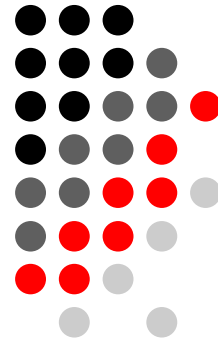




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Academic debates and the complexity of the hydroxychloroquine controversy

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Abstract

In the present pandemic context, all disciplines try to show that they can contribute to a better understanding of this unique situation. Sociology and STS are no exception but we think that for them to be perceived as credible they should take care not to replace symmetrical and impartial analysis of a complex landscape of actors and institutions with taking side for one actor in the debate. Such confusion can only discredit the discipline. We thus think it is important to comment on Laurent Mucchielli's recent 'academic' statements on the controversy in France over the use of hydroxychloroquine as they raise a number of questions for the practice of sociology and STS in times of societal crisis as well as methodological ones on the most appropriate manner to analyze scientific and public controversies. Focusing on « big pharma » as the only underlying cause of the opposition to Pr. Didier Raoult's protocol, Mucchielli's analysis does not describe the opposing camps in the controversy. It also neglects the technical content of the many arguments exchanged between the various protagonists in the international field of clinical medicine and provides a very simplistic analysis of the organization of biomedical research. More surprisingly, it promotes Raoult's particular treatment of the virus and ignores completely what STS studies have taught us about scientific and public controversies over the last forty years.

Keywords

Hydroxychloroquine; controversy; symmetry; gate keeping; academic literature

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Introduction

The COVID-19 pandemic, with its urgency and uncertainty, has propelled the issues of biomedical research into the public arena as never before. The public engagement of researchers from many disciplines has led to a deluge of publications aimed at informing action and commenting inaction, often erasing the usual distance between the scientific and the mediatic fields. More specifically, a central event in this sanitary crisis, on which much of the traditional as well as socio-numeric media have focused attention, has been the scientific controversy surrounding the use of hydroxychloroquine as a medical treatment against the SARS-COV2 virus, a kind of “miracle drug” promoted by Pr. Didier Raoult, particularly after President Donald Trump mentioned that he was himself taking that treatment.

In the present pandemic context where all disciplines try to show that they can contribute to a better understanding of this unique situation, it is certainly legitimate that the disciplines of sociology and STS, through their academic journals, want to show they can also shed light on the specifically sociological aspects of that multidimensional crisis (Pickersgill 2020). This is even more important when we note that the specialty of sociology of science and STS have developed, over the last forty years, many tools and concepts to analyze scientific controversies as well as the dynamics of biomedical research.

To reflect on the best manner in which our disciplines could contribute in a credible manner to shedding some light on the on-going scientific and public controversy surrounding hydroxychloroquine and his main proponent, Pr. Didier Raoult. we think it is useful to comment on the recent academic interventions of sociologist Laurent Mucchielli. We suggest that his case provides a clear example of what should not be done by sociologists who take seriously the accumulated knowledge in STS and want their analysis to be perceived as useful and credible and not simply as another personal opinion about the various actors of that controversy.

A specialist in deviance and crime – a field in which he regularly publishes articles in peer-reviewed journals as well as recognized books – Laurent Mucchielli plunged into the public arena during the health crisis to defend Pr. Didier Raoult's public positions and his treatment

based on hydroxychloroquine as an efficient drug against the SARS-COV-2 virus. He first expressed himself essentially on a blog (hosted by the online French media Mediapart) and one can of course consider that he was then acting as any citizen can do in democratic regimes. He was simply offering, as many others have done, what can be considered a spontaneous sociology of the controversy – in which Pr. Raoult was involved – on the mode of “David against Goliath”, the first being the “good” Pr. Raoult and the other the “bad Big Pharma”. However, from the personal blog, the sociologist moved on to the apparently scholarly publication by writing in the *Journal of Sociology*, an Australian academic journal published by the Sage publications group, an article devoted to the controversy over the efficiency of hydroxychloroquine. In doing so, he placed himself in principle on the academic terrain and could then be criticized in the name of the Mertonian norm of “organized skepticism”, which requires a critical evaluation of any sociological analysis to test its robustness and credibility.

In a nutshell, Mucchielli ‘explains’ the controversial reception of Didier Raoult’s promotion of hydroxychloroquine in France by denouncing the (bad) influence of the pharmaceutical industry on political decisions. In his view, this molecule has been unfairly criticized to the benefit of another one, remdesivir, allegedly more financially interesting for the powerful biomedical industry. To justify his position, he draws on various arguments: the effects of that industry’s funding on research, the hidden interests of the scientific board of researchers appointed by the French president, the shortcomings of Evidence Based Medicine (EBM) and the biases of the peer-review publication system.

