A REPORT ON SCIENCE AND TECHNOLOGY COVERAGE IN THE SA PRINT MEDIA

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INTRODUCTION

The South African press has often been criticised for its lack of science and technology coverage. No research has, however, confirmed these accusations.

The aim of this study was to establish the status of science and technology in a representative sample of the South African press. The study involved a detailed quantitative analysis of the amount and type of coverage in a sample of publications.

The following categorical variables were studied: the profile of journalists, tone of articles, use of visuals and infographics, discourse of benefits and risks, prominence awarded to science stories, prominence awarded to controversial aspects, science categories covered and sources used in the compilation of science stories.

The Department of Journalism of the University of Stellenbosch conducted the scientific research in collaboration with the Foundation for Education, Science and Technology (FEST). The research methodology was based on a similar study conducted in Britain in 1995.

LITERATURE REVIEW

The importance of science journalism

Carl Sagan presents us with a romantic definition of the importance of science journalism: "Understanding the world is a kind of joy, and I find that every time people, ordinary people, understand some aspect of nature they hadn't grasped before - why the sky is blue, why the moon is round, why we have toes - they are delighted. This is a delight first in the joy of knowledge itself and second because it gives them some intellectual encouragement: they discover they're not so dumb as they had been told they were" (Weigold, 1998, p. 15).

It is generally believed that the public should at least have access to reliable information (Shortland & Gregory, 1991). Not only does the public's participation in science debates, by means of the media, lead to the funding of research projects, it also helps society to act "wisely and intelligently" (Hartz & Chappell, 1997, p.117) especially in terms of science policy issues (Weigold, 1998, p. 15). “Knowledge is power” (Francis Bacon) and, in a democratic society, this means that the public can make better judgements, to the benefit of the individual or the society as a whole (Nelkin, 1995, p. 2).

Certain literature suggests that a society devoid of scientific knowledge can lose its economic competitive edge (Weigold, 1998, p. 15).

For this reason it can also be argued that the media have a responsibility to provide its audience with the details of the latest developments in science.

Whatever the case might be, the communication of science and technology by means of the mass media should not be underestimated.

Science and journalism: uneasy partners

In recent years the popularisation of science has, to a large extent, become the task of the journalist who depends on his or her communication with the scientist to provide relevant, accurate science news. "Yet there is a reluctance by many scientists to engage in exactly this kind of public dialogue" (Weigold, 1998, p. 22).

History has shown that the agendas of scientists and journalists may differ. It is argued that "science knows only one commandment: (to) contribute to science" (Bertolt Brecht's play *The Life of Galileo*, quoted in Bolles, 1997, introduction). In an effort to contribute to the greater truth that is science, scientists' papers are usually informational - written in academic jargon for erudite peers. The common belief is that scientific peers will condemn the publication of academic information in what their contemporaries regard as "trivial" media (Weigold, 1998, p. 22).

In opposition to this, journalism is guided by human interest, timeliness, proximity, and, in many respects, sensationalism (Weigold, 1998, p. 7). In other words "what is existent, what is happening and what is important" (Weingart, 2002, p. 4). In many instances the

media create their own reality by employing biased selection criteria (Weingart, 2002, p. 4-6). These criteria are often worlds apart from the criteria set by scientists.

Dorothy Nelkin highlights the widespread tendency of scientists, engineers and physicians to condemn the media, with specific emphasis on the apparent lack of quality science journalism and the popularisation of science. Scientists complain about inaccurate, sensational and skewed reporting and feel that the press encourages a negative public perception of science (Nelkin, 1995, p. 7-8).

This negativity is reflected by the fact that only 11% of the participating scientists in the 1997 Worlds Apart survey indicated that they have a great deal of confidence in the press (Hartz & Chappell, 1997, foreword). They believe that media reports are "grossly inaccurate" and that science is merely seen as entertainment (Eron, 1986, p.12). The scientist, it seems, perceives the journalist as "a (wo)man who knows the price of everything, and the value of nothing" (Oscar Wilde, quoted in Hartz & Chappell, 1997, p. 13), while journalists blame scientists for providing them with inadequate information. A common complaint is that scientists are "so intellectual and immersed in their own jargon that they can't communicate with journalists or with the public" (Hartz & Chappell, 1997, p. 31).

