

GM Crops in Hungary: Comparing Mass Media Framing and Public Understanding of Technoscientific Controversy

LILLA VICSEK

Institute of Sociology and Social Policy, Corvinus University of Budapest, Budapest, Hungary

This manuscript is a pre-print version of the following article:

Lilla Vicsek (2014): GM Crops in Hungary: Comparing Mass Media Framing and Public Understanding of Technoscientific Controversy, *Science as Culture* (2013

Impact Factor: 0.596), 23 (3) 344-368., DOI:

10.1080/09505431.2014.884062,

<http://www.tandfonline.com/doi/abs/10.1080/09505431.2014.884062#.VBMEL20Gc6w>

The current manuscript version had been created before the article was copy edited, so some of the formulations are different in the final text.

ABSTRACT

Unlike some Western societies, in Hungary there has not been intensive public debate on the issue of genetically modified crops. The mass media has published little to inform Hungarian lay people about GM crops or their relevance to the country. Nevertheless the media did convey some general impressions, mainly from within an Anti-GM Threat frame. Several elements from the mass media were present in lay focus group discussions – e.g. GM crops branded a food risk, general focus on risks, health risk identified as important risk, foreign companies regarded as source of the problem and as being ‘just out for profit’, image of corn, rhetoric of deterioration, etc. This overlap is in consonance with theories postulating such similarities, whereby the media framing provides a resource which can be appropriated for public understanding. At the same time, there were also differences: some elements of the dominant media frame were mentioned only vaguely or in a somewhat modified way. Other issues raised in the media frame, not resonating with wider cultural themes, were absent from focus group discussions (e.g. environmental concerns). And participants were also able to rely on other conversational resources (analogous reasoning, cultural themes) to formulate some additional issues beyond the media reportage.

KEY WORDS: GM CROPS, PUBLIC UNDERSTANDING OF BIOTECHNOLOGY, GENETICALLY MODIFIED CROPS, MEDIA FRAMING

1. Introduction

‘Gene-fouled or gene-improved?’ – this was the title of a recent meeting of the Hungarian Skeptic Society, an organization which propagates scientific thinking¹. The title alludes to the division existing within scientific circles in Hungary between GM proponents and GM skeptics.

While there have been intense public debates on GM crops in several societies, this has not been the case in Hungary (Shineha & Kato, 2009). The GM issue – including the differences in opinion among scientists – has received little attention from the media.

Political parties in Hungary were in agreement on opposing cultivation of the genetically modified MON810 corn in Hungary, but this issue was low on their agenda, and the agreement was not heavily publicized. Environmentalists in Hungary began to pay more attention to the GM question in the second half of the nineties, when some environmentalists started an anti-GM campaign, although that campaign received little attention from the media or the wider public (Acsády & Ferencz, 2008; Harper, 2004). Since then there have been only a few small demonstrations on the GM issue organized by environmentalists. There were no big campaigns reaching many people directly, compared for example to those conducted in the UK (Levidow, 2000).

When questioned in surveys Hungarians offer negative evaluations of GM crops, but consumers did not engage in active protest against the issue, the public did not become mobilized in the GM controversy (Bánáti & Lakner, 2006; Gaskell et al., 2006; Gaskell et al., 2010; Kasza & Lakner, 2012).

At the time of the research the cultivation of GM crops for commercial purposes was not allowed in Hungary. Although the EU had by then allowed the cultivation of MON810 corn, Hungary has opted for a national safeguard clause. The European Commission has several times introduced motions to lift the moratorium in Hungary – to date unsuccessfully.

Members of the Hungarian public met with information on GM mainly from the media: there were no anti-GM campaigns at stores in Hungary and citizens do not meet with GM labels in the stores. It is obligatory to label GM content above 0.9 percent, however, there are basically no labeled products in the stores.

In my research, I chose to focus on genetic modification as it is a technology that is used in cultivation in great and growing areas around the world and has a potential to affect the lives of many people. The technology has aroused controversy in many countries: proponents emphasize its benefits, opponents the great risks linked to the technology (Shineha & Kato, 2009). Decisions on how to cultivate crops are important in Hungary, among others because of the importance of seed production in agricultural exports. Although GM crop cultivation is not allowed in Hungary and stores basically do not stock labeled GM products, according to experts Hungarians do eat products which have some degree of GMO content in them as GMO content is present in many unlabelled food products, in some cases even exceeding the 0.9 percent labeling limit (Kasza & Lakner, 2012).

Science and Technology Studies scholars and policy experts applying new models of public understanding of science have argued that it is important to study how the public sees technoscience and to consider their views when making decisions on science issues, and have stressed the relevance of the scientific citizenship of the public (Király, 2007). The European Commission (2009) has lately also stressed that the views of the public need to be taken into account. In addition to the study of public understanding of GM it can also be relevant to study the media framing, as the media can potentially be an important source of information for the public on science and technology issues (Crawley, 2007).

The exploratory research presented in this paper examined the following questions in Hungary:

1. What frames did the mass media apply in the GM controversy?
2. How did lay people make sense of the GM issue in group discussions?
3. In what ways was the lay understanding that emerged in the focus groups similar to and different from the media framing?
4. How did the media frames/media content operate as a conversational resource in the lay discussions?

In order to answer the research questions, I conducted a content analysis of newspapers and a focus group study which comprised eight groups.

Few previous social scientific works have focused on any aspects of the GM controversy in Hungary, where examining social dimensions of biotechnologies is not part of the main research agenda of social scientists. Thus, very little is known internationally on the details of the Hungarian situation (Kasza & Lakner, 2012).

2. Two Arenas of the Public Sphere of Technology: Mass Media and Public Understanding

Following some ideas of Bauer's (2005b, p. 9) on the public sphere of technology, I consider public perception/understanding and mass media to be two arenas of the public sphere which 'operate according to different rules', are often different in their cycle of attention and contents. However, in certain circumstances there can be a coupling, resonance and a degree of congruence between media representation and public understanding. One of the objects of this paper is to study whether in the case of the GM issue in Hungary similarities in terms of content exist between the media arena and the public perception, and if so, in what respects.

2.1. The Mass Media Arena

In the investigation of the mass media arena of the public sphere I relied on the theoretical and conceptual work related to frames (Entman, 1993; Gamson, 1992; Gitlin, 2003; Iyengar, 1991; Kitzinger, 2007; Scheufele, 1999). It has been argued that frames are an 'essential feature of news' (Tuchman, 1978, p. 193). The term 'frame' has been used in divergent ways. Here I build mainly on the views of Entman (1993) and Kitzinger (2007). According to Entman (1993, p. 52): 'to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described.' Besides these, Kitzinger (2007) also regards some other elements such as metaphors, images, labels, definitions, how issues are categorized, etc. as key cues of frames. Frames can be regarded as interpretative packages. 'Condensing symbols' enable even one element of a frame to represent the whole package (Gamson & Modigliani, 1989, p. 3).

