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Risk Conflicts, Critical Discourse Analysis, and Media Discourses on GM Crops and Food

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Abstract:

As techno-environmental controversies increasingly confront us with tremendous democratic challenges, it is imperative to investigate which discursive strategies and processes in media discourses facilitate or impede democratic debate and citizenship. This paper puts forward an approach combining the risk conflicts-perspective with the analytical framework of critical discourse analysis to analyze how two Belgian elite newspapers discursively (re-)define and interpret four controversial events in the debate on genetically modified crops and food. The analysis identifies two distinct ideological cultures. Driven by an unproblematic idea of scientific consensus, one ideological culture is found to repeatedly take up the defense of the status quo and to continuously enact processes of de-politicization to impede democratic debate. The other is found to facilitate democratic debate by repeatedly challenging existing power relations, in terms of revealing competing sets of assumptions, values and interests underlying opposing responses to scientific uncertainty.

Key words: risk conflict, critical discourse analysis, media discourse, democratic debate, Belgium, GM crops and food, de/politicization, discursive strategies

Introduction

Science and technology have not only pervaded our daily lives through the many technological products and services whose comfort we enjoy, but they have also taken centre-stage in many of today's social and political debates: climate change has achieved 'celebrity status' as an international social problem since the early 2000s. Worldwide, the nuclear energy debate has come back with a vengeance after Fukushima. Following a protest action against a field trial of genetically manipulated (GM) potatoes in May 2011, Belgium witnessed the outbreak of a fierce social debate on the freedom of expression and academic research in the context of an ever increasing commercialization of science. This eventually culminated in the dismissal by the Catholic University of Leuven of a post-doctoral researcher for declaring her sympathy about the action to a television reporter. The many rapid advances in science and technology clearly confront us with tremendous democratic challenges. These examples demonstrate that scientific and technological developments not only offer many potential benefits to health, quality of life or economic development, but simultaneously introduce known and unknown risks to health, the environment and social justice.

To adequately address these democratic challenges, it is imperative to investigate which discursive strategies, processes and practices facilitate or impede democratic debate and citizenship in techno-environmental controversies. This brings forward the question of how to evaluate public and media discourses on whether and to what extent they are found to facilitate/impede democratic debate and citizenship, and consequently, how to assist in the creation of spaces for conflict and dissent to be expressed in terms of a specific social scientific research design (Mouffe, 2005; Swyngedouw, 2010). In terms of conceptual perspective, this paper proposes to approach these controversies as a new type of social conflict in late modern societies, i.e. *risk conflicts*, in which various social actors aim at either the politicization or depoliticization of these controversies, depending on their respective material

and/or ideological interests (author(s) name(s) removed for blind review). In terms of research design, this paper puts forward Carvalho's (2007, 2008) innovative analytical framework of Critical Discourse Analysis (CDA) as a qualified framework for revealing and analyzing these processes, as it aims at a *politicized* reading of science reports in the press by focusing on their ideological nature. To illustrate this combined approach, its conceptual and empirical tools are used to analyze how two Belgian elite newspapers discursively (re-)define and interpret four controversial events in the GM debate, with a focus on revealing and analyzing the discursive strategies and practices either facilitating or impeding democratic debate and citizenship.

This paper starts by introducing the risk conflicts-perspective and by specifying how its conceptual tools can be used for evaluating media discourses on their contribution to democratic debate and citizenship. A second section elaborates the research design, subsequently discussing the literature on science in the media and the analytical framework of Critical Discourse Analysis in general, and Carvalho's approach in specific. A third section focuses on the analysis in terms of four case studies. The paper concludes by discussing which discursive strategies and practices were found facilitate or impede democratic debate and citizenship, the unique contribution of this paper's approach, and the limitations of the study.

The risk conflicts-perspective

The increasing emergence of techno-environmental controversies in social and political debates has been related to the confluence of two structural developments in late modern societies: modernization risks and the commercialization of science (author(s) name(s) removed for blind review).

Modernization risks

As by-products of scientific and technological progress, *modernization risks* refer to a specific category of risks which are global, imperceptible and fundamentally intractable in terms of spatio-temporal consequences, such as climate, genetic engineering or radiation risks (Beck, 1992). For making sense of these risks, scientific research has become a necessary as well as insufficient condition: insufficient, since the existence of incompatible epistemic cultures within science results into a variety of (hypothetical) scientific findings regarding the level of *unknown* and *unforeseeable* risks involved (Böschen et al., 2010). Consequently, these often conflicting (and contested) claims to knowledge are found to be selectively adopted by various social actors as a material and discursive resource in pursuing broader social, economic or political agendas (Carvalho, 2005c; McCormick, 2007; author(s) name(s) removed for blind review). Put differently: their respective ideological (i.e. value systems) and/or material (i.e. financial and economic) interests influence which scientific rationality claims are considered acceptable and significant. This has been well documented with regards to the role of the American conservative movement in the climate change debate (McCright & Dunlap, 2010) and the political dynamics in the GM food controversy (Böschen et al., 2010).

Commercialization of science

Furthermore, these processes are taking place in a context in which we find an increasing *commercialization of science* (Baskaran and Boden, 2004; Bauer and Gregory, 2007), which simultaneously raises the stakes for science organizations, industry and policy-makers as well as the weight placed upon public credulity and legitimation. Inspired by the broader politico-economic context of *neo-liberalization*, a general shift has taken place from public to private patronage of scientific research since the late 1970s and early 1980s, in conjunction with legislation relating to

university patenting. This has allowed the private exploitation of publicly funded research, leading university researchers to either license patents to industry or start up *spin-off* companies. The biotechnology industry for instance has not only been regarded as the early driving force behind industry-university coupling, but some authors (Gaskell and Bauer, 2001; West, 2007) argue that in this case science and private business have blended together into a ‘science-industrial complex’ united by powerful economic interests.