Although these diverse fields are "mutually dependent, the communities of science and journalism are (both) wary collaborators in the business of science communication" (Nelkin, 1995, p. 8) - a situation which leaves the public in a vulnerable position.

Science journalism trends

The content and style of science reporting have adapted to the different agendas of science journalists and have changed to correlate with the shift in the audience's needs during the last couple of decades. The tone of science reporting also reflects the cycles of scientific development.

A study of science and technology in the British press in the post-war period (1946-1990) provides valuable insight into some of the developments in the field of science

communication during the 20th century (Bauer, Durant, Ragnarsdottir & Rudolfsdottir, 1995).

Contrary to popular belief, a steady decline in the coverage of science and technology did not take place, at least not in Britain. According to the British study, the trend has, however, been different in the quality press and in the popular press (Bauer et al., 1995, p. 7-8).

From 1946 to the early 1960s the quality press demonstrated a 400% increase in the coverage of science and technology, whereas the popular press showed a 300% increase. From the early 1960s to the mid-to-late 1970s the quality press demonstrated a 50% decrease in the relevant coverage, while the coverage of the popular press stabilised. After this, the quality press made a 50% recovery towards the 1990s, whereas the popular press presented a 60% decline in the coverage of science and technology. The general increase in science coverage during the 1970s and 1980s was reflected by similar results obtained from Australia and Germany over the same period (Bauer et al., 1995, p. 7).

According to Nelkin, the journalists' approach to science has also varied considerably in the second half of the 20th century. "Breakthroughs" and "revolutions" dominated the coverage of science and technology during the 1960s - an era of amazement that coincided with the first space exploration efforts. In the 1970s the wonder of science was replaced by a concern for the environment, while the 1980s was, once again, characterised by a discourse of benefits in the press. "The idea of progress was resurrected as innovation, and the celebration of technology turned to high-tech hype". This "hype" continued right through to the 1990s, although the emphasis shifted from the biological to the physical sciences (Nelkin, 1995, p. 7).

The above-mentioned British study confirms these trends. From 1950 to 1965 the evaluative tone of science coverage was "positive" and "celebratory", while the overall tone was "negative" and "critical" from 1965 to 1990. The evaluative tone trend also corresponds with the discourse of benefits and risks pertaining to the science topics covered, with a discourse of benefits dominating until the late 1960s. This relationship became more balanced in the 1970s (Bauer et al., 1995, p. 8).

Throughout the post-war period an average of 5-6% of editorial space was devoted to science and technology (Bauer et al., 1995, p. 8). About a quarter of all stories selected for the British study dealt with a controversial aspect of science and technology.

There has been a general increase in the amount of feature articles on science topics in the post-war period (Bauer et al., 1995, p. 9). The more democratic newsroom might have had an effect. A 1987 survey found that the majority of science writers preferred to write feature articles (Bauer et al., 1995, p. 10).

The coverage of science in the 1990s was influenced by growing competition in the media (Nelkin, 1995, p. 7). Yet the degree of homogeneity between different publications increased in the 1990s. Most articles on a certain subject dealt with exactly the same issues in precisely the same way (Nelkin, 1995, p. 9). Furthermore, it seemed as if the smaller publications used the more prominent publications as benchmarks for the selection of stories (Nelkin, 1995, p. 9-13).

During the 1990s, in an era of unprecedented scientific discovery, journalists seemed to be pulled in several directions by scientists, the industry, advertisers and politicians. This usually meant that science journalists were not always in sync with the needs of their readers. In an American survey conducted in 1979, it was found that science writers most often covered medicine (39%), followed by the environment and energy (27%), the biological sciences (10%), physical sciences (7%) and behavioural science (6%) (Dennis & McCartney, 1979, p. 9-15), while readers seemed to prefer different topics.