Bauer (2002, p. 93) has argued that a change has taken place in the 'symbolic environment' of biotechnology and that the way it is framed in the media in many countries has changed. Previous studies (which did not include Hungary in their sample) showed that whereas in the early nineties in numerous societies the media applied similar frames with respect to medical and agricultural applications of biotechnology, over time in many countries the media increasingly differentiated between these applications, and applied divergent frames. The media representation of agri-food biotechnology became more negative, with a concern frame employed more often in connection with the issue (Bauer, 2005a; Bauer, Kohring, Allansdottir, & Gutteling, 2001; Marks, Kalaitzandonakes, Wilkins, & Zakharova, 2007).

2.2. The Public Perception Arena

The literature on the different models of public understanding of science and technology (PUS/PUST) and the empirical studies on PUS have informed my thinking on the public perception arena of the public sphere. Deficit models of PUS have emphasized that the lay public is irrational and illiterate with respect to science and technology matters and if it were properly educated then it would have a positive attitude towards science – as positive attitudes were regarded by this model to be the proper attitudes towards science issues (Bucchi, 2008). This perspective has envisioned 'a singular Olympian objective body of scientific knowledge

at the mercy of the vagaries of lay public ignorance' (Ezrahi, 2008, p. 183). I am sympathetic to the numerous critiques that have been made of many of the assumptions of this model.

Negative evaluation of technoscience innovations in many cases cannot be traced back to a purely information deficit as the deficit model supposes (Bucchi, 2008). In recent decades more positive views on PUS have emerged that do not treat PUS as just an 'impoverished or quantitatively inferior version of expert knowledge' (Bucchi, 2008, p. 60), but rather acknowledge that it is something qualitatively different (Irwin & Wynne, 2004). Some authors even reject use of the term public understanding because they see it as linked to the deficit model – while others use it in a more general sense in the meaning of public perception without the implications of the deficit model (Bauer, 2009). This second approach is followed here.

Bauer (2005a) has argued that similarly to the media, within the public understanding there is an increasing demarcation between medical (red) and agri-food (green) applications of biotechnology. Empirical studies on the public understanding of biotechnologies show that in many countries in Europe at the end of the 20th century and in the 21st century the public evaluated agricultural applications negatively and medical applications more positively (Bauer, 2005a; Gaskell et al., 2006; Gaskell et al., 2010). This was also the case in Hungary according to Eurobarometer data (Gaskell et al., 2006; Gaskell et al., 2010).

2.3. Relationship Between the Two Arenas

There has been extensive debate over many decades on the relationship between the PUS arena and the mass media arena of the public sphere (Hardt, 1992). If there are similarities between media content and PUS, what can explain this?

In my view, in order to consider explanations of potential congruence between the PUS arena and the mass media content, it is useful to conceptualize the communication of science and technology as an interactive field in which actors (political institutions, opposition parties, civic organizations, business groups, expert communities, etc.) compete 'to advance their preferred view of events and issues and to mobilize support' (Petts, Horlick-Jones, & Murdock, 2001, p. 3). The major players can in some cases communicate their views directly to the public, but most often have to rely on the media. In this model the lay public is not just the receiver of media information, it is also in interaction with other actors. Due to the complex nature of relationships, it can be difficult to separate the causes and effects. However, not all routes of influence necessarily have the same strength in all situations (Bucchi, 2008).

In the model, there is a possibility that public pressure influences the media content (either directly or indirectly via pressure on political organizations which then influence the media) and that also contributes to similarities between media content and public perception, or the similarities may be due to a third party (e.g. environmental organizations) communicating directly to the public. As I have argued in a study based among others on expert interviews these types of influence were not characteristic in Hungary for the GM issue: the public was quite passive, thus did not exercise pressure and campaign groups did not communicate directly to the public (Vicsek & Gergely, 2012).

If we look at theories that touch upon the route of influence from the media arena to the public perception arena of the public sphere, there is a difference in the time range involved: cultivation theorists for example tend to focus on a long-term effect of the media on public perception (Gerbner & Signorielli, 1986). In contrast, the framing tradition – which I rely on in this paper – does not have such a long-term perspective (Entman, 1993; Scheufele, 1999; Schuck & de Vreese, 2006). Thus, based on framing theory one would expect some

similarities between the dominant media frame and the dominant public understanding within a shorter time range, compared to the application of cultivation theory².

Gamson (1992) has suggested that the extent of the similarities between dominant media framing and public understanding can vary issue by issue: media influence thus has to be investigated issue by issue within a society. Some authors within the field of science and technology studies (STS) have argued that technoscience issues present a special case with respect to the role of the media. Crawley (2007) has emphasized that media frames might be more relevant in determining PUS in the case of topics where lay people gather most of their information from the media – in contrast to topics with which they have personal experience or which they discuss with others.

In my view it is fruitful to apply the tool/resource metaphor of framing researcher Gamson (1992) to conceptualize how media frames/content can affect PUS. This understanding of media influence – building also on framing theory – puts emphasis on ‘effects in use’. It regards media content as a tool or a resource. When people rely on such tools during conversations – by using elements of the media frames in their line of argument – this can be regarded as a media effect. This approach looks at how, within the process of actively constructing meaning, people draw on media content as a resource. The perspective does not imply that media determine how people think or that there is a one-way influence between media discourse and public understanding. It takes into consideration that one factor in deciding which tool to use is its availability, the ‘ease of access’ (Gamson, 1992, p.180), because ‘making sense of the world requires an effort, and those tools that are developed, spotlighted, and made readily accessible’(Gamson & Modigliani, 1989, p. 10) are easier to use.

When looking at how the media content can operate as a resource, it is important also to take into consideration that different kinds of news might resource PUS to different degrees, different kinds of news pieces might engage people to different extent, as well as the fact that various issues and various aspects of a news story can also capture the attention and resonate with the public to differing extent. Soft news articles focusing for example on human interest stories might draw the attention more than hard news dealing with political issues (Henderson & Kitzinger, 1999; Vicsek, 2011; Vicsek & Gergely, 2011). A public that is interested in post-material issues might engage more with environmental issues of the GM media reportage, than publics which are of material orientation, such as the Hungarian public (Inglehart & Welzel, 2005; Karácsony, 2001). Particular kinds of new outlets might also reach different segments of the public (Henderson & Kitzinger, 1999; Vicsek, 2011; Vicsek & Gergely, 2011).

Apart from the media there can be other, conversational resources which people draw on to construct their understanding of an issue: such as information gathered from talking with others, relying on what one learned at school, relying on personal experience (Gamson, 1992), relying on broader cultural themes, schemas (Parales-Quenza, 2004), applying analogous schemas (Hornig Priest, 1994). Hornig Priest (1994) has argued that people can also rely on their own experience in the case of other topics and can apply analogical reasoning to support argumentation in the case of technologies that they have no experience with – and that audience schemas in interaction with media coverage can influence public understanding of an issue.

