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CERLIS Series
Volume 1

Stefania M. Maci & Michele Sala (eds)

Genre Variation
in Academic Communication
Emerging Disciplinary Trends

CELSB
Bergamo

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CERLIS SERIES Vol. 1

CERLIS

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GENRE VARIATION IN ACADEMIC COMMUNICATION.
EMERGING DISCIPLINARY TRENDS

Editors: Stefania M. Maci, Michele Sala

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CLAUDIA AGOSTINI / FRANCESCA SANTULLI

The Case against Homeopathy: A Study of the Rhetoric of Meta-Analysis*

1. Introduction

Meta-analysis (MA) is a sub-genre of scientific communication which is used for synthesizing the results produced by original research. It can be considered a form of Systematic Review (SR), though MA synthesizes previous literature on a single research question by means of statistical techniques, while SR analyses previous research papers systematically selecting, summarizing and assessing all high-quality research on a given topic. Both SRs and MAs are secondary studies, which summarize and assess scientific evidence with quantitative (in the case of MA) and semi-quantitative (in the case of SR) methods (Mungra 2006). SRs and MAs differ from the Narrative Review (NR), in that they explicitly indicate the search strategies, which are a fundamental part of the investigation. Editorial criteria in SRs and MAs are stable and the studies focus on a clear research question, whereas the NR gives a more comprehensive overview and does not select a specific target in re-examining the topic (White 2009).

The aim of MAs is to put together data obtained in previous original research through statistical analysis; therefore it is applicable to original research that produces quantitative results rather than qualitative findings. The MA produces knowledge, as previous results are considered under a new perspective, so that new and unexpected conclusions can be drawn (White 2009). The MA is frequent in all scientific disciplines – from medicine to biology, from agronomy to social sciences. In medicine MA plays an important role, because of

* Claudia Agostini is the author of Sections 1-3; Francesca Santulli is the author of Sections 4-6.

the high volume of primary research articles, the results of which need to be proofed.

As far as biomedical sciences are concerned, the Cochrane Collaboration¹⁶ has set specific criteria for selecting the studies and reporting results in MAs. The Cochrane Library contains a database of SRs and papers on MA methodology (White 2009). The necessity to proof the results obtained by disciplines involved in healthcare has brought to the fore the importance of SRs, and the Cochrane Collaboration has been able to meet this need, although there had been various unsuccessful attempts to create a standard before its foundation.

In social sciences the Campbell Collaboration¹⁷ has developed a protocol for SR, based on rigorous and transparent procedures, which are explicitly described in order to make them replicable if necessary. It is important to underline that all SR is peer reviewed, and in determining the quality level of the paper, reviewers take into consideration the precision of the author(s) in study selection and accuracy in the application of procedures. Therefore, in MA the standard IMRD¹⁸ pattern is integrated with a special macro-move, a section totally focused on methodology.

2. Study design and theoretical background

Mungra (2006) offers an exhaustive description of the macrostructure and rhetorical moves in MA, analysing a corpus of MAs from the medical field on the basis of the model described by Swales (1990) for

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- 1 The Cochrane Collaboration is a nonprofit organization established in 1993 to produce SRs (Cochrane Reviews), in order to proof the quality of studies on health care, and publishes them on the Cochrane Library (<http://www.cochrane.org/>).
 - 2 Established in 1999, the Campbell Collaboration screens for quality studies in education, crime and justice, social welfare (<http://www.campbellcollaboration.org/>).
 - 3 Introduction, Methods, Results and Discussion.

Research Articles. This chapter takes into consideration the macro-structural level, and aims to analyse the rhetorical structures typical of the MA in view of the responsibility towards the authors of the reviewed studies, and the consequences that the results of an MA can have both for the specialized readership and the lay public.

Indeed, it is interesting to note that MAs dealing with controversial issues, which illustrate new unexpected results, are often accompanied by the publication of an editorial focusing on how the new data will be accepted by the scientific community and disseminated in the media context. It is well known that in the last thirty years the popularisation of science and the public's keen interest for all the matters concerning healthcare have increasingly modified the way scientists relate to a non-specialist audience. At present, there is a tendency to handle all controversial findings with caution, and in the case of MAs it is sometimes necessary to warn specialists that they should offer clear information, to avoid possible misinterpretations.

In this chapter the analysis will start with a case study, taking into consideration both the MA by Shang *et al.* (cf. Appendix: Homeopathy E) published in 2005 in the prestigious journal of medicine *The Lancet* and the editorial which accompanied the publication, as well as a major confutation of its results and the corresponding reactions. The chapter will then take into consideration other examples of MAs accompanied by editorials, in order to verify if rhetorical strategies change according to the subject.

