

APPEARANCE AND ESSENCE IN SCIENTIFIC RESEARCH, AND ABOUT FALSE HYPOTHESES

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Abstract. *Appearance and lack of depth can be found in many contemporary researches, which can be found in such papers being published even in prestigious journals. Inter-, trans- and multidisciplinary in investigative approaches can sometimes be the occasion for such researches. This paper presents the case of the famous Sokal practical ironic joke, i.e. the article published by Trinh Xuan Thuan, a researcher at the Astrophysics Institute in Paris, and also a professor at Virginia University. The article exemplifies the false hypothesis and its impact on babies' health in pediatric or medical research, using the case of a study published in The Lancet, a medical journal, in 1998, by the researcher Andrew Wakefield. Wakefield's major error was a false hypothesis, completely made up and describing a close connection or link between autism and vaccines and it causes serious and problematic effects and it made sicker all the young people.*

Key words: *scientific research, scientific irony, false link or connection, false hypothesis, scientific appearance and essence.*

1. INTRODUCTION

This paper describes two fundamental errors with difficult or maybe the worst impact in researches, researchers' career and society as a final destination of any kind of scientific approaches: Sokal case and paper and Wakefield's false link between autism and vaccines.

These two cases become virtually special in that, to a lesser or greater extent, they are to be found in many researches currently published in the present world (so varied in point of both thematic range and manner of formulating the investigative hypotheses) of the testing methods or models, followed by validation or invalidation, and especially as forms of writing and publishing scientific research..

2. THE SOKAL CASE AND ITS CONTEMPORARY IMPACT

Somewhere behind Sokal case, there are some important consequences, which deserve to be well-known and the similar practices, partial investigated, and characteristic to a significant minority of young teachers and researchers in their attempts to publish papers in prestigious journals using all the necessary and unnecessary solutions, deontological or not.

Who was the real Sokal and what really means Sokal case for world research in modern times? Behind Sokal there is an ironic but also a very good and talented researcher named Trinh Xuân Thuận and the final impact poses another question regarding the difference between the profound and the formal researches, and thus it delimitates the appearance from the essence in any type of research corresponding to different domains and their specific journal, peer review processes, peer reviewers, eligibility of the research papers,

editors opinions and expertise, and finally of the accepted papers to be published even in the prestigious journals.

First of all a few words about this remarkable and ironic researcher Trinh Xuân Thuận are necessary to be known by the readers. He was born on 20th August 1948, being now a well-known Vietnamese-American astrophysicist, and he was born in Hanoi, Vietnam. He completed his B.S. at the California Institute of Technology, his Ph.D. at Princeton University and he has taught astronomy at the University of Virginia, where he is a professor, since 1976. Trinh Xuân Thuận is Research Associate at the Institut d'Astrophysique de Paris, being also a founding member of the International Society for Science and Religion and his areas of interest are extragalactic astronomy and galaxy formation, a lot of his researches being focused on the evolution of galaxies and the chemical composition of the universe, and on compact blue-dwarf galaxies (*The Birth of the Universe* in 1993. *The Secret Melody* in 1994, *Chaos and Harmony* in 2000, *The Quantum and the Lotus* (with Matthieu Ricard as co-author in 2001). One of the most appreciated books was *Le Cosmos et le Lotus, les confessions d'un astrophysicien* (2011), and he published together with Jean Bricmont during the same year *Pseudosciences et postmodernisme: Adversaires ou compagnons de route?* analysing the postmodernism syndrome in scientific research too. Thuận was the recipient of UNESCO's Kalinga Prize in 2009 for his work in popularizing science, and also the Kalinga chair award at the 99th Indian Science Congress at Bhubaneswar. In 2012, he was awarded the Prix mondial Cino Del Duca from the Institut de France. This prize recognizes authors whose work [1,2,3,4], literary or scientific constitutes a message of modern humanism (http://en.wikipedia.org/wiki/Trinh_Xuan_Thuan).

The appearance or just the formalism of writing, accomplished in a research, typical of an increasing number of papers written solely for the purpose of publication in prestigious journals so as to gain more visibility for the authors in the world of modern research, makes this type of article unable to reach, or else likely to quickly lose, even if it managed to reach a minimum level of citation, sometimes even the meaning of essential researches, which encroached even into the modern so-called soft sciences inspired sometimes by hard sciences, underlines the American physicist Alan Sokal, beyond the case itself. In fact, Alan Sokal, a name used to be nothing else than an alias for Trinh Xuân Thuận, from New York University to be more credible, closely observing the debates on the nature of science, dealt a blow to more and more theories lacking depth, while also warning on the danger of expanding apparent, shallow research (1996, *Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity*), a parody

paper *written* in a hermetical style, *baptized* by the author in that splendid manner of writing titles in the all-and-nothing way of thinking, abounding in so many cases of *scientific nonsense*, and buried into the *baroque wording of involved idiom*, ready to be apparently scientific to a novice reader, and published in the journal of cultural studies *Social Text* [5].