A number of researchers from other countries have reported some kind of empirical relationship between media use and public understanding of biotechnologies – including GM as well as the red-green biotechnology distinction – even if not necessarily all media variables were significant, and even if differences were found between countries (Bauer, 2002, 2005a; Besley & Shanahan, 2005; Ho, Brossard, & Scheufele, 2008; Hornig Priest, 1994; Hughes et al., 2008; Liu & Priest, 2009; Nisbet & Goidel, 2007; Stewart, Dickerson, & Hotchkiss, 2009;

Vilella-Vila & Costa-Font, 2008; Wagner & Kronberger, 2001; Wagner, Kronberger, & Seifert, 2002). Many of these previous studies have concentrated on societies where there has been heated public debate on the GM controversy (Hughes, Kitzinger, & Murdock, 2008).

3. Data and Methods

I examined the coverage on the topic of GM crops and food for a two and a half year period (from May 1 2007 to October 31 2009 – the end date leading up to the time the focus groups of the research presented in this paper took place) in the two political papers (Népszabadság, Magyar Nemzet) and the two tabloids (Blikk, Bors) with the highest circulation in Hungary.

The articles of these dailies which contained search terms related to ‘genetic modification’ and which had a content rated by the coders (the author and an independent coder) upon reading to be in connection with GM crops or food were selected from the electronic database of Observer Kft.

A quantitative content analysis and a more in-depth qualitative data analysis were made. The analytical criteria for the qualitative analysis of the frames were built on the ideas of Entman (1993) and Kitzinger (2007). Details of the methodology can be found in Vicsek (2012).

The research also involved eight focus groups conducted in 2009³. As Table 1 shows, research subjects came from diverse segments of Hungarian society. Heterogeneity was aimed for mainly between groups rather than within the groups. Some groups were held in the capital, some in other cities, and in a small village (Penyige). In some groups there were people who knew each other, others consisted of strangers. Some focus group members (in the villagers’ group, in the Debrecen group and in the pensioners’ group in Budapest) had at least some experience with cultivation of crops (not large-scale cultivation, but mainly cultivation for their family’s own use). All participants were media users, although to differing degrees (for practical and financial reasons it was not possible to make a more detailed screening on media usage).

Table 1 about here

In order to enable some comparison with results from another country, the sampling strategy and the guide applied were similar to those employed by Hughes, Murdock and Kitzinger (2008) in their research on the construction of the GM issue in the UK. It is important to note that the possibilities for comparison were somewhat constrained because of the different focus of their analysis. The UK is an interesting country for comparison as there the GM issue played out very differently within the public sphere: there was heated public debate, it was not of low salience in the media, and there were also campaigns which directly targeted the lay public (Cook, Robbins, & Pieri, 2006; Levidow, 2000).

The transcripts of the focus groups were coded with the qualitative data analysis software NVivo.

When interpreting focus group results it is important to take into account that diverse social psychological phenomena operate during the discussions. Some people might not want to emphasize that their opinion is different from that of the group majority (Stewart & Shamdasani, 1990; Vicsek, 2007). In all groups negative evaluations of GM crops were dominant. It is possible that fewer pro-GM statements were made in the groups than if the research subjects had been asked in an individual interview. The focus groups allow us to observe how people converse upon the topic, but we cannot tell what they feel internally. This however does not present a problem for the media effect in use approach that I apply in this

paper: within this approach one wants to see how media content is used as a resource in conversations and not what the participants' internal opinions are.

It is a limitation of the research that the results of the discussions were compared to frames which had been found to be typical in only four newspapers (even if they were the most widely read political papers and tabloids). However, based on interviews with experts and on study of some of the television content, it can be hypothesized that the coverage of other media outlets in Hungary was of similarly low salience and dominantly negative and that the arguments of the GM debate appeared in a similar form (Vicsek, 2012).

The present research has limitations linked to generalization of focus group results: conventional generalization of results is not applicable to focus groups (Vicsek, 2010). However, the fact that in spite of a diverse sample there were many common patterns among many of the groups of the present research suggests that the results might have relevance outside the concrete context in which they originated.

4. Results

4.1. Mass Media Framing of GM Crops

The topic was of very low salience in the period investigated in the press outlets analyzed. Low salience of the coverage meant that not only were there very few articles touching on the topic during this two and a half year period (in all, 196 articles in these four media outlets mentioned the topic), but that these basically never made front-page news and in many cases the topic of GM was discussed only very briefly within the articles (60 percent of the writings contained no more than one paragraph on the topic). Analysis of the diffusion of the Hungarian press articles into news formats and press outlets showed that the topic was basically missing from soft news and was hardly present at all in the tabloids (only 16 of the 196 articles appeared in the tabloids).

Building on the literature on frames (Entman, 1993; Kitzinger, 2007), together with another coder I identified two distinct frames based on the study of the media coverage.

The Anti-GM Threat frame was the dominant frame in 54.6 percent of the 196 articles. The Pro-GM Advancements and Benefits frame was much less frequent: it was the dominant frame in only 13.8 percent of the writings.

Comparing the Hungarian press coverage to the results of some media analyses of the coverage in Western countries we can see that the issue was of lower salience in the Hungarian press and the treatment was particularly negative (Cook et al., 2006; Marks et al., 2007). A comparison of the results to my earlier findings on the media representation of stem cell research and treatment (Vicsek, 2011; Vicsek & Gergely, 2011) also shows that similarly to what was found in many other countries (Bauer, 2005a), in Hungary too a difference could be seen in the applied media frames for red and green biotechnology, with negative frames utilized more often in the case of green biotechnology.

It exceeds the limits of the current paper to reproduce here a detailed description of the results of my previous in-depth qualitative analysis of the press frames on GM crops (full information on the analysis and the methodology is found in (Vicsek, 2012)): here in Table 2 only a summary of the results is presented.

Table 2 about here

Figure 1 about here

4.2. Lay Understanding of GM crops

All participants claimed to have heard of genetically modified crops. The overwhelming majority of the focus group participants evaluated GM crops negatively. This contrasted with the positive evaluation participants expressed on stem cell research in the groups. The existence of this green-red biotechnology contrast fits with findings of previous quantitative research (Gaskell et al., 2006).

In the following I describe the lay understanding of GM crops that emerged in the focus group discussions according to the same dimensions I employed for the qualitative analysis of the media frames. Relying on more positive perspectives on PUS as opposed to the deficit model (Bucchi, 2008), I describe the components of the lay understanding that emerged in the focus groups and in the next section I discuss what resources the participants drew on, rather than treating PUS as just a quantitatively inferior version of a ‘proper’ scientific understanding.

