académie des Sciences has not considered the work of Luc Montagnier’s team to be scientifically valid. A number of doctors and scientists consider that the controversy no longer exists in the scientific sphere, while others believe that it remains relevant.

Since 2018, news in France have called into question the scientific nature of homeopathy, involving the Academies of Medicine and Pharmacy, the High Authority for Health and health professionals from various groups. Confrontations on the subject have been developing significantly on social networks (in particular Twitter) and in the media (newspapers, radio, television) since the beginning of 2019, notably through opposing collectives: “Fakemed” versus “a collective for the defence of homeopathy” grouping together associations of doctors, patients and industrialists

of homeopathic medicines. The “Fakemed” group wants to oppose a “conglomerate of unions and learned societies of homeopathy supported by the pharmaceutical laboratories”, and questions the scientific nature of homeopathy. They equate it at best with a placebo effect, based in particular on the latest Australian study compiling data in this sense (NHMRC, 2013) as well as on the report of the Scientific Council of the European Academies of Sciences (EASAC, 2017). The others want to defend the scientific integrity of homeopathy, believing that it must be studied within an appropriate frame of reference. They base their argument on the latest Swiss study (Bornhoft & Matthiessen, 2011) and on the EPI 3 study conducted from 2006 to 2010 (Grimaldi-Bensouda et al., 2016), for example.

It is in this context, in September 2018, that the HOMEOCSS project was born (HOMEopathy Object of Controversy in the Societal Sphere). Its objective is to look at the socio-scientific controversy surrounding homeopathy. To do this, a multidisciplinary team of researchers from the Information and Communication Sciences, Education Sciences, Neurosciences, Social Psychology and Pharmacy are embarking on the analysis.

Controversy can be defined as a communication situation with a triadic structure (Lemieux, 2007). Indeed, the controversy is a dispute between two parties, staged before an audience, a third party playing the role of judge. Both parties are given the same right to put forward their arguments to convince the public of the truth of their thesis. Controversy has its roots far from the general public, as controversy is originally a debate of ideas between two opposing parties with peer status. But sometimes, the scientific controversy sees its audience widen to a public of laymen, of non-experts, passing from the status of scientific controversy to that of societal controversy. Thus, in the case of homeopathy, two arenas are at the heart of the controversy, the academic and media arenas.

The analysis of the controversy surrounding homeopathy makes it possible to distinguish the role of the different actors in society involved in this debate, which is both scientific and societal. In order to encompass all of these actors, the HOMEOCSS project is composed of different objects of study (OBJ): the school public (high school students, college students), the media (traditional and digital), the medical profession, scientists and the general public. How do these different actors participate in the controversy? What are the reasons and motivations that push these individuals to be more or less in favour or against homeopathy? Through HOMEOCSS, we sought to understand the representations associated with homeopathy, we wanted to grasp the positions of each individual and identify the factors of influence. Social representations, defined as “*an organised and structured set of information, beliefs, opinions and attitudes*” (Abric, 2001), help to understand what guides each person towards a choice in favour or against an object. They also make it possible to define the ‘central role of communication in the emergence, deployment and stabilisation of controversies’ (Badouart & Mabi, 2015). This analysis of representations is based on the sciences of education and the sciences of information and communication,

which come together to define an individual's social representations as the product of three components: values, practices and the knowledge/knowledge that structures them (Moscovici, 2013; Clément, 2006).

The HOMEOCSS project started in September 2018 and ended in January 2022. The first year was dedicated to the development of the methodology and the first data collection. During the second year, the researchers finalised this data collection and started the first phase of analysis, which was completed in the third year of the project. Finally, in the year 2021–2022, a conceptual mapping of the controversy was developed. Mapping a controversy, as the authors of the European MACOSPOL project initiated by Bruno Latour (MACOSPOL, 2009) explain, 'is *not to look at it in an ideal of perfect objectivity but to adapt a second-order objectivity, i.e. to present all the positions [...]*'. This mapping of the controversy surrounding homeopathy can be seen at the following address: <https://view.genial.ly/613f4a04ce4d4f0d78ec350f>

Methodology

The various actors in the homeopathy controversy studied were grouped into study objects. Below are the six objects of study that were finally selected and whose methodological details can be found in the collective work entitled "Homeopathy in question" (Di Scala, 2020a):