Sokal's paper is a practical joke or "*an act of intellectual salubrity*", which logically leads to a necessary end, through which a truth of scientific research is revealed under the premise that the laws of nature discovered by scientists are mere psychological, sociological and, finally, even cultural constructs delimited by social and individual capacity of understand the reality, then, *any scientific theory is suspicious because it is necessarily ridden with racism, sexism, capitalism, colonialism, militarism, and other imaginable isms*. [6]

The practical joke was exposed by Sokal, in a second article published in a different journal in *Lingua Franca*, where he explained his aim was to denounce the lack of scientific rigour of researchers preaching cultural relativism, who misuse scientific concepts, images and metaphors borrowed from "*pure*" sciences, such as physics or mathematics, mishandled and poorly assimilated, and so the result is opposing scientific meanings, which darken rather than illuminating scientific research (relativity, quantum mechanics, chaos theory or Godel's theory are cited by postmodernists as having deep political, social and cultural implications).

The text of the paper was premeditatedly full of nonsense, but the editorial staff of *Social Text* published it without as much as asking approval by an expert in quantum physics, since it was in agreement with their own ideological bias. On the contrary, they persist in their attachment to the dogma imposed by the Enlightenment on Western intellectual thought, which can be summarized as follows: there is an outer world, whose properties are independent of the human being. And, really, of all of human kind; these properties are encoded in "*eternal*" physical laws; humans can acquire a poor, imperfect and provisional knowledge of those laws by applying "*objective*" procedures and epistemological rules prescribed by what is called "*the scientific method*."

Some excerpts from Sokal's paper can reveal the full dimension of nonsense and the lack of utility of such a paper, which was written by the author deliberately with the purpose of warning about a potential invasion of inter-, trans-, and multidisciplinary scientific researches that are absolutely non-scientific according to their contribution to the development of a truly holistic research.

"Here my aim is to carry these deep analyses one step farther, by taking account of recent developments in quantum gravity: the emerging branch of physics in which Heisenberg's quantum mechanics and Einstein's general relativity are at once synthesized and superseded. In quantum gravity, as we shall see, the space-time manifold ceases to exist as an objective physical reality; geometry becomes relational and contextual; and the foundational conceptual categories of prior science – among them, existence itself – become problematized and relativized. This conceptual revolution, I will argue, has profound implications for the content of a future postmodern and liberatory science". [5, p. 2]

Scientific discernment, defined as perception of the difference between the good and the evil generated by their own assumptions, methods, models and results on the future research is completely crippled by the formalism of apparent

and superficial approaches, whose sole purpose is ensuring visibility. The initial support given by the prestige of some journals or publications finally brings research itself into a shaded cone or into a field of the total drift of meanings and ambiguous approaches to reality. Writing that goes along the sole way of publication according to the criterion of selection and in relation only to the hierarchy of publications, may ultimately lead to an extreme situation, where people who are not worthy of scientific respect will be respected. That is why Trinh Xuân Thuận's warning is real, and the Sokal case materializes it with the sharpness of successful experiments. [7].

Finally, the content of any science is profoundly constrained by the language in which its discourses are formulated; and mainstream Western physical science has, since Galileo, been formulated in the language of mathematics. But whose mathematics? The question is a fundamental one, for, as Aronowitz has observed, "neither logic nor mathematics escapes the contamination" of the social"... [5, pp.11 -12]

Everything looks like a syllogism full of nonsense, if someone could describe a syllogism in the following manner:

A. Physics is a great science:

16-5 equivalent $(4 * 4) + (5 * 1)$

B. Statistics is universally applicable:

7+4 equivalent $(2 * 3 + 1) + (2 * 1 + 2)$

C. So, physics is statistics

16-5 equivalent $7 + 4$

An example of a false syllogism, nourished by apparent correctness, which does not represent a correct and logical attitude, can change the entire significance of the scientific language in general. The verb to be signifies anything else not a value of equivalence, in this case... And everything becomes phony and incorrect. Statistical physics does exist, but it brings together three disciplines of theoretical physics, related by their subject, but different by the methods they use: thermodynamics, statistical mechanics and kinetic theory...

3. WAKEFIELD'S HYPOTHESIS AND ITS PROFOUND NEGATIVE IMPACT

Another aim of this article is to exemplify the false or invalid hypothesis on the topics of medical research, using a similar case of a study published in *The Lancet*, a medical journal, in 1998, by the researcher Andrew Wakefield. This study also generates a difficult problem for scientific research and its impact was indeed a major and negative one. Wakefield's major error was an untrue hypothesis, completely made up and describing a close connection or link between autism and vaccines and it causes serious, problematic and disastrous effects and it made sicker all the young people [8]. The background of the paper is an investigation of a consecutive series of children with chronic enterocolitis and regressive developmental disorder. The assumption is the untrue hypothesis, completely made up of the close correlation between autism and vaccines. The major method was the study of a sample of 12 children (mean age 6 years [range 3–10], 11 boys) who were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including

language, together with diarrhoea and abdominal pain. The so called essential findings reveal the interpretation of a set of data about behavioural disorders included *autism (nine children)*, *disintegrative psychosis (one)*, and possible postviral or vaccinal encephalitis (two), and thus the paper have identified a possible association in time between autism and vaccines. Wakefield had conducted invasive investigation on the children without obtaining the necessary ethical clearances ... picked and chose data that suited their case and finally the authors have falsified facts if you read the addendum: *Up to Jan 28, further 40 patients have been assessed; 39 with the syndrome.* [8, p. 640].