Many focus group participants defined the problem as the trend towards mass-produced, tasteless, suspicious, artificial, ‘foreign’ food available in the stores, which displaces traditional, good-tasting, healthier, Hungarian products from the domestic market. Often participants did not separate this from the GM issue (many thought that certainly or probably there were many GM foods in the stores). It also emerged recurrently that GM foods were risky and had unfavorable characteristics. The gap between the possibilities of the rich and the less affluent was found to be problematic in some accounts: people who were not affluent might have to buy gene-modified food, because it is cheaper and that is what they can afford (in contrast to rich people who could buy healthy food).

Only very few people identified the problem as being the failure to support a technology which might be useful. Not everyone defined a problem.

When sources of the problem were named, they were connected either in general to ‘foreignness’ – or in several cases linked to either the US, or to multinational companies, to hypermarket chains, or multinational fast-food chains – and these were then often rated negatively among others for being ‘just out for profit’.

Andrew⁴: Then they went ahead and brought in the multi chains and everything that comes with them. Which is bad. And they can sell it all for a profit and they take the Hungarians’ money out of the country. (Group 6)

Throughout the discussions, the topic was treated almost exclusively as a food issue, other uses were hardly mentioned (in the negligible number of cases where they were brought up, the following were mentioned: use for fuel, for making medicine, animal feed, potential military use).

The question of risks and negative aspects connected to GM featured strongly within first associations with the topic and also later in the discussions. Human health risk was the major focus of risk concerns. Some thought it likely or certain that GM food was unhealthy for humans, others were uncertain, but often found the uncertainty itself problematic.

Agnes: Good heavens, what an effect this could have on the human organism! (Group 3)

Mary: The first thing that occurred to me is that it’s a bit frightening that they fiddle with the products and perhaps this might not be healthy. (Group 1)

A key element in the discussions was that GM was unnatural, artificial, it was an interference with nature – and this was seen as a problem.

Sandra: My opinion is that it’s unnatural. It’s not normal. (Group 2)

John: Why do they have to intervene in the natural order? (Group 2)

Alex: A big, very big intervention in the order of life and nature. (Group 2)

It was a recurrent theme in the lay accounts that an important negative aspect of this type of food was that it did not have a good enough taste, was tasteless.

Peter: I've eaten real Hungarian apples... and that really had taste. The apples I bought in the Interspar shop had no taste at all, they didn't have anything to do with apples.

Moderator: Do you think they were gene-modified?

Peter: I'm not saying that they definitely all were, but anything that's not produced according to the natural order must have a different taste, and that applies to the ones that are gene-modified. (Group 7)

A range of other risks/negative aspects were also brought up, but these featured less emphatically, such as: man should not play God, it led to less variety in the case of vegetables and fruits, it placed small producers at a disadvantage, it had less vitamins, was irreversible, destroyed traditional agriculture, banished Hungarian products from the Hungarian market, yielded seeds which could not be planted. That it had a negative effect on animals was brought up in a few groups, however basically in all cases this was connected to a negative effect on humans (e.g. that in animal experiments it was shown to have a bad effect, thus it possibly had a bad effect on humans), that it would be potentially harmful to animals was thus not discussed as a problem in itself. The Hungarian focus group results link with previous results of quantitative surveys in Hungary, which have found that concerns about human health linked to GM crops were stronger than concerns about the environment (Bánáti & Lakner, 2006; Kasza & Lakner, 2012; Lakner & Kasza, 2005).

Benefits featured much less emphatically in first associations with the topic. Some of the benefits were mentioned only when the moderator asked at a later stage about benefits. Most prominent benefits included: greater productivity, big size and good appearance of the crops. Other benefits that were occasionally raised included: better price, ripened faster, greater resistance of the crop to adverse conditions, pests and diseases, better nutrient content, remained fresh for a longer period, did not need to be sprayed with chemicals.

Evelyn: I think it's rather that they are bigger, better, can be consumed easier and for longer, are easier to transport. (Group 2)

If a contribution on benefits was formulated it often contained a reference to risks, negative aspects, or rejection.

Ben: They do it because of productivity and higher yield, and for the quickest possible growth. But that serves business policy more than it does human health, it serves their goals. (Group 6)

Big size and good appearance were almost always discussed together with a characterization of lack of taste – and that good appearance is suspicious, not natural.

Ann: When something is beautiful, big and perfect. When you can hardly believe that fruit or vegetables could be so beautiful, that's suspicious too. (Group 3)

Good price was connected to involuntariness: non-affluent people might have to buy this kind of food because of the price.

If beneficiaries of the technology were named it was mainly the producers, developers. It was sometimes explicitly stated that it did not benefit ordinary people.

Laura: Well, the ones who grow them have a benefit. (Group 6)

In a few groups it was mentioned that it might be a solution for the hungry, but the conclusion was mainly that it is even too unhealthy for them to eat.

Stephen: And this problem simply has to be solved. But it's not right that I feed Africa and it destroys Africa. (Group 3)

Gene modification was often used in the narrow sense to refer to a new, present-day, controversial technology.

Ian: In my opinion this gene modification didn't begin so long ago. These different types and varieties of, say, potatoes could be developed in a different way. For example, by crossing them, there are rules for that in biology and experiments for what you can cross with what, and what you will get. That's how they developed them so that they would be, I don't know what, and more productive. In my opinion these gene modifications are more recent... Plant breeding is different from gene modification. (Group 8)

In some cases a broad anti-GM concept was applied, where GM food was understood in a wider sense to represent or to be associated with a negative category of foods (food that

has been tampered with, containing unhealthy elements, blown up, big size and good appearance but without taste, artificial, 'foreign', sold and produced in great quantities, sold in multinational hypermarket chains). In some cases GM crops were explicitly equated with this category (all food which had such characteristics was gene-modified).

A few participants applied a broad pro-GM concept and associated GM with a procedure of plant breeding, namely hybridization – however others either did not react to this – and did not refer to it as such or attacked this understanding stating that plant breeding and genetic modification were different.

Examination of the labels used shows that participants used the terms 'gene-modified', 'gene-manipulated' and 'gene-treated' most often. Other terms were used rarely. No one used the expression 'improved with gene technology' or 'gene-improved'. The moderator used the expression 'gene-modified' which could have influenced the word usage of the participants to some degree.

When participants were asked for visual associations with the theme, mainly corn or some kind of vegetable came in, in several cases big, beautiful vegetables, in a few cases extremely large vegetables (such as 'a tomato the size of a melon') – with reference to news stories.

The past was often idealized as containing tasty traditional agricultural products and food. A trend of deterioration in food was perceived:

Lionel: It makes you think, we are moving more and more towards such artificial foods. Because 40 years ago people still ate home-made products and it did them no harm, but now we have no idea what we are eating. (Group 3)

The trend regarding food was sometimes fitted into a broader discourse on societal deterioration, on negative societal changes taking place.