Risk conflicts

The risk conflicts-perspective argues that in these processes antagonisms originate which produce a new type of social conflict in late modern societies. These ‘risk conflicts’ involve contestation between various social actors over competing *risk definitions*, which are based on the confluence of competing (i) *scientific rationality claims*, (ii) *values* and (iii) *interests*. Eventually, what is at stake in these controversies is an ideological struggle between alternative (techno-environmental or socio-ecological) futures, based on competing analyses of the current and ideal state of affairs (Goeminne, 2010; Mouffe, 2005; Swyngedouw, 2010). To arrive at the heart of what is at stake, these controversies should be approached from an identification of the competing values and interests at work, instead of starting from an unproblematic ‘scientific consensus’ and the legitimate agents to speak in its behalf in opposition to those who distort ‘the science’ in promotion of ‘special interests’. From a perspective of facilitating democratic debate and citizenship, it is therefore important to approach these controversies from a framework of *political* conflict, entailing ideological discussion and collective debate and choice. A narrow science-led framing on the other hand only conceals what is at stake, thereby functioning as a de-politicizing operation.

This risk conflicts-perspective opens up a discursive space for evaluating media discourses about techno-environmental controversies on their contribution to democratic debate. More specifically, it raises the question whether news media discourses facilitate or impede democratic debate by *framing* these controversies, respectively, as involving key *political* choices between *alternative* techno-environmental *futures*, or as predefined scientific matters best left to *technocratic* decision-making and/or *market* forces - in other words, by contributing to processes of *politicization* or processes of *de-politicization*, respectively (Mouffe, 2005; Swyngedouw, 2010; author(s) name(s) removed for blind review). To be able to evaluate the extent to which public and media discourses contribute to democratic debate and citizenship, an empirical framework is needed which allows not only to register the extent and nature of ideological discussion in mediated discourses on science, but also to reveal and analyze the relevant discursive strategies and practices at work.

The case of GM crops and food

The Dutch-speaking northern part of Belgium (further referred to as Northern Belgium) is a particularly interesting place to analyze the GM crops and food controversy from the risk conflicts-perspective: the Northern Belgian scientists who developed the technique to transfer foreign genes into the plant genome in the 1970s also founded the first company to develop genetically engineered plants with insect tolerance in the 1980s (Plant Genetic Systems (PGS)). Eventually, a so-called ‘Biotech Valley’ originated in the university city of Ghent hosting the Flanders Interuniversity Institute for Biotechnology (VIB) as well as agbiotech multinationals such as BASF Plant Science, Bayer CropScience and Syngenta, each of whom has taken over a former VIB spin-off. The promotion of GM crops and food has been challenged by a broad coalition of new social movements (environmental, nature, north-south/Third World and farmer movements together with consumer organizations),

starting multiple campaigns in the summer of 1999 which lasted until June 2003 (author(s) name(s) removed for blind review).

Research design

Literature

The literature on science in the media has evolved in the last decades from an instrumental and linear perspective on how to communicate science more effectively (Farago, 1976; Kriehbaum, 1967), over a multilevel and interactive perspective between media and scientists (Bucchi, 1996; Lewenstein, 1995), to more sociological perspectives focussing on the meaning-making practices underlying media discourses on scientific and technological developments (Anderson et al., 2005; Gamson and Modigliani, 1989). Inspired by this latter perspective, research into the media representation of the GM debate has greatly multiplied during the last decade. However, this growing body of work is predominantly characterized by content analytic studies identifying the frequency of predefined thematic categorizations (often referred to as ‘frames’) and their evaluation of the technology (Gaskell and Bauer, 2001; Nisbet and Hume, 2006; Priest and Ten Eyck, 2003). Empirical work combining the in-depth examination of discursive strategies and practices with the role of ideology is ‘blatantly under-researched’ in media representations of science (Carvalho, 2007, p. 226). Using Critical Discourse Analysis (CDA), a handful of studies have focused either on the discursive strategies at work in the articulations of competing social actors (Augoustinos et al., 2009; Cook et al., 2006), or on the role of ideology, such as Holmgren (2008) in her metaphor analyses and Rupar (2007) in her illustration of how editorials achieve their persuasive goals. Carvalho (2007), on the other hand, has developed a CDA-approach combining both in her research on climate change in the British press.

Critical Discourse Analysis

Social constructionist discourse analyses in general start from the assumption that language and ways of talking are not neutral reflections of our world, identities and social relations, but on the contrary, play an active role in creating and changing these (Jørgensen and Phillips, 2002). Critical Discourse Analysis (CDA) in particular, puts forward discourse as a social practice which is in a dialectical relationship with other social dimensions: discourses not only (re-)shape social structures, but are simultaneously shaped by them (Fairclough, 1995, Wodak, 1996, van Dijk, 1991). By empirically analyzing language use within its social context, CDA aims to reveal the role of discursive strategies and practices in the creation and reproduction of (unequal) relations of power, which are understood as ideological effects. As a critical approach, CDA is politically committed to emancipation and social change, which directly connects with the ambition of this paper to analyze the GM debate from a risk conflict-perspective.