By publishing both a critique of Mucchielli's paper and the Australian journal's reasons for refusing to publish it in their journal, we want to contribute to advancing our collective reflection on what should be a rigorous social science practice in time of societal crisis as well as reflecting on the responsibility of scholarly journals, which should encourage exchanges and not censor them in order to safeguard their reputation by refusing to admit that they may sometimes publish texts of dubious quality that can only harm the image of the discipline. For if their flaws are not commented upon, such papers may then be considered an accepted contribution to the discipline.

Saving the face of a journal: A new kind of “gate keeping”?

Given that we considered Mucchielli’s analysis of the controversy simplistic and limited to one simple explanation, namely that the drug industry was “behind the French controversy over the medical treatment of Covid-19”, we wrote a response to contribute to a better explanation by using the tools and methods that sociology of science and STS have developed over the last forty years to understand scientific controversies and which, for some unknown reasons, Mucchielli (as well as the editors of the Journal) did not find useful to take into account. After the online publication of Laurent Mucchielli's article (2020), we sent our response to the journal.

To our surprise, the editor in chief refused to publish it by arguing that “The journal does not publish short replies. In this case, the reply is to a short online commentary piece. To be considered for publication in the Journal it would need to be an article-length study and it would need to be of broader interest to our readership”. First, we find bizarre that the editor says that Mucchielli offers a “short on-line commentary”, while the first page of his on-line paper contains the word “article” at the top and is followed by an “Abstract” which begins with the words: “This article explores...”. The second curious point is that our response followed the usual rules of being a comment, thus shorter than the paper, though by not much as Mucchielli’s essay only covers nine pages of the journal. The third argument concerning the fact that our paper should be of “broader interest” to the readership of the journal, seems also bizarre given that they did publish a paper on the French controversy. How could the readers of Mucchielli’s paper not be interested in a critique of that very paper?

So, we decided to send a more developed version of our comment, broadening the argument about methodology and the cumulativeness of social sciences knowledge, suggesting that taking account of what the sociology of science and STS have contributed over the last forty years help provide a much more complex analysis of the controversy. We thought that such an analysis of the importance of methodological norms like symmetry, impartiality and soundness and their role in giving credibility to any serious analysis would certainly be of interest to sociologists even if their occasion is stimulated by a particular paper and event. This longer version was then about the same length as Mucchielli’s paper.

Instead of doing like most serious academic journals and publishing the critique after asking the criticized author to respond, the journal's editor again refused to examine that longer version on its merits arguing this time that the journal was mainly Australian and that our analysis only concerned France, which was partially false given our focus on the best method to analyze a scientific and public controversy. Finally, and quite incredibly, the editor said that in addition to what he considered “the limited interest” of his readership, he does not publish critical comments because of “their poor citation rates”! This argument about citations offers a new confirmation of the perverse effects of the use of citations measure like the journal’s Impact factor – encouraged by publishing houses – that make journals no longer aiming at producing robust knowledge through rational debates but at producing citable units to rise the Impact factor of the journal (Gingras 2020).

These various arguments seemed to us too weak to be reasonable and we consider that the refusal to publish our comment constitutes a regression of the discipline, which should accept to discuss and debate the arguments put forward by an author to understand a controversy as original as the one surrounding the use of hydroxychloroquine and the role of Pr. Didier Raoult in this history. We seem to have here a use of “gate keeping” not to assess the quality of a paper, as its official function demands, but to silence critical comments that in fact suggest not only that an author may be mistaken in his analysis but that the journal itself may have made a mistake in publishing a seriously flawed paper, now trying to reclassify it as “non peer-reviewed on-line commentary.” Though much has been written about the limits of peer reviewers in assessing the quality of papers, much less is known about journals’ strategies to do their best not to retract papers. They often do it only after some whistle blower has put much pressure to force such retractions that affect negatively the image of the journal and thus potentially its profitability .

So, what should have been a simple academic debate on the sociological interpretation of a particular scientific controversy must now be prefaced by this reflection on the role of scholarly journals. That being said, the important methodological and also ethical question about

sociology's capacity to offer a robust, symmetrical, and convincing analysis of a social controversy still remains and we think it is legitimate to take Laurent Mucchielli's intervention in the Journal of Sociology as a starting point to discuss that question.

The next section will thus offer a critique of Mucchielli monocausal – and thus simplistic – explanation of the scientific controversy around Raoult and his “miracle” hydroxychloroquine treatment.

