

**Automatic media monitoring on stem cell research in Brazil:
when the science section is not the limit**

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Abstract

Stem cell research is an example of scientific issue that gained a lot of attention of the Brazilian society in the last decade. In March 2005 the Brazilian National Congress approved the Biosafety Law – which cleared for human embryonic stem cell (hESC) research and triggered all sorts of reactions, including a Direct Action of Unconstitutionality, the first public hearing ever at the Brazilian Supreme Court and a trial that cleared for human embryonic stem cell research in Brazil in 2008. Media played an important role on bringing the subject to broader public by covering the process and arguments involved. In this study we present a quantitative content analysis of stem cell articles published by the Brazilian news portal Estadão.com.br during the years 2005 to 2008 using a novel media monitoring software developed as a prototype in Labjor/Unicamp called SAPO – Scientific Automatic Press Observer –, which collects, measures and classifies articles as of scientific content or not. The analysis shows that science topics not only surpass the limits of its designated section on the newspaper, but that a very technical issues such as stem cell has been with some frequency brought up on contexts not related to science.

Introduction

Biotechnology, according to the Convention on Biological Diversity of the United Nations (UN), is defined as "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use" (UN, 1992). The concept, which covers techniques long practiced by man (such as fermentation, i.e.), includes more recently sophisticated molecular genetic techniques (such as tissue culture, genetic engineering, cellular therapies etc.) and applications in different areas, such as agriculture, and veterinary medicine.

With the so called 'new genetics' arise some boundary objects, i.e. objects that "have different meanings in different social worlds but their structure is common enough to more than one of these worlds to make them recognizable" (STAR and GRIESEMER, 1989 apud ACERO 2011, p. 28). Stem cells are examples of controversial biosciences boundary objects that occupy spaces of discussion in the scientific, political, economic, cultural, ideological and epistemic fields.

In Brazil, human embryonic stem cell (hESC) research is an example of scientific issue that extended beyond the borders of academia and gained a lot of attention of the society in the last decade. In March 2005 the Brazilian National Congress approved the Biosafety Law – which cleared for hESC research and triggered all sorts of reactions, including a Direct Action of Unconstitutionality, the first public hearing ever at the Brazilian Supreme Court and a trial that cleared for human embryonic stem cell research in Brazil. During this period, media played an important role on bringing the subject to broader public by covering the process and arguments involved.

The media plays a fundamental role in shaping the perceptions of society regarding scientific issues since, for most people, the reality of science is what the media reports (NELKIN, 1995). In this sense, media analysis serves as an important tool for the study of public understanding of scientific topics (BAUER, 2000; BAUER and HOWARD, 2012). With the large supply of news published on digital platforms, more recent approaches have sought to make use of software and text mining technology as tools for media analysis (under the big data model), especially in quantitative terms.

In this study, we analyze online news about stem cells published by a major Brazilian newspapers, through a system developed by the Laboratory for Advanced Studies in Journalism

(Labjor) of the State University of Campinas (Unicamp): the SAPO - Automatic Scientific Press Observer. The software, in addition to performing quantitative analysis, has the distinction to allow automatic content classification of the articles as scientific or not.

Methodology

We used the SAPO system to make a quantitative content analysis of the articles about stem cell appearing between the years 2005 to 2008 in the online portal *Estadao.com.br*¹, which was launched in the year 2000 and aggregates the contents of the newspapers *O Estado de S.Paulo*² and *Jornal da Tarde* (extinguished in 2012) and the Estado Agency (news agency of the Estado Group).

The system performs in an automated fashion the functions of collection, selection, organization and measurement of the content published in online vehicles. The collected content is stored in a database and classified by using a method based on keywords related to S&T (thesaurus) and associated score values (VOGT et al., 2011; VOGT et al., 2013). The score determines whether the text is of scientific content, may be of scientific content (intermediate zone), or is not of scientific content. In this study, the articles classified in the intermediate zone were considered as not of scientific content (not S&T).

The search was performed using the SAPO system in the whole content published online by the newspaper from 1/1/2005 to 12/31/2008, using the keywords in Portuguese for stem cell and stem cells (“célula-tronco”, “células-tronco”). We analyzed the number of articles about stem cell published in the period, the distribution of these articles on the newspaper’s section and the classification of the selected articles as of scientific content or not.

For effects of comparison, the whole content published online by the newspaper in the same period was also analyzed, regarding the quantity and the classification of the articles as of scientific content or not and the sections distribution.

Results and discussion

The analysis shows that of the total articles published in the portal *Estadao.com.br* during the period between 2005 and 2008, 3% (9961) were classified as of scientific content. The

¹ In January 2003, the portal surpassed one million monthly visitors, consolidating its leadership position in queries in real time journalism vehicles in Brazil.

² *O Estado de S. Paulo* is the oldest newspaper in the city of São Paulo still in circulation, having been founded in 1875. Currently, it is one of the most influential newspapers in Brazil and one of the big four in number circulation in the country and the second in the State of Sao Paulo.

number of S&T articles published increased each year from 2005 to 2008 (respectively 77, 2116, 2736 and 5032).

When it comes to articles about stem cells, the newspaper published 640 articles in the same four-year period. When considering the content of the texts, 23% of the articles about stem cells were not classified as S&T. The 77% (492) classified as S&T constitute 5% of the total scientific content published online by the newspaper between 2005 and 2008, with little variation over the years (from 3% to 6%). With the exception of 2005, the percentage of articles about stem cells classified as S&T also increased over the years: 42% in 2006, 81% in 2007 and 92% in 2008. Considering that the articles are classified by its content, based on a set of keywords related to S&T, it could be presumed that the stem cell related coverage has been getting more technical over the years during the period analyzed.