Only in a few cases was a rhetoric of technological progress applied:

Evelyn: In my opinion it's technological progress. (Group 2)

Audrey: We can definitely regard it as innovation, can't we? It would be rather narrow-minded if we were to reject something because it represents progress. (Group 1)

The reason for the existence and development of GM technology was identified as dominantly economic, it was viewed as an issue about profit and this was rated negatively:

Peter: There are very powerful financial interests behind these, that's the only reason why they do it. (Group 7)

Frank: All they want is power, power and money, money. And that's why there are these gene modifications, and trying to squeeze as much as they can out of people. They want to sell more and more of that bad stuff and they don't care that in 10 or 5 years everyone will die or that there are already people who are sick because of these things. (Group 4)

If there was discussion of who is developing the technology, then development of the technology was mainly said to be coming from abroad (some people could only vaguely connect it to foreignness but did not name concrete foreign entities), in some cases it was connected to big companies, America, or American companies.

Ian: It all comes from gene-manipulated things and America and good little groups with loads of money. (Group 8)

In a few cases development was attributed to scientists – and this was sometimes connected to hopes that because of that it could not be bad for human health:

Mary: I think I wouldn't be against it because ... it's probably not idiots experimenting with it but, say, professors and people who, at least I hope, know what they're doing and then there is always the possibility that they might be doing good for someone if it's authorized. (Group 1)

Robert: I don't think that it harms the health because, after all, it's been developed by scientists. (Group 6)

4.3. Media Framing and Lay Understanding

One of my aims was to investigate how the media content and media frames operated as a resource, building on the perspective of Gamson (1992).

Focus group participants named the media as their major (and in many cases sole) information source on GM crops. Other information sources were reported to be hardly utilized at all: GM crops was not a topic most of them would discuss with other people (although some reported talking with others in general about suspicious aspects of foods, food scares, and the trend that foods taste worse and worse, etc.); they basically did not report seeing any information in stores on GM – including GM labels on food.

Although the media was named as the main information source, there were still constraints on the degree the media could resource discussions. If an issue is of low salience in the media (as is the case with GM in Hungary), then media content on that issue can potentially be mobilized less easily than in the case of a topic that is high on the media agenda (Gamson & Modigliani, 1989). As the diffusion of the media representation into media outlets was uneven, consumers of certain media outlets were able to receive even less information. The GM topic appeared in the Hungarian press almost exclusively in the form of hard news, which often engages members of the public less (Henderson & Kitzinger, 1999; Vicsek, 2011; Vicsek & Gergely, 2011).

The fact that many participants were not interested in the topic limited the extent to which media content could operate as a resource: many reported that if they met with GM-related articles in the printed press or on the internet they did not read these articles, some even said they switched channels if news on the topic came up on television (others commented that if it was on television among other news and it was not too long they might watch it).

Susan: The truth is that we don't even pay attention because it doesn't interest us ..., because I switched to another channel too and didn't listen to it. (Group 8)

It is an indication of the limitations of media content as a conversational resource that many could not name any news items when the moderator asked for concrete events or news items participants had heard about in connection with GM; only a small minority of the participants were able to do so. While media supplied the participants with some general impressions on the topic, it was a difficult task for many participants to mobilize concrete information on the news stories. Many reported an impression that media coverage on the topic was small and negative without being able to recall any news piece at the moderator's request. However, it is important to note that a significant part of these participants were able to activate some information in other parts of the discussions when conversing not on the topic of media reporting, but on GM itself and could then identify some elements from news stories.

In view of the above constraints it is not surprising that the media did not sufficiently resource discussions for typical participants to be able to know much about the situation of GM in Hungary (for example on the legal regulation, on the position of the political parties, on debates regarding MON810 corn, etc.).

Despite these gaps in the participants' knowledge, when comparing the media frames on GM crops with the discourse in the groups on the topic, it can be seen that a number of the fundamentals of the dominant Anti-GM Threat frame *did* emerge as major themes in the group discussions. A key similarity between the media coverage and the lay discussions was the focus on food. Although participants were asked in the first question and throughout the groups about 'genetically-modified plants' (as the word plant is used in the Hungarian media when referring to GM crops), all groups instantly associated from the questions to food and focused on the GM topic in terms of food throughout the discussions. This happened in spite

of the fact that the dominant meaning of the word plant in Hungarian is not in connection with food – thus if they had not heard about it in the media, they could have focused on other meanings of the word plant. The branding of the GM issue as a food issue can potentially lead to the mobilization of different analogous schemas, rhetoric, and experiences – than if it was associated with cure or industrial use (Hughes et al., 2008; Vicsek, 2011).

Other similarities between the dominant frame and the lay understanding that emerged in the groups were that the discussions focused on risk; GM crops were evaluated negatively by the majority; human health risk was identified as one of the major risks; the reason for development was seen to be profit; sources of the problem were linked to foreign entities; beneficiaries and developers were identified as foreign entities/multinational companies; the topic was basically not linked to a rhetoric of scientific progress, but rather to a rhetoric of deterioration; the image of corn was a key visual for the participants. Many of the labels of the Anti-GM frame were employed recurrently in the group discussions.

One type of similarity between the dominant framing and lay understanding of a biotechnology can involve what gets left out of both. Many gaps in the media coverage were present in the focus group discussions as well. Debates on the approval of the BASF Amflora potato which was intended for industrial use were already taking place within the EU at the time of the focus groups. However, the dominant media portrayal neglected the industrial aspect and it was basically not present in the focus group discussions either.

There were also many differences between the dominant media framing and the group discourse.

Often elements of the Anti-GM frame were formulated much more vaguely than what was present in the media coverage. Some parts of the frame (including some which appeared recurrently in the press material examined) did not appear at all in the group discussions, for example arguments that GM potentially harmed nature and wildlife, that it was not in the economic interests of Hungary to cultivate such crops, that the kind of moth to which MON810 was resistant did not exist in Hungary, etc, or the EC as a source of the problem. This vagueness and absence of certain issues was also possibly related to gaps in the participants' knowledge of the Hungarian situation and to the fact that certain topics (e.g. environmental and other post-material issues) resonate with the Hungarian public less than others (Inglehart & Welzel, 2005; Karácsony, 2001).

In some cases in the groups multinational supermarket and hypermarket chains (such as Tesco) and fast-food chains (such as McDonald's) were held to be sources of the problem as they were thought to be selling GM food – whereas in the press if GM food was linked to companies it was mainly to GM-producing companies, with Monsanto mentioned repeatedly. Within the group discussions Monsanto was mentioned only once. Thus, even if many people were not aware of the concrete details, similarly to the media they connected GM to foreign entities, particularly multinational companies.

There were also some issues which figured prominently in the group discourse but were marginal or absent from the dominant framing of the press. These were often brought up with the help of other conversational resources (Gamson, 1992): references were made to personal experience, cultural themes (Parales-Quenza, 2004) were evoked and analogical reasoning (Hornig Priest, 1994) was applied.