Carvalho’s approach

Carvalho’s framework (2005a, 2005b, 2007, 2008) operates at both textual (with attention for morphological characteristics, objects of discourse, actors, language and rhetoric, discursive strategies and processes, and ideological standpoints) and contextual levels (attention for simultaneous portrayals in different media outlets as well as for temporal sequence, evolutions and context). Furthermore, it explicitly aims at integrating the following three aspects: (i) the time plane in discourse analysis (to trace the history of public issues and consider the particular context of an event), (ii) the discursive strategies of social actors (sources’ as well as journalists’ interventions), and (iii), extra- and supra-textual effects of the modes of operation of discourse (such as discourse structuration, indicating

that a certain discourse dominates the terms of the debate). Furthermore, defining ideology as ‘a system of values, norms and political preferences, linked to a program of action vis-à-vis a given social and political order (Carvalho 2007, p. 225)’, Carvalho puts forward a concept of ‘ideological cultures’: this concept emphasizes their socially constructed nature and allows a certain level of diversity and pluralism. Although values and norms are shared to a large extent, ideologies are not ‘internalized by individuals in a fixed and uniform way’. Ideological cultures, then, refer to ‘communities of ideas, values and preferences inside media organizations and in their particular audiences’ (Carvalho 2007, p. 239-40).

Her research has illustrated how ideological cultures have implications for the selection, interpretation and presentation of three key news elements: (i) regarding the interpretation of certain ‘facts’ or ‘scientific truth claims’, journalists may choose to defend the techno-scientific status quo by de-legitimizing or ignoring critical scientific reports, or alternatively, legitimate these reports by discussing their social relevance. (ii) Regarding the selection and authorization of certain ‘agents of definition’, journalists may choose to only grant epistemic authority to institutionalized actors (such as industry, science institutes or governments) or alternatively to critical scientists or environmental and social movements. (iii) Regarding the illations drawn from knowledge for political action, journalists may take up the defense of the social, political and economic status quo in propagating a non-regulatory approach, or alternatively challenge the status quo by calling for mitigating action to protect fellow citizens, future generations or nature. In these interpretations, two ideological referents are at work: nature and the economy (Carvalho, 2007). In the former, a Promethean discourse in which there are no limits to the mastery and exploitation of nature for material development or economic growth is distinguished from a discourse of harmony with and respect for nature and other species. In the latter, a non-regulatory approach driven by values of market liberalism, individual freedom and profitability is distinguished from a public accountability approach. In this approach, the precautionary principle (i.e. technological innovations should not be commercialized before risks and dangers are sufficiently known), social responsibility and equity warrant political action.

Case selection

Following Carvalho, a comprehensive analysis in a selected period with the aim of identifying ‘established’ discursive positions was combined with an analysis of ‘critical discourse moments’: these involve topical events in which sedimented discursive positions are potentially challenged. The newspaper articles are collected from a database - compiled for another research project of the author - containing 1385 articles reporting on agricultural biotechnology from five Belgian newspapers published between 1 January 1998 and 31 December 2007. The analysis took place in two steps. First, four distinct case studies were selected from the so-called ‘years of controversy’ (Gaskell and Bauer, 2001) in which the introduction and marketing of these products in Europe was well underway but was being challenged by various parties on different grounds: In the Swiss ‘Gen-Schutz’-initiative of June 1998 (case study 1), Swiss citizens could vote on the prohibition of several applications of this technology, thereby calling into question its democratic legitimacy. In August 1998, the Hungarian scientist Arpad Pusztai declared on British television that rats fed with GM potatoes suffered severe damage to their immune system (case study 2), thereby calling into question the safety assurances of science institutes, industry and governments. However, Pusztai was immediately expelled from his institute, and it was only when an international group of fellow scientists publicly vindicated his results in February 1999 (case study 3) that what becomes known as the ‘Pusztai-affair’ kicks off the so-called ‘Frankenstein-food controversy’ in the United Kingdom. This led to a sequence of reported events, like the subsequent declaration by food and retail chains of clearing their products from GM ingredients. This eventually culminated in a de facto moratorium in June 1999 on new approvals in the

European Union (case study 4). All the articles reporting on these four cases in two elite newspapers with an opposite ideological image from the northern Dutch-speaking language community were analyzed: *De Morgen* is the heir of two socialist newspapers and still characterizes itself as a progressive newspaper. *De Standaard* used to have a pronounced Christian-Democratic and pro-market editorial line, but characterizes itself today as a 'centrist' quality paper. Secondly, to reveal established discursive positions, we focus on the analysis of both newspapers' articles in the database from 1 January until 2 June 1998 first (case study 0), since no controversial events took place until the Swiss referendum in early June 1998.