A point that deserves special attention is the role of the accompanying editorial, which is not a specialized text, but is of great interest for media experts, who play a crucial role in popularization. With a view to the mediation of journalists who then report data, quote opinions and mention the sources of their information in more popular publications, editorials sometimes function as a sort of introduction to the study or a comment on its results. This function of editorials is particularly evident in the case of MAs, as the latter represent a sort of final verdict on a given research topic, which is of great interest for the lay audience and can have a high impact on the media. As pointed out by van Dijk (1995), editorials can be *factual* and/or *evaluative*, in that they can present facts but also opinions on these facts. Indeed, the editorials considered here generally do not only present mere facts but also arguments to support an MA (often

raising crucial questions about specific points) or to tone down the results emphasising the limits of the study.

According to Carnet and Magnet (2006), there are two types of editorials: one addressed to the scientific community and health professionals, which raises issues on the state of biomedical research and its influence on society, and one accompanying a research article published in the same issue of the journal. In the case of MAs, accompanying editorials, though focused on the topic discussed in the MA, extend the discussion to further implications of the findings both for the scientific community and society at large. As a consequence, the accompanying editorial of an MA is a hybrid text, which shows characteristics typical of both types. The editorial usually stresses the importance of the results of the MA for society and acts as a sort of ethical guide, giving advice on how to apply the new findings, which often come to light after years of false beliefs and oppose well-established behaviour.

3. The case against homeopathy: an MA in *The Lancet*

The MA by Shang *et al.* is an excellent example of the impact that a controversial MA can have both on expert and non-expert public. The study tackles a controversial issue, and aims to invalidate the effectiveness of a whole discipline – not a single remedy or procedure. Indeed, we assist to a full de-legitimization of homeopathy, as the results of previous studies – assessed and compared thanks to statistical techniques – show that the effectiveness of homeopathic remedies is comparable to placebo. This research has marked a turning point in the attitude towards homeopathy, even though six years after its publication homeopathy is still widely used.

3.1. *The MA by Shang et al.: rhetorical moves and linguistic features*

The macrostructure of the paper is typical for an MA in that it has a summary and follows the IMRD pattern, but the Methods section is more elaborated compared with a standard RA. The Introduction is relatively short and displays a strong rhetorical effort. It contains the three basic moves described by Swales (1990) in the CARS model. In the first move, the authors establish a territory: they single out their topic and give fundamental indications about the state of the art. The Introduction of the article actually starts directly with Step 2 of the first move, Topic generalization. The authors briefly explain the basic principle of homeopathy. In the very first sentence the position of the authors is recognisable thanks to a non-integral citation,¹⁹ which emphasises the controversial status of the discipline:

- (1) Homeopathy is a widely used but controversial complementary or alternative therapy. (Homeopathy E: 726)

According to Skelton (1997), contextual truth⁵ is used in the introduction as well as in the discussion section of medical papers with both an overt and a covert function. In this case, the overt function is evident from the first move, as the authors delineate the context of the debate and assert those notions which are assumed to be true and known by the audience. Contextual truth is covertly exploited as soon as the authors, after introducing the basic principle of homeopathy, start reviewing items of homeopathy previous literature. Scepticism about homeopathy is conveyed by hedging strategies, which are used to create a distance between the authors and the opinions expressed:

4 Swales (1990) distinguished between integral and non-integral citation in research papers. Integral citation is a citation in which the author's name is stated in the sentence; a non-integral citation is a citation in which the author's name is referred either in the notes or in parenthesis.

5 Contextual truth is "truth as the research tradition states it to be, truth as the statistical evidence states it to be, and truth as a matter of deriving possible non-statistical meaning from" (Skelton 1997: 121).