Another American research group found that readers most frequently read stories about natural disasters, followed by stories pertaining to energy and conservation (Nelkin, 1995). After this, readers preferred to read articles on health, human psychology, nature and the outdoors, space and exploration, in order of preference. In a survey of Michigan (USA) residents, this readership pattern was supported. Respondents indicated that they most often read environmental stories because these events were most likely to affect their lives (Atwater, 1988).

In another survey, environmental and medical news tended to appear throughout newspapers, but other science and technology stories were often limited to special science sections (Bader, 1990). Increasingly, in the 1990s, science appeared in the

coverage of such global issues as climate change, environmental disasters and international economic affairs (Nelkin, 1995, p. 2).

It is clear that the field of science and technology has also taken on a whole new dimension in the last few decades, that of "post-normal science" – science closely related to politics and social legitimisation (Weingart, 2002, p. 2). Weingart identifies another important trend: that of science, which is increasingly commercialised and increasingly linked to the media as scientists use the media to gain funds (Weingart, 2002, p. 5).

Very little literature could be found on the trends in the South African press. The aim of this study was to contribute to the available knowledge on this topic.

METHODOLOGY

This research study was a quantitative analysis and an attempt to identify large-scale patterns and trends in the South African press.

Fifteen South African publications were monitored over a period of three months, from the morning of 18 March to the evening of 17 June 2002. South African regional and national print media titles, which reflect a geographical and cultural diversity in its target markets and are produced by South African based companies, were selected.

In the category for dailies, the following publications were studied: *Die Burger*, *Beeld*, *Cape Argus*, *The Star* and *Sowetan*. In the category for weekly national newspapers, the following were included: *City Press*, *Mail & Guardian*, *Sunday Independent*, *Sunday Times*, *Rapport* and *Business Day*. Two magazines, *Finance Week* and *Financial Mail*, were selected. And, finally, two regional newspapers formed part of the study: *Eikestadnuus* and *Sasolburg Bulletin*.

The project was a team effort that involved 22 students from the Department of Journalism at the University of Stellenbosch. The students had to monitor the publications on a weekly basis and complete a questionnaire on the relevant science articles published. A project leader (the writer of this article) monitored the selected articles and compiled a unique electronic database.

Generally, the articles that were included dealt either directly with an issue of science and technology or with a broad issue for which scientists could provide perspective. Any report or feature, which had science as a main theme, focus or subject, was included.

The articles were collected according to a well-defined sampling procedure through which a broad spectrum of science categories was covered. Students were given a clear indication of what articles were to be included. The study leader checked these. No articles were included that exclusively dealt with political or social issues linked to a science topic. An example of this was the Nevirapine debate. The South African government's role in the provision of this medication to pregnant HIV-positive women via clinics and state hospitals was widely debated. Although the benefits and risks of the medication came into play, the debate was, to a large extent, of a political nature. Articles about Nevirapine were only included if they revolved around the scientific development of the medication. Articles concerned with the political debate over the legalisation of the medication were excluded, except if it dealt prominently with the benefits or risks of Nevirapine.

Approximately 994 articles qualified.

The overall amount of coverage of science and technology was calculated by counting the overall amount of editorial space in the selection of publications and dividing it by the 994 science and technology articles. Average values for editorial space were calculated by using the average number of articles that appeared in five randomly selected issues and multiplying this value by the number of publications studied. No letters from readers or promotional features were counted.

Categorical variables monitored

The variable information pertaining to the articles were entered into a Microsoft Excel file, from which a statistician extracted the data to do the analysis by means of a statistics software package.

Each article was classified according to the author. A distinction was made between articles written by editorial staff ("local") and articles obtained through wire services or

foreign publications ("foreign"). If local authors wrote for different publications within a newspaper group (an example is the Naspers group), the article was categorised as "local".

A study was made of the number of dedicated science writers. If a journalist reported three or more science and technology stories during the three-month period, he or she was considered to be a "dedicated science writer" (see p.4).

All the relevant stories were classified as either “breaking news" or "feature" stories. Breaking news stories were identified by their current value and the use of the so-called inverted pyramid structure - where the "who, what, when, where, why and how" aspects of the science story were given prominence. Feature stories were recognised by their longer format containing a more detailed analysis of the issue.