What is “behind” the French controversy?

Laurent Mucchielli's article on the role of the drug industry in the French Controversy on the medical treatment of COVID-19, focused on a single aspect of what is certainly a complex controversy that mix serious scientific debates on testing methodologies, interventions in the media by a major actor who has physical and charismatic characteristics that help attract the media, the medical field and the pharmaceutical industries who are central in the market for vaccines.

By focusing his analysis only on “big pharma”, his paper does not make it possible to understand the complexity of this recent and fascinating controversy that is simultaneously scientific and public.

But in order for sociology and STS as scientific disciplines to be taken seriously in the present context, we think it is important to make sure that we provide an analysis that respects the rules of the art of these disciplines. One of them is to provide an analysis of all the actors' positions and interests in a symmetrical manner and not just an indirect or implicit defense of one of the actors of the controversy. As it is, Mucchielli's paper provides a very one sided analysis of a complex situation that reads more like a defense of the main actor of that controversy, namely Pr. Didier Raoult, than a sociological analysis of the many reasons why this particular scientist has become the focus of all attention, not only in the scientific field itself, through publications in peer reviewed journals, but also of the mediatic field which transformed him in a few months from an little known public figure (he had some previous public

exposition from writing books and newspaper editorials) into a popular hero that some even saw as a possible new President of the French Republic.

So, we think it is important to follow up on Mucchielli's paper in order to underline its blind spots which prevents him from providing a useful understanding instead of a blunt denunciation of Raoult's opponents as if only strategic economic interests lie behind those who doubt the efficacy of his treatment protocol using hydroxychloroquine. In order to be credible, sociologists should take seriously the real complexity of scientific and medical problems. For one cannot seriously begin by postulating that only one actor is right and that all the opponents thus have covert reasons to oppose an obvious 'truth'. That lack of symmetry and impartiality typical of sociology of science in the 1950s and 1960s was severely criticized in the 1970s by the then new sociology of scientific knowledge and it would be a grave regression of the discipline to abandon these fruitful methodological norms.

It is thus very important for the credibility of social science to propose an alternative to Mucchielli's paper, whose weaknesses can be linked to his neglect of the vast literature of sociology of science and STS.

A striking effect of that neglect of the sociological literature on scientific controversies is that Mucchielli completely neglects the specific scientific content of the hydroxychloroquine controversy as if it did not exist: the exchanges of scientific arguments going on at the international level in many scientific journals are not subject to any analysis. Even the discussion of the biomedical industry does not really take account of existing sociological work on the links between medical research and medical industry as the author only refers to magazines like *The New York Review of Books* and *Marianne*.

There is of course no doubt that power relationships and conflicts of interest are important factors that contribute to explain the decisions taken during this period. No dimensions should be left out, especially not the ones linking political and industrial actors. This is especially true as numerous empirically grounded investigations of social scientists and journalists have, in the past, shed light on the many ways in which industrial and business interests influence medical decisions as well as research priorities. They have been found to determine

physicians' prescriptions as well as global public health policies via a wide variety of mechanisms ranging from direct corruption to remote strategies such as regulatory capture (Oreskes, Conway 2010, Proctor 2011).

Sociological and historical analyses of pharmaceutical industry in France all point to a tension between “the management of a public service” and “the principles of free enterprise” (Chauveau 2002, 172; see also Nouguez, Benoit 2017). This tension is all the greater since the pharmaceutical market is now global, and structured around large groups involved in chemistry, pharmacy and biotechnology (Mathé 2006, Abecasis, Coutinet 2018, Brunet-Jailly 2016). The interplay between public action and market interests is in fact widespread. It concerns both drug control (Hauray 2007) and its pricing (Grandfils 2007). It translates into strong power relations hiding under various pretexts, such as security, in order to control a market (Quet, 2018). Mucchielli cites the case of the American group Gilead, then notes that the most powerful pharmaceutical groups in the world are established in four Western countries (United States, Switzerland, France and Great Britain). Conflicts of interest are of course numerous, given a market structure that leads to tensions with public interests, but this does not mean that scientific production in the field of medicine is systematically involved in conflicts of interest. And a good part of the sociological literature shows precisely that the foundations of the public regulation of drugs are based on political logics (Hauray 2007; Hauris, Urfalino 2007, Hauray 2006). Moreover, pointing out the relations with industry in the innovation process should not lead to forgetting that this dynamic between public research and industrial development is at the heart of many of 20th century therapeutic advances (Gaudillière 2008, Gaudillière, Löwy, 1998). Even in the field of rare diseases, largely supported by philanthropic and public funding, industrialists still remain a necessary point of passage (Brunet, 2019).

