

COSTS AND BENEFITS OF STEM CELL RESEARCH AND TREATMENT: MEDIA PRESENTATION AND AUDIENCE UNDERSTANDING IN HUNGARY

Lilla Vicsek

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

Preprint version of article: Vicsek Lilla (2011): Costs and benefits of stem cell research and treatment: media presentation and audience understanding in Hungary, *Science Communication*, 33 (3), 309-340.

Address: Lilla Vicsek, Institute of Sociology and Social Policy, Corvinus University of Budapest, Budapest, Közraktár u. 4-6., 1093, Hungary.
Telephone: + 36 1-482-7350, fax: +36 1-482-7348
E-mail: lilla.vicsek@uni-corvinus.hu.

1. Introduction

Hungary differs in many respects in the scientific, political, religious and cultural background linked to stem cells from societies that have been the focus of previous studies on social scientific aspects of the issue (Augoustinos, Russin, & LeCouteur, 2009; Chekar & Kitzinger, 2007; Critchley, 2008; Evans, Kotchetkova, & Langer, 2009; Giarelli, 2006; Glasner, 2005; Gottweis, 2002; Haran, Kitzinger, McNeil, & O'Riordan, 2008; Hughes, Kitzinger, & Murdock, 2008; Jurberg, Verjovsky, de Oliveira Cardoso Machado, & Rodrigues, 2009; Kirejczyk, 2008; Kitzinger, 2008a, 2008b; Kitzinger & Williams, 2005; Liu & Priest, 2009; Mulkay, 1993; Nisbet, Brossard, & Kroepsch, 2003; Nisbet & Goidel, 2007; Pardo & Calvo, 2008; Prainsack, 2006; Priest, 2006; Reis, 2008; Stewart, Dickerson, & Hotchkiss, 2009; Svendsen & Koch, 2008; Weingart, Salzmann, & Wormann, 2008; Williams, Kitzinger, & Henderson, 2003)¹. While there has been public debate on ethical concerns regarding the

utilization of the embryo for stem cell research in a number of societies, such as the United States, the United Kingdom, Germany, Brazil, the Netherlands, Italy (Gaskell et al., 2006; Gottweis, 2002; Kirejczyk, 2008; Reis, 2008), in Hungary up to the end of the examined period in 2008 there was basically no such public debate and controversies surrounding the embryo were a minimal topic in the media. There were no organizations, politicians or political parties actively campaigning for or against embryonic stem cell research². Even the Catholic Church – by far the largest denomination in Hungary (Hegedűs, 2007; Tomka, 1996) – had not done so either.

Stem cell research is being carried out in a number of places in Hungary, in particular at the university research centers in Debrecen, Pécs, Szeged and Budapest, and at the National Blood Provision Service, the Institute of Experimental Medicine of the Hungarian Academy of Sciences, as well as some further smaller research sites. Research is done primarily on adult stem cells; embryonic stem cell research is allowed only on imported stem cell lines. Hungarian scientists buy stem cell lines from abroad for the purpose of embryonic stem cell research. There is direct government funding for stem cell research, and it is also possible to apply for grants.

Only adult stem cells may be used for treatments in Hungary. Bone marrow transplants are carried out routinely in cases of cancer (mainly leukemia) and immune deficiency disorders in order to restore blood formation.

Although there was no public ethical debate surrounding the embryo in Hungary leading up to 2009, there were other kinds of debates and controversies linked to stem cells, which received some degree of attention in the national media: an administrative conflict linked to umbilical cord blood stem cell storage in 2003, and in 2008 controversies surrounding the stem cell capsule that had been developed in Hungary. Manufacturers of the stem cell capsule claimed it increased the number of stem cells in the body. In 2008 the

Hungarian Competition Authority fined the manufacturers, arguing that they were unable to prove conclusively the therapeutic effect of the capsule³.

These controversies received some media attention, but the major focus with respect to stem cells in the most read nationwide Hungarian press between May 2006 and October 2008 was not on controversies. As we found during a previous analysis of the media dataset which is utilized in this paper, most articles fell into one of two categories: they were either breakthrough stories of discoveries in stem cell research, or human interest stories where the plight of a patient attempting to raise money for a special kind of stem cell treatment abroad – typically China or Kiev – was featured (Vicsek, 2009).

The intent of the present exploratory study was to investigate within Hungary:

- the press coverage on the costs and benefits of stem cell research and treatment,
- the way in which audience members made sense of the costs and benefits of stem cell research and treatment in group discussions,
- the role of the media in resourcing discussions on these issues.

In the case of both the media and the audience analysis, we examined what were seen to be definite costs (negative aspects) and benefits and also what were raised as just a possibility: what were seen as potential risks and benefits for the future. The view of the future is important as “controversies about biotechnologies often centre not so much on present scientific facts as on speculations of risks and benefits in the future” (Kitzinger & Williams, 2005, p. 731).

To achieve the objectives set, two empirical researches were conducted: a content analysis of the press coverage and a focus group study. We also compared the findings of the two methods to each other to gain a better understanding of the role of the media. An additional goal was to compare the observed results to the findings of the previous research conducted by Jenny Kitzinger, Emma Hughes and Graham Murdock in the UK, which

investigated among others human genetics in the media and the way media representation impacted on the construction of the risks and benefits of stem cell research perceived by the lay public (Hughes et al., 2008; Kitzinger, 2008a).

We approach the issue of risks (and benefits) from a subjectivist, sociological-anthropological perspective, which in contrast to the formal-normative paradigm, does not regard the evaluation of risk as a technical process, but rather emphasizes the role of social, political and cultural factors in shaping it (Hornig, 1993).

2. Previous Research on Social Scientific Aspects of Stem Cell Research and Treatment

There have been many developments in recent years in stem cell research. Social scientists reacted to the growing importance of this biotechnology and there is now a sizeable literature on stem cell research from a social scientific perspective. Within the social science literature regarding stem cells the focus is often on stem cell *research* (or even more specifically embryonic stem cell research), rather than issues surrounding for example stem cell *treatment*.

Our review of the articles of the major social science journals and books showed that analysis of the media coverage linked to stem cells has been reported from a number of countries, although most articles reported on data from the UK and the US and we found no articles for example from post-socialist countries (Augoustinos et al., 2009; Chekar & Kitzinger, 2007; Giarelli, 2006; Haran et al., 2008; Jurberg et al., 2009; Kitzinger, 2008b; Kitzinger & Williams, 2005; Kruvand & Hwang, 2007; Leydesdorff & Hellsten, 2005; Nisbet et al., 2003; Reis, 2008; Schäfer, 2009; Weingart et al., 2008; Williams et al., 2003). Part of this literature discussed the coverage of the Hwang scandal, while another part analyzed the presentation of stem cell research without focusing on this event.

The latter strand of literature documented that the US, UK, Brazil and Germany all had phases of intensive media coverage of stem cell research in which debate on embryonic stem cell research was present to a considerable degree. Media coverage featured individual actors and organizations also from within these countries who argued for and against embryonic stem cell research. A major concern of the opponents of such research was ethical and moral issues regarding the utilization of embryos. In spite of a controversial image being significantly present, those studies which discussed how negatively or positively stem cell research was depicted, also reported that stem cell research tended to be presented in the media outlets analyzed in the US, UK and Brazil more in a positive light, with an emphasis on potential benefits (Jurberg et al., 2009; Kitzinger & Williams, 2005; Nisbet et al., 2003; Priest, 2006; Reis, 2008). These results fit in with arguments that medical applications of biotechnology are often more positively evaluated in the media than agricultural applications (Bauer, 2005; Marks, Kalaitzandonakes, Wilkins, & Zakharova, 2007). It is also relevant to refer to the research of Kitzinger and her colleagues which analyzed how human genetic research was presented in the UK national newspapers from January to June 2004. They found that most news items in that period on human genetic research focused on cloning or on stem cell research. Human genetics was presented in the analyzed papers as having benefits outweighing the threats, with a focus on medical benefits. 62 percent of the articles made a mention of medical benefits (Hughes et al., 2008).

