Astronomy in Newspapers: Evaluation A Hands-on Guide

(Reproduced, with minor editorial changes, from IYA2009 in Newspapers: Evaluation Hands-on Guide, March 2009)

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Key Words

Astronomy in the Media
Newspapers
Evaluation

Summary

This article aims to provide basic information on how to evaluate, understand and contextualise astronomy and space science in the media.

Introduction

To demonstrate how to evaluate, understand and contextualise astronomy and space science in the media, we will use newspapers as an example. According to the academic literature about science and technology in the media, newspapers are representative of the whole media spectrum in science and technology topics (Hansen & Dickinson, 1992).

This basic evaluation methodology will allow a standard analysis of newspaper articles concerning astronomy and space science topics.

Why evaluate?

Many organisations, particularly in the public and voluntary sectors, are turning to evaluation as a source of learning, as well as to justify their use of funds. Through evaluation, you can:

- determine if the objectives of a project were reached;
- obtain information on the outcomes of a project, along with suggestions for improvements;
- identify changes in perception resulting from the implementation of the project;
- identify ways in which the project could have been more effective and efficient;
- identify unexpected results;
- crystallise ideas about the project and what it is intended to achieve;
- find out who attends events, along with suggestions for improvement; and
- provide encouragement by demonstrating that the effort has been worthwhile.

Methodology: how to evaluate?

The collection of an exhaustive number of newspaper articles concerning astronomy and space science would allow a powerful analysis of the impact of astronomy in the media. However, this task is too big to be carried out by simple press information offices or public outreach departments. As such, we describe here a more basic, standardised and simple methodology to be used in different countries or regions.

Newspaper articles should be gathered from, at least, the most important daily newspapers sold regionally or nationally. To obtain a good sample it is important to have one "quality" and one "popular" newspaper, which together form the accepted definition of "dominant media". These newspapers will be the ones that set the social and political agenda and whose news selection criteria and style are followed by the other media, who reproduce their opinions, style and contents, in the search for larger audiences.

With the help of standard software (Excel, Statistical Package for the Social Sciences (SPSS) etc.) samples should be selected for each weekday over a specific period of time (e.g., one or two years). Newspaper companies may also provide back issues. But where this is not possible, please note the start date. Using the same software, five publishing days per week should be randomly selected to be used for the analysis.

The entire publication must be checked, since astronomy and space science articles do not always appear in a specific newspaper section.

What kind of information is important for us?

The full analysis of a newspaper article can provide us with a very rich and complex dataset, but for this task we just need to analyse a few features.

It is very important that the coder, i.e. the person updating the database, only considers the content of the analysis unit. By analysis unit we understand the texts, illustrations or texts and illustrations that by themselves form a unit distinct enough to be clearly limited and that constitute an object of study itself.

The coder should not use his/her general knowledge about the subject to presuppose informative elements not explicitly stated in the article.

For the analysis, the coder should select all newspaper articles concerning astronomy and space science topics in the publication.

The coding frame is divided into seven different features:

- characterisation;
- scientific content;
- actors;
- scientific events;
- location;
- source; and
- news play.

The goal of the **characterisation** feature is to formally characterise the newspaper and the article under consideration. It includes the following items:

- Type: The newspaper source should be classified as "Popular" or "Quality";
- Day: The day on which the newspaper was published (e.g., 27);
- Month: The month when the newspaper was published (e.g., February);
- Year: The year when the newspaper was published (e.g., 2010);
- Newspaper title: The name of the newspaper (e.g., *The Times*);
- Article title: The title of the article. This is almost always at the beginning of the text, and uses larger letters;
- Location: Whether the article is on the upper half or in the lower half of the page. If the article is mainly in the lower half of the page but the top of the article is in the upper half, we should consider it as an article in the upper half of the page;
- Main illustration content: Illustration content can be classified as: people, planets, stars, galaxies, nebulas, space vehicles, satellites, telescopes, landscapes, buildings, symbols or other illustration content. If there are several different items featuring in the illustration, only the bigger one should be considered;
- First page highlight: Whether the article has a highlight on the newspapers first page (yes/no);
- Prominent page: Whether the article is on a prominent page: first, second, third or last page. The page should be identified (first, second, third or last page);

Given that astronomy and space science are science and technology topics, the **scientific content** feature, is very important in this analysis. The coder should be able to identify elements matching the following list of features expected in a piece of scientific writing:

- Scientist(s)/ expert(s) quotations: Whether there is a quotation from a scientist/expert (yes/no);
- Theory mention: Whether the article makes any mention of the theory (yes/no);
- Methodology mention: Whether the article makes any mention of the scientific methodology (yes/no);
- Technical language/ jargon: Whether the article uses any technical language/ jargon (yes/no);
- Bibliography: Whether the article makes any reference to a bibliography (yes/no);
- Data/results presentation: Whether the article shows any research data or results (yes/no);
- Scientist(s)/ expert(s) name(s): Whether the article contains the name of any scientist/expert (yes/no);
- Scientific Index: This is an index built to evaluate "how scientific" an article is. This index is determined by the expected features in a scientific article (scientist quotations, theory, method, technical language/ jargon, bibliographic references, data and results, names of scientists). The coder should give one point to each of the features that appear in the article. The total score will determine the article's Scientific Index, the overall level of scientific content:
    - From 0 to 2 points: low scientific content;
    - From 3 to 4 points: medium scientific content;
    - From 5 to 7 points: high scientific content.