- (2) During this process information is thought to be transferred from the diluted substance to solvent, which in light of current knowledge seems implausible. (Homeopathy E: 726)

Actually, in this sentence the authors refer to the fundamentals of homeopathy (presumably deriving them from previous literature), and they express their doubts with growing emphasis: first, they attribute the opinion to others in an impersonal way (*is thought to be*), then they define those opinions *implausible*, though limiting their statement (they *seem*) and appealing to a general principle of *current knowledge*. Finally, in the last sentence of the first paragraph the authors introduce a topic generalisation, establishing a causal link between their previous statements and the accepted conclusion:

- (3) Many people therefore assume that any effects of homeopathy must be non-specific placebo effects. (Homeopathy E: 726)

This sentence is a non-integral citation from previous research, and is a way to appeal to the discourse community to accept the MA as related to sensible criteria. The second paragraph is taken up by Move 2 – Establishing a niche, through the analysis of potential problems and weakness of the discipline – and tackles the issue of the effectiveness of homeopathy, focusing on the bias²⁰ problem. The word *bias* is emphasized by collocating it at the beginning of the sentence in a thematic position:

- (4) Bias in the conduct and reporting of trials is a possible explanation for positive findings of placebo-controlled trials [...]. (Homeopathy E: 726)

Moreover, *bias* is repeated at the beginning of the following sentence to stress the real reason for positive results in research on homeopathy:

6 Bias is a form of systematic distortion in experimental research, in that data are inaccurate because of wrong procedures, manipulation or false estimating techniques.

- (5) Publication bias is defined as the preferential and more rapid publication of trials with statistically significant and beneficial results [...]. (Homeopathy E: 726)

Though in a different syntactic structure, *bias* is crucial also in the third sentence:

- (6) The low methodological quality of many trials is another important source of bias [...]. (Homeopathy E: 726)

The investigation of these different forms of bias leads the authors to single out the niche, and at the same time the fundamental method, for their research, which lies in the *topos* of quantity: large is better than small. They use hedges in expressing this crucial concept:

- (7) These biases *are more likely to affect* small than large studies [...] whereas large studies *are more likely to be* of high methodological quality [...]. (Homeopathy E: 726)

However, this principle is not discussed further and must be accepted as a shared premise, which at the same time legitimises the need for this MA, that promises a new and more valid approach. Move 3 is performed in the last sentence of the paragraph and outlines the purpose of the research. It uses a descriptive and narrative approach, anticipating the Methods section in content and in style by means of the deictic reference *we* together with verbs in the past tense (*we examined / we observed / we assessed / we estimated* etc.). This linguistic choice shows the self-confidence of the authors in giving a firm answer to a controversial issue.

In agreement with Mungra (2006), the Methods section describes carefully the research strategy adopted, data extraction and quality assessment methods – all considered fundamental steps in the guidelines for MAs. This section differs from the corresponding part of a research paper in that it accurately describes the steps of search and selection of the articles. It is divided in subsections (search, selection, procedures, statistical analysis), as it is the central part of the analysis, giving plausibility to the study. On the contrary, in a research paper this section is usually shorter as the methods are not

actually described but rather simply named or labelled (sometimes with the researcher's name); they are taken for granted because of standardization procedures (Swales 1990). The accuracy in describing the methods applied to the research provides rhetorical support to the claims: the total lack of hedging is a sign of virtual absence of problems, as the section is purely descriptive (Salager-Meyer 1994).

The interesting feature in this section is the shift from the deictic reference *we* referring to the authors' identity and thus emphasising their commitment (*we checked, we searched, we defined, we excluded, we used, we coded*), to agentless passives, as a sort of anticipation of the Results section, where this form prevails. Lexical choice is also limited and repetitive (*Outcomes were selected and trials matched, Data were extracted, Homeopathic interventions were defined, Indications for treatment were classified*). The agentless passive maximizes objectivity, stressing the object of the research and what has been done, while the deictic reference gives authority to the authors, who acquire credit by means of self-confident and bold statements. This rhetorical technique has also emerged in the corpus analysis by Mungra (2006), yet this MA displays a rather interesting pattern: a large part of the section (about 2/3) adopts almost exclusively the personal style, while the last part is characterised by the agentless passive, which normally occurs in MAs. It is worth noting that in a previous MA on homeopathy by Linde *et al.* (Homeopathy C) the use of *we* is rare, while agentless passives prevail. The use of this verbal form is meant to reduce the responsibility of the authors and can be seen as a form of hedging (Hyland 1998). However, Lachowicz (1981) and Varttala (2002) do not completely agree with this hypothesis, as in many cases the hedging effect is obtained thanks to the use of a modal verb in the passive sentence.

No modal occurs in connection with the agentless passive in this MA, but the passive is used to stress the objective approach of this part of the research: the Results section, both in RAs and MAs, is unambiguous and aims to illustrate data and thus demonstrate the research hypothesis with evidential and scientific methodology. Although in Mungra's analysis hedged expressions are frequent, in Shang *et al.* we only found one:

- (8) This difference *is unlikely to be* due by chance. (Homeopathy E: 729)

This might be due to the fact that this MA has been conceived with the awareness that its results would be strongly attacked by the homeopathic community, and thus the authors want to show a self-confident or authoritative rhetoric in order to discourage any attempt at criticism.