Analysis

Case study 0. New approvals and new applications (January – June 1998)

Both newspapers publish 7 similar articles between 1 January 1998 and 2 June 1998 which focus either on new approvals or new applications. Regarding the former, reporting kicks off with a series of short articles from press agencies on the positive recommendations from the scientific advisory committees to the European Commission concerning new GM varieties from Monsanto, Novartis and AgrEvo (Belga, 'EU-scientists pro-genetically modified maize and rapeseed', *De Standaard*, 13 February 1998; Na¹, 'Genetically manipulated maize not harmful', *De Morgen*, 13 February 1998). While legitimating the European regulatory level as a knowledgeable agent on the science of GM products, these short articles discursively reduce its political role to an apparently 'neutral' and 'objective' technocratic risk assessment by affiliated scientists. GM products are constructed as an exclusively scientific matter: non-technical and normative discourses are implicitly excluded. In addition, we find an unproblematic linking of corporate strategies with the science of genetic manipulation, which is also found in articles regarding the announcement of new applications or products, either by corporations or science institutes, such as in 'Food companies enrich their products and themselves', published in *De Morgen*:

The British biotech-giant Zeneca has started a research program with regards to the possibilities of increasing the amount of lycopene in tomatoes on an industrial scale through genetic manipulation. Several studies have shown that an increased uptake of lycopene in people decreases the odds for prostate cancer ... For corporations, these new biotech applications constitute an attractive market, for they amount to the literal creation of added value (LV, 9 February 1998)

This representation of agricultural biotechnology as a corporate science in which scientific and economic progress are intimately interwoven amounts to a discursive strategy of naturalization and objectification, turning contingent propositions into 'natural' and 'inevitable' arrangements. Furthermore, although the developments concerned are clearly speculative and refer to possible future benefits, these reports sum up plenty of reasons to support the technology (see also Reuters, 'A cholera virus? Serve it with potatoes', *De Morgen*, 3 March 1998; Na, 'Plastic from plants possible in 10 years time', *De Morgen*, 31 March 1998; Pieter Van Dooren, 'Transgenic plants are safer', *De Standaard*, 6 April 1998; HVdE, 'Vitamin C synthesis unraveled', *De Standaard*, 2 June 1998).

Eventually, the general discursive construction of agricultural biotechnology in both newspapers during this period is found to start from a framework of *scientific progress* and *economic prospects* starring three central agents: the European regulatory level, science institutes and biotech-industry. These are discursively related by their involvement with new products from the application of genetic modification in agriculture, and the use of science, either to create these products or to confirm their safety. The science of agricultural biotechnology is depicted as consensual and reliable,

and scientists in either government, industry or science institutes as the uncontested and exclusive definers: there is no sign of any conflict of interest between these different social sectors which are depicted as harmoniously co-operating for the public good. The hegemonic role of science and technology for innovation and social progress is discursively reconstructed and uncritically reproduced (thus endorsed), by means of the discursive strategies of authorization, rationalization and scientification (Carvalho, 2005b, 2007): this implies, respectively, that (i) the authority of individuals and institutions in positions of recognized importance is called upon to legitimate knowledge claims, (ii) GM technology is represented as a tangible and tractable technology dealt with by credible agents, and (iii) the technical nature and the implicit scientific certainty of GM science is put forward as the basis for policy decisions. In these processes, both newspapers act as the secondary validators of institutionally validated 'facts' (Gamson, 1999, p. 23) and no ideological differences between them are found to exert any influence. In the face of a lack of social conflict, a hegemonic influence of media coverage *beyond* specific newspapers appears to function as a common selection device for relevant facts and authorized agents of definition for scientific news, whether on a policy, corporate or science domain. This domination of the terms of the debate is an extra-textual mode of operation of discourse which Carvalho (2008) identifies as *discourse structuration*: the discourse of the 'science-industrial complex' has a structuration effect on the discourse of both media outlets.

In the remainder of the paper, these established discursive positions function as the status quo which is potentially challenged by the four following events.

Case study 1. The Swiss referendum (June 1998)

The first event is the Swiss Gen-Schutz Initiative (Gene Protection Initiative). Under the Swiss system of direct democracy it is possible to call for a national referendum after collecting a necessary amount of signatures. On 7 June 1998 Swiss citizens were allowed to vote on an initiative calling for the prohibition of (i) the production and sale of GM animals, (ii) the release of GM plants and animals, and (iii), the issuing of patents on GM plants and animals (Bonfadelli et al., 2002). The initiative was eventually rejected by a majority of voters.

De Standaard: tripartite construction of the debate. *De Standaard* provides full coverage of this event in terms of both an editorial and a long feature article in the science section of 2 June and a short article by a press agency afterwards. In the editorial, science journalist Hilde Van Den Eynde delegitimizes the option of a referendum and in the feature article she calls on the industry to urgently revise and improve its public relations-policies. A lengthy quote will be copied from both of these articles, as they provide key insights into the discursive strategies which underpin the ideological culture of *De Standaard*.

It does not happen often that a nation deliberately carries a flourishing industry to the grave. Next Sunday the Swiss decide in a referendum whether a stop should be put to research on genetically modified plants and animals ... Stocks of renowned corporations such as Novartis and Roche ... are plummeting. ... To turn the tide, scientists and industrialists have taken to the streets the last couple of weeks to demonstrate. Swiss Nobel Prize winners have organized a press conference in which they called the proposed prohibition 'short-sighted and idiotic' ... Opponents proceeded less cerebral, with large posters and slogans like 'No genes in my bread' ... Prospects are gloomy. ... it looks like the opponents will make it. Their emotional arguments find easier acceptance with the man in the street than the hard facts of scientists ... Polls point out that 40% of the Swiss will cast their vote on Sunday without understanding what is at issue. It remains the question whether a referendum is an appropriate instrument to

decide a highly complex matter like this. Maybe the Swiss should hold a referendum on that ('A slow affair')

In this editorial, Van Den Eynde clearly sets out to defend the status quo by employing a discursive practice which narrows the debate to three groups of mutually exclusive actors. First, the (epistemic) authority of industry and science is legitimated by referring to their positions of recognized importance, their role in economic prosperity and their use of 'hard facts'. Second, resistance is de-legitimated by referring to 'opponents' that have no credentials except for their deplorable communication methods ('posters and slogans', 'emotional arguments'). Third, a homogeneous public consisting of all citizens not belonging to the previous groups is constructed as ignorant, passive and particularly vulnerable for the opponents' manipulation. Both their democratic rights and the Swiss system of direct democracy is de-legitimized for 'complex' matters. This *tripartite* construction of the debate directly implies that neither opponents of the technology nor members of the public are able to make use of scientific reasoning or have any scientific credibility (see also Cook, 2004). The technology itself and the matters at issue in the referendum are not debated. Furthermore, it is remarkable that the referendum is constructed as a call for the prohibition of scientific research, which is factually untrue, as only certain applications of the technology are at issue.