- The object of study 1 (OBJ1) corresponds to the school and university sphere. Several members of the HOMEOCSS project have divided their efforts to study the representations of homeopathy among secondary school students (Sandrine Esquirol-Paquerot and Robert Andres) as well as among several student groups, distinguished by their level of study and especially by their field of study. Dalila Kessouar and Emmanuella Di Scala, on the one hand, compared students in Medicine, Psychology and Life Sciences. Narjiss Mekaoui El Idrissi, Marie-Stéphanie Abouna and Pascal Bourgeois, on the other hand, focused on STAPS (Sciences and Techniques of Physical and Sports Activities) students. A single questionnaire was used to collect the representations of homeopathy among these different audiences, making it possible to compare the results obtained between the different levels and courses.
- Study object 3 (OBJ3) corresponds to the media sphere. Guy Lévêque was interested in the treatment of homeopathy in several press media with very different editorial lines: a generalist daily newspaper – *Le Monde*, a monthly popular science magazine – *Sciences et Vie*, and a monthly magazine categorised as "women's press" – *Top Santé*. To complete this study, Sophie Demonceaux analysed the digital, online version of *Top Santé*. In addition, she looked at the controversy surrounding homeopathy on the Internet and more particularly on *Twitter* and on the discussion forum of the *Doctissimo* website, which specialises in health information. In the case of the written press, the research consisted of counting and analysing the articles published on the subject of

homeopathy, their symmetrical or dissymmetrical orientation, diachronically, over a more or less long period and more particularly during certain years when a particular event re-launched the attention paid to homeopathy. In particular, in 2018, the doctors of the Fakemed collective launched an article in *Le Figaro* against the reimbursement of homeopathy. On the internet, research has focused more on the conflicting relations between pro-homeopathy and anti-homeopathy, on their rhetoric and their communication strategies.

- Study object 5 (OBJ5) corresponds to the academic sphere. Emmanuella Di Scala studied the representation of homeopathy among researchers involved in scientific research, with various profiles, some of whom are or have been involved in research on homeopathy, others who have never worked on homeopathy and have research subjects in the field of biology/health or medicine. For the collection of data, the life story was favoured in order to collect the representation of homeopathy among these researchers in as much detail as possible.
- Study object 6 (OBJ6) corresponds to the medical sphere. Two members of the HOMEOCSS project studied the representations of homeopathy among pharmacists on the one hand (Prisca Bouillé) and among doctors on the other (Sébastien Malpel). The doctors who took part in the study again had very varied profiles: some were homeopaths, others were not, they were generalists or specialists, practising in a practice or in hospital. The pharmacists had probably more similar profiles, most of them were dispensing pharmacists and all of them, whatever their opinion of homeopathy, sold it in their pharmacy. In both cases, a mixed-method approach was used: a similar questionnaire was developed and distributed via the internet, and the data collection was completed by semi-structured interviews.
- Study objects 2 and 7 (OBJ2/OBJ7) correspond to the general public. Mohamed Djouani sought to collect the representations of homeopathy among patients with the most varied profiles possible. To do this, he drew up a questionnaire which he distributed on the Internet in several ways. In particular, he contacted an association of patients in favour of homeopathy (OBJ2), and he also received responses from numerous people mobilised against homeopathy, who were members or sympathisers of the Fakemed collective. In addition to these two distinct groups from opposing collectives, there were responses from patients with more heterogeneous profiles (OBJ7).

Study object 4, not mentioned above, corresponds to the involvement of field actors in the form of participatory research so that both pro- and anti-homeopathy actors can take part in the research by giving their opinions and positions. This was achieved by involving researchers in favour and against homeopathy in the construction of the theoretical framework on the controversial notion of homeopathy (Di Scala, 2020a), or by asking each stakeholder to give their opinion on the proposals for improving science-society communication (Di Scala, 2020b).

Apart from the media study, which used its own methodological approach, focusing on the thematic and lexical analysis of the corpus, the other studies used a rather similar analysis methodology, based partly on the use of the free software IRaMuteq-R (version 0.7 alpha 2). This tool most often allowed the analysis of the representations by means of a similarity analysis (ADS), which makes it possible to highlight the central core of a representation, as well as the peripheral elements that complete this representation. To this was sometimes added a factorial correspondence analysis (FCA), which allowed a better understanding of the roots of the representation and the main factors that oppose the groups studied. Other statistical tools were sometimes used in addition, such as Chi2 tests, correlation tests or principal component analyses (PCA) to try to identify factors linked to a certain position with regard to homeopathy. In addition, the analysis of representations was often illustrated by conceptual maps, which make it possible to identify a logical structure in the corpus (responses to questionnaires or interviews).

Summary of results

The following results emerged from the analyses of each of the identified study objects:

School audience (OBJ1)

Analysis of the representations of secondary school pupils (Esquirol-Paquerot et al., in submission), via a questionnaire, has made it possible to identify that homeopathy is defined by its descriptive aspect: a marble used to treat. A number of students do not really know what homeopathy is, although it appears that girls look for more information about it than boys. Care and the medical aspect emerge from this representation in its normative dimension, without the associated notions of proper action *versus* placebo effect being known and identified at this age.