The evaluative tone of the articles was monitored. This was done since it is often claimed that press coverage of science and technology is "unduly negative" (Bauer et al., 1995). In a similar way, as employed by the British research group, the "degree of negativism" was simply measured by classifying the articles as either "negative" (a discourse of criticism) or "positive" (a discourse of promise).

The use of visuals and infographics was studied. The classification of "visuals" was awarded to any article that was accompanied by one or more photographs or graphic images. The term "infographics" applied to any article accompanied by "informative graphics" - visual displays with accompanying labels and text. The use of visuals and infographics generally adds prominence to a story. Infographics are also known to be an extremely effective way to package in-formation in an easy-to-read format.

"A specific claim which relates to the general charge of negativism within press science coverage concerns the discourse of risks and benefits" (Bauer et al., 1995). The discourse of risks and benefits only applied to science and technology as such. By grouping the articles into the following categories on a categorical scale, this discourse was monitored: "only benefits", "mostly benefits", "only risks", "mostly risks" and "equal proportions of benefits and risks". A sixth category, "not in question", was included since many articles did not deal with the benefits or risks of science per se. As an example, an informative article about healthy diet patterns was classified as "not in question" (it dealt with the

benefits of good nutrition but not with the benefits of scientific development), while an article about the benefits of a new cancer treatment was included.

The articles that formed part of the study were also classified as "controversial" or not. An article was "controversial" if the topic in question was widely and publicly debated or if it was apparent from the text that scientists or other authorities still disputed the science issue. Unfortunately, in many instances this classification was very subjective and depended on the student's discretion.

The prominence of science and technology in the press was monitored by means of another categorical scale. Prominence was measured by the position of the article in the publication. This was done by means of a simple coding system that differed for newspapers and magazines respectively. Articles that appeared earlier in a publication was considered to have greater prominence than articles that appeared in the latter part of a publication. The coding system for the newspapers was as follows: A (p. 1-3); B (p. 4-6); C (p. 7-9); D (p.10+) and E (supplements), compared to the coding system for magazines: A (p.1-10); B (p.11-30); C (p.31-50) and D (p. 50+). For the purpose of this study the size of articles was not taken into consideration.

The use of local sources was monitored. If local scientists or sources were quoted or mentioned, the article was awarded a "yes" in this section. If sources from abroad were used or foreign scientists were quoted or mentioned, the article was awarded a "no".

A rough profile of the reporters was drawn up. The aim was to establish how many "dedicated" science writers were involved in the coverage of science and technology during the monitoring period. Reporters that published more than three articles during the research period were regarded as "dedicated".

The weight of the scientific subjects covered was measured on a categorical scale. This meant that all the articles were placed in a science subcategory to establish what science and technology fields were given greater prominence. The 19 subcategories were defined as follows (various sources were used to compile the definitions):

• **Anthropology & Archaeology:** The study of man's nature and development. The study of the buried remains of ancient times.

• **Astronomy:** The science of space, the sun, the moon and the stars.

• **Behaviour:** Facts and theories about human behaviour.

• **Biomedicine:** The science of clinical medicine, biochemistry and basic biology (excluding botany and ecology).

• **Botany:** The study of plants.

• **Zoology:** The study of animals.

• **Cell & Molecular Biology:** The science of the microcosmos, including living cells and their properties.

• **Chemistry:** The study of the elements, compounds and the behaviour of substances.

• **Earth science:** A broad term, which includes geology (the study of rocks and minerals) and oceanography (the physics and chemistry of the oceans, marine biology and the exploitation of the ocean's resources).

• **Environment & Ecology:** The study of the relation of plants, animals and people to one another and to their surroundings.

• **Food science & Nutrition:** The science of food and how the body utilises food.

• **Mathematics:** The science of numbers.

• **Computers:** The science and technological developments pertaining to computers.

• **Paleobiology:** The study of fossils.

• **Physics:** The study of matter and natural forces.

• **Technology:** The study of scientific and industrial methods and their use in society and industry.

• **HIV/Aids:** Scientific developments in the understanding of HIV/Aids and the combating of the disease.