In the feature article, social resistance to the technology is discursively constructed as the result of flawed PR of the 'science-industrial complex' and the idea of social debate is reduced to a PR-'war'. In this war the Davids of the science institutes and -industry face the Goliaths of the environmental movement, who have succeeded in monopolizing coverage by relying on huge international campaign efforts and emotional and fear-arousing arguments. None of the articles published since 1 January 1998, however, have mentioned environmental movements.

The European biotech-industry reluctantly admits to have made a mess of its public relations-policy ... [this] is resulting in America running off with the economic profits of a technology born on the old continent. The question is whether there is still time for reversal, now that Greenpeace and co. have elevated the fear for genetically modified foodstuff almost to a religious level ... [they] have succeeded in almost totally monopolizing coverage ... From their labs and fresh start-up companies, scientists have done nothing to turn the tide. They were not organized, as their green opponents were ... to fight back in the PR-war with the 'green' movement. When it comes to PR, the biotech-industry is dashing in a dinghy at high sea, whereas the environmental movement looks down upon it as a mastodon ('A dinghy at high sea')

This discursive construction of the referendum, in which we find the promotion of business interests, the privileging of policy options that serve the most powerful industries, and the interpretation of social debate as a PR-war in which resistance to the technology is explained in terms of flawed PR- strategies, is clearly driven by values of profitability and market liberalism. Furthermore, the defense of the status quo, the depiction of the interests of the science institutes and biotech-industry as public interests and the tripartite construction of the debate appear to be grounded on an implicit assumption of the development and marketing of GM crops and food as a *normal* element of an *inevitable, natural* scientific and economic development. This naturalization of GM crops and food as scientific and economic progress insulates the technology and its promoters from any epistemic, axiological and normative questioning and interprets democratic control (either on science or the economy) as counterproductive, since it can only disrupt this *natural* process.

De Morgen: a democratic opportunity. A totally different picture is found in *De Morgen* in the article 'Swiss are allowed to vote on genetic manipulation in referendum' (Sven Rooms, 6 June 1998) in which (i) the referendum is discursively constructed as a democratic opportunity (and the exact propositions at issue are set out), (ii) biotechnology is framed as a matter of public accountability, and (iii) the article is introduced by a subtitle that emphasizes the notion of agency in scientific and technological developments: 'It is about time that not only science defines the meaning of [scientific] progress' (Sven Rooms, 'Swiss are allowed to vote on genetic manipulation in referendum', 6 June 1998). Here, we find different social actors locked in a discursive competition around how to frame the referendum: the views of opponents (industry spokespersons) and supporters ('herself a biologist') of the referendum are quoted. By mentioning the scientific credentials of the supporters, *De Morgen* clearly constructs a different relational field than *De Standaard*, which only provided the promoters of the technology with epistemic authority. This is also found in the lead of the article on the eventual rejection of the initiative in which the industry is labeled as powerful, so far as even suggesting that the latter possibly misled voters:

Yesterday the powerful Swiss pharmaceutical and food industry had reason to be relieved: the Swiss have spoken out against limiting gene technology ... The Swiss appear to think that experiments like Dolly the sheep are not risky, but according to environmental activists voters have been misled (Reuters, 'Swiss love Dolly', *De Morgen*, 8 June 1998)

De Morgen is found to draw from an ideological culture in which technological and economic progress are represented as *contested* objects whose direction is steered by powerful *agents*. Furthermore, political action is legitimated by supporting the referendum as an opportunity for direct democracy, and the power context from which current GM applications originate is questioned. And secondly, whereas *De Standaard* reported on the referendum through the format of science journalism (uncritically reporting 'science claims' and clearly identifying with the science-industrial complex), *De Morgen* exposes conflicting views and promotes public scrutiny and discussion on questions of knowledge and technological innovation.

Case study 2. The Pusztai-affair: Part 1 (August 1998)

A second potential threat to the status quo occurs when a frame of scientific uncertainty concerning health risks is thrust into public discourse after a BBC-interview broadcast on 10 August 1998 with the senior Hungarian scientist Arpad Pusztai from the Rowett Institute (U.K.). Pusztai and his team found GM potatoes to damage the immune system of rats. After it became clear that the director of the institute had communicated wrong information to the press during interviews and the conclusions in general went against the government's policies, Pusztai was forced to retire and forbidden to publicly speak (Smith, 2003). Two days later the institute sent out press statements that blemished Pusztai's credentials and research in an effort to save its reputation.