Research on public understanding of stem cell research has been conducted in a range of countries (Critchley, 2008; Gaskell et al., 2006; Haran et al., 2008; Ho, Brossard, & Scheufele, 2008; Hughes et al., 2008; Kitzinger, 2008a; Liu & Priest, 2009; Nisbet & Goidel, 2007; Pardo & Calvo, 2008; Priest, 2006; Stewart et al., 2009). Some of the articles concentrate on a particular society. Articles belonging to this strand of the literature reported on data mainly from Anglo-Saxon countries, we found no article focusing on Hungary or any

other post-socialist country. The research of Kitzinger and her colleagues (Hughes et al., 2008; Kitzinger, 2008a), to which we compared our results, belongs to this strand of literature focused on individual societies. They used 20 focus groups to investigate the construction of risks and benefits of stem cell research and treatment among the audience in the UK in 2004 and 2005. They found that high hopes were often connected to stem cell research and treatment and that the healing of serious diseases was the dominant benefit attributed to stem cells, while the major risks were seen to be the abuse of the embryo or misuse.

Another strand of the literature discussed results of public opinion research on stem cell research from more than one society. One of these is the report of the Eurobarometer survey of 2005, which discussed public understanding in the countries of the European Union (Gaskell et al., 2006). This report contains some data on Hungarian public opinion as well. According to the Eurobarometer survey there was widespread support for medical applications of biotechnology in most EU countries in 2005, which contrasts with the widespread opposition to agricultural biotechnology found in many societies. Hungary counted among the countries with high approval rates for stem cell research: 66 percent of the Hungarian respondents answered that they approved of embryonic stem cell research (with current or tighter regulations), 12 percent did not approve except under very special circumstances, 7 percent did not approve under any circumstances, while 15 percent responded that they did not know (Gaskell et al., 2006).

Some of the studies on public understanding also investigated the possible effects of media use. Quantitative studies have demonstrated some relationship between some measures of media consumption/attention to media and sentiments towards stem cell research, for example in the US (Ho et al., 2008; Liu & Priest, 2009; Nisbet & Goidel, 2007). According to Kitzinger and her colleagues (Hughes et al., 2008; Kitzinger, 2008a), results from their UK research mentioned above highlighted the relevance of the media in “introducing ideas about

the main risks and benefits” (Hughes et al., 2008, p. 23). Kitzinger and her colleagues also investigated in their research the assumption that science fiction greatly contributed to concerns regarding stem cell research by the ‘public’ and to a negative evaluation of such research (Hughes & Kitzinger, 2008; Kitzinger, 2010). They found that the role of science fiction was more complex than the above assumption suggests.

3. Media Content as Resource

Many studies document that media influence is a complex issue and the hypodermic model – which viewed the audience as a passive and undifferentiated mass on which the media had an immediate, strong, direct and uniform effect – has been discredited by a great body of empirical research (Colombo, 2004; Kitzinger, 2002; Petts, Horlick-Jones, & Murdock, 2001)⁴.

Gamson (1992) argued in his groundbreaking work *Talking Politics* that it was useful to think of media content as a tool or a resource. His understanding of media influence moved beyond the simplistic stimulus-effect models such as the hypodermic model and laid emphasis on ‘effects in use’. He stated that when people relied on such tools during conversations – i.e. they used information that they had gathered from the media – this could be considered a media effect. The tool metaphor allows us to consider the complexity of media influence and also to take into consideration that one element in choice of tools is how easily they are available. This does not imply that the media content predetermines how a person thinks and that it is a one-way influence. Besides media discourse, Gamson identified other conversational resources as well. In the current paper we apply this conception of media

content as resource and similarly to Gamson, we will be looking at how this resource is utilized in group discussions.

4. Framing

In this paper we regard media frames from a social constructivist perspective “as necessary to turn meaningless and nonrecognizable happenings into a discernible event” (Scheufele, 1999, p. 106). Following Tuchman (1978, p. 193) we look upon the news frame as an “essential feature of news”, which “organizes everyday reality” and which is “part and parcel of everyday reality”. We refer to framing as a process “through which complex issues are reduced to journalistically manageable dimensions in the construction of a news story, resulting in the selective presentation of some subthemes but not others” (Hornig Priest, 1994, pp. 167-168).

Frames and framing have been defined in a variety of ways. According to some detailed definitions of frames that exist in communication research we can only talk of a media frame if it contains certain elements such as moral evaluation or a policy solution (Entman, 1993), while other definitions do not contain these criteria. In our understanding of frames, moral evaluation or policy solutions are not necessary elements of media frames.

Frames can also be understood at different levels: “the researcher may be interested in very broad frames, or in very finely calibrated distinctions” (Kitzinger, 2007, p. 142). Gamson in his 1992 research had a long list of key statements which together made up each frame, Marks and his colleagues (2007) on the other hand in their analysis of risk-benefit frames of biotechnologies looked at occurrences of individual words. For example if a word that could be associated with benefit appeared in the text it was coded under benefit.

The present study focuses on valenced news frames. Valenced frames evaluate issues in “either positive or negative terms” (Schuck & de Vreese, 2006, p. 6). Previous research has

found that valenced frames are often present in health communication and are often conceptualized within health communication as ‘gains’ vs. ‘losses’, or ‘benefits’ vs. ‘costs’ (Schuck & de Vreese, 2006, p. 9).

Agenda-setting theory asserts that media impacts on what issues the public finds important and not on how the public sees the issue (Baran & Davis, 2009). Some framing researchers go further and argue that the way an issue is framed in the media can influence the way it is understood by the audience (Entman, 1993). A number of studies have indeed demonstrated that news frames can affect how the audience makes sense of an issue (Gamson, 1992; Iyengar, 1991; Schuck & de Vreese, 2006). Framing effects are of course not omnipotent (Schuck & de Vreese, 2006). There are factors that can mitigate media influence. The extent media is relied on as a resource can differ from topic to topic and between people (Gamson, 1992). Media influence can even go in unexpected directions (Gamson, 1992). Thus, more in depth case studies of media influence are needed for researchers to gain a fuller understanding of how media influence plays out in different situations.

Gamson emphasized that framing analysis has to take into account “the complex interaction of texts with an active audience engaged in negotiating meaning” (Gamson, 2001, p. x). Other authors also draw attention to the fact that the media information does not reach people without pre-existing notions in their heads and that the audience actively interprets the media content and can even have oppositional readings of the news items (Hall, 1980) (although according to some arguments the low level of intellectual resources or lack of personal experience can limit to a degree the freedom of interpretation in case of some topics (Kitzinger, 1999)). Hornig Priest (1994) pointed out that audiences could also rely on their knowledge and experience in case of other related or non-related phenomena in their understanding of an issue they have small experience with. She argued that audience schemas in interaction with media frames could influence the way the audience interprets certain

issues. She used the term “schema processing” to refer to “the cognitive processing of news information by individual audiences or readers through categorizing an issue or story as being of a particular type previously encountered” (Hornig Priest, 1994, p. 168).

5. Data and Methods

Media analysis: The media analysis material comprised all the articles in which the expression stem cell and its variations were mentioned in the five most-read national dailies in Hungary within the time interval of May 1, 2006 to October 31, 2008. The articles were obtained from the electronic database of Observer Budapest Médiafigyelő Kft. The five dailies include two tabloids and two political newspapers, as well as a daily sports paper⁵. The tabloids investigated were: Blikk, Bors (earlier name Színes Bulvár Lap). The elite political newspapers: Népszabadság (left-wing, liberal in its political orientation) and Magyar Nemzet (right-wing, conservative orientation). A sports daily (Nemzeti Sport) was included as it is among the most widely read newspapers and it had a few articles dealing with stem cells.

There were 326 articles in total. The articles were analyzed primarily with quantitative content analysis complemented with a few qualitative elements. The author developed a coding manual that was revised after a pilot coding of 30 articles by the author and two coders. Articles were then coded for the quantitative aspects by two coders⁶. Intercoder agreement was tested on a sample of 50 articles which were chosen randomly from the 326 articles. The intercoder reliability test using the conservative Cohen’s kappa measure yielded acceptable results, with all variables included in the content analysis having a value of .68 or higher (Landis & Koch, 1977). The qualitative remarks on the media coverage were based on a close reading of all the press materials by the author of this article.