This self-confidence and authoritative stance is more evident in the Discussion section where hedging does occur, but only in few expressions, especially in the form of epistemic modality:

- (9) This finding *might be* expected [...].
 [...] we *probably* missed some of these trials.
 The biases [...], as shown in our study, *might promote* the conclusion [...].
 For some people, therefore, homeopathy *could be another* tool that complements conventional medicine [...].
 We found that the benefits of conventional medicine are *unlikely to be* explained by unspecific effects. (Homeopathy E: 730-731)

In this last part of the MA the authors return to the use of *we* (*we compared, we assumed, we discussed, we addressed, we emphasize* etc). The repeated reference to the authors' identity has an effect opposite to that of hedging, and emphasizes the authors' responsibility towards their claims and their confidence in the correctness of their scientific findings. This aspect is stressed also by the use of intensifiers, as in the following examples:

- (10) Our results *confirm* these hypotheses [...].
 [...] we *are confident that* we identified a near-complete set of published placebo-controlled trials of homeopathy.
 Our study *powerfully* illustrates the interplay and cumulative effect of different sources of bias. (Homeopathy E: 730-731)

It is interesting to note that in the MA by Linde *et al.* mentioned above the Discussion section contains many hedged expressions containing epistemic modality and probability adverbs like *likely* and *unlikely*. This linguistic strategy is certainly linked to the fact that this MA on homeopathy gave positive (though weak) results *in favour of*

homeopathy. As a consequence, the authors tried to limit their commitment and speculated on the ambiguity of their findings in order to be accepted by the whole medical community, both conventional and homeopathic. On the contrary, Shang *et al.* are convinced that they are offering clear and unquestionable results *against* homeopathy, which stem from sound and reliable statistical processing of data.

According to the classification by Mungra (2006), Move 9 illustrates limitations of the study and problem areas, thus indicating the need for further research. Shang *et al.* emphasize the ‘narrowness’ of the issue investigated, in that the RAs examined were focused on homeopathic remedies and not on context effects, which can however influence the effectiveness of a remedy — for example, a deeper relationship and a form of alliance between patient and carer can be considered a form of treatment in itself. The authors want to highlight the positive side of homeopathy, which has nothing to do with the remedies but with a cultural belief; therefore, they suggest that further research should investigate context effects rather than focusing on remedies.

3.2. *The editorial*

The results of the MA were enhanced by an editorial, published in the same issue of the journal, which contributed to fuel the debate both in the academic and in the larger media context. The position adopted by the journal is clearly expressed in the very title of the editorial, ‘The End of Homeopathy’ (Homeopathy A), which emphasises the crucial role of the new data. Moreover, the editorial (which is not signed, to indicate unequivocally that the opinion expressed coincides with the journal’s stand) does not express surprise for the new findings and welcomes them as long-expected results.

Negative expressions of all types are linked to homeopathy: *homeopathy fares poorly*, the new data are *unsurprising*, previous findings were *unfavourable*, complementary treatments in general *do not meet efficacy and cost-effectiveness criteria*, it is totally honest to inform patients about *homeopathy’s lack of benefits*; negative

evaluation is clearly conveyed by *spurious arguments of putative benefits from absurd dilutions*, which synthesise the writer's stand against the practice. On the other hand, any form of criticism against homeopathy is seen as a form of *enlightenment*.

The aim of this editorial is twofold: on the one hand, it emphasises that the new data make any further discussion useless, thus ending a debate that has been too long and dangerous; on the other, it offers a reason for the popularity of homeopathy, which does not lie in its effectiveness, but rather in the attitude of patients who do not accept the technological and impersonal approach of conventional medicine. As a consequence, the conclusion highlights the importance of higher awareness of the needs of patients, which – as a consequence – would lead to a more objective evaluation of scientific data about homeopathy. The editorial displays an aggressive tone and does not leave any doubts about the pointlessness of further investigation. It is worth noting that there are no forms of hedging, except for two modals (one occurring in a quotation and the other with reference to a comment on Shang *et al.*'s study). This is in contrast with the findings of Salager-Meyer (1991), stating that in most cases Editorials and Review Articles are heavily hedged.

