

Evaluating Assertions About Science Writing, Reporting and News Selection: A Content Analysis of the Washington Post and Los Angeles Times

Abstract

In this study, science news in the Washington Post and Los Angeles Times within biennial periods from 1989-1995 is analyzed to explore seven research questions about science reporting, writing and news selection.

The study suggests an inconsistency between actual performance and qualitative criticisms of the science's news media reporting, writing and news selection tendencies.

Among the findings are: the percentage of issue oriented stories in the Washington Post and the Los Angeles Times was higher than suggested within the literature. The percent of stories in the Washington Post and the Los Angeles Times that embedded educational-informative content was higher than suggested within the literature.

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Presented to: 5th International Conference on Public Communication of Science & Technology. Berlin, September 1998.

Introduction

Of the branches of research regarding the public understanding of science, one area focuses on the public's science and mathematical literacy as well as the science policy, perceptual differences between scientists and citizens (Miller, 1987, 1983, 1986; Prewitt, 1982, 1983; Lewenstein, 1992). A second, broad research tradition discusses how forms of mass communication besides the news media (such as museums, fiction, film, art, K1-12 and higher education) contribute to the public's understanding of science (Lewenstein, 1992).

A third area narrowly focuses on the social impact of the lay press' science coverage. The emphases on the news media's overall performance is tied to a 70 year old perception that public awareness, understanding, and eventual support for science are inextricably linked to news coverage of scientific activities (Council of Scientific Society Presidents, 1991; Burnham, 1987; Trachtman, 1981). Tobey (1971) explained that U.S. science journalism was initiated in the 1920s mostly by scientists, who were interested in news coverage to advance public knowledge and funding. The scientists, who 70 years ago sought news coverage, believed that news would advance an awareness of science, which would elevate public understanding plus foster appreciation, literacy and tax-supported support for research (Tobey, 1971). While it is difficult to demonstrate a linear cause-effect model, the perception remains that the impact of news coverage of science follows a similar scenario (Yankelovich, 1982; Laetsch, 1987; Trachtman, 1981). Certainly, a linkage between ascribed public misunderstanding and overreaction to science-derived developments (as well as poor mathematical and science literacy) is often tied to the news media's alleged inaccurate, sensational, contrived or acontextual coverage of science, as well as an emphasis by the news media on entertainment rather than educational issues (Hagedorn and Allender-Hagedorn, 1997; Efron, 1985; Trachtman, 1981; Ciba Foundation Conference, 1987; Council of Scientific Society Presidents, 1991).

Nelkin (1995) suggested that critics of science journalism assess how the press shapes science news through a framework that evaluates editing, writing plus news selection decisions. Nelkin (1995) noted that each area (writing, reporting and news selection) affects news content and influences what the public perceives about science, medical and environmental issues. The frameworks by which journalists decide what is news, use writing motifs and make reporting decisions also are widely perceived as critical dimensions, or variables, in the quality of news reporting outside of science writing (Manoff and Schudson, 1987; Signorielli, 1993; Schudson, 1978; McQuail, 1992, 1994).

Among more specific criticisms of science news reporting are: an emphasis on event-reporting and a parallel inattention to in-depth scientific topics and issues. Wilkins (1987), Nelkin (1995), Shepard (1979, 1981), Angell (1996) and Saari, Gibson and Osler (1998) all find that science and medical journalists overcover staged events, which are often managed by public relations offices within industry, government, universities, scholarly societies and public interest groups. Press conferences and staged events provide a convenient venue for reporters to obtain basic information and conduct interviews on deadline. But Nelkin (1995) finds that science reporting has become overdependent on events set up for journalists which undermines the capacity of reportorial enterprise and inhibits diverse science news coverage.

The overemphasis on a prepackaged preparation and presentation of science and medical news has three other undesirable side effects that are widely discussed in the literature. First, news coverage of what Boorstin (1973) termed 'pseudo-events' is seen to reinforce journalism's dependence on established, well-organized sources for news. Since time and space limitations restrain most news organizations, an emphasis on reporting about events is alleged to occur at the expense of underlying sociological, cultural, ethical, historical and educational aspects of science (Freimuth, Greenberg, DeWitt, Romono, 1984; Pfund and Hofstadter, 1981; Wilkins, 1987, 1989; Pellechia, 1997; Friedman, Gorney and Egolf, 1992).