The coding units were the distinct articles, and the entire text of the articles was coded. For the cost frame, articles were coded according to whether there was any mention in the text of possible, likely or certain negative aspects either for the present or for the future of stem cell research or treatment (0 – no such mention of costs, 1 – costs mentioned – either as potential costs or as certain costs). No differentiation was made between whether the author of the article wrote of the cost directly or quoted a source. We also recorded what kind of cost was mentioned. Based on the pilot testing and the literature we developed 8 variables on costs: 1. it is connected with/leads to misuse, 2. it has negative health consequences, 3. its consequences are unpredictable, 4. it is expensive, 5. it raises ethical problems, 6. it is problematic that an embryo is used, 7. it is unnatural, 8. its danger is that it can lead to cloning of whole people (reproductive cloning). These were all separate dichotomous variables, and it was checked whether mention is made of these costs as potential or certain costs in the text (0 – no such mention of costs, 1 – cost type mentioned either as potential cost or as certain cost). We also had an open cost variable where the coders had to type in the names of the concrete types of additional costs if any came up in the articles.

For the benefit frame, it was coded into a dummy variable whether the articles contained any reference to potential or certain benefits (0 – no such mention of benefits, 1 – mention of possible or certain benefits, or any practical use of stem cell research or treatment). Based on the pilot testing and the literature we developed three dichotomous variables for the types of benefits mentioned: a medical benefit variable, a cosmetic applications variable, as well as an economic prospects variable (0 – no such mention of benefits, 1 – mention of the benefit type as potential or certain). An open variable for coding additional benefits mentioned in the text was also created.

Analytical variables included the type of the news bulletins and type of press outlet. Henderson and Kitzinger (1999) argued in their study on risks of breast cancer that it was

important to study not only ‘hard’ news, but ‘soft’ news as well because of its ability to reach and influence the audience. In our research we regarded scientific and political topics as hard news and regarded human interest stories on non-famous patients and non-political stories on celebrities as soft news. Articles were rated as either: 1 – soft news, or 2 – hard news if either type of topic dominated, otherwise coded as 3 – neither type. There were 180 articles that were coded as hard news, 121 were coded as soft news, and 25 were coded as neither type. Another variable was the type of papers the articles appeared in (0 – tabloid or 1 – political newspapers). Tabloids reach a different segment of the population than political newspapers, moreover Hungary’s widest-read daily is a tabloid: Blikk. Readers of political newspapers tend to be of higher status (GfK Hungária Market Research Institute & Szonda Ipsos Media Opinion and Market Research Institute, 2007). 170 articles appeared in the two political papers, 152 in the tabloids, and 4 in the sports daily. 97 soft news articles appeared in the tabloids, compared to 20 in the political papers. 47 of the hard news articles appeared in the tabloids, while 133 of the hard news articles appeared in the political papers.

We also analyzed whether the articles contained anything specifically of Hungarian relevance, as we supposed those articles which have national relevance attract more attention from the readers. Articles which mentioned Hungary in general, or Hungarian people or organizations, or places were coded as having Hungarian relevance. 202 of the articles were classified in this category.

The press analysis took as basis some of the coding categories of the media research on human genetic research conducted by Hughes, Kitzinger and Murdock (Hughes et al., 2008), but the focus of the Hungarian research was somewhat different and we developed many other categories prior to the media analysis specifically for the Hungarian research to take account of the way the issue plays out in the Hungarian context.

Focus group study: We applied focus groups because rather than giving simply a static view of what people think and just placing the respondents on a pro- and anti- scale, our goal was to explore the sense-making processes and how the participants built their arguments (Kotchetkova, Evans, & Langer, 2008).

One of the goals of our research was to be able to relate our results to the findings of the previous UK research of Kitzinger and her colleagues (Hughes et al., 2008; Kitzinger, 2008a). Therefore, the focus group study in most aspects applied the methodology of the UK research both in organizing, conducting the focus groups and in the analysis of their results.

The research involved seven focus groups held in October and November of 2008. The site of four focus groups was Budapest, the rest took place in three other cities. Research subjects belonged to different segments of the Hungarian society, were diverse with respect to age, educational level, economic status, profession, and activity (student/working/on pension/unemployed). Some groups consisted of strangers, while other groups were made up of people who knew each other, and there were mixed groups (where some people knew each other, while others did not). There was some heterogeneity within part of the groups with respect to age. This did not seem to cause problems, both the young and old contributed to the discussions. Focus group members were mainly given monetary incentives to participate (the BA students received plus points on a course for participating). There were 56 participants in total. Table 1 contains more information on group composition.

Table 1. Composition of the focus groups

Table 1 about here

Participants in the focus groups were asked: a. what came to their mind when they heard the expression “stem cell research”, b. what they knew about stem cells/stem cell research or how they imagined it to be, c. what their sources of information were and how

they had first heard of the issue, d. what they saw as costs, risks and benefits of stem cell research, e. how they saw the future with respect to stem cell research and what they thought already happened in stem cell research, f. how they thought the media has presented the topic. These were the major questions and they were asked in all the groups. Groups lasted one and a half to two hours.

The questioning strategy of the moderator (the author of the article) – similarly to that employed in the UK focus groups by Kitzinger (2008a) – was to try to get the group to exhaust a topic and offer information only if the participants were on an entirely wrong track. This way rather than getting from the participants their reactions to scientific ‘facts’ right from the beginning, we were able to tap into their existing associations, knowledge and how this informed their understanding of the costs and benefits. As basically no mention was made of embryonic stem cell research by the participants in the Hungarian groups (just of adult stem cells), the moderator introduced the topic of embryo into the groups after a range of issues had been discussed extensively. Participants were asked among others about their views on costs and benefits of stem cell research before the moderator mentioned the embryo issue and then again afterwards.

Focus groups were recorded with video camera, transcribed and then analyzed with the help of qualitative data analysis software (NVivo). Besides coding the texts and reading the coded fragments, emphasis was also placed on analyzing the ‘whole picture’, the entities of the discussions as a whole.

6. Findings

6.1. News Coverage

Stem cell research and treatments were framed in the Hungarian papers analyzed as having benefits which outweighed the costs. Benefits were mentioned in 80 percent of the articles, while costs and risks were referred to in 50 percent of all the articles. Not only were benefits mentioned in many more articles than negative aspects, but a close reading of the texts shows that these benefits were also emphasized more, for example benefits were much more likely to appear in the headlines than costs.

<p style="text-align: center;">Examples of headlines mentioning benefit</p> <p>“Christian beats leukemia” (Bors, 22 August 2008)</p> <p>“Stem cells cure rat hearts” (Blikk, 28 August 2007)</p> <p>“A new chapter could be coming in therapy” (Népszabadság, 9 October 2007)</p> <p style="text-align: center;">Example of headlines mentioning negative aspects</p> <p>“Families go into debt for stem cell transplants” (Bors, 6 November 2007)</p>
--

Figure 1. Benefits attributed to stem cell research/treatment in the articles⁷ (N=326)

Figure 1 about here

Almost the only benefit attributed to stem cell treatments and research was healing, cures. This benefit was mentioned in 75 percent of all articles. Somewhat less than 3 percent of the articles attributed benefit in terms of cosmetic applications (such as growing of bigger breasts). All other practical benefits mentioned (such as economic advantages, homosexual

couples being able to become genetic parents, etc.) were present in no more than a few articles each.

Stem cell research/treatment was often framed in the Hungarian papers as the solution to grave illnesses or impairments. High hopes were connected to stem cell research: the delivering of benefits in the future was presented mainly as something that would happen with certainty or at least with high probability.

Not only were negative aspects/risks mentioned in fewer articles than benefits, but while one type of benefit – medical benefit – dominated almost exclusively within the benefits, the presentation of risks was more fragmented. The major negative aspect – the high price of stem cell treatment – appeared in 24 percent of the articles. Although mention of other negative aspects occurred much less frequently, several risks and negative aspects appeared in more than 3 percent of the articles: ethical problems, health/biological risks, misuse, utilization of embryo as problem, uncertain developments.

Figure 2. Negative aspects, risks attributed to stem cell research/treatment in the articles⁸

Figure 2 about here

Articles touching on the major negative aspect – high price of treatment – were often about the drama of a Hungarian patient who wanted to go abroad for stem cell treatment, and fund raising was an emphatic topic in these writings.

The second most frequent mention in the Hungarian press was of ethical problems: but even this was a relatively neglected issue. It was present in 11 percent of the articles. However, our argument is that the nature of its coverage was such that it probably occupied an even less emphatic place in the eyes of many readers. It was often referred to briefly, in many cases in just one sentence, without the article actually informing readers what the ethical dilemma was about. Indeed, the aspect that the utilization of the embryo was held to be

problematic by some people was found in only somewhat less than 5 percent of the articles. When ethical debate was mentioned in the papers we analyzed, it mostly referred to the debate in the UK or the US, and it was not brought up in connection with Hungary.