In the following sections, we argue that Mucchielli's analysis must be completed on at least two levels: 1) its lack of symmetry in the examination of the actors involved, 2) its simplistic analysis of the dynamic of scientific controversies. Another important aspect that we will not develop here, but would demand further attention, are the strong interactions between the

scientific and the mediatic fields where the latter clearly magnified the debates going on in the former by focusing on the charismatic personality of Raoult.

A lack of Symmetry

Probably the most important problem of Mucchielli's analysis is the lack of symmetry in his treatment of the controversy. Sociology of science has produced robust knowledge to understand how, faced with a methodological or epistemic opposition between two experimental procedures or two observations, the social scientist should proceed. The challenge is to identify all the actors, all the power relationships present, as well as the major arguments exchanged within the scientific field on the basis of the empirical evidence provided by the many scientists involved in the debate. This should now be obvious since David Bloor, insisted in the mid-1970s on the importance of the principle of symmetry for explaining all knowledge production processes: social phenomena relating to knowledge should be explained without postulating their righteousness or falseness but by relating them to the various actions and discourses of the competing actors (Bloor 1976, 7).

What Mucchielli does not show, when he points out the links between French researchers and the Gilead pharmaceutical company, are those that Didier Raoult might himself have with the pharmaceutical sector. To be credible, the analysis should have included Didier Raoult's own ties (or absence thereof) with this sector. In focusing only on some of the agents and their alleged links with the pharmaceutical industry and in passing over in silence on those of Didier Raoult and all the other defenders of hydroxychloroquine, Mucchielli's text oversimplifies the sociological analysis. Mucchielli's article offers reasons for the actions of some opponents of Raoult (the search for financial gains), but curiously does not look at the motives of Didier Raoult and his allies, as if there were none or that they were obvious. He also does not present precisely the nature of these ties and how they are likely to bear on the judgments and public claims of the actors he singles out. This omission results in a narrative that completely erases the existence of a scientific controversy. This brings us to our second point.

A mix of scientific and public controversy

Sociology of science has listed various factors weighing on the issues pertaining to knowledge production. Greed and/or self-interest are among them. But for Mucchielli, they

appear to be the only explaining factor. In his narrative there is no space left for all the scientific arguments against hydroxychloroquine, which have been expressed in the scientific literature. Such a silence on the scientific content of the controversy amounts to erasing more than forty years of research in sociology of science and STS. Moreover, Mucchielli acts as if Raoult was the only one to promote hydroxychloroquine, which is obviously not the case. A quick glance at the French newspapers is enough to find that a number of arguments have been put forward by experts, other than Raoult and the handful of experts evoked in Mucchielli's article. To follow his reasoning we must ask: do these promoters of hydroxychloroquine also work at the service of the pharmaceutical industry? The paper does not tell, though a symmetric analysis requires that this kind of question be asked for all actor of the controversy, in a kind of double entry accounting.

Within the scientific field, numerous criticisms have been levelled at Raoult's articles, pointing in particular to a large number of methodological weaknesses and the fact that they were published in journals where some of the authors were also editors, thus suggesting conflicts of interests. STS research has clearly shown that conflicts between scientists are often explained by disagreements over the best methods to be used and the selection of relevant data. There is nothing in Mucchielli's article to answer these questions touching upon epistemic and methodological matters and he does not justify why focusing the explanation on conflicts of interest is enough to understand the debate. Moreover, this disinterest for the scientific content drives Mucchielli to act as if there were only two molecules at stake (hydroxychloroquine versus remdesivir). However, the situation was (and still is) much more complex. Researchers have been interested in many molecules and combinations of treatments. The debates surrounding dexamethasone, for instance, show how other inexpensive and generic molecules are being studied and discussed (Ledford, 2020). More generally, the question of the therapeutic repositioning of known molecules has been initiated from the beginning by a great diversity of researchers and was not put forward only by Raoult as Mucchielli seems to suggest.

In short, Mucchielli's analysis does not take account of the scientific and technical arguments exchanged nor the positions in the scientific field of the various researchers who participated in this controversy (Bourdieu 1975). His choice to neglect arguments and positions and to focus only on the interests of some pharmaceutical companies, thus offers a very simplistic explanation of what is in fact a complex reality. Sometimes, there are good reasons to favor a single causal factor, but then such a choice must be discussed against other possible explanations and grounded in previous work or empirical investigations. This is clearly not the case in Mucchielli's paper.