• **Pseudo science:** Assertions that are incapable of being tested or refuted by evidence (for the purpose of this study astrology columns were excluded).

• **General science:** Science discussed as a general topic.

RESULTS

Under every heading, an overall assessment will be made across the different groups of publication types included. This means that the results for the daily newspapers, the weekly national newspapers, the regional newspapers and the magazines will be grouped together to form an overall impression of the status of the South African press. After this, the results will be split up to assess the situation within the different groups respectively. Important associations will also be discussed.

Amount of coverage

Of the editorial content studied during the three-month period, only 1,8% was dedicated to science and technology.

Local vs. foreign authors

Overall, it seems as if more local authors are used to write science and technology stories than foreign authors.

A great number of articles were obtained from foreign publications, like the *Daily Mail*, and wire services like Reuters, Sapa and Associated Press. According to the data, 38% of the science and technology coverage in this particular sample of the South African press can be attributed to foreign sources or non-editorial authors.

During the three-month monitoring period, the sampled magazines utilised their local authors best. Eighty-nine percent of the coverage in magazines could be attributed to local authors. The daily magazines fared second best by awarding 65% of science and technology space to local authors. The regional papers published an equal number of stories by local and foreign authors and the weekly national newspapers used more foreign sources (52%) than local sources (48%).

Profile of reporters

The average number of dedicated science and technology writers across all 15 publications during the research period amounted to two reporters per publication.

The different publication groups did, however, differ significantly in this respect. The daily newspapers seemed to employ the most science writers with an average of four reporters per newspaper. The average for the magazines was two reporters per publication, while the average for the weekly national newspapers was one reporter per newspaper. None of the reporters employed by the selected regional newspapers fitted the criteria of a dedicated science writer.

Table 1 indicates the number of science writers employed by the respective publications (the reporters of *Die Burger* and *Beeld* were grouped together as many of their science reporters overlapped):

Table 1: Profile of reporters

Publication	Number of reporters
Argus	3
Burger & Beeld	10
Star	5
Sowetan	2
M&G	2
Sunday Independent	0
Sunday Times	2
Rapport	1
Business Day	1
Eikestadnuus	0
Sasolburg Bulletin	0
Financial Mail	4
Finance Week	0
Average	**2**

Note: some of these publications may have employed more than the above-mentioned number of science and technology writers. These figures referred only to the writers that published three or more of the relevant science and technology stories during the three-month period. It also did not give an indication of how many articles were not published. Gatekeepers (editorial staff who influence the flow of information) in the newsrooms

might have had a significant impact on the number of science and technology stories published.

Coverage according to type of story

The sampled print media generally published more news (74%) than feature stories (26%).

The daily and weekly newspapers published the fewest feature stories. Only 25% of the science coverage in the daily newspapers and 21% in the weekly newspapers were published in feature format. As expected, the magazines published the most feature articles (67%). Magazines are usually characterised by longer, more in-depth type stories. The regional newspapers made use of both types of formats in equal proportions.

Evaluative tone of coverage

The South African press appears to have a positive attitude towards science and technology.

Overall, the evaluative tone of the coverage was more positive (70%) than negative (30%) in the sample of publications.

This trend was reflected in the respective subgroups as well. Seventy-eight percent of the articles published in magazines were written in a positive tone, while 75% of the regional coverage, 71% of the daily coverage and 63% of the weekly coverage was written in a positive tone of voice.

Use of visuals and infographics

Only 8% of the studied articles were complemented by infographics, while 39% were accompanied by visuals.

The daily newspapers demonstrated the largest use of infographics (9%), while none of the few science articles in the regional newspapers used this type of graphics. Five per-

cent of the science articles in the weekly magazines had an infographic accompanying it, while 4% of the articles in the magazines made use of these graphics.