The analysis of the representations of high school students (Esquirol-Paquerot et al., in submission), via the same questionnaire, made it possible to identify that homeopathy is also defined by its descriptive and functional aspects: effectiveness based on the use of plants, or no effectiveness. Students who believe that there is an efficacy associate homeopathy with herbal medicine. As in secondary school, it appears that girls seek more information on this subject than boys. Furthermore, the analysis shows that homeopathy is evaluated either as an alternative medicine for those who believe it is effective, or as a placebo for those who believe it is not effective. The notion of placebo effect is not particularly formulated by the high school students, who are probably not familiar with it. The term alternative medicine is still associated with herbal medicine.

The analysis of the representations of students of life and earth sciences, medicine, psychology (Kessouar & Di Scala, 2020), and sport (Mekaoui et al., in submission), through the same questionnaire, allowed us to identify that the concept of homeopathy is defined by its descriptive and functional aspects: either homeopathy

possesses an efficacy based on the use of herbs or diluted substances, or it does not possess any efficacy. On the other hand, the analysis shows that homeopathy is evaluated as being either a placebo acting through the placebo effect (for those who do not see efficacy) or as a medicine without side effects acting through its own action (for those who see efficacy). Nevertheless, a distinction is observed according to the study pathway:

- Medical students either see homeopathy as effective and based on a dilution of active substances, or they do not see it as effective. Homeopathy is not the same as phytotherapy.
- Students of life and earth sciences either see homeopathy as effective and based on a dilution of active substances or as phytotherapy, or they do not see it as effective.
- Students of psychology either see homeopathy as effective and based on an essentially herbal action, thus being assimilated to phytotherapy, or they do not see it as effective. Very few mention a lack of effectiveness.
- Sports students see homeopathy as effective and based on an essentially herbal action, thus often being equated with herbal medicine. None will mention a lack of effectiveness.

Media sphere (OBJ3)

With regard to the press media (Lévêque & Demonceaux, in submission), this is an inventory of what three media say: a daily newspaper *Le Monde*, a monthly popular science magazine for the general public *Science et Vie*, and a monthly women's health magazine *Top Santé*. This study is an inventory and not a comparison of the history of the delisting of homeopathic granules (analysis of articles for the period 2018 and 2019). The magazine *Le Monde* seems to react in the immediacy on medicine, science and health economics. Symmetrical information can be observed. The magazine *Science et Vie* presents scientific/chemical information without complacency with regard to very/overly diluted active products, tempered by a societal openness of free choice. Readers can choose their type of medicine with full knowledge of the facts. *Top Santé* magazine offers its readers a wide range of information on conventional and non-conventional medicine to help them make the right choice to stay healthy. These press media present symmetrical, non-militant arguments that inform on the scientific, medical, societal and economic levels.

The majority of Internet health users visiting the Doctissimo "Homeopathy" forum are individuals in favour of homeopathy in search of help and practical advice (Demonceaux, 2022). However, an analysis of the posts on this forum has shown that anti-homeopaths regularly make inroads. The exchanges are more like a fight than a debate. A dialogue of the deaf is established between pro-homeopathy people who base their arguments on personal experience, testimonies and beliefs, and opponents of homeopathy who are in line with a scientific standard based on evidence, scientific authority and institutional expertise.

Scientists (OBJ5)

The interviews with scientists showed opposition on the description and functional explanation of homeopathy (Di Scala, 2020b). Some scientists explain its functioning solely by a placebo effect. In this case, either the researchers do not see the value of its use, or for others, they see the value of using a placebo. On the other hand, some other scientists see a own action in homeopathy, or a probable own action, or an own action that cannot be ruled out, not excluding a possible action by the placebo effect either.

The life stories also showed the existence of an opposition between a value of a medicine without side effects that takes better account of the individual and a scientific pharmacological norm. It appeared that if the scientist points to the scientific pharmacological norm as the structuring element of his representation (action by active molecules present only), he will assimilate homeopathy to a placebo and will see its functioning through a placebo effect only. In this case, however, there will be some scientists who see an interest in using a placebo and others who do not. If the scientist points to the value of a medicine without side effects that takes better account of the individual as a structuring element of its representation, he will see the functioning of homeopathy by its own action, whether certain, probable or not excluded (not excluding in this case the action by placebo effect).