De Standaard (Afp/reuters, 'Rats fall ill after genetically modified potato', 11 August 1998) and *De Morgen* (Chris Ceustermans, 'Genetically manipulated potato sickens rats', 12 August 1998) publish from the initial press statements about the BBC-interview that quote Pusztai saying that GM foods need more testing before commercialization as it is unfair to use fellow citizens as guinea pigs. Both declare this study to be the first to demonstrate health risks. Whereas *De Standaard* provides balance by quoting Monsanto, *De Morgen* does this by quoting a geneticist from Ghent University. Both reassure that each marketed product is found safe by companies and governments, thereby discursively isolating this study as to avoid any inferences to the technology in general. Two days later, *De Standaard* (Reuters, 'Investigator fired after criticism of genetically manipulated food', 13 August)

and *De Morgen* (Belga, 'Alarming results even before potato study was started', 14 August) again publish very similar articles that uncritically reproduce the Rowett Institute's discursive intervention to re-define Pusztai and his study: the technology itself and any scientific uncertainty are now definitely removed from discussion and the focus is put to Pusztai himself whose capacities are questioned, thereby eliminating all legitimacy from his findings. Two weeks later, science journalist Steven Stroeykens looks back at these events in an editorial in the science section of *De Standaard* ('Lies and genetic manipulation', 31 August 1998), focusing on the role of media:

The news fitted perfectly with a general atmosphere of distrust for genetic manipulation, it came from an unsuspected source and it sounded credible. Sufficient to be picked up by about all media, and here and there even a front page ... Obviously it is still easier to manipulate the media than to manipulate DNA. And probably more dangerous

In relating the reporting on Pusztai's study to the sensational character of 'the media', this suggests that the ideological culture of *De Standaard* questions whether news media have a role to play when it comes to warning fellow citizens of possible dangers in the case of new profitable technologies.

Case study 3. The Pusztai-affair: Part 2 (February 1999)

The frame of scientific uncertainty only becomes politicized when a panel of 23 scientists releases a memorandum on 12 February 1999 vindicating Pusztai's results.

De Morgen: mobilizing public concerns. *De Morgen* not only provides full coverage of this event on 13 February 1999 with a front page article and two analyses inside but also seizes the opportunity for an in-depth investigation of the socio-economic aspects of agricultural biotechnology with four more articles. In the front page article Pusztai's results are reiterated before stating that:

While the news unleashed a storm of protest on the canal island and in the rest of Europe, the European Commission voted against the import of genetically modified cotton that could lead to antibiotic resistance. The European Parliament proposed stricter regulation. Scientists remain divided (Peter Goris, 'European agitation on genetically manipulated vegetables')

In acknowledging the existence of scientific uncertainty, the author implicitly legitimizes political action by the European regulatory level. In 'Genetic potato attacks immune system', he mobilizes public concerns by emphasizing the social call for a moratorium in the lead and by awarding Greenpeace the framing power to relate the silencing of Pusztai to the extent of corporate control and involved financial interests. The socio-economic context and consequences are further elaborated in a feature article on patents (Emmanuel Vanbrussel, 'Biotech and software: legal minefields') and a long interview with an Indian professor who is the leader of a farmers' movement (Hans van Scharen, 'March on Europe in global battle for seed'). In this interview, the technology is discursively constructed as a development pursued by multinational corporations, which will only further increase global social inequality and the dependency of citizens and farmers worldwide to multinationals for world food security. The following lead introduces the interview:

It will be a modern crusade against unbridled global free trade and patenting ... by chemical multinationals such as Monsanto ... five hundred Indian farmers will visit some European countries ... to make clear that they feel threatened in their existence by current developments.

But European consumers also need to wake up, according to the ... Indian farmers' leader and professor ... At least, if they care about food security, biodiversity and safe food

In addition to its questioning of the power structure from which GM applications originate, *De Morgen* chooses to highlight the uncertainty concerning health, environmental and socio-economic risks for local as well geographically distant peoples, thereby promoting support for a precautionary approach and moratorium. As in case study 1, *De Morgen*'s coverage points to an ideological culture in which values of equity and global responsibility drive its discursive construction.

De Standaard: 'sound science'. By ignoring this event at first, the ideological culture of *De Standaard* clearly devaluates its significance. This is confirmed two days later in an editorial ('Yes/no discussion on biotech continues', 15 February 1999) by Hilde Van den Eynde in which the legitimacy of this event is skillfully deconstructed in an apparent effort to defend the status quo: the Pusztai-affair is constructed as merely a 'yes/no-discussion' between two groups. Her linguistic choices for labeling both, however, construct a preferred meaning in which the authority of the Rowett Institute is validated by word choices like 'the distinguished Scottish biotechnology lab'. The panel and Pusztai on the other hand are de-authorized by putting the adjective renowned in 'Twenty 'renowned' scientists' between quotation marks and by using the adjectives 'expelled' and 'controversial' to label Pusztai. Six weeks later in a long feature article called 'Biotech kicks its own tail' (22 March 1999), science journalist Pieter Van Dooren returns to the Pusztai-affair and its possible consequences for European agriculture.

What started as a riot about a genetically modified potato is starting to get out of hand. The creator of this affair has already been devoured by his own creation, but the next prey could well be the entire European agriculture. Have biotechnologists underestimated the fear of the public?