Third, in cases where a major science story develops a several day life span, Nelkin (1995), Wilkins and Patterson (1987) and Logan (1998) found a tendency for reporters cover events in an episodic fashion. Instead of providing readers with a educational context or background, or seeking fresh angles, journalists are said to frequently follow a compelling news story by relaying the results of daily news conferences arranged by major governmental agencies, large companies or well-organized public interest organizations.

In terms of a trend, or a variable to research, the literature suggests event and episodic reporting are ubiquitous and there is dearth of reporting generated by a more-thoughtful attention to underlying issues, where developments and resulting staged events are less likely to occur.

Another critical genre of news reporting has centered on the press' tendency to cover emerging or 'pioneer' science in lieu of established 'textbook' science. These criticisms often migrate into questions about news judgment (how journalists initially select news topics.)

In reporting about electromagnetic fields, breast implants, Alar in apples and endocrine disrupters within the late 1980s and 1990s, journalists have been criticized for providing a false impression that preliminary epidemiological and toxicological data represent significant public health risks (Friedman, Villamil, Surian and Egolf, 1996; Logan, Fears and Wilson, 1997; Logan, Tessier and Kingsbury, 1995; Wilkins and Patterson, 1987). In terms of reporting, the press is seen as relaying scientific claims without critically examining their underlying epidemiological or toxicological basis, explaining the nature of the potential harm, and comparing actual to involuntary or voluntary risks that are well known or persons take for granted (Friedman, Villamil, Surian and Egolf, 1996; Logan, 1997; Wilkins and Patterson, 1987). This lack of context is said to convey an erroneous impression about the nature of risks and the requisite need for public intervention.

The resulting climate of public concern about risks is alleged to foster a public policy agenda which drives legislation (or a recycling of limited funding for questionable projects) in advance of a prudent, empirical grounding (Hartz and Chappell, 1997; Logan, Fears and Wilson, 1997; Prewitt, 1982; Council of Scientific Society Presidents, 1991). For example, some critics link the extensive publicity in the late 1980s surrounding risks from exposure to electromagnetic fields (EMFs) with fostering regulatory statutes within several U.S. states (Logan, Fears and Wilson, 1997). In 1996, after legislation in several states occurred, a National Academy of Sciences report noted the links between exposure to EMFs and health risks were equivocal (Logan, Fears and Wilson, 1997). The Academy's findings reinforced the concern that undiscerning journalists can inadvertently initiate a process where legislation gets ahead of scientific evidence (Logan, Fears and Wilson, 1997).

The consequences of reporting about pioneer science and the fostering of a questionable public policy agenda also are criticized as exemplars of unethical news judgment (Logan, Fears and Wilson, 1997). Since the news media foster public awareness of issues and legitimize social actors by publicizing their assertions, critics note that the press needs to be especially prudent- not reckless - in initial journalistic decisions to cover assertions about public health risks, the extent of subsequent coverage, the prominence of the coverage, the tone of the coverage plus the context provided (Logan, Fears and Wilson, 1997; Wilkins and Patterson, 1987).

Unquestionably, the potential hyperbole created by reporting pioneer science is a core topic in current science journalism criticism (Hartz and Chappell, 1997; Council of Scientific Society Presidents, 1991; Nelkin, 1995; Logan, Fears and Wilson, 1997). The extensive criticism suggests that news organizations tend to frequently select pioneer

science topics for news coverage and simultaneously, avoid covering topics that provide grounded, more definitive scientific information because these are less newsworthy (Hartz and Chappell, 1997; Council of Scientific Society Presidents, 1991; Logan, Fears and Wilson, 1997; Nelkin, 1995).

Two persistent criticisms of how journalists write about science revolve around motifs in news stories where a) journalists try to overlay a story about research findings with details about a scientist's background and personality and b) science writers create an artificial narrative tension by juxtaposing scientists in conflict with one another.

Blakeslee (1986) finds the press' emphasis on human interest and personalities in science often leaves readers without an educational context to understand the significance of science and medical news. In biomedical procedures, the educational aspects of the story that might help readers understand a complex medical procedure, or why changes in health care practices occur, are seen as secondary to introducing readers to the personality characteristics, demeanor, lifestyle and personal habits of physicians and research scientists (Blakeslee, 1986).