It does not mean however that articles on stem cell or with scientific content in general are restrained to the science section of the news portal. On the contrary, the S&T articles and the articles about stem cell (S&T or not) published in the period were widely distributed on the various sections. The texts classified as scientific content appeared in 20 of the 30 sections, mainly in: Vida E³ (24,3%), International (13,2%) and Science (10,8%). The distribution observed shows that S&T content may be found on the coverage of the most various subjects and in different approaches, since it could be found in 2/3 of the total of the newspaper's sections, from Technology and Science to Art & Leisure and Economics. It also may reflect the space each section occupies in the newspaper. The Vida E section, for example, covers subjects related to "quality of life", including topics such as education, science and health, which are praised by the audience. Another point to be highlighted is that foreign scientific developments account for a great share of S&T coverage on Brazilian newspapers, which could explain the International section as the second one with more S&T content.

As for the stem cell coverage, even though it configures a very technical issue, stem cells were the subject of articles published in half (15) of the total newspaper's section. The Vida E accounted for 34% of the total, followed by General (19%) and Science (15%) sections.

Despite accounting for the biggest share of articles about stem cell published during the period, the section Vida E held the highest percentage of content on the subject not considered as

³ The section Vida E (free translation, "Life E") was created in 2004 when the newspaper *O Estado de S. Paulo* went through a publishing reform. It was extinguished in 2013, after another editorial change, and the topics were incorporated into another section (Metropole).

scientific. Half of the articles about stem cell published in the section were classified as not S&T, and the section accounts for 73% of articles about stem cells not considered as of scientific content in the period.

The months that held the most expressive peaks of articles about stem cell were March (65) and May (64) 2008, respectively when the decision about hESC research by Supreme Court was scheduled (but then extended) and when the vote for it finally happened.

In March 2008, the great majority of the 65 articles about stem cell were classified as of scientific content. They were published in seven sections, with emphasis on the General (33) and Science (15) sections. Apart from six articles that covered issues on basic research with stem cells, all other articles addressed issues related to the trial in the Supreme Court about research with human embryonic stem cells. The news dealt with the progress of the trial, opinions of political and religious people, scientists and the general public (through public opinion research conducted by one of the largest market research companies in Latin America⁴), and public demonstrations for and against research with human embryonic stem cells.

In May 2008 the 64 articles about stem cell were published in six sections of the portal, but this time they were more equally divided between the General (29) and Science (27) sections. Apart from a few news about the British discussion on research with hybrid embryos, the coverage held full attention to the judgment by the Brazilian Supreme Court about research with human embryonic stem cells. This time, the focus was on the judges arguments and votes during the trial.

Conclusion

SAPO – this new tool for automatic media monitoring and content classification – allowed an analyses on media coverage showing that not only science topics and content widely surpass the limits of its designated section on the newspaper, but that a very technical issues such as stem cell has been with some frequency brought up on contexts not related to science.

References

⁴ The Brazilian Institute of Public Opinion and Statistics (Ibope) ascertained that 75% of the Brazilian population was in favor of embryonic stem cells research in order to find treatments for serious diseases through national sampling survey conducted in January 2008.

BAUER, M. (2000) "Science in the Media as Cultural Indicators: Contextualising Survey with Media Analysis," in M. Dierkes e C. von Grote (eds) *Between Understanding and Trust: The Public, Science and Technology*, pp. 157–78. Amsterdam: Harwood Academic Publishers.

BAUER, M. W. and HOWARD, S. (2012) "Public Understanding of Science – a peer-review journal for turbulent times". *Public Understand. Sci.* 21(3) 258–267.

NELKIN, D. (1995) *Selling Science: How the Press Covers Science and Technology*. 2^a edição. New York: W.H. Freeman.

UN (1992) "[Convenção sobre Diversidade Biológica](http://www.cbd.int/convention/text/) (Artigo 2. Utilização de Termos)." *Nações Unidas*. 1992. <http://www.cbd.int/convention/text/>

STAR, S.L. e GREISEMER, J. (1989) "Institutional ecology, 'translations' and boundary objects: amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39". *Social Studies of Science*, 19: 387-420, 1989; In ACERO, L. (2011). *Pesquisas e terapias com células-tronco: governança, visões sociais e o debate no Brasil*. Rio de Janeiro: E-papers.

VOGT, C.A.; CASTELFRANCHI, Y.; RIGHETTI, S.; EVANGELISTA, R.A.; MORALES, A.P.; GOUVEIA, F. (2011) Building a science news media barometer SAPO. In: Bauer, M.; Shukla, R.; Allum, N.. (Org.). *The culture of science - how the public relates to science across the globe*. 1st ed. New York/London: Routledge, p. 400-413.

VOGT, C.A.; GOUVEIA, F.; MORALES, A.P.; DAHER, F.; PISARUK, F. (2013) Scientific Automatic Press Observer (SAPO): sistema automatic de geração de indicadores de Cultura Científica e de monitoramento de temas científicos na mídia. IX Congreso Iberoamericano de Indicadores de Ciencia y Tecnologia, Bogotá. Available at: <http://congreso2013.ricyt.org/files/mesas/2fPercepcion/SAPO.pdf>