Such a commentary by a prestigious journal helped the MA to gain more visibility, giving it a wide media coverage, which in turn raised further debate. It is interesting to note that since Shang *et al.*'s MA came out, no other SR on the topic has been made, although research on single remedies has continued. *The Lancet* has published no further articles on this topic, while previously it had occasionally given room to homeopathic research: for example, in 1997 it had published the MA by Linde *et al.* mentioned above, which did not accept the hypothesis that the clinical effects of homeopathy are completely due to placebo. This study, however, did not give an exhaustive answer for every single treatment and suggested that further investigation was needed. The MA by Shang *et al.* can be considered a form of updating of the previous survey (and actually it echoes its title), as confirmed by the fact that the results of Linde *et al.*'s study are mentioned in the discussion section, though they are in contrast with the new findings. Shang *et al.* contest the fact that the MA by Linde *et al.* did not include trials of conventional medicine;

moreover, further research by Linde *et al.* is cited, in which the authors admit an overestimation of the results of their 1997 MA.

4. The answers to Shang *et al.*

4.1. Fisher's commentary

Obviously, the results of the MA by Shang *et al.* deeply annoyed the homeopathic community, which reacted with many articles and commentaries published in specialized journals for complementary medicine, trying to refute such provocative claims. One of the most interesting replies is the commentary by Fisher, 'Homeopathy and *The Lancet*' (Homeopathy B), who systematically rejected the claims of Shang *et al.*'s article. Despite the rational and clear criticism of Shang *et al.*'s MA, the author shows a very emotional attitude. The use of exclamation marks is functional to suggesting emphatic delivery, while adjectives such as *hostile* and nouns such as *justice* and *attacks* forward a metaphorical interpretation of the scientific contrast as a war. This shows that the homeopathic community reacted to the MA with a form of aggressive defence.

In the long introduction, Fisher does not give any scientific evidence to support his criticism of Shang *et al.*'s MA, but discusses its political implications. This confirms that an MA in itself can trigger endless polemics. Exactly for this reason the set of methods and procedures adopted must be clearly described and scrupulously followed. This aspect is underlined by Fisher, who suggests that the authors missed the QUORUM statement (i.e. the quality of reporting MAs must adopt when presenting descriptive data for each trial) and did not even mention which of the trials were included in the survey. It is also interesting to note that Fisher cites not only the article but also the editorial, as if it were impossible to separate the two texts.

Fisher reacts to Shang *et al.*'s MA in the form of a rhetorical confutation. The weak points of the study, concerning the small number of studies selected for the trial and the lack of transparency,

are described and criticized in detail. Fisher uses an effective rhetorical technique, in that he mentions the selection parameter declared by the authors:

- (11) It is well established that high quality trials are less likely to be positive than those of lower quality. (Homeopathy B: 146)

He uses this statement against the MA itself, as he affirms that the studies on homeopathy and allopathy were not well matched, in that homeopathic studies “were generally of better quality”. Using the same technique, Fisher quotes a statement from the MA, and then uses it for his confutation:

- (12) They state that eight studies is too few to question their conclusion about the whole set of publications. Their conclusion about the whole set, however, was also based on eight studies. (Homeopathy B: 146)

Furthermore, it is important to focus on the language used by Fisher, which is aggressive, far from the objective and formal style typical of a scientific article. Fisher also uses sarcasm to express his strong disappointment for the way the research was carried out. As the identity of the trials selected was not disclosed by the authors of the MA, Fisher is unable to give more precise answers: therefore he talks of “natural justice”, “the accused has the right to know the evidence against him” (Homeopathy B: 146). Moreover, through rhetorical questions he puts into doubt the intellectual honesty of the MA’s authors, asking: “is eight enough for a conclusion or not? Or does it depend on what that conclusion is?” (Homeopathy B: 146). According to Fisher, it is therefore to be concluded that this MA does not contribute to the development of “open, transparent science”, rather it is an instance of “opaque, biased analysis and rhetoric” (Homeopathy B: 146).