Efron (1985), Nelkin (1995) and Burnham (1987) maintain that too many science and biomedical stories emphasize conflicts regarding evidence, procedures and public policy implications among scientists and physicians. While debate is a normative feature of scientific discussion, several critics find that news media depiction of differences about data and interpretations among scientists appear to be adversarial, or fail to provide a context about the nature of scientific argumentation, or are occasionally contrived by journalists (Efron, 1985; Nelkin, 1987; Burnham, 1987; Friedman, Villamil, Suriano and Egolf, 1996). The result is that readers find science's self-righting processes confusing and inconsistent, which results in an unjustified, declining public confidence in science and medical institutions (Hartz and Chappell, 1997; Efron, 1985, Whelen, 1985, Burnham, 1987).

In both cases, critics allege that narrative devices are used widely in news reporting and have a questionable impact on elevating the public's understanding of how science functions. While the critique of writing motifs is alleged to occur, it is rarely described as widespread as reporting techniques that focus on events or episodes, or the tendency to generate news from pioneer science topics.

A similarity among the current criticisms of science reporting, writing and news selection is a consensus about negative public consequences without supporting empirical research to confirm the assertions.

There are relatively few content analysis studies that have tried to evaluate science news performance over time. Recently, Pellechia (1997) found a modest increase in the number of science articles printed in the Chicago

Tribune, Washington Post and New York Times within the past three decades. While five major newspapers and three television networks reported extensively about the Chernobyl accident, Friedman, Gorney and Egolf (1992) found the coverage lacked a context to elevate the public's understanding of nuclear power's safety and costs-versus-benefit considerations. Friedman, Villamil, Suriano and Egolf (1996) noted the performance of 13 U.S. newspapers in 1989 was inconsistent with the intense criticism that accompanied news coverage of the health risks from spraying Alar on apples.

While these and other recent studies provide an excellent overview of the volume of science news and introduce some of the qualitative issues criticized in the literature, the persistent assertions about flaws in news reporting, writing and judgment merit more empirical investigation than they have received.

In this study, the science news in the Washington Post and Los Angeles Times in biennial periods from 1989-1995 is analyzed to explore seven assertions about science reporting, writing and news selection.

The literature suggests these research questions:

R1 - there should be a high percentage of stories with an episodic and event-orientation in the Washington Post and Los Angeles Times and these high percentages should remain consistent during an eight year period of science news coverage

R2 - there should be a low percentage of science news stories that focus on science issues in the Washington Post and Los Angeles Times and these low percentages should remain consistent during an eight year period of science news coverage

R3 - there should be a low percentage of stories with embedded educational and informative components within the Washington Post and Los Angeles Times and these low percentages should remain consistent during an eight year period of science news coverage

R4 - there should be a moderate percentage of stories with human interest component in the Washington Post and Los Angeles Times and these moderate percentages should remain consistent during an eight year period of science news coverage

R5 - there should be a moderate percentage of stories that embed a motif of conflict, dispute and argumentation among scientists in the Washington Post and Los Angeles Times and these moderate percentages should remain consistent during an eight year period of science news coverage

R6 - there should be a high percentage of stories that focus on pioneer and emerging science topics in the Washington Post and Los Angeles Times and these high percentages should remain consistent during an eight year period of science news coverage

R7- there should be a low percentage of stories that focus on textbook science topics in the Washington Post and Los Angeles Times and these low percentages should remain consistent during an eight year period of science news coverage.

Methods

Two independent coders read all the science, biomedical, environmental news and news analysis stories in all sections of the two newspapers. Editorial commentary, columns plus question and answer sections were excluded from the study.

The Washington Post and the Los Angeles Times were selected because each news organization covers science, medicine and the environment and both newspapers are distributed within regional and selected national markets. Both newspapers have won many national and regional awards for news reporting and writing. Since each is in a industry leadership role, both newspapers are among those that are often criticized for their editorial decisions. The Washington Post and Los Angeles Times are owned by different companies and are distributed in two different, heterogeneous regions within the U.S.