The diffusion of the representations of benefits and costs into news formats and press outlets shows that benefits and costs were presented in both soft and hard news articles and in both political and tabloid papers⁹. More interesting is the fact that there were great differences between the different kinds of costs in their diffusion into news formats and press outlets. For example 75 percent of the articles in which concerns about the high price of treatment were discussed, were soft news articles. On the other hand, none (!) of the articles, which mentioned that stem cell research might raise ethical issues and the aspect that the utilization of embryos was problematic, were soft news articles. High price appeared mainly in the tabloids (65 percent of the articles which mentioned it were in the tabloids) and the embryo as an ethical issue mainly in the political papers (86 percent of the writings mentioning ethical concerns appeared in political papers, 73 percent of the writings referring to the use of the embryo as problematic were found in the political papers).

Figure 3. The diffusion of negative aspects into soft and hard news types

Figure 3 about here

6.2. Focus Group Results

6.2.1. Benefits and Costs

Benefits

Benefits featured strongly in the group discussions. All groups connected stem cell research/treatment with cures and medical benefit. During first associations with stem cells and also when asked about costs and benefits, cure was mentioned by the participants. It is an indication of the great hopes linked to stem cell research that in many cases it was argued that with the help of stem cell research it would be possible to cure illnesses which are serious and often currently incurable, and to help serious medical conditions and handicaps. In a few groups it was argued that stem cell research might be the only possible way to cure those illnesses/deficiencies. Curing successes in the future were connected by most participants to a sense of certainty/likeliness.

Thomas¹⁰: In my opinion the advantage is,... so I've heard, that there will be an end to incurable illnesses at last, research is in such and such a stage and they will soon be able to cure all kinds of disease. (*Group 5*)

However, the extent of benefit attributed to stem cell research was in many cases limited by views that not everyone can be a beneficiary of stem cell research. Several participants commented that it was too far away in time before results of such research would be applied in "less rich" nations such as Hungary. Many expressed the view that for a long time or even forever, stem cell cures will only be for the rich nations, for very rich people. It was a recurring theme in the lay accounts that for themselves or their loved ones stem cell research was not/would not be relevant (a few on the other hand did mention that it might be of value in the future for their grandchildren).

Anna: In the end I would support it, but I think it will be far beyond the means of ordinary people, so I won't have much interest in it. This won't be of help for our world either. (*Group 4*)

Costs

Before the moderator brought in the topic of *embryonic* stem cell research, the question concerning possible costs and risks of stem cell research was often followed by silence. In this situation many participants named only one kind of risk/negative aspect or none at all. Some participants explicitly stated they felt there were no risks of stem cell research and treatment, or that they did not know or had not heard of any risks. (While there were no participants who stated with certainty that there would be no benefits of stem cell research.) Only a few people attributed several different kinds of potential negative consequences to stem cell research or treatment.

Julia: Well I don't feel any disadvantage, because that's what the world's about, that makes us move forward and develop. (*Group 6*)

The major negative aspect mentioned was the high expense of stem cell treatment.

Carolyn: That's not the problem, but the fact that it's so expensive that once again it's health for the rich. (*Group 7*)

A risk mentioned in many groups was potential misuse for military and/or business purposes:

Joseph: Just as the first the atomic bomb, .. someone had the idea right away of making an atomic bomb, just mankind is sufficiently creative to be able to use something differently, as a weapon or in any other way, not the way it was made for, so you can't tell what will come of playing around with genetics, combined with this. (*Group 5*)

For some participants however it was unclear what concrete misuses might be. Some others did mention that it might lead to cloning people (though for the most part this was not seen as a likely outcome). Some did not perceive any kind of relationship between cloning and stem cells.

Biological risks were raised in many groups. However, the potential risks mentioned were quite diverse, each concrete biological risk was named in just one or few groups. These

concerns included that new illnesses might develop as a side-effect, that the immune system might become too weak as a result of stem cell treatment or that in case of receiving stem cells from a donor, some of the donor's health problems might be transferred to the recipient.

Other risks that were mentioned by some participants (often after stem cell research had been discussed for a while) included: the growth of the (older) population as a consequence of the success of stem cell cures would be expensive for society in the future; treatment does not have a 100 percent success rate; there is unforeseeability with respect to possible negative developments; such cures are unnatural/contrary to natural selection/interfering with the laws of nature; there can be cosmetic, frivolous applications and these were evaluated negatively.

It is worth noting that risks or negative aspects connected to embryos were not mentioned in the part of the discussion where the moderator had not yet talked of the existence of embryonic stem cell research. This was true in spite of the fact that a few people later claimed that they had known that embryos could be a source of stem cells – still they basically made no reference to this fact during the discussions. However, the overwhelming majority of the participants reported that it was new information for them that the embryo could be a source. Even those who said that they knew about it, mostly said that their knowledge was very minimal, for some basically only that it existed.

After the moderator brought up the fact that embryos can be a source of stem cells participants were asked to assess the costs and benefits again. A few participants said that it was difficult for them to evaluate this kind of research because of their lack of knowledge. It was also remarked by a few individuals that embryonic stem cell research was a more complex issue, with many aspects, and that it raised a lot of questions. In most groups however, the discussion of the risks and negative aspects became easier after they received the information on the embryo as source. In many groups a range of costs, which did not come up

earlier in the discussions, was now volunteered, or some costs which were identified earlier were mentioned here with more vehemence¹¹.

There were some cases where people instantly associated embryonic stem cell research with ethical/legal/religious problems. For a few participants this was recalled from having heard about ethical problems/debate from the media without knowing any details of the debate, just stating that they had heard about an “ethical debate” or “ethical problems”, often without being able to specify these ethical issues. A few others had not remembered hearing about ethical problems connected to stem cell research before; they themselves inferred that if the research involved embryos this raised ethical issues.

Participants did not report having heard information on what happens to the embryo when its stem cells were extracted (only one participant remarked that he had seen information on this). In many groups it was supposed that stem cells from the embryo were taken from the mother’s womb and that the embryo would stay alive after the extraction of stem cells. Many risks/negative aspects were raised by the participants even for this scenario when the embryo was imagined as staying alive after stem cells were extracted from it. This is also relevant as there are new innovations in the experimental phase within stem cell science which make taking stem cells from embryos possible in such a way that the embryo might stay alive. Among the costs and risks mentioned in many groups for this scenario was that it was dangerous/unnatural to interfere with the development of the embryo, that the embryo might suffer harm (but not death).

Evelyn: As a woman I certainly wouldn’t allow anyone to touch the child growing inside me, I would break their hand. Why would I risk not giving birth to a healthy child?

(Group 5)

After being told that with the current wide-spread practice the embryo died when stem cells were taken from it, in many groups this was rated as a problem.

Jack: Well, if it doesn't harm the embryo say, then it's a good thing. But if they kill it that way, then I'm not sure that's a good thing. (*Group 3*)

However, there were participants who seemed not to be disturbed at all that the embryo died (especially in the case of spare embryos).

Other new potential dangers that were mentioned in several groups after the embryo as a topic was introduced included: developments might lead to mutations and the creation of freaks/hybrids, the poor might be constrained to sell their embryos, and it was a risk that perhaps stem cells would be used without the consent of the woman whose eggs/embryo was involved, it was dangerous when "mankind played God".

Justin: One day we'll produce little hybrid people or virtual hybrid people and the thing will practically shift towards a kind of animal breeding. (*Group 6*).

Sophia: I think that's not OK, because does the person whose egg or whatever it was know about it? Does she know what's happening with it, or doesn't she? (*Group 1*)

There were also different kinds of risks which were named in one or two groups each, such as incorrect handling of the stem cells and concerns that stem cells could be used somehow for manipulation of characteristics of the baby to be born, or concerns that an illness of the embryo could be transferred to the recipient.

A hierarchy of acceptance was established, where different scenarios of embryonic stem cell research were rated differently. It was viewed as more problematic if the embryo was not young when the stem cells were harvested, if it suffered damages, if parents were not asked to give consent, if the mother received money for donating the embryo, if an embryo was used which was not spare, etc. Some would favor embryonic stem cell research only provided the embryo was 'spare' – and spareness was thought to be an obvious, given fact¹².