Participants frequently referred to their own sensory experiences linked to food in hypermarkets, claiming that the vegetables and fruit sold there were different from their experiences with, among others, home-grown vegetables and fruits. These arguments based on their sensory experiences were often intertwined with a rhetoric of deterioration in the quality of food. The cultural theme of natural/unnatural often appeared in the groups: the technology was evaluated as unnatural and interfering in an unpredictable way in an inherently good and valuable nature and this was seen to be one of the legitimate reasons for

its rejection⁵. Social inequality, the differences between the possibilities of the rich and the non-affluent seems to be another theme that occupied the participants. Analogous reasoning was often applied in the groups – mainly in support of arguments against GM. Cases where some kind of food – or other phenomenon – was regarded as initially healthy and later found to be unhealthy were brought up as analogies to support the claim that even if people think nowadays that there are no risks to health from GM, in the future it might turn out to have been harmful. Analogies were brought up in support of the argument that certain economic interests can influence what kind of information is given on a product. It was mentioned, for example, that the milk industry's economic interests stood in the way of 'revealing' that milk had bad health effects as well.

Some elements of the minority Pro-GM Advancement and Benefit frame were present in the groups – albeit marginally. Typically, it was the same few people within the sample who applied the different Pro-GM elements. Many elements of the Pro-GM frame were absent from the group discussions: such as the label 'improved with gene technology', or the argument that politicians are the sources of the problem because they opposed this technology, etc.

Comparing the findings of the Hungarian focus groups to the results of the research in the UK by Hughes et. al. (2008), several differences emerge. Although participants in the UK as well were often hazy about some of the details and specifics, they were more aware of the GM media coverage than their Hungarian counterparts: similar media stories emerged recurrently in the discussions. In Hungary the mobilization of media stories proved to be more difficult for the participants. UK focus group members were aware of the main risks, benefits, the major pros and cons and the key players presented in the media and they used this information to make points in the conversations. They also relied more on such supplementary sources of information as meeting with action and labeling in supermarkets.

5. Conclusions

In my analysis of the media arena of the public sphere of the technology (Bauer, 2005b), I identified two types of media frames in the investigated media materials, which contained distinct word usage, views on moral evaluation, ideas on who was to blame. The Anti-GM Threat frame was found to be the dominant frame, and the Pro-GM Advancements and Benefits the minority frame.

As regards the public perception arena of the public sphere of the technology (Bauer, 2005b), I studied the characteristics of the lay understanding that emerged in the groups, building on more positive perspectives of PUS as opposed to the deficit model view (Bucchi, 2008). The dominant understanding of GM in the focus groups involved thinking of GM as a negative, unnatural food technology that presents risks to human health and is associated with a trend of deterioration in food quality, whereby mass-produced, cheap, tasteless, suspicious, artificial, in some cases 'foreign' food which is available especially in multinational store chains displaces traditional, good-tasting, healthier vegetables, fruits, and grains.

For the investigation of the connections between the two arenas of the public sphere, the research applied the approach of Gamson which regarded media content/frames as a potential resource for discussions (Gamson, 1992). Gamson's approach was useful for the research, as – similarly to Gamson – in the examination of public understanding I employed focus groups because they provide an opportunity to observe how people converse on a topic. In this way, I analyzed how media content and frames operated as a resource in the Hungarian focus group discussions on GM. Although participants claimed that the media was their

dominant information source, and had the general impression that GM was connected in the media to food issues and was presented as something negative, many participants had a hard time mobilizing concrete news stories – especially at the beginning of the debate. I argued that several factors which according to the literature can limit the successful functioning of the media content as a resource (Gamson, 1992; Henderson & Kitzinger, 1999; Vicsek, 2011; Vicsek & Gergely, 2011) could be observed in the case of the GM issue. These factors included: the low salience of the media coverage – with especially marginal coverage in some media outlets, dominance of a news format which has a low capability to engage the public, nature of the coverage, a low level of interest of the participants in the topic as a whole and in some of its aspects, low resonance of some aspects of the topic with wider cultural themes that are popular among the public. The participants demonstrated a low level of knowledge of the GM situation in Hungary.

Thus, we see that the scope of lay people's scientific citizenship was impoverished as the media did not give information on GM crops in such a way that people exposed to the media afterwards would be aware of the details of the debates surrounding GM – a technology which is present in their lives as they consume products with some degree of GM content in them (according to experts the extent of GM content of some products is even over the 0.9 percent labeling limit, although the products remain unlabelled) (Kasza & Lakner, 2012). It is also a technology about which Hungary has to make strategic decisions with respect to its agriculture.

In spite of the above limitations, some findings of this research are in consonance with expectations based on framing theories (Entman, 1993) which postulate similarities between the dominant media frame and the dominant public understanding (although of course definite conclusions on the causal links cannot be drawn). Several of the fundamental elements of the major Anti-GM media frame *were* present in the answers of the group members (GM crops branded a food issue, focus on risks, health risk identified as important risk, foreign entities/multinational companies regarded as source of the problem and as being 'just out for profit', the image of corn, use of some labels, using a rhetoric of deterioration, etc.). Members of the public participating in the groups often did reach the same conclusion in their discussions as the dominant media frame – that GM crops were something negative and risky.

Numerous previous studies have found some extent of empirical co-occurrence of media content/media use and public understanding of GM crops or other kinds of biotechnologies (Bauer, 2002, 2005a; Besley & Shanahan, 2005; Ho et al., 2008; Hornig Priest, 1994; Hughes et al., 2008; Liu & Priest, 2009; Nisbet & Goidel, 2007; Stewart et al., 2009; Vilella-Vila & Costa-Font, 2008; Wagner & Kronberger, 2001; Wagner et al., 2002). The present paper intended to contribute to this body of literature among others by providing a case study from a country where the issue of GM crops was of lower salience in the media and lower on the public agenda than in the societies on which the earlier studies had focused.

Besides a number of similarities between the dominant media framing and the lay understanding, a range of differences also emerged.

The elements of the dominant media frame were often formulated vaguely and some elements in a slightly modified way. This vagueness and absence of certain aspects was also possibly related to gaps in participants' knowledge of the Hungarian situation and to the fact that certain topics (e.g. environmental and other post-material issues) resonate less than others with wider cultural themes that are popular among the Hungarian public (Inglehart & Welzel, 2005; Karácsony, 2001).

Although participants identified the media as their major information source on the topic, this did not mean that media coverage on GM crops was the only source they could utilize in the discussions. Some of the results on the divergences between the media framing and the lay understanding as expressed in the groups are in consonance with arguments that

people can rely on other conversational resources; that audience schemas and analogous reasoning can ‘actively and independently contribute to the interpretation of news accounts’ (Hornig Priest, 1994, p. 177); and that people can apply existing cultural themes to make sense of topics on which they have little information (Parales-Quenza, 2004). The use of conversational resources other than the media content also contributed to the differences between the media framing and the lay construction of the issue, as participants brought up additional issues beyond the media reportage with their help (such as arguments regarding the unnaturalness of the technology, the lack of taste of GM crops, or social inequality issues).