In 1999 a study of 500 children found no link, in 2001 another one using a bigger sample of 10.000 children also found no connection. The research has spread during the next year, in 2002, to Denmark and Finland on much larger samples of 537.000 and 535.000 children and once again found no connection. A review of 31 studies covering an entire statistical population, more than 10.000.000 children, also found no link between autism and vaccines. Another review of 27 cohort, realized in 2012, including 17 case studies, 6 controlled case studies, 5 time series trials, 2 ecological studies, 1 case cross-covering trial covered over 14.700.000 children [9].

In the meantime, false Wakefield's hypothesis generates the wrong idea that vaccines are the real cause of the autism (e.g. 1/4 of US parents believe that even today). The medical reality shows in 2013 that vaccines have saved 8 million babies in the entire world...

The young scientists, researchers or teachers who are genuinely *inter-, trans-, and multidisciplinary* may have difficulties in formulating hypothesis but it is deontological or ethical forbidden to chose data using subjective selection that suited their hypothesis and finally the to falsify facts and realities

The degree of reality coverage possible by using *inter-, trans-, multi-, and cross-disciplinary* methods and models increases significantly in contemporary academic research and education, connected with a number of interdependences between science, culture and ethics, underlying the classical and obsolete tendency of isolation in mono- or unique discipline methods and models [10]. The new culture and ethics of *inter-, trans-, multidisciplinary* research remain some practical and minimal conditions, in that sense, of a realistic research and valuable impact at the same time.

4. SOME FINAL REMARKS

In conclusion, the modern research demands of strong sense of correctness and professionalism not only in specific knowledge domains but also confidence and deontological attitude in research within *inter-, trans-, and multidisciplinary investigations*, and it is up to the young research team members to respect not only the real sense of scientific language and the realistic formulating of the hypothesis, but also the validation of the final models, and even the reality of findings or results, etc. The *inter-, trans-, and multidisciplinary* research did not need as priority formal visibility or appearance, but especially ethics and reproducible sense of scientific language and principles and reliable criteria to formulate hypothesis in an impeccable manner.

In our opinion the major causes of superficiality and lack of depth in contemporary research are:

1. *lack of involvement in research teams of a trans-, inter-, cross- and multidisciplinary type, applying to researchers (from students, assistants, and MA students to professors) ;*
2. *lack of trans-, inter-, cross- and multidisciplinary expertise of the researchers;*
3. *the separate, one-disciplinary academic discourse ;*
4. *the separate, one-disciplinary validation of theories and models in universities;*
5. *academic education dominated by the obsolete one-disciplinary model;*
6. *lack of trans-, inter-, cross- and multidisciplinary courses of lectures, and teaching academic teams ;*
7. *lack of trans-, inter-, cross- and multidisciplinary education for students and MA students.*

Ethical and deontological elements of any kind of research cannot include manipulation of the words and phrases that are, in fact, meaningless, all the research attitudes must not import concepts from natural sciences into the humanities without the slightest justification, and without providing any rationale for their use or display superficial erudition by shamelessly throwing around technical terms where they are irrelevant, presumably to impress and intimidate the non-specialist reader not to use scientific or pseudoscientific terminology without bothering much about what these words mean [11,12] and a good career is revealed from the rigor and language as well as from professionalism and research competence.

The Sokal experiment, the Sokal affair, or the Sokal case revealed a phenomenon concerning the attempt to endow with absolute value the relative that is ubiquitous in contemporary culture. Relativistic extremism exploits the specificity of the language of hard sciences and seeks to reduce the deviation from the soft sciences, drifting away from both classes of sciences, language being thus manipulated to say anything and "prove" anything. Contemporary research highlights a contrasting and contradictory development, playing between experimental or practice and poetics or speech, an untenable compromise between hard and soft sciences, between their methods, between their models, and mainly between their different language, as solutions of constructive-pragmatic and social-cultural representation. This is carried so far as proclaiming a "chasm" between scientists and the other intellectuals (Weinberg), as purely objective, a prerequisite for the birth and development of modern science, i.e. the rift between the world of physics and the world of culture is an objective reality. But Sokal relapses, publishing another book in 2011 (written in collaboration with Jean Bricmont) and titled „Pseudosciences et postmodernisme: Adversaires ou compagnons de route?

The practice of science constantly resumes and questions the value of enquiry and observation, the value of discussing, or the permanent contradiction of its own answers ... Rational and irrational, logical and illogical, matter and spirit, purpose and infinite continuity, order and disorder, pure chance and necessity, objective and subjective, etc. – here are increasingly used concepts based on a *classical* vision of reality, in disagreement with experiments and practice. In this way millions of articles and books can be written without however having knowledge, science or research

advance one millimeter. This dimension or type of research should be, relatively or currently, closed...

The authors believe that honesty and common sense together with simplicity, out of all the other qualities of a researcher, can have the greatest influence on his reputation.

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