Even in the case of embryonic stem cell research most participants declared that the benefits outweighed the costs.

Gaps in Knowledge

Both the benefits and risks that the participants could imagine for stem cells were constrained by gaps in participants' knowledge of certain aspects of stem cell research/treatment of therapeutic cloning. For example some thought it was only possible to get help if the patient's own umbilical cord stem cells were used. Thus, a participant remarked that he had "missed" the possibility with stem cells, stem cell cures would not be able to help him, as he had not had stem cells taken from his umbilical cord.

6.2.2. Media Content as Conversational Resource

Media content was the major conversational resource for the participants on the stem cell topic. Throughout the discussions on stem cell research and treatment the media was often referred to spontaneously by the participants. All participants identified the media as their major source of information on stem cell research and treatment, and for many media was the sole information source. Some participants, besides designating the media as their primary site of information, mentioned other secondary sources of information. These secondary information sources mainly informed participants about stem cell treatment/storage, but not stem cell research as such. Stem cells were not a topic that participants talked of during their everyday life among themselves except for the rare cases where there was a personal connection involved for at least one of the parties in the conversation (personal connection being for example needing stem cell treatment).

Although the media content was the main conversational resource on the topic for the participants, often information recalled from the media was very vague, without concrete cases and details, rather just recounting typical elements of new stories.

It seems that Hungarian news media resourced the discussion on benefits more than on the costs. During discussions on benefits participants often referred to stories in non-fiction media sources and talking about benefits seemed much more effortless than talking about costs. During the discussion on risks references to the non-fiction media were much less common and it seemed that costs was a topic that was difficult for the participants to talk about – especially before the topic of embryos was introduced by the moderator.

As participants did not recall hearing of many types of costs from the news media, this was a topic where participants themselves had to try to figure out what possible risks there might be. In the discussion on costs, in some cases they employed analogical reasoning. References were made to phenomena other than stem cell research and logical inferences were made from risks of these other phenomena to possible risks of stem cell research. Historical analogies were also brought up in the reasoning on costs: arguments referred to previous historical examples of science being used for evil ends, such as the atomic bomb, Nazi experiments. Stem cell research was often understood in a “techno-scientific progress” schema: it was seen to be a step in technological and scientific progress, and it was argued that “sometimes risks are necessary for progress”. A source of some of the analogies that the participants used in their reasoning on costs of stem cell research was the media coverage of other phenomena. For example, in several groups their argumentation on possible future misuse linked to stem cells was supported with references to previous cases of misconduct of doctors or healthcare workers which had featured prominently in the media (for example a case which was quite recent at the time of the groups where doctors at a hospital asked patients to pay for anesthesia when it was actually free of charge).

In the discussions on costs a few references were made to science fiction films, but these references were less common than references to news media and historical events. That stem cell research might lead to cloning of whole people was brought up in some cases with

reference to science fiction films. What was seen in science fiction films was not regarded by most to be just a simple indication of what was likely to happen in ‘reality’ in the future. We found that even those people who referred to risks based on science fiction often tended to evaluate stem cell research positively in the end. In the groups fears were sometimes undermined and discredited on the basis that they were evaluated as being *too much* like a film, and science fiction films also evoked *positive* associations with science and technological innovations.

6.3. Comparing the Results of the Two Methods

The way focus group participants talked of the costs and benefits of stem cell research and treatment in many aspects echoed the dominant framing of the issue in the press. In both the press articles and the spontaneous focus group discourse the topic was constructed more in terms of benefits than of risks, with medical applications identified as the almost exclusive benefit and the high expense of stem cell treatment constructed as the dominant negative aspect. We found in the focus groups that, similarly to the press, stem cells were often viewed as a necessary means to curing serious, otherwise incurable diseases and that it was rarely questioned whether stem cell research would be able to deliver results in this respect.

That participants talked easily about benefits, but were sometimes at a loss to discuss possible costs might also be due to the fact that costs were not only presented in fewer articles than benefits, but that the presentation of costs was more fragmented. Also while benefits were strongly emphasized across media outlets and news types, there were differences between the different cost types in their diffusion into media outlets and news types.

It was apparent in the groups that soft news articles were the ones which engaged our participants most with their focus on the drama of ill children. Out of the costs which were

presented in the press, those costs which had some part of their coverage in soft news articles were echoed in the focus groups. The source of the participants' notion that stem cell treatment is not for ordinary people, but for the rich, might be partly these soft news articles which discussed the extreme difficulties families faced in raising the funds necessary to obtain stem cell treatment abroad.

Our results also show that even though the dominant framing of the press was echoed in the focus groups, there were also concerns voiced by some of the participants, which were missing from the analyzed news coverage of stem cell research and treatment. For example the concern that developments in stem cell research might lead to cloning of whole people or to mutations and the creation of freaks, or the concern that the poor might be constrained to sell their embryos, or the concern that the growth of the (older) population as a consequence of the success of stem cell cures would be expensive for society in the future, or the concern that healing with stem cells is unnatural – all of which were raised in some of the focus groups – were basically absent from the press articles.

7. Discussion

The representation of stem cell research and treatment in the Hungarian papers analyzed had similarities in some respects with the media coverage of other countries. Similarly to findings of media analyses that reported data from the US, Brazil and the UK (Jurberg et al., 2009; Kitzinger & Williams, 2005; Nisbet et al., 2003; Priest, 2006; Reis, 2008), the Hungarian press analyzed featured stem cell research and treatment more in a positive than in a negative light: the presentation of the benefits outweighed that of costs. Moreover, similarly to the

media analysis of Hughes et al (2008), which analyzed human genetics in the UK media, we found that by far the most dominant benefit in the media was medical benefit.

There are also characteristics where the Hungarian media coverage is distinctly different from findings reported previously from other societies.

Economic development, prospects – which were found by some foreign media analyses to appear in the media connected to stem cells (Nisbet et al., 2003; Weingart et al., 2008) – were basically missing from the press outlets we analyzed.

The dominant negative aspect we found for the Hungarian press analyzed – high expense of future treatment – was less present in the media coverage of some other countries, where the media often focused on issues surrounding embryonic stem cell research (Nisbet et al., 2003; Reis, 2008; Williams et al., 2003).

Within the Hungarian press coverage ethical issues of the embryo were relatively marginalized in comparison to what previous research reported from the US, UK, Brazil or Germany for certain time periods (Kitzinger & Williams, 2005; Nisbet et al., 2003; Reis, 2008; Weingart et al., 2008; Williams et al., 2003).

Gamson (1992) has highlighted that conversations on different topics can be resourced to a different degree by the media. In the case of biotechnology, the role of the media can be especially important as the media can be the dominant information source for the lay public (Gaskell, Bauer, Allum, Lindsey, & Durant, 2001; Wagner, Kronberger, & Seifert, 2002). We had found in our focus groups that the media was the dominant – for many even the sole – information source.

If we compare our results with those of the earlier UK research of Kitzinger and her colleagues (Hughes et al., 2008; Kitzinger, 2008a), we find that similarities and differences between the discussions of the focus groups of the two countries in many respects echoed similarities and differences between the media framing of the two countries. In both countries

the strong media message that stem cells equal cures and that stem cell research was a necessary road to curing serious illnesses was echoed in the focus groups. On the other hand the dominant negative aspect was perceived differently by Hungarian and UK participants also in consonance with differences in the media representation of the two countries. While it was the most prominent concern in the Hungarian groups that stem cell treatments were expensive (before the embryo as a topic was introduced by the moderator), the price of treatment was a relatively marginalized risk in the UK groups. Whereas in the UK groups a dominant negative aspect was abuse of the embryo and participants there immediately associated from stem cell research to ethical problems with the embryo – we have seen that the embryo was missing from the spontaneous discourse in the Hungarian groups. Our results suggest that the way the costs and benefits of stem cell research and treatment were dominantly framed in the media could have influenced how the audience discussed these issues in these two countries.