Note on contributors

Lilla Vicsek, Ph.D. conducts research at the Institute of Sociology and Social Policy at Corvinus University of Budapest on the gender culture of organizations and research related to the sociology of science and technology. Her recent publications dealt with the media framing of stem cell research/treatment and the role this played in shaping public understandings of the issue; they appeared in *Science Communication* and in *New Genetics and Society*.

Acknowledgements

The author would like to express her gratitude to Jenny Kitzinger, Susanna Priest, Cynthia Coleman, Les Levidow, Kean Birch and Roland Keszi for their constructive suggestions for the research. The research project reported in the paper was funded by the Hungarian Scientific Research Fund (OTKA), and the author was supported in her work during the project by the Hungarian Academy of Sciences with a János Bolyai Grant.

Notes

Bibliography

- Acsády, J., & Ferencz, Z. (2008) Perception and Attitudes towards Biotechnology in Hungary. In F. Molfino & F. Zucco (Eds.), *Women in Biotechnology: Creating Interfaces*, pp. 93-106 (Dordrecht: Springer).
- Bánáti, D., & Lakner, Z. (2006) Knowledge and acceptance of genetically modified foodstuffs in Hungary. *Journal of Food and Nutrition Research*, 45(2), pp. 62-68.
- Bauer, M. W. (2002) Controversial medical and agri-food biotechnology: a cultivation analysis. *Public Understanding of Science*, 11(2), pp. 93-111.
- Bauer, M. W. (2005a) Distinguishing Red and Green Biotechnology: Cultivation Effects of the Elite Press. *International Journal of Public Opinion Research*, 17(1), pp. 63-89.
- Bauer, M. W. (2005b) Public perceptions and mass media in the biotechnology controversy. *International Journal of Public Opinion Research*, 17(1), pp. 5-22.
- Bauer, M. W. (2009) The evolution of public understanding of science. *Science Technology & Society*, 14(2), pp. 221-240.
- Bauer, M. W., Kohring, M., Allansdottir, A., & Gutteling, J. (2001) The dramatisation of biotechnology in elite mass media. In G. Gaskell & M. W. Bauer (Eds.), *Biotechnology 1996–2000: The years of controversy*, pp. 35-52 (London: Science Museum).
- Besley, J. C., & Shanahan, J. (2005) Media Attention and Exposure in Relation to Support for Agricultural Biotechnology. *Science Communication*, 26(4), pp. 347-367.
- Bonfadelli, H., Dahinden, U., & Leonarz, M. (2002) Biotechnology in Switzerland: high on the public agenda, but only moderate support. *Public Understanding of Science*, 11(2), pp. 113-130.
- Bucchi, M. (2008) Of deficits, deviations and dialogues – Theories of public communication of science. In M. Bucchi & B. Trench (Eds.), *Handbook of public communication of science and technology*, pp. 57-76 (New York, NY: Routledge).
- Cook, G., Robbins, P. T., & Pieri, E. (2006) “Words of mass destruction”: British newspaper coverage of the genetically modified food debate, expert and non-expert reactions. *Public Understanding of Science*, 15(1), pp. 5-29.
- Crawley, C. E. (2007) Localized debates of agricultural biotechnology in community newspapers – A quantitative content analysis of media frames and sources. *Science Communication*, 28(3), pp. 314-346.
- Entman, R. M. (1993) Framing – toward Clarification of a Fractured Paradigm. *Journal of Communication*, 43(4), pp. 51-58.
- Ezrahi, Y. (2008) Controlling biotechnology: science, democracy and “civic epistemology”. *Metascience*, 17(2), pp. 177-198.
- Gamson, W. A. (1992) *Talking politics* (Cambridge [England]; New York, NY, USA: Cambridge University Press).
- Gamson, W. A., & Modigliani, A. (1989) Media Discourse and Public-Opinion on Nuclear-Power – a Constructionist Approach. *American Journal of Sociology*, 95(1), pp. 1-37.
- Gaskell, G., Allansdottir, A., Allum, N., Corchero, C., Fischler, C., Hampel, J., et al. (2006) *Europeans and biotechnology in 2005: Patterns and trends. Final Report on Eurobarometer 64.3*. Retrieved 24.2.2010, from http://ec.europa.eu/research/biosociety/pdf/eb_64_3_final_report_second_edition_july_06.pdf.

- Gaskell, G., Stares, S., Allansdottir, A., Allum, N., Castro, P., Esmer, Y., et al. (2010) *Europeans and biotechnology in 2010. Winds of change?*. Retrieved 22.05.2012, from http://ec.europa.eu/public_opinion/archives/ebs/ebs_341_winds_en.pdf.
- Gerbner, G., & Signorielli, N. (1986) Living with television: The dynamics of the cultivation process. In J. Bryant & D. Zillmann (Eds.), *Perspectives on media effects*, pp. 17-40 (Hillsdale, N.J.: L. Erlbaum Associates).
- Gitlin, T. (2003) *The whole world is watching: mass media in the making & unmaking of the New Left* (Berkeley, CA: University of California Press).
- Hardt, H. (1992) *Critical communication studies: Essays on communication, history and theory in America* (Routledge).
- Harper, K. (2004) The genius of a nation versus the gene-tech of a nation: Science, identity, and genetically modified food in Hungary. *Science as Culture*, 13(4), pp. 471-492.
- Henderson, L., & Kitzinger, J. (1999) The human drama of genetics: 'hard' and 'soft' media representations of inherited breast cancer. *Sociology of Health & Illness*, 21(5), pp. 560-578.
- Ho, S. S., Brossard, D., & Scheufele, D. A. (2008) Effects of Value Predispositions, Mass Media Use, and Knowledge on Public Attitudes Toward Embryonic Stem Cell Research. *International Journal of Public Opinion Research*, 20(2), pp. 171-192.
- Hornig Priest, S. (1994) Structuring public debate on biotechnology. *Science Communication*, 16(2), pp. 166-179.
- Hughes, E., Kitzinger, J., & Murdock, G. (2008) *Media Discourses and Framing of Risk. Working Paper 27*. Retrieved 8.12.2009, from <http://www.cardiff.ac.uk/jomec/resources/KitzingerWkPaper27.pdf>.
- Inglehart, R., & Welzel, C. (2005) *Modernization, Cultural Change and Democracy* (New York: Cambridge University Press).
- Irwin, A., & Wynne, B. (Eds.) (2004) *Misunderstanding science?: The public reconstruction of science and technology* (Cambridge, UK: Cambridge University Press).
- Iyengar, S. (1991) *Is anyone responsible? : how television frames political issues* (Chicago: University of Chicago Press).
- Karácsony, G. (2001) Értékek és választások [Values and choices]. *Educatio*(3), pp. 504-516.
- Kasza, G., & Lakner, Z. (2012) Social Trenches in the GM Food Battlefield: Experiences of a Survey Series in Hungary. In P. Robbins (Ed.), *Exploring Central and Eastern Europe's Biotechnology Landscape* (New York: Springer).
- Király, G. (2007) *Democratization of Science and Technology in Europe. Participation of Citizens in a Post-national community* Unpublished Ph.D. Dissertation, ELTE (Budapest, Hungary).
- Kitzinger, J. (2007) Framing and frame analysis. In E. Devereux (Ed.), *Media studies: key issues and debates*, pp. 134-161 (London: Sage).
- Lakner, Z., & Kasza, G. (2005) Hungarian consumers and genetic engineering. *Soziale Technik*, 2, pp. 6-8.
- Levidow, L. (2000) Pollution Metaphors In The Uk Biotechnology Controversy. *Science as Culture*, 9(3), pp. 325-351.
- Levidow, L., & Boschert, K. (2011) Segregating GM Crops: Why a Contentious "Risk" Issue in Europe? *Science as Culture*, 20(2), pp. 255-279.
- Liu, H., & Priest, S. (2009) Understanding public support for stem cell research: media communication, interpersonal communication and trust in key actors. *Public Understanding of Science*, 18(6), pp.704-718.
- Marks, L. A., Kalaitzandonakes, N., Wilkins, L., & Zakharova, L. (2007) Mass media framing of biotechnology news. *Public Understanding of Science*, 16, 183-203.