Actors constitutes a rather important feature in newspaper articles. The coder should code the main actor type. If the article has more than one actor, only the most important should be considered.

Actors can be classified as: man on the street, scientist/ expert, authority, worker, celebrity, consumer, national (military), European Union, Press Officers, IAU, other astronomy societies, other scientific institutions, government or other actors.

The **Scientific Event** feature provides us with information about the kind of event covered by the article. It has two variables: main scientific event and scientific area.

To code the main scientific event, the predominant scientific event mentioned in the article should be chosen. Events can be classified as: astronomy in general, education or public outreach, local or national project or others. To code the scientific areas, the predominant scientific area of the scientific event should be chosen. Areas that can be classified include: astronomy in general, astronomy communication, astronomy education, Solar System exploration, stellar astrophysics, galactic anthroponomy, extragalactic astronomy, X-ray astronomy, infrared astronomy, radio astronomy, instrumentation.

The **location** feature allows us to place the event geographically. It has two variables: region and country. In the location (region), the coder must choose one of the locations where the scientific event happened or the location of the institution involved in the event. The regions are: European Union, other European countries, North America, Central and South America, Asia, Africa, Australia, Antarctic, Arctic. In the location (country) the coder should write the name of the country where the scientific event happened or the country of the institution involved in the event.

Source of information is another analysis feature. This will allow us to know where the information came from. Different information sources can be chosen. They can be: national news wire service, foreign news wire service, other national newspapers, foreign newspapers, national scientific magazines, foreign scientific magazines, non–governmental organisation (NGO), scientific institutions, scientists, public enterprises, private enterprises, scientific/ technical reports, books, IAU, the publication itself, without information or others.

The **news play** feature, is based on the Budd score (Budd, 1964). This is a score that gives a news play measure, allowing the understanding of the highlight of the article within the newspaper context. The higher the Budd score, the higher the news play. The Budd score is composed of a combination of a few features: highlight on first page, location on prominent page, location on page upper half, illustrations, title size above average (each one of these features counts one point). The news play can be classified as: very low news play (1 point), low news play (2 points), average news play (3 points), high news play (4 points) and very high news play (5 points).

Potential results

Once this data has been collected there are a few results that we can extract, for instance: the correlation between some global/national events, the correlation between press releases and the number of astronomy news pieces; the trend of the number of news articles related with astronomy throughout the period. If previous data is available the new results can be compared with the results from previous periods or for other sciences. Once again, these studies will provide important information about the real impact of a communication strategy.

Conclusion

We understand that this is a big task, but it can give very interesting results and useful data for a proper evaluation of your efforts. A piece of advice: it can be an advantage to establish a partnership(s) with one or more universities with experience in evaluation in order to set up a centralised data coordination and analysis centre. We hope these guidelines can help you with the evaluation of your astronomy communication.

References and further reading

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Notes

[1] According to the literature, "popular" newspapers are those whose contents are soft, less profound and mainly sensationalist, targeting a less educated and less demanding public". The "quality" newspapers are those whose contents are more profound and sober, mainly about politics and economics, targeting higher educated publics and cultural and power elites.

[2] List of science communication research groups/ departments: http://www.communicatingastronomy.org/training/index.html

Biographies

Rui Brito Fonseca has a degree in Political Science and a master's in Labour Sciences. He is now working on a sociology PhD looking at science and technology in Portuguese newspapers between 1976 and 2005. A researcher at CIES/ISCTE-IUL, Lisbon, Portugal since 2000, his main area of study is the public understanding of science, media studies and communication.

Pedro Russo is the Global Coordinator for the IYA2009 working at the European Southern Observatory for the International Astronomical Union. He is a member of the Venus Monitoring Camera/Venus Express Scientific Team and has been working with Europlanet, IAU Commission 55: Communicating Astronomy with the Public, EGU Earth and Space Science Informatics Division and the IAF Science and Society Committee.

Mariana Barrosa is the IYA2009 Co-ordination Assistant. She obtained degrees in International Relations (University Fernando Pessoa, Portugal) and Cooperation and Management of non-profit organisations (ISAG, Portugal) and a Master's Degree in Communicating Science (University of Glamorgan, UK). Before assuming her current position, she worked as assistant manager for the Navegar Foundation in Portugal and has been involved in several space science projects in Europe.

Lars Lindberg Christensen is a science communication specialist heading the ESO education and Public Outreach Department (ePOD) in Munich, Germany. He is responsible for public outreach and education for ESO, for ESA's part of the Hubble Space Telescope, for the International Astronomical Union Press Office and for the International Year of Astronomy 2009 Secretariat.