Our data on the use of sci-fi as resource in the discussions are consistent with the results of the UK groups (Hughes & Kitzinger, 2008; Kitzinger, 2010). We found that the role of science fiction was complex and that it was simplistic to view science fiction as contributing only to fears and rejection of stem cell research and treatment. Our results are also in consonance with the findings of Nisbet and Goidel (2007), who found in their survey research that attention to science fiction television showed a statistically significant relationship to positive evaluations of human embryonic stem cell research. They argued that it was possible that those watching science fiction were already pro-science and science fiction programs strengthened their positive views.

Our results which suggest the possible relevance of the dominant media framing to audience discussions, are in consonance with other researches which had found some relationship between certain measures of media use/media frames and public understanding of

issues connected to stem cells (Ho et al., 2008; Liu & Priest, 2009; Nisbet & Goidel, 2007; Stewart et al., 2009). Numerous previous studies on other biotechnologies had also concluded that there could be a connection between media presentation of these and the way the public made sense of them (Bauer, 2005; Bonfadelli, Dahinden, & Leonarz, 2002; Hornig Priest, 1994; Wagner & Kronberger, 2001; Wagner et al., 2002).

The present study attempted to extend on these previous works by providing a case study from a country which was under-researched in relation to social scientific aspects of biotechnologies. Its aim was among others to provide a unique glimpse into a situation that despite some similarities, in many respects exhibited great differences from what had been previously reported from other societies in connection with stem cells. The research reported in this paper aimed to contribute to this body of research on media influence in the case of biotechnologies by utilizing an ‘effects in use’ perspective of media influence: in the paper we treated as instances of media effects cases where focus group participants utilized the media content as a conversational resource.

Regarding the relationship of our results to theoretical assumptions, we can state that our results are consistent on the one hand with assumptions that the way the media frames an issue influences audience discussions of that issue, but on the other hand our data also contain some indications in favor of the argument that at the same time to some degree audience schemas can “actively and independently contribute to the interpretation of news accounts” (Hornig Priest, 1994, p. 177). Similarly to what Hornig Priest (1994) had found to be the case in her research on media frames and public responses connected to biotechnology, we found in our research that there were some risks brought up in the focus groups which were missing from the press coverage of the investigated issues. In their argumentation on costs, besides references to the news media content on stem cells, participants also relied on analogical reasoning and formulated some risks based upon that.

It is important to consider however, that although analogical reasoning seemed to play some role, we found that the costs and benefits which were voiced most widely *did* mirror the dominant framing of the stem cell press coverage. It is also relevant that there is a limit to the range of dangers lay persons can deduce on their own concerning stem cell research, without help from the media. For example, as in the UK research of Kitzinger (see Haran et al., 2008), the issue of health risks of women as egg donors for IVF was missing in the discussions on embryonic stem cell research in the groups – and in the press coverage. Thus, some gaps of the media coverage can be echoed in gaps in lay discussions – impoverishing the scope of scientific citizenship.

Our findings have implications for future media research strategies. Our research reinforces the arguments of Henderson and Kitzinger (1999) that it can be useful to include tabloids and not just elite papers, and soft news, not just hard news, if we want to analyze representations that might reach and engage the lay public. Similarly to Henderson and Kitzinger (1999, p. 576) we also found that some themes “translate across different formats/outlets, while others ... may not”. It was soft news articles which engaged the participants the most and the costs that were echoed in the focus groups were the ones which had at least some of their coverage in soft news articles. Further research is needed to assess the role of news types and outlets in influencing how stem cell research and treatment are constructed by the Hungarian audience. The absence of ethical and embryo concerns in the spontaneous discourse of our focus groups could possibly be related to factors other than its complete absence from soft news articles.

Our research results are also relevant in relation to the dilemmas on ‘risk society’ (Beck, 1992, 1999). Beck (1992) argued that contemporary techno-scientific development can produce effects which cannot be predicted or controlled by experts. He held that “ ‘citoyens’ could perhaps win back the autonomy of their own judgements” if concerns over the

technologies were made “publicly visible” (Beck, 1999, p. 71). Assessing the media’s role in this context we find that a range of concerns – which have been voiced by organizations such as the UK Human Genetics Alert (such research can lead to genetic discrimination, reproductive cloning, etc.) or various Western feminist organizations (health risks of women donating eggs to IVF, etc.) or by some stem cell researchers (therapy based on embryonic stem cells might cause cancer¹³) – were basically absent from the Hungarian papers analyzed.

Our findings also have relevance in the context of Mulkay’s (1993, p. 724) concept of “rhetoric of hope” that he identified to be the dominant discourse in the 1990 debates in Britain surrounding embryo research. This set of interrelated assumptions and assertions according to him depicted embryo research, or science in general, in a “strongly positive fashion”, containing the supposition that it would be able to deliver “significant benefits” in the future. Within the Hungarian news reporting and amongst the participants of our research, several elements of this rhetoric were employed, such as the argument that scientific knowledge gained from stem cell research would extend “our control over disease, disability and death” in the future.

One of the limitations of the research is that we studied only a segment of the media and for a certain time period. There are indications however, that the press coverage of the stem cell issue might have been similar to the coverage of other media outlets, such as television channels. At least when focus group participants were asked about typical news items that they had met with in the media, they named the two types that were dominant in our analyzed papers as well: human interest stories involving patients wanting to go abroad for stem cell treatment and scientific breakthrough stories (Vicsek, 2009).

There are also limitations of the research with respect to generalization. Conventional generalization of research findings is not applicable to focus groups (Vicsek, 2010). However, the fact that in our Hungarian research and in the UK research of Kitzinger and her colleagues

(Hughes et al., 2008; Kitzinger, 2008a) the focus group samples were quite *diverse*, and in spite of this within each country many aspects of the discussions were *homogenous*, suggests that the results might have relevance beyond their particular situated locations.

Acknowledgements

The author gratefully acknowledges the constructive suggestions of the three anonymous referees and of Susanna Hornig Priest. The author would like to thank Jenny Kitzinger for the help she provided throughout the research and for her useful and insightful remarks on earlier versions of this paper. The research reported in this article was made possible by funding from the Hungarian Scientific Research Fund (OTKA), and the author was supported in her scientific work by the Hungarian Academy of Sciences with a Bolyai János Grant.

Notes

¹ The overview of the Hungarian context in these paragraphs is based on study of the legal regulation, the analysis of websites of organizations and political parties, on interviews with stem cell experts Dr. Balázs Sarkadi (head of the Stem Cell Committee of the Health Science Council), Dr. Judit Cserepes, and on consultations with church expert Dr. Béla Somfai and with a Member of Parliament – István Balsai. The interviews were conducted by Júlia Gergely, following the instructions of the author.

² Here we give only an overview of the Hungarian context up to the time the focus groups took place in our research in October 2008. Since then, there have been new developments, such as the so-called “stem cell scandal” in 2009 which received heavy media attention and involved people charged with illegally administering stem cell treatment utilizing aborted fetuses. This mobilized the pro-life group Alpha Alliance and they held a demonstration.

³ The position of the Hungarian Competition Authority can be found at: http://www.gvh.hu/gvh/alpha?null&m5_doc=5389&pg=72 [Accessed 18 May 2009].

⁴ Perse (2001) argues that in some special situations – such as in times of crisis – the direct effects model can explain audience reactions, but in most cases it is not an appropriate model for explanations.

⁵ All of the papers analyzed are in Hungarian. We did not analyze articles from the widely-read, but free newspaper, Metropol.

⁶ The coders were two students: Júlia Honfi and Marcell Márkus.

⁷ The diagram shows the benefits which were present in at least 2.5 percent of the articles.

⁸ The diagram shows the risks which were present in at least 2.5 percent of the articles.

⁹ 53 percent of the articles mentioning benefits were hard news articles, 42 percent soft news articles. 47 percent of the benefit articles appeared in the political papers, 52 percent in the tabloids. Out of the articles that mentioned costs, 53 percent were hard news, 44 percent were soft news; 53 percent appeared in the political papers, 46 percent in the tabloids.

¹⁰ In the quotations we use English names for the participants (in order to preserve confidentiality they are not translations of the original names).

¹¹ Benefits of embryonic stem cell research were basically seen not to be different from adult stem cell research as there was no knowledge of the different capability of embryonic stem cells compared to adult stem cells.

¹² In contradiction to this notion, Svendsen and Koch (2008) argue, based on their ethnographic research, that sparseness is not a “straightforward biological fact”.

¹³ Dr. Balázs Sarkadi voiced this concern during an expert interview.