Medical profession (OBJ6)

Among the doctors and pharmacists studied, three distinct profiles could be identified (Bouillé, 2020; Bouillé & Malpel, in submission; Malpel, in submission):

- Practitioners who are convinced of the effectiveness of homeopathy and who use it frequently.
- Practitioners who are not convinced of its own efficacy, but who are in favour of its use and who occasionally use it for its placebo effect.
- Practitioners who consider homeopathy a deception and do not use it, even for its placebo effect.

General public (OBJ2/OBJ7)

The analysis of the representations of the general public (Djouani, in submission), via a questionnaire, has made it possible to identify that homeopathy is defined by its descriptive and functional aspects: either homeopathy has an efficacy based on the use of plants or diluted substances, or it has no efficacy. Nevertheless, a distinction is observed according to the audience studied:

- The public defined as opposed to homeopathy sees it as ineffective, likening it to sugar.
- The public from associations in favour of homeopathy sees it as effective and based on a dilution of active substances.

- The intermediate public without a declared tendency sees homeopathy as effective and based on an action through plants essentially, thus assimilating it to phytotherapy.

On the other hand, the analysis shows that homeopathy is evaluated either as a placebo acting by placebo effect or not acting at all, or is evaluated as a medicine without side effects taking better account of the individual:

- The public defined as opposed to homeopathy evaluates the latter as a placebo acting by placebo effect, whose interest in use is nil or low to moderate.
- The public from associations in favour of homeopathy evaluate it as a medicine without side effects, taking better account of the individual.
- The intermediate public, without any declared tendency, evaluates homeopathy as a medicine without side effects, taking better account of the individual, through herbal treatments.

Discussion

In the light of these data from the different audiences studied, a synthetic conceptual map (Figure 1) is proposed to better understand the positioning of each.

In each case, it appears that the representation of the different audiences is centred either on an assimilation of homeopathy to a medicine, or on an assimilation of homeopathy to a placebo (which is not considered as a medicine). Each person will then see either a proper efficacy, concerning the subjects assimilating it to a medicine, or an absence of proper efficacy, concerning the subjects assimilating it to a placebo (who may then consider that there is a placebo effect or not).

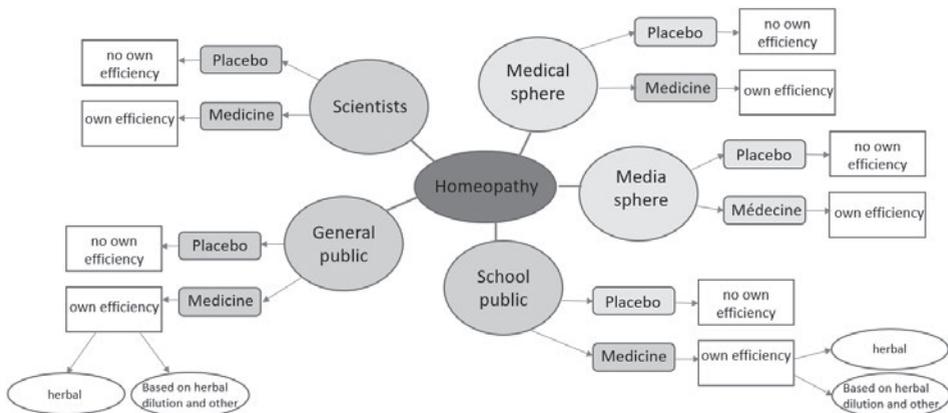


Figure 1. Conceptual map of the representations of the different audiences studied on the subject of homeopathy: scientists, the medical profession, the media, the school public and the general public

Work on the representations of OBJ scientists 5 (Di Scala, 2020b) has shown that these divergences stem from a different sociological anchoring between the subjects: modern *versus* postmodern. The modern sociological anchorage is defined as a representation with the benefit/risk balance as its centre of gravity. The post-modern sociological anchorage is defined as a representation whose centre of gravity is the limits of science as a structuring element. It also emerged from the analysis that the post-modern anchor is coupled with a value of “medicine without side effects that takes better account of the individual”, whereas the modern anchor is coupled with the scientific and pharmacological norm.

The study of the representations of the various other audiences did not allow for the analysis of a sociological anchoring. However, the same distinctions (Figure 1) within the representations appeared. It could therefore be proposed that this sociological anchoring could also condition the positioning of other types of public. In order to confirm this, it would be necessary to undertake additional studies on this subject. If this hypothesis proves to be true, we could propose a synthetic explanatory diagram including the anchoring to the representations of the different audiences, which can be found in figure 2. This diagram would thus show that for each audience studied, the opposition within the debates on homeopathy would originate in the sociological anchoring which structures the representation and thus conditions its centre of gravity: norm *versus* values of a medicine without side effects. These centres of gravity would then condition the subject’s positioning with regard to his functional and descriptive evaluation of homeopathy: no efficacy of its own (but possibly by placebo effect) *versus* efficacy of its own (certain, probable or not excluded).