A limited grasp of the academic literature

The weaknesses of the explanation proposed by Mucchielli are obvious when we look at his bibliography. The cumulativeness of knowledge is not an empty word and a more complete review of the literature – particularly on biomedical research, scientific controversies and conflicts of interest – would have helped him to provide a more convincing sociological analysis.

Previous work has shown that EBM and rationalization of medicine is a movement partly grounded within the medical world (Capraş *et al.* 2019, Timmermans, Berg 2003, Castel and Dalgalarondo 2005). A very good example of this rationalization process is described by Jack Pressman in his history of lobotomy in the United States in the mid-nineteenth century, where the formalization of metrics and evaluations of the effectiveness of treatments – neurosurgery in particular – was initiated by the American Psychological Association (APA) (Pressman 1998). While Mucchielli points to very real concerns regarding the role of industry in shaping medical research, his analysis is too simplistic compared with, for instance, the way these issues have recently been debated around COVID-19 (Geenhalg 2020).

Another example of the problematic simplifications in Mucchielli's analysis, relates to biases in the peer-reviewing process. The question concerns the effect of commercial and utilitarian expectations on publication practices (Marcovich and Shinn 2012, 43-47). Nicolas Chevassus-au-Louis reports, in his book on scientific malpractices, that the relations between public research and private interests are not one-sided since industrialists can also be victims of dubious publications. For instance, the BioDigital Valley company, which markets images of electrophoresis gels, has had to purge its database: “a quarter of the images proved to be unusable because they were manipulated in some way” (Chevassus-au-Louis 2019, 59). The world of industry is not only subject to the laws of the market and competition. It is also subject to the law. This means that they can face financial consequences for having released new treatments based on bad science. The relationships between financial interests and the quality of data produced by pharmaceutical companies are therefore much more complicated than the framework proposed by Mucchielli.

Also, much of the competition for publication is not only directly linked to the influence of industrialists but also to the organization of academic biomedical research, which creates its own deviance. Pressure to publish bears heavily on academic researchers and can lead them to transgress scientific norms in many ways: doctoring and falsifying data, making methodological shortcuts, publish in “friendly” journals, etc. These issues are not mentioned in Laurent Mucchielli's article, even though Didier Raoult was publicly accused of all these transgressions in his work on hydroxychloroquine. Of course, it should go without saying that

recalling the critics is not saying they are right against Raoult, but a symmetric analysis demands that all actors and their arguments be thoroughly analyzed. Mucchielli thus clearly failed to take seriously the structure of the scientific field, with its specific dynamic and complex relations with other fields.

Conclusion

Mucchielli's article seems to want to warn people of the dangers of conflicts of interests for public health. But its schematic model of a unicausal explanation only scratches the surface of a complex controversy that involves multiple actors and multiple fields.

Even if it now seems to exist serious scientific arguments to disprove the efficiency of hydroxychloroquine as a treatment for COVID-19 (Fiolet *et al.* 2020), we can say that the controversy is still alive on specific aspects (such as toxicity) even if part of this uncertainty might be artificially produced. It will take some time for scientists active in the fields of clinical medicine and biomedical research to establish the effectiveness (or lack thereof) of the many proposed medical treatments to the SARS-COV-2 virus.

The specific interest of the Raoult case is that the crisis created by the COVID-19 transformed a banal scientific debate about the efficiency of a treatment into a full public controversy where media and public commentators intervened as if on a par with the peer-reviewed technical arguments usually circulating in the scientific field. Building on previous work, we know that such a case is not original and has also been seen in the case of Vitamin C (Richards 1988) or the Chronic fatigue syndrome (Clarke, James 2003). These cases, as well as many others, give us clear directions about the best way to conduct a rigorous investigation of what can be named the "Raoult affair".

As we have mentioned, it is obviously legitimate to question the way in which research is conducted and decisions are made in crisis situations, especially regarding the role that pharmaceutical companies can play. We believe however that such analyses must conform to the trades of the discipline in order to be credible.

Though it is certainly difficult to study "science in action", that is an active and open controversy, sociologists of science and STS scholars have developed tools that make this possible by keeping to the rules of symmetry and impartiality. Even in periods of social crisis, social science disciplines cannot gain credibility by taking side in a scientific debate without strong methodological and conceptual reasons. And even so, some caution is expected. Not only replacing rigorous analysis by simple political or ideological statements do not contribute to

a better understanding of a social phenomenon, but it also affects the credibility of the social sciences and their previous achievements.

In a truly reflexive manner, we should also ask ourselves what the pandemic is doing to our discipline. In a sense, our paper provides an answer to that question by suggesting that sociologists and STS scholars must continue to observe social actors and refrain from becoming their spokespersons or advocates.

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