Shoemaker and Reese (1996) explain that in content analyses a range of external factors, such as changes in news personnel, management and profitability can influence how news is reported. This suggests a number of confounding variables potentially undermine the reliability and validity of sampling news organizations over time. However, both The Washington Post and Los Angeles Times had dedicated science, environmental and health reporters well before and during the entire sampling period. During the period surveyed, both newspapers had the same ownership, hired a veteran staff, had relatively little turnover and maintained a self-imposed an ongoing newsroom dialogue about internalized standards of appropriate journalistic behavior (Washington Post Writers Group, 1974; Shaw 1977). The unusual stability within some external factors in both newspapers, that is, provides some controls that suggest the news coverage in The Washington Post and Los Angeles Times can be compared over time.

Science news was operationally defined as reporting about environment, computers, biology, ethics, geology, space, social science, chemical sciences, physics, nuclear energy and miscellaneous categories. Biomedical news was defined as reporting about cancer, health prevention, medical advances or research, heart disease, AIDS, environmental influences on health, birth control, abortion, addictions, health services, medical competence/malpractice, disabilities, dental health and other diseases. The reported findings are an aggregate of the science and biomedical news coverage in both newspapers (Los Angeles Times n=1417; Washington Post n=809; Sum of all stories n=2226.)

Outcome variables were the percentage of: news stories that are generated by events or are episodically generated; stories that are generated by science issues; stories with an embedded human interest component; stories with an embedded educational/informative component; conflicts among scientists embedded as a writing motif; a news focus on pioneer science and a news focus on textbook science.

Outcome variables were not seen as mutually exclusive. For example, it is possible that a news story could focus on issues and be generated by a news conference. Or, it is possible that a news story could have multiple components, such as an embedded human interest component a discussion of conflicts among scientists as well as an integrated educational/informative section.

Event-oriented reporting was operationally defined as a story that reports on information originated by (or generated from) a news conference, release of journal article, conference paper delivery, or press release from a university, public interest group, government agency, scientific organization, biomedical organization and industry. Episodic reporting was operationally identified as reporting on a continuing topic that has received recent, usually daily, news media attention. Similar to event-oriented reporting, the origination (or generation) of the information in an episodic oriented news story is from a news conference, release of journal article, conference paper delivery, or press release from a university, public interest group, government agency, scientific organization, biomedical organization and industry.

Issue oriented reporting was operationally defined as a story that: a) may or may not originate in a news conference, press release, or journal article; b) is focused on, or raises, sociological, cultural, ethical, historical, educational, scientific and biomedical questions or contentions and c) sometimes demonstrates reportorial enterprise in topic generation.

A human interest context embedded in reporting was operationally defined as providing background that provided some aspects of the personality, characteristics, demeanor, lifestyle and habits of a scientist or physician, or the ambiance surrounding a scientist and physician's work. These stories mostly discussed a researcher's or a research team's extrascientific motivations as a motif or component within the text of a broader-based article.

An educational/informative context embedded in reporting was operationally defined as either: background about the previous history of similar research; explaining how the research worked; discussion of its impact with the

discipline, or explanation of its social, historical, economic, ethical, legal orientation, or educational implications. An educational/informative context was usually embedded as a component with the text of a broader-based article.

Conflict reporting was operationally defined as stories that embedded arguments, debates, disputes, disagreements between scientists and physicians, or describe a scientific or biomedical controversy. Stories that primarily focused on a body of work, or ideas without refutation, critical discussion, or challenges among scientists or physicians were not categorized as conflict reporting. Conflicts were usually embedded as a component within the text of a broader-based article.

Pioneer or emerging science was operationally defined as a news focus on scientific research that was often acknowledged by scientific news sources to be: preliminary; tentative; unconfirmed by extensive testing; without extensive review or challenge within the scientific community; without grounding by extensive replication or parallel findings by other researchers. Pioneer or emerging research sometimes challenges conventional wisdom and the scientific status quo, raises unanticipated scientific and social questions, raises social concerns, sometimes is not peer reviewed, sometimes is unpublished in peer reviewed literature and is under peer discussion and scrutiny.

A focus on textbook science in news reporting was operationally defined as research that is extensively published in peer reviewed papers, journals, books and textbooks to teach students K-12 or in higher education. The research findings are no longer regarded within the scientific community as preliminary; tentative; unconfirmed by extensive testing; without extensive review or challenge or without grounding by extensive replication or parallel findings by peer researchers.