With an allusion to Frankenstein in the lead of the feature article, Van Dooren employs a strategy of dramatization: Not to warn fellow citizens of possible health or environmental risks, quite to the contrary, by narrativizing their acknowledgement as a major risk for the future food supply of Europe. Van Dooren constructs his argument in three steps. First, Pusztai is discredited as an agent of unwanted knowledge: a former colleague is quoted denouncing the soundness of his study, claiming '[t]he embarrassing thing is that he had to beg for support from people he previously called 'idiots'', thereby concluding that '[h]e must have been after a riot'. Second, the tripartite construction of the debate is expanded by including the food industry (of which several chains in the meantime have declared bans on using GM ingredients) as well as politicians (who have called for regulation or a moratorium) in the group of opponents for opportunistically following their fearful customers and voters, respectively. Furthermore, the authoritative voice of 'gene technologist' Marc Van Montagu (the Fleming who developed the gene transfer technique and subsequently founded PGS) is used to stigmatize opponents as 'that coalition of fundamentalist nature worshippers and old anti-multinational-gauchists' and characterize 'the public' as driven by 'absurd' fears which have been misguidedly underestimated by 'we as scientists'. Third, by quoting Pusztai's former colleague again, who also draws from the tripartite characterization of the debate, any political action is delegitimized for its certain catastrophic economic consequences:

Our fears are not stopping the Chinese ... In a few years from now, that rice will reach the market, take it or leave it. This is already the case with American maize and soy ... meanwhile, European regulation relies on public fear, the consequence of ignorance and campaigns by

green terrorists. If that circle is not broken, European agriculture will be wiped out in ten years from now

This last quote demonstrates how the re-interpretation of Pusztai's study as a case of flawed science serves to justify and promote preferred courses of political (in)action, which in this case is making regulation dependent on 'sound science' alone. This argument legitimizes technocratic decision-making and market forces over 'counterproductive' democratic control and debate. However, this assumption of a direct link between evidence and political action is highly problematic (Cook, 2004). First, if the authority of molecular biologists is rooted in their 'sound' use of the scientific method for studying biological processes, how then, could they argue that this authority carries over into the economic domain, which would imply that sound scientific thinking is in fact a property of particular people? Second, even if we would assume that achieving absolute certainty concerning a technological risk is feasible, preferred courses of action will necessarily entail value judgments as these will be grounded on an evaluation of the current and ideal state of affairs. By re-locating the actual risk of GM food in the acknowledgment of scientific uncertainty (which could serve as a motivation for regulation) and by stressing its catastrophic economic consequences, this ideological culture clearly prefers a non-regulatory approach.

Case study 4. The Moratorium (June 1999)

On 25 June 1999 the European Council of Environment Ministers proclaims a 'de facto moratorium' on the approval of new GM varieties until Directive 90/220 is reviewed. This constitutes a unique policy act in the politico-economic context of Western 'high-tech knowledge societies' in which the role of science and technology for innovation and social progress generally goes unquestioned.

De Morgen: precautionary principle. Whereas *De Standaard* only reports on the Council decisions in terms of one article afterwards, *De Morgen* provides full coverage of this event with two articles in the run-up to the Council meeting and one report afterwards. As the debate moves into the political realm of regulation, *De Morgen* takes up the task of debating responsibilities and mobilizing attention to facilitate an inclusive discussion. In the subtitle of one article which reads as 'Governments should be able to stop GMOs out of precaution, without scientific proof of their harmfulness', Max Borka rejects the scientific argument of 'sound scientific evidence' as the only argument for political action ('Europe wants to strengthen its grip on GMOs', 24 June 1999). Greenpeace is awarded the framing power in making three demands: (i) the primacy of the precautionary principle in regulating GMOs, a position *De Morgen* has endorsed by uncritically reproducing it in its subtitle, (ii), environmental regulation to have priority over free trade, motivated by stressing its need in allowing developing countries to protect their biodiversity, and (iii), a system of traceability to ensure liability for any adverse effects. Again, we find the reporting of *De Morgen* to be driven by values of social and global responsibility, especially in promoting a version of sustainable development in which future environmental security is highly valued.

De Standaard: free trade. On the other hand, the ideological filter of economic journalist Pascal Sertyn, the author for the report of the Council decisions in *De Standaard*, leads him to analyze the decisions from the perspective of both industry and the United States (US):

How the industry will react ... remains the main question ... Plant Genetic Systems from Ghent already sounded a warning ... There is a danger that biotech-companies ... may have little interest to further invest in Europe ... [Europe] is going against the American grain with

[this] decision ... In the United States and elsewhere GM varieties are planted on a massive scale ... [this] may lead to more trade frictions ... The Americans have been complaining for a long time that European decisions are mainly politically inspired and hardly take into account scientific assessments ('Genetically modified food in the fridge', 26 June 1999)

By debating the Council's decisions from the perspective of industry and US trade relations, Sertyn weighs the policy decisions in terms of the consequences for the business interests of the most powerful social groups in society, contrary to *De Morgen's* attention for the consequences for developing countries. In this discursive construction, the European Union stands isolated in the world resulting from its choice of motivating policy through 'political' and not scientific motivations, again implying that there is a direct link between evidence and action. This discursive construction ignores power relations in society and in fact fights claims for a need to change the status quo. It starts from the implicit assumption that the current economic power structure is a *natural* and *inevitable* arrangement in which political interventions damage the public interest. The technology that originates from this power structure is discursively isolated from any axiological and normative questioning.

Discussion

By presupposing an underlying ideological conflict between alternative technological futures, the risk conflicts-perspective opens up spaces for evaluating media discourses on whether they are found to facilitate or impede democratic debate, by contributing to processes of politicization or de-politicization, respectively. In seeking to reveal and analyze the relevant discursive strategies at work in these processes, this paper has applied Carvalho's CDA-approach to selected media discourses on GM crops and food in two Belgian elite newspapers. This has resulted in the identification of two distinct ideological cultures.