4.2. Correspondence by Linde

In his letter to the editor (Homeopathy D), Klaus Linde (who belongs to the Center for Complementary Medicine of Munich) emphasises the main problems of Shang *et al.*'s MA. Linde starts by expressing his agreement with the main premise (homeopathy is *implausible*) and with the methods adopted by Shang *et al.*, which largely reproduce those used for his own research. Despite this, there are reasons for dissent: "However, there are major problems [...]" (Homeopathy C: 2081). This opening makes his criticism even more severe. Two points are developed: the authors follow neither the QUORUM nor the Cochrane (and this is considered *unacceptable*), and secondly they did not discuss pooling problems and thus risked "producing a false-negative result" (Homeopathy C: 2081). For this reason, Linde criticizes sharply the tones of the accompanying editorial:

- (13) The Lancet should be embarrassed by the Editorial that accompanied the study. (Homeopathy D: 2081)

It is important to bear in mind that Linde shares part of Shang *et al.*'s view and in his conclusions compares the misuse by homeopathy supporters of his previous MA to the misuse by a "major medical journal" of Shang *et al.*'s work (Homeopathy D: 2082). As a matter of fact, both MAs have been used as a means of propaganda both by specialists and by the media, in favour or against homeopathy: the one by Linde *et al.* was used by the supporters of homeopathy and the one by Shang *et al.* by its detractors. The results of the first MA were presented more cautiously, because these were not robust enough to decide whether homeopathy is effective or not. But Linde *et al.*'s MA was misused by supporters of homeopathy. The results of the second MA are presented boldly, with little doubt about the need for further investigation on this topic. The difference between the two studies clearly emerges if we compare their final discussions:

- (14) The resources needed for such a systematic research strategy would be considerable with the risk that in the end homeopathy may be found to have no value [...]. No matter what the end result is for homeopathy, an investment

in such a systematic research could provide us with a model for the evaluation of other emerging fields of medicine, both complementary and conventional. (Homeopathy C: 841)

- (15) Clearly, rather than doing further placebo-controlled trials of homeopathy, future research efforts should focus on the nature of context effects and on the place of homeopathy in health-care systems. (Homeopathy E: 731)

It is clear that the first MA is more cautious in declaring the uselessness of homeopathy and tries not to offend the homeopathic community, while the second MA takes responsibility for this claim, which is even reinforced by the editorial. It is worth remembering who financed these studies: Linde was partially supported by a grant from the Carl and Veronica Carstens Foundation, an organization for the promotion and support of Complementary Medicine, while Shang was supported by the Complementary Evaluation Programme (PEK) of the Swiss Federal Office of Public Health, which has assessed the effectiveness of various complementary medicines in Switzerland but was mainly interested in reducing costs for healthcare.

5. Further examples of MA in the biomedical sector

Given that the MA by Shang *et al.* shows special features which do not reflect the results of the analysis by Mungra (2006), in the last part of this study we will analyse MAs on different topics, in order to see if the rhetorical strategies change according to the subject. We will focus on medical MAs which have had an important impact on the scientific community, concerning respectively nutritional supplements and pharmaceuticals. These topics have had a wide media coverage, because they are of great interest for the general public.

5.1. Two MAs on nutritional supplements

We shall first take into consideration two MAs on nutritional supplements, focusing on general antioxidants and on vitamin E, respectively. The MA on antioxidants by Bjelakovic *et al.* (Nutr. Supp. A), published in *The Lancet*, discusses whether antioxidant supplements can prevent gastrointestinal cancer or not: the authors conclude that these substances can even increase mortality. The nutritional supplements market is a very large industry, comparable to the pharmaceutical one. The interest of consumers for self-treatments is growing fast, especially in the United States, and criticism like this is strongly rejected by the trade associations as in the case of homeopathy. As far as nutritional supplements are concerned, the lay audience interested in the topic is even larger, because the accused product is generally used by many – healthy – people, who simply want to prevent illnesses. This is a crucial aspect, as the discussion is not focused on a medicament (which could be effective or not, or even harmful), but on a form of preventive treatment aimed at increasing health and vitality.

In this context the MA on antioxidants represents an attack on faith in these supplements. Yet, the editorial by Forman and Altmann (Nutr. Supp. B) does not use an aggressive tone to present the topic, as in the case of homeopathy. First of all, the editorial is not anonymous, but signed by two estimated scientists, who explain carefully the findings of the MA, emphasizing the limits of the study and the need for further research. The MA itself suggests that further studies on this topic should be carried out and the authors clearly illustrate the potential limits of their study. However, the rhetorical strategies used in the MA indicate that the authors' purpose is to emphasise their authoritativeness to gain the approval of their readership. Impersonal forms and agentless passives do not occur in the Methods section, where active forms with deictic reference *we* predominate (*we identified / we used / we excluded / we compared* etc.). The paper is also heavily hedged in the Introduction and Discussion sections (with a high number of epistemic modals, such as *might be expected / might be a cause / might be needed* etc.). Moreover, at the beginning of the Methods section the authors mention the fact that this review has

followed the Cochrane methodology protocol. The reference to a well-recognized standard protects them from methodological criticism and gives more strength to their claims. The editorial emphasises this aspect, in order to support the validity of the paper.