Bibliography

- Augoustinos, M., Russin, A., & LeCouteur, A. (2009). Representations of the stem-cell cloning fraud: from scientific breakthrough to managing the stake and interest of science. *Public Understanding of Science*, 18(6), 687-703.
- Baran, S. J., & Davis, D. K. (2009). *Mass communication theory : foundations, ferment, and future* (5th ed.). Boston, MA: Wadsworth Cengage Learning.
- Bauer, M. W. (2005). Distinguishing Red and Green Biotechnology: Cultivation Effects of the Elite Press. *International Journal of Public Opinion Research*, 17(1), 63-89.
- Beck, U. (1992). *Risk society : towards a new modernity*. London ; Newbury Park, Calif.: Sage Publications.
- Beck, U. (1999). *World risk society*. Malden, MA: Polity Press.
- 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), 113-130.
- Chekar, C. K., & Kitzinger, J. (2007). Science, patriotism and discourses of nation and culture: reflections on the South Korean stem cell breakthroughs and scandals. *New Genetics and Society*, 26(3), 289-307.
- Colombo, M. (2004). Theoretical Perspectives in Media-Communication Research: From Linear to Discursive Models [Electronic Version]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 5, Article 26. Retrieved 21.2.2009. from <http://nbn-resolving.de/urn:nbn:de:0114-fqs0402261>.
- Critchley, C. R. (2008). Public opinion and trust in scientists: the role of the research context, and the perceived motivation of stem cell researchers. *Public Understanding of Science*, 17(3), 309-327.

- Entman, R. M. (1993). Framing - toward Clarification of a Fractured Paradigm. *Journal of Communication*, 43(4), 51-58.
- Evans, R., Kotchetkova, I., & Langer, S. (2009). Just around the corner: rhetorics of progress and promise in genetic research. *Public Understanding of Science*, 18(1), 43-59.
- Gamson, W. A. (1992). *Talking politics*. Cambridge [England] ; New York, NY, USA: Cambridge University Press.
- Gamson, W. A. (2001). Foreword. In S. D. Reese, O. H. Gandy & A. E. Grant (Eds.), *Framing public life : perspectives on media and our understanding of the social world* (pp. x-xv). Mahwah, N.J Lawrence Erlbaum Associates.
- 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., Bauer, M. W., Allum, N. C., Lindsey, N., & Durant, J. (2001). United Kingdom: Spilling the beans on genes. In G. Gaskell & M. W. Bauer (Eds.), *Biotechnology 1996-2000: The years of controversy*. London:: Science Museum Publications.
- GfK Hungária Market Research Institute, & Szonda Ipsos Media Opinion and Market Research Institute. (2007). Mindenki olvas - Tömegeket és speciális célcsoportokat is elér a nyomtatott sajtó [All read - Masses and special target groups are both reached by the print media] [Electronic Version], 2009. Retrieved 18.11.2009 from http://www.gfk.com/imperia/md/content/gfk_hungaria/pdf/press_extra_h/press_extra_20070828_h.pdf.

- Giarelli, E. (2006). Images of cloning and stem cell research in editorial cartoons in the United States. *Qualitative Health Research*, 16(1), 61-78.
- Glasner, P. (2005). Banking on Immortality? Exploring the Stem Cell Supply Chain from Embryo to Therapeutic Application. *Current Sociology*, 53(2), 355-366.
- Gottweis, H. (2002). Stem cell policies in the United States and in Germany. *Policy Studies Journal*, 30(4), 444-469.
- Hall, S. (1980). Encoding/decoding. In S. Hall (Ed.), *Culture, media, language : working papers in cultural studies, 1972-79* (pp. 128-138). London Hutchinson
- Haran, J., Kitzinger, J., McNeil, M., & O'Riordan, K. (2008). *Human Cloning in the Media: from science fiction to science practice*. London: Routledge.
- Hegedűs, R. (2007). Újabb adatok a magyar „egyházias vallásosság” társadalmi megjelenéséről [Recent data on the social appearance of Hungarian "church religiousness"]. In R. Hegedűs & E. Révay (Eds.), *Úton. Tanulmányok Tomka Miklós tiszteletére* (pp. 283-296). Szeged: Szegedi Tudományegyetem Vallástudományi Tanszék.
- 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), 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), 171-192.
- Hornig Priest, S. (1994). Structuring public debate on biotechnology. *Science Communication*, 16(2), 166–179.
- Hornig, S. (1993). Reading risk: public response to print media accounts of technological risk. *Public Understanding of Science*, 2(2), 95-109.

- Hughes, E., & Kitzinger, J. (2008). *Science fiction fears? An analysis of how people use fiction in discussing risk and emerging science and technology*. SCARR Working Paper. Retrieved 24.2.2010., from <http://www.cf.ac.uk/jomec/resources/SciFiFearsWP28.pdf>.
- 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>.
- Iyengar, S. (1991). *Is anyone responsible? : how television frames political issues*. Chicago: University of Chicago Press.
- Jurberg, C., Verjovsky, M., de Oliveira Cardoso Machado, G., & Rodrigues, A. M. (2009). Embryonic stem cell: A climax in the reign of the Brazilian media. *Public Understanding of Science*, 18(6), 719-729.
- Kirejczyk, M. (2008). On Women, Egg Cells and Embryos Gender in the Regulatory Debates on Embryonic Research in the Netherlands. *European Journal of Womens Studies*, 15(4), 377-391.
- Kitzinger, J. (1999). A Sociology of Media Power: Key Issues in Audience Reception Research. In G. Philo (Ed.), *Message Received* (pp. 3-20). London: Longman.
- Kitzinger, J. (2002). Impacts and Influences. Media influence revisited: an introduction to the 'new effects/influence research'. In A. Briggs & P. Cobley (Eds.), *The media: an introduction* (2nd edition ed., pp. 272-281). New York: Pearson Education.
- Kitzinger, J. (2007). Framing and frame analysis. In E. Devereux (Ed.), *Media studies: key issues and debates* (pp. 134-161). London: Sage.
- Kitzinger, J. (2008a). *A Basic Overview of Findings from Focus Groups about Stem Cell Research*. Unpublished manuscript, Cardiff.

- Kitzinger, J. (2008b). Questioning Hype, Rescuing Hope? The Hwang stem cells scandal and the reassertion of hopeful horizons. *Science as Culture*, 17(4), 417-434.
- Kitzinger, J. (2010). Questioning the sci-fi alibi: a critique of how 'science fiction fears' are used to explain away public concerns about risk. *Journal of Risk Research*, 13(1), 73-86.
- Kitzinger, J., & Williams, C. (2005). Forecasting science futures: Legitimising hope and calming fears in the embryo stem cell debate. *Social Science & Medicine*, 61(3), 731-740.
- Kotchetkova, I., Evans, R., & Langer, S. (2008). Articulating Contextualized Knowledge: Focus Groups and/as Public Participation? *Science as Culture*, 17(1), 71-84.
- Kruvand, M., & Hwang, S. (2007). From Revered to Reviled: A Cross-Cultural Narrative Analysis of the South Korean Cloning Scandal. *Science Communication*, 29(2), 177-197.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-174.
- Leydesdorff, L., & Hellsten, I. (2005). Metaphors and diaphors in science communication: Mapping the case of stem cell research. *Science Communication*, 27(1), 64-99.
- 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), 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.
- Mulkay, M. (1993). Rhetorics of Hope and Fear in the Great Embryo Debate. *Social Studies of Science*, 23(4), 721-742.

- Nisbet, M., Brossard, D., & Kroepsch, A. (2003). Framing science - The stem cell controversy in an age of press/politics. *Harvard International Journal of Press-Politics*, 8(2), 36-70.
- Nisbet, M., & Goidel, R. K. (2007). Understanding citizen perceptions of science controversy: bridging the ethnographic survey research divide. *Public Understanding of Science*, 16(4), 421-440.
- Pardo, R., & Calvo, F. (2008). Attitudes Toward Embryo Research, Worldviews, and the Moral Status of the Embryo Frame. *Science Communication*, 30(1), 8-47.
- Perse, E. M. (2001). *Media effects and society*. Mahwah, NJ: L. Erlbaum Associates.
- Petts, J., Horlick-Jones, T., & Murdock, G. (2001). *Social amplification of risk: The media and the public. Contact Research Report*. Sudbury: HSE Books.
- Prainsack, B. (2006). 'Negotiating life': The regulation of human cloning and embryonic stem cell research in Israel. *Social Studies of Science*, 36(2), 173-205.
- Priest, S. H. (2006). The public opinion climate for gene technologies in Canada and the United States: competing voices, contrasting frames. *Public Understanding of Science*, 15(1), 55-71.
- Reis, P. (2008). How Brazilian and North American Newspapers Frame the Stem Cell Research Debate. *Science Communication*, 29(3), 316-334.
- Schäfer, M. S. (2009). From Public Understanding to Public Engagement. An Empirical Assessment of Changes in Science Coverage. *Science Communication*, 30(4), 475-505.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*, 49(1), 103-122.
- Schuck, A. R. T., & de Vreese, C. H. (2006). Between Risk and Opportunity. *European Journal of Communication*, 21(1), 5-32.