- Nisbet, M., & Goidel, R. K. (2007) Understanding citizen perceptions of science controversy: bridging the ethnographic survey research divide. *Public Understanding of Science*, 16(4), pp. 421-440.
- Parales-Quenza, C. J. (2004) Preferences need no inferences, once again: germinal elements in the public perceptions of genetically modified foods in Colombia. *Public Understanding of Science*, 13(2), pp.131-153.
- Petts, J., Horlick-Jones, T., & Murdock, G. (2001) *Social amplification of risk: The media and the public. Contact Research Report* (Sudbury: HSE Books)
- Scheufele, D. A. (1999) Framing as a theory of media effects. *Journal of Communication*, 49(1), pp.103-122.
- Schuck, A. R. T., & de Vreese, C. H. (2006) Between Risk and Opportunity. *European Journal of Communication*, 21(1), pp. 5-32.
- Shaw, A. (2002) "It just goes against the grain." Public understandings of genetically modified (GM) food in the UK. *Public Understanding of Science*, 11(3), pp. 273-291.
- Shineha, R., & Kato, K. (2009) Public engagement in Japanese policy-making: a history of the genetically modified organisms debate. *New Genetics and Society*, 28(2), 139-152.
- Stewart, C. O., Dickerson, D. L., & Hotchkiss, R. (2009) Beliefs About Science and News Frames in Audience Evaluations of Embryonic and Adult Stem Cell Research. *Science Communication*, 30(4), pp. 427-452.
- Stewart, D. W., & Shamdasani, P. N. (1990) *Focus groups: Theory and practice* (London: Sage).
- Vicsek, Lilla (2007) A Scheme for Analyzing the Results of Focus Groups. *International Journal of Qualitative Methods*, 6 (4), pp. 20-34, available at: <http://ejournals.library.ualberta.ca/index.php/IJQM/article/view/982>
- Vicsek, L. (2010) Issues in the Analysis of Focus Groups: Generalisability, Quantifiability, Treatment of Context and Quotations [Electronic Version]. *The Qualitative Report*, 15, 122-141. Retrieved 24.2.2010 from <http://www.nova.edu/ssss/QR/QR15-1/vicsek.pdf>
- Vicsek, L. (2011) Costs and benefits of stem cell research and treatment: Media presentation and audience understanding in Hungary *Science Communication* 33(3), pp. 309-340.
- Vicsek, L. (2012) "Gene-fouled or gene-improved?" – Media framing of GM crops and food in Hungary [Electronic Version]. *New Genetics & Society, iFirst*, 10.1080/14636778.2012.705513.
- Vicsek, L., & Gergely, J. (2011) Media presentation and public understanding of stem cells and stem cell research in Hungary. *New Genetics & Society* 30(1), pp. 1-26.
- Vicsek, L., & Gergely, J. (2012) *GM növények helyzete Magyarországon* [Situation of GM crops in Hungary]. Unpublished manuscript, Budapest.
- Vilella-Vila, M., & Costa-Font, J. (2008) Press media reporting effects on risk perceptions and attitudes towards genetically modified (GM) food. *Journal of Socio-Economics*, 37(5), pp. 2095-2106.
- Wagner, W., & Kronberger, N. (2001) Killer tomatoes! Collective symbolic coping with biotechnology. In K. Deaux & G. Philogène (Eds.), *Representations of the social: bridging theoretical traditions*, pp. 147-164 (Oxford, UK: Wiley-Blackwell).
- Wagner, W., Kronberger, N., & Seifert, F. (2002) Collective symbolic coping with new technology: Knowledge, images and public discourse. *British Journal of Social Psychology*, 41(3), pp. 323-343.

¹ Insights into the Hungarian context in the introductory paragraphs are based on a background study (Vicsek & Gergely, 2012) which involved the study of the legal regulation, websites of political parties and environmental organizations, and interviews and consultations conducted with GM experts, scientists, activists, ministry officials and actors of the media field.

² Another factor accounting for some congruence between media content and PUS could be that actors in both arenas of the public sphere can rely on shared cultural understandings, broader cultural themes, schemas which are common to most people within a given society (Gamson & Modigliani, 1989). However, the issue here is, how do people choose which broader cultural theme and schema they mobilize in case of new technologies? In some of these cases the media can provide starting points for these associations. The associations can then trigger a way of thinking and mobilize the employment of certain cultural schemas on behalf of the public. If GM is associated with food that can lead to the mobilization of a different set of concerns than if it was associated for example with industrial use or medicine (Hughes et al., 2008).

³ Six of the focus groups were moderated by the author; two focus groups were moderated by a Ph.D. student, Zita Nagy following the instructions of the author.

⁴ In the quotations English names were used for the participants (in order to preserve confidentiality they are not translations of the original names).

⁵ This theme has been shown to appear in the construction of the GM issue by lay people in other societies as well and also in the arguments of stakeholders (Bonfadelli, Dahinden, & Leonarz, 2002; Hughes et al., 2008; Levidow & Boschert, 2011; Parales-Quenza, 2004; Shaw, 2002). Although in some of these cases the media coverage within the society could have contributed more to this theme being raised. However, in Colombia that was probably not the case, as there the media coverage was extremely minimal (Parales-Quenza, 2004).