- (16) Now, in this issue of The Lancet, a Cochrane systematic review by Goran Bjelakovic and colleagues shows no benefit in the prevention of gastrointestinal cancer. (Nutr. Supp. B: 1193)

Another important aspect of the editorial is the title, ‘Vitamins to Prevent Cancer: Supplementary Problems’, in pure journalistic style, which attracts the attention of potential readers by means of suggestive and evocative wordplay (*supplementary problems*), pointing to the controversial results of the MA. The title, as van Dijk (1988) highlights, is a sort a semantic macrostructure, which defines the main theme of a text; in this case it is a typical example of media language, as it communicates effectively by means of a very condensed form. As Carnet and Magnet pointed out, editorials in a medical journal stand “at the crossroads between scientific and general journalistic discourses” (2006: 232), and their titles are used to attract readers as happens in newspapers.

Greenberg’s editorial (Nutr. Supp. C), which accompanies the MA on Vitamin E by Miller *et al.* (Nutr. Supp. D), published in *Annals of Internal Medicine*, also has a sensational and allusive title: ‘Vitamin E Supplements: Good in Theory, but is the Theory Good?’ Indeed, the editorial draws the attention to the fact that, in theory, vitamin E does have positive effects for the prevention of major chronic diseases, but taken as a supplement can be harmful and even cause death. It is interesting to note that this editorial provides an overview of the current situation in the market of nutritional supplements, illustrating the risks of taking high doses of vitamin E and suggesting that doctors should discourage consumers from buying these products. The article is written in an informal and journalistic style, as the topic is of interest for a wide audience. The author gives his opinion on the MA by describing it as *carefully conducted* (Nutr. Supp. C: 75) and defines antioxidants as a *fuzzily defined category* (Nutr. Supp. C: 75), which has become quite popular although clinical

trials have shown no clear benefits deriving from their use. The author's intention here is to illustrate the current situation, as at this point scientists should be able to give reliable advice:

(17) It won't hurt and might help, so why not take it? (Nutr. Supp. C: 75)

However, although previous studies had already shown the ineffectiveness of antioxidants in preventing diseases, their market is growing. The author talks of 'public faith', which is based exclusively on the indications of scientists and health professionals who follow a theory proofed only by single studies. Like in the editorial on homeopathy, the author tries to destroy the faith in antioxidants, although the tone used here is not aggressive and he is cautious in expressing his trust in the findings. The style of the editorial is quite convincing as rhetorical questions are repeatedly used to encourage the reader to consider the issue under a new perspective, offering new persuasive arguments:

(18) But could antioxidants supplements actually be harmful? [...]
 Yet, how firm is the conclusion that the risk for death is increased? [...]
 But isn't it past the time for the scientific and public health communities to loosen their ties to a theory that lacks predictive ability for human diseases?
 (Nutr. Supp. C: 75-76)

The two editorials considered here seem to support the findings of the MAs, focusing on aspects that the authors had failed to highlight. In the case of Miller *et al.*'s MA, the editorial by Forman and Altman is even cited in the discussion section, in order to prevent possible criticism about the methodology used in the study:

(19) A recent meta-analysis that examined the effects of antioxidants, not specifically vitamin E, in preventing cancer noted a possible increase in all-cause mortality. However, in an accompanying comment, Forman and Altman cautioned that these mortality analyses were exploratory and incomplete. A strength of our paper is the systematic search for trials that presented mortality data. (Nutr. Supp. D: 40)

Furthermore, Miller *et al.*'s MA presents similar rhetorical characteristics to the one on antioxidants, and in particular the use of

the deictic reference *we* in the Methods and Results sections and a heavy use of hedging in the Discussion section. Accompanied by a well-argued and relatively long editorial, which supports their conclusions, both MAs differ substantially in style from the one by Shang *et al.* on homeopathy. Indeed, we can say that the authors' approach is heavily influenced by the topic of the research and the message they want to communicate.