- 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), 427-452.
- Svendsen, M. N., & Koch, L. (2008). Unpacking the 'Spare Embryo': Facilitating Stem Cell Research in a Moral Landscape. *Social Studies of Science*, 38(1), 93-110.
- Tomka, M. (1996). Vallás és vallásosság [Religion and religiousness]. In R. Andorka, T. Kolosi & G. Vukovich (Eds.), *Társadalmi riport 1996 [Social Report 1996]* (pp. 592-616). Budapest: Társi.
- Tuchman, G. (1978). *Making news : a study in the construction of reality*. New York: Free Press.
- Vicsek, L. (2009). *Press coverage and audience perceptions of stem cells in Hungary*. OTKA Research report. Unpublished manuscript, Budapest.
- 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>.
- 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), 323-343.
- Weingart, P., Salzmann, C., & Wormann, S. (2008). The social embedding of biomedicine: an analysis of German media debates 1995-2004. *Public Understanding of Science*, 17(3), 381-396.

Williams, C., Kitzinger, J., & Henderson, L. (2003). Envisaging the embryo in stem cell research: rhetorical strategies and media reporting of the ethical debates. *Sociology of Health & Illness*, 25(7), 793-814.

Table 2. Composition of the focus groups

Group number	Group	Number of participants (female/male)	Age range	Location
1	Sociology BA students at a university	8 (6/2)	20-31	Budapest
2	Members of a pensioners' club	9 (8/1)	58-80	Dunaújváros
3	Students at a secondary school (studying to be car mechanics, studying marketing, hospitality)	8 (4/4)	16-19	Veszprém
4	Four unemployed people taking part on a vocational course and three people with low-status jobs	7 (4/3)	40-59	Debrecen
5	People with diverse jobs	8 (4/4)	25-54	Budapest
6	People with diverse jobs	8 (3/5)	29-54	Budapest
7	Six people with diverse jobs and two unemployed people	8 (3/5)	28-60	Budapest

FIGURES

Figure 4. Benefits attributed to stem cell research/treatment in the articles¹⁴ (N=326)

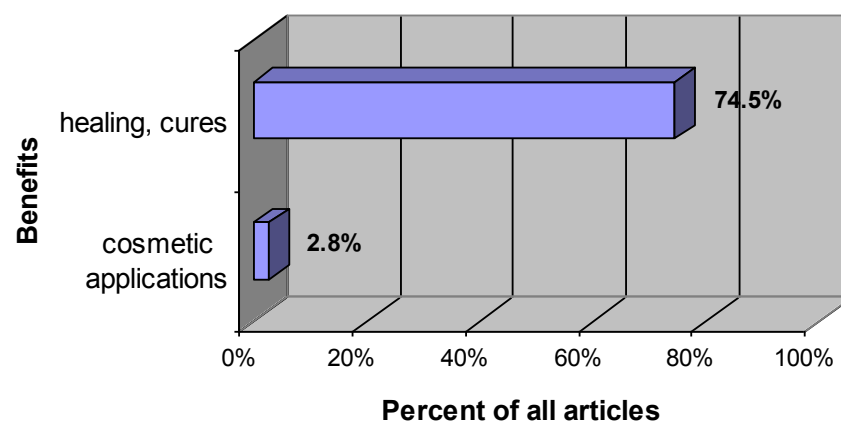


Figure 5. Negative aspects, risks attributed to stem cell research/treatment in the articles¹⁵ (N=326)

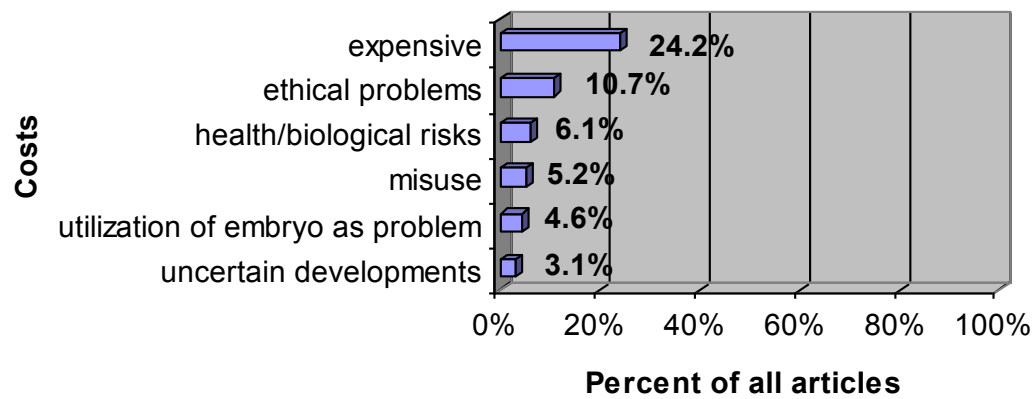
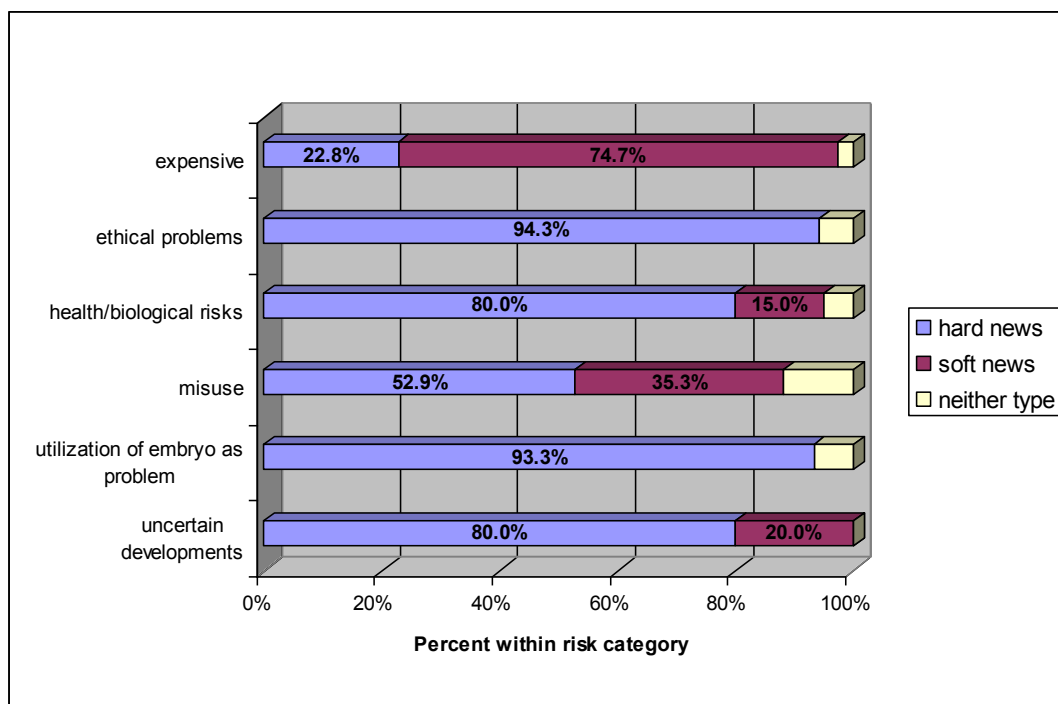


Figure 6. The diffusion of negative aspects into soft and hard news types



¹⁴ Those benefits are shown in the diagram which were present in at least 2.5 percent of the sample.

¹⁵ Those risks are shown in the diagram, which were present in at least 2.5 percent of the sample.