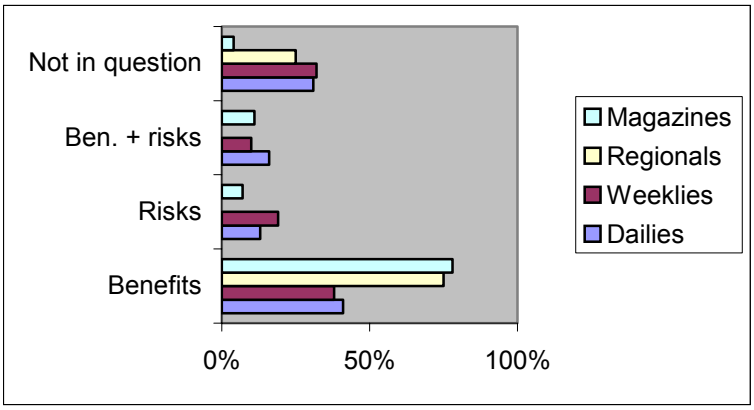
The magazines had the best record of visual use (81%). Forty percent of the articles in the daily newspapers, 28% in the weekly newspapers, and 25% in the regional newspapers were accompanied by visuals in the form of photographs or other images.

Discourse of benefits and risks

Thirty-one percent of the analysed articles did not deal directly with benefits and/or risks pertaining to science and technology. However, the largest proportion of the articles (42%) seemed to promote the benefits of science and technology. Nineteen percent were placed into the "only benefits" category, while 23% were placed in the "mostly benefits" category. In total, only 14% of the articles tended to promote the risks of science and technology. Fifteen percent of the articles covered equal proportions of risks and benefits.

The magazines (78%), the regional newspapers (75%), the daily newspapers (41%) and the weekly news-papers (38%) all reflected the positive discourse trend in the coverage of science and technology (see Chart 1).

Chart 1: Discourse of benefits and risks

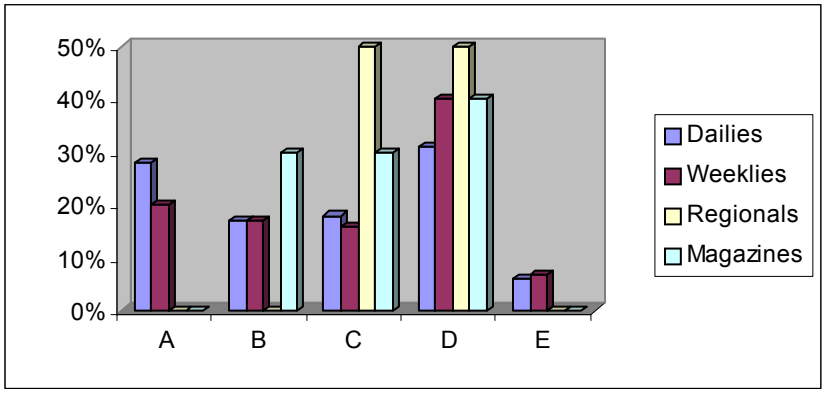


Prominence of coverage

The overall position of science and technology articles in the sample of publications is conflicting. Although the D-section (p.10+ for newspapers and p.50+ for magazines) seemed to be the most popular (33%) section for science and technology articles, a large number (25%) of articles also appeared in the A-section (p.1-3 for newspapers and p.1-10 for magazines). The E-section (supplements) contained only 6% of the relevant articles.

In all the publications the data seemed to bend towards the D-section. A fair amount of coverage was, however, also positioned in the B- (p.4-6 for newspapers and p.11-30 for magazines) and C-sections (p.7-9 for newspapers and p.31-50 for magazines) of the publications (see Chart 2).

Chart 2: Prominence of coverage



Prominence of controversies

Since controversy in any form is usually associated with major news value, it was expected that controversial science and technology stories would dominate. Contrary to this expectation, the majority of articles (71%) in the sample of publications did not deal with a controversial issue.

The monitored weekly national newspapers covered the most (33%) controversial topics, while no controversy was apparent in the small number of science and technology articles that appeared in the regional newspapers. Twenty-eight percent of the coverage in the daily newspapers dealt with controversy, while 26% of the magazine articles were about some or other controversial aspect of science and technology.

Local vs. foreign research

It seems that more foreign sources and scientists (62%) are quoted in the South African press than local sources and scientists (38%).