The main discursive operation of one ideological culture (central in *De Standaard*) is exactly to eliminate this space for fundamental political conflict by constructing a very specific relational field: at its core, it locates any epistemic authority (in terms of an unproblematic notion of scientific consensus) firmly with the promoters of the technology, shifting the site of struggle from alternative technological futures to dichotomies such as science versus anti-science/ideology/fear, rationality versus emotionality, sound science versus junk science. Subsequently, the emanating discursive strategies are aimed at neutralizing whatever factors or actors question this scientific consensus: critical scientists are discredited as agents of unwanted knowledge; social critics as fundamentalists, radicals, terrorists, etc.; media that report on them as sensational; precautionary politicians, food and retail industries as opportunistic, etc. Citizens, on the other hand, are characterized as driven by fear and ignorance and are perceived as particularly vulnerable for manipulation, which is why they are delegitimized as democratic subjects. In other words, by naturalizing the technology and its promoters as scientific and economic progress, this discursive practice insulates both from any epistemic, axiological and normative questioning and explains resistance exclusively by factors external to the technology or the power structure from which it originates. In taking up the defense of the status quo in each of the selected case studies, this ideological culture is found to be driven by values of market liberalism and profitability, as business interests and US trade relations provide a benchmark for evaluating policy options, and the underlying motivation for fighting claims of scientific uncertainty is to eliminate any legitimation for political regulation. Furthermore, by deriving normativity exclusively from 'sound scientific evidence', i.e. technocratic decision-making and market relations, this ideological culture clearly interprets democratic control and debate as disruptive and counterproductive.

By constructing a relational field in which epistemic authority is also awarded to critics and by framing the marketing of GM products as a contested process steered by powerful agents, a second ideological culture (central in *De Morgen*) is found to create a very different discursive space: one which approaches the issue as a conflict between alternative technological futures, making it the object of public accountability, democratic debate and political regulation. Instead of amplifying the idea of a scientific consensus, the emanating discursive strategies are aimed at revealing the competing sets of assumptions, values, and interests underlying the opposing responses to scientific uncertainty: potential health, environmental and socio-economic risks for local as well geographically distant peoples are put against corporate control and financial interests; the precautionary principle against 'sound scientific evidence'; environmental regulation against free trade, etc. Driven by values of equity and social and global responsibility and solidarity, this ideological culture is repeatedly found to seize on the selected controversial events to question the power structure from which the technology originates, while authorizing the agents and institutions calling for citizen and political mobilization, and mobilizing public concerns by reinforcing the call for political action.

The unique contribution of combining the risk conflicts-perspective with Carvalho's CDA-framework lies in its revelation of two accumulative analytical levels: while this conceptual and empirical perspective aimed at revealing the extent of ideological struggle by assisting in the creation of spaces for conflict and dissent to be expressed and registered (level 1), the subsequently identified ideological cultures (and their associated discursive strategies) are found to either aim at foreclosing these spaces again (processes of de-politicization) or cultivating them (processes of politicization) (level 2). In other words, it was shown that instead of finding two ideological cultures with competing ideological projects, we find the discursive strategies and practices of one ideological culture aimed at eliminating any space for ideological conflict (and consequently, democratic debate), while the discursive strategies and practices of the other are aimed at opening or safeguarding this space. Ultimately, the recognition of the existence of ideological conflict between alternative futures, or put differently, the legitimacy of a broad democratic debate, is what is found to differentiate the identified competing ideological cultures. The approach put forward in this paper then has succeeded in revealing the respective discursive strategies and practices at work in the(se) processes (of facilitating or impeding democratic debate). Furthermore, compared to previous content analytic studies (Gaskell and Bauer, 2001; Nisbet and Hume, 2006; Priest and Ten Eyck, 2003), this CDA-approach not only succeeds in identifying similar interpretative frames (i.e. scientific progress, economic prospects, public accountability and scientific uncertainty), but more importantly, also allows conclusions about the values they promote, the ideological cultures they are part of, and how they are used to either close or open spaces for democratic debate and citizenship.

The limitations of this study serve as important avenues for future research. First, it was limited to two Belgian elite newspapers and four selected cases of events which occurred between January 1998 and June 1999. Although these specific selections were motivated by the need for registering a high level of ideological discussion, the results of this study require to be complemented, enriched and expanded by analyzing different events and different techno-environmental controversies in different newspapers in different countries. Second, it was limited to the analysis of media texts. This leaves open important questions in relation to production and reception processes. Regarding the former, the analysis of the newspaper articles suggests a large influence of press releases (confirming Davies 2008), which is particularly evident in those instances in which no significant differences between newspapers was found (case studies 0 and 2). But what exactly is the relationship between specific ideological cultures and the influence of press releases? And furthermore, how do current affairs journalists (mainly in the case of *De Morgen*) and science journalists (mainly in the case of *De Standaard*) relate differently to the identified ideological cultures and to press releases on science reports? This latter question is especially significant as in those instances where media discourses were

found to reproduce existing power relations, news was reported through the traditional format of science journalism, reporting science claims as mainstream science opinion, typically drawing on press releases. Regarding reception processes, definite conclusions regarding facilitation or impediment of democratic debate and citizenship will only be possible when future research assesses the reception of these media texts by different social groups in society.

Notes

1. Na is used when no author or source is indicated in the selected newspaper articles.

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