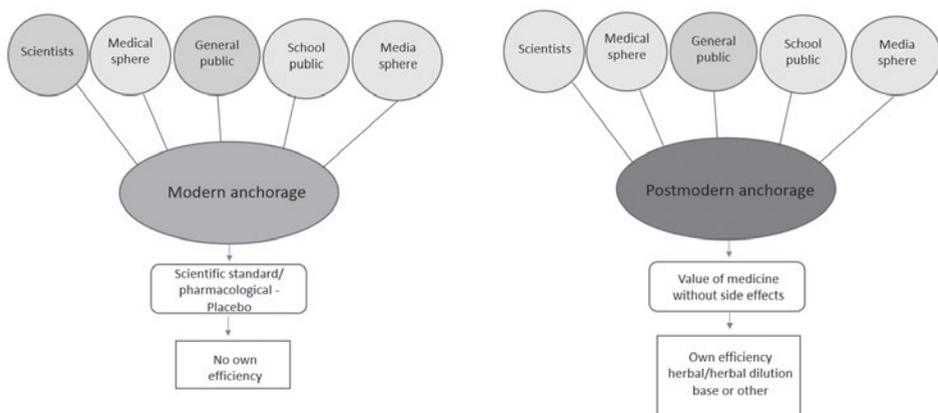


Figure 2. Hypothetical synthesis diagram including the sociological anchoring to the representations of the different societal actors studied: scientists, medical profession, media sphere, school public and general public

Conclusion

This analysis also shows how important it is to make pupils aware, from a very early age, of the existence of representations that differ from their own, of the reasons why each person takes a different position, and of the need to respect these, in order to limit the difficulties that can be encountered in controversial debates. The challenge is not to change their representation but to understand that of others, and to understand why it can sometimes be very difficult or even impossible to change an individual's representation. This awareness is also found in the French EMC (Moral and Civic Education) school programmes. In this respect, the HOMEOCSS project has developed digital resources for students from secondary school to university in order to raise their awareness of the representations that oppose the subject of homeopathy (appendix 1).

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Appendix 1

- Digital resource for secondary schools, Sandrine Esquirol-Paquerot and Robert Andres: <https://view.genial.ly/5f80c6ab9d6d260d614bc4a8/vertical-infographic-timeline-projet-homeocss-controverse-de-lhomeopathie-niveau-college>
- High school digital resource, Robert Andres and Sandrine Esquirol-Paquerot: <https://view.genial.ly/5fa5471c9bff5f0cee6ce3eb/presentation-lhomeopathie-en-question>
- Digital resource for high school and university level, Emmanuella Di Scala: <https://view.genial.ly/5fa83c9f9bff5f0cee6d1c27>
- University level digital resource, Mohamed Djouani: <https://view.genial.ly/5fc370b-345f1430d9d71dae4/interactive-content-lhomeopathie-objet-de-controverses>

Synthesis of the HOMEOCSS Project – the influence of representations in a controversial debate about homeopathy

Abstract

The HOMEOCSS project was born in 2018 (HOMEopathy Object of Controversy in the Societal Sphere) and ended in January 2022. Its main objective is to promote dialogue between Science and Society, so that citizens can form an informed opinion on a scientific subject that is debated in our society, namely homeopathy. The analysis of the controversy around homeopathy makes it possible to distinguish the role of the various actors of society involved in this debate and to define their representations of it: what are the reasons which push these individuals to orient themselves in favor or in against homeopathy? The project is therefore made up of different objects of study (OBJ): the school public (middle school students, high school students, students), the media (traditional and digital), the medical profession, scientists and the general public.

It appears that the representation of the different audiences is centered either on an assimilation of homeopathy to medicine, or on an assimilation of homeopathy to a placebo (which is not considered to be medicine). Everyone will then see either a specific efficacy, concerning the subjects assimilating it to a medicine, or a lack of specific efficacy, concerning the subjects assimilating it to a placebo (being able to then consider that there is a placebo effect or not). Work on the representations of scientists has shown that these divergences come from a different sociological anchoring between the subjects: modern versus postmodern. It could be proposed that this sociological anchoring could also condition the positions of other types of audiences.

This analysis also shows the importance of making pupils aware from an early age of understanding the existence of representations different from their own, of the reasons which condition each person to position themselves differently, and of respect for these, in order to limit the difficulties that may be encountered in controversial debates.

Key words: homeopathy, controversy, representations

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