This trend seemed to differ for the different types of media. While the regional papers exclusively made use of local sources, only 27% of the sources in the weekly national newspapers were South African. Fifty-six percent of the articles in the sampled magazines and 41% of the articles in the daily newspapers used local sources or quoted local scientists.

Weight of scientific subjects covered

Certain subjects received more attention during the three-month period. According to the results, the category for biomedicine was by far the most popular (18% of the articles fell into this category). After this, fourteen percent of the coverage could be grouped under astronomy, followed by the category for HIV/Aids (12%) and the technology (12%) category. Of the 994 articles studied, only two (0,2%) mathematics articles and four (0,4%) physics articles were published.

It should be noted that the study took place during the period when the South African Mark Shuttleworth travelled to the international space station in April 2002. The large amount of press coverage this event received probably attributed to the high percentage of articles that fell into the category for astronomy.

The results are summarised in Table 2.

Table 2: Topics covered

Category	Proportion
Biomedicine	18%
Astronomy	14%
HIV/Aids	12%
Technology	12%
Environment & Ecology	9%
Food Science & Nutrition	6%
Cell & Molecular Biology	5%
Pseudo science	5%
Zoology	5%
Behaviour	4%
Computers	3%
Anthropology & Archaeology	2%
Paleobiology	1%
General science	1%
Earth Science	1%
Chemistry	1%
Botany	1%
Mathematics	0,2%
Physics	0,4%

Important associations

The statistical analysis of the data also yielded certain important associations. The chi-square test was used to make categorical inferences about the relationship between the categorical variables studied.

In each case a zero hypothesis was tested and either accepted or rejected. The zero hypotheses referred to insignificant associations between the categorical variables, while the alternative hypotheses referred to significant associations between the categorical variables.

Only the results that yielded a significant association will be discussed, although other associations were also tested.

Association: category and author

A significant association existed between the two categorical variables "category" and "author". The data was skewed towards the categories for behaviour, food science and nutrition, paleobiology and physics.

This meant that slightly more foreign authors published articles in these categories in relation to the other categories where local authors dominated.

Association: category and controversy

A significant association existed between the variables "category" and "controversy". The data was skewed towards the HIV/Aids category.

This meant that more of the articles in this category contained information that was considered controversial. The association could probably be attributed to the extensive coverage of the Nevirapine debate during the research period.

Association: category and visuals

A significant association existed between the variables "category" and "visuals". The data was skewed towards the categories for astronomy, technology and botany.

This means that slightly more visuals were used to accompany articles that fell into these categories in comparison to the articles that fell into the other categories.

CONCLUSION

The small percentage of science and technology articles published during the research period points to a lack of science and technology coverage in the South African press. Unfortunately a "lack" of coverage is difficult to define and judge. "Such a judgement is inherently political, and different stakeholders in the scientific community and the media are likely to have different views" (Bauer et al., 1995). More research is needed to assess the view of readers and to express the amount of science coverage in terms of other areas of coverage.

It can be argued that the local press is too dependent on foreign publications and news agencies in the provision of science stories. This also explains why fewer local sources are quoted. It should be noted, however, that economic restraints probably add to the apparent lack of dedicated science writers within the South African context. Time

restraints could also have had an effect. The question of the allocation of resources within the newsroom was beyond the scope of this study.

The small number of published feature articles might be a problem. A significant imbalance between breaking news stories and feature stories might contribute to a public misunderstanding of science issues. Once again, the definition of such an imbalance is hard to define and beyond the scope of this study.

The positive evaluative tone of coverage and the discourse of benefits point to a positive relationship between science and the South African press.

There is need for concern with regards to the use of visuals, and especially infographics, in the South African coverage of science and technology. Although the beneficial properties of visuals and infographics have been pointed out by several research studies, it seems as if the local press has not quite caught up with the trend.

RECOMMENDATIONS

It is suggested that in future this study be repeated at regular intervals. The results will be even more reliable if the study is conducted over a longer period, preferably for a minimum time span of a year. This will compensate for irregularities in breaking news stories, like Mark Shuttleworth's space voyage in April 2002.

A complementary qualitative research study is suggested to accompany similar future studies.

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