5.2. An MA on pharmaceuticals

Other interesting aspects of MAs and accompanying editorials emerge when we examine studies on pharmaceuticals. An example is the MA by Sipahi *et al.* (Pharm. B) on angiotensin-receptor blockers, where the accompanying editorial displays a very moderate attitude. This MA assesses whether the angiotensin-receptor blockers (a group of pharmaceuticals used in the treatment of hypertension) can affect the occurrence of cancer. The results are presented with a cautious approach, although hedged expressions are not as frequent as in the MAs on nutritional supplements. However, the study reports findings with extreme moderation, as shown by the following statements taken from the Discussion section:

- (20) In this meta-analysis, we found that ARBs are associated with a *modestly* increased risk of new cancer occurrence. [...] The increased risk of new cancer occurrence is *modest* but significant. [...] Our study has *important limitations*. [...] Our findings warrant *further investigations*. (Pharm. B: 633)

Agentless passives prevail over the deictic reference *we* throughout the paper, and this could be due to the authors' intention to highlight the actions performed and reduce their commitment. As this study brings further implications for the market of pharmaceuticals and the kind of substance analysed is vital for patients who suffer from a serious disease, the authors need to be cautious on reporting their findings, which could cause alarm without even being completely reliable. The difference lies in the safety of the substance. Homeopathic remedies are known to have no mortal side effects,

nutritional supplements are not pharmaceuticals and are generally used not for treatment, but for prevention. Drugs, on the contrary, are more involved in safety issues, as they are used to cure diseases, and need to be certified and proofed before being marketed (homeopathic remedies and nutritional supplements do not yet). As a consequence even the slightest doubt about their safety is crucial. Furthermore, it is interesting to note that some of the authors of the study have received a grant from pharmaceutical companies that produce this drug:²¹ for this reason there could be a conflict of interest, which may have influenced the way the findings are reported.

The editorial by Nissen (Pharm. A) describes the MA as ‘disturbing and provocative’ and questions the results concerning the safety of these drugs, emphasising that it is necessary to obtain more reliable data about actual risks. The author, who is also a consultant for various pharmaceutical companies, some of which produce this kind of drug, declares no conflict of interest and shows the strengths and the limits of this MA. In order to illustrate these aspects and give some suggestions on how the research should proceed, Nissen uses a question-answer format, not in the form of rhetorical questions that Greenberg used in his editorial on vitamin E, but rather as pure questions, which introduce the three main issues and contribute to convey correct information:

- (21) In this context, how should we view the analysis of Sipahi and colleagues?
What should be the next steps in resolving this important emerging controversy?
How do we access additional, unpublished data on ARBs and cancer safety?
(Pharm. A: 627)

The last question concerns the problem of publication bias, which is mentioned also in the MA as a limit, because studies with negative outcomes tend not to be published when financed by pharmaceutical companies. On the other hand, as pharmaceutical companies must submit detailed results from clinical trials to regulatory agencies, these data are put under investigation whenever safety questions arise.

7 Diovan from Novartis, Atacand from Astrazeneca, Losartan from Ranbaxy.

Nissen suggests this should be done in the case of ARBs, as emphasised in the title of the editorial, ‘Angiotensin-receptor Blockers and Cancer: Urgent Regulatory Review Needed’.

6. Conclusions

Though MAs are a common tool in other disciplines as well, this presentation has focused exclusively on the biomedical sector. MAs in social sciences are often used to assess a large number of single studies, and in applied linguistics they have been used for two decades in order to assess a vast literature on language learning and language teaching. Here MAs represent a valid tool to perceive the progress in the study of a specific issue and predict in which direction research should proceed. In the biomedical sector, however, findings have more interesting implications for the lay community, while other research fields tend to remain isolated, and the debate is confined within the scientific community. The final verdict, which is expressed by the most controversial biomedical MAs, has a crucial impact not only on scientists and health professionals, but also on the general public.

The MA on homeopathy by Shang *et al.* – displaying a very limited number of hedged expression and a more extensive use of personal reference (*we*) – reveals that the authors take it for granted that their addressees are willing to accept their findings (and are possibly looking forward to them). Linde, on the contrary, had been cautious in presenting his results pro-homeopathy in his own MA, while in his criticism to Shang *et al.* he focuses on method and on the aggressive tone of both MA and editorial, rather than on the implausibility of the conclusions. Moreover, he does not show emotional involvement, as instead Fisher (who is overtly in favour of complementary medicine) does.

As confirmed by the analysis of texts dealing with different subjects, the attitude of researchers (and their financiers), as well as the expectations of both their peers and the wider social context, have a

crucial role in determining the discourse strategies that are preferred and the rhetorical and linguistic structures chosen to realize them. In other words, the style and approach of an MA are directly linked to the importance of the question raised in the study, the interests of the authors and the dominating ideology.

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Appendix

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