Representative samples were taken of biennial time periods from 1989-1995 based on a procedure described by Krippendorff (1980). Two constructed weeks were randomly selected to represent each year. One constructed week represented news coverage for a six month period for each selected year.

Coders were trained in content analysis techniques prior to data collection. Intercoder reliability was 92 percent in for the 1989 articles, 94 percent for the 1991 articles, 95 percent for the 1993 articles and 96 percent for the 1995 articles via a formula proposed by Holsti (1969).

In the analysis of outcome variables, a high percentage of occurrence was operationally defined to be more than 66 percent; a moderate percentage was operationally defined as between 33-66 percent and a low percentage of occurrence was operationally defined as less than 33 percent.

Results

Research question one states there should be a high percentage of stories with an episodic and event-orientation in the Washington Post and Los Angeles Times and these high percentages should be consistent during an eight year period of science news coverage.

Table one reports that the percent of science news stories in the Washington Post that were generated by events or episodes ranged from 64-87 percent. In the Los Angeles Times, the range of stories generated by events or episodes ranged from 82-84 percent. Both of these percentages are seen as high and are consistent with the research question.

Within this variable there are differences across the four sampled, biennial time spans in both newspapers. Table two reports the mean percentages of mean percentages of episodic and event oriented reporting did not vary significantly in the Los Angeles Times, but varied significantly in the Washington Post from 1989-1995 ($F=12.374$). The latter results indicate there is a shift within one news organization regarding the percentage of episodic and event oriented reporting in science news stories. This finding marginally challenges the research question, but since the overall percentages of episodic and event coverage remained high, the empirical difference does little to challenge previous qualitative assertions.

Research question two states there should be a low percentage of science news stories that focus on science issues in the Washington Post and Los Angeles Times and these low percentages should remain consistent during an eight year period of science news coverage.

Table one reports that the percent of news stories in the Washington Post that focused on science issues ranged from 20-83 percent. In the Los Angeles Times, the range of stories focused on science issues ranged from 23-71 percent. These percentage ranges vary between low, moderate to high and partially challenge the research question.

Within this variable there are differences across the four sampled, biennial time spans in both newspapers. Table two reports the mean percentages of issue based reporting varied significantly in both the Washington Post and the Los Angeles Times from 1989-1995 ($F=15.0425$; 20.274 respectively). Since these differences vary significantly, the results indicate there is a shift in the percentage of coverage that focused on science issues in both newspapers over time. This finding also challenges the research question.

Research question three says there should be a low percentage of stories with embedded educational and informative components in the Washington Post and Los Angeles Times and these low percentages should remain consistent during an eight year period of science news coverage

Table one reports that the percent of science news stories in the Washington Post with embedded educational and informative components ranged from 29-78 percent. In the Los Angeles Times, the range of stories with embedded educational and informative components ranged from 24-61 percent. These percentage ranges vary between low, moderate to high and partially challenge the research question.

Within this variable there are differences across the four sampled, biennial time spans in both newspapers. Table two reports the mean percentages of reporting with embedded educational and informative components varied significantly in both the Washington Post and the Los Angeles Times from 1989-1995 ($F=4.013$; $F=8.626$ respectively). Since these differences vary significantly, the results indicate there is a shift in the percentage of content with educational and informative components in both newspapers over time. This finding also challenges the research question.

Research question four says there should be a moderate percentage of stories with a human interest component in the Washington Post and Los Angeles Times and these moderate percentages should remain consistent during an eight year period of science news coverage

Table one reports that the percent of science news stories in the Washington Post with a human interest component ranged from 11-29 percent. In the Los Angeles Times, the range of stories with a human interest component ranged from 7-31 percent. These percentages are low and challenge the research question.

Within this variable there are differences across the four sampled, biennial time spans in the Los Angeles Times. Table two reports the mean percentages of reporting with a human interest component did not vary significantly in the Washington Post, but varied significantly in the Los Angeles Times from 1989-1995 ($F=5.80$). The latter results indicate there is a shift within one news organization regarding the percentage of embedded human interest content in science news stories. This finding marginally challenges the research question and since the overall percentages of embedded human interest coverage remained low, the empirical difference additionally challenges some qualitative assertions.

Research question number five says there should be a moderate percentage of stories that embed a motif of conflict, dispute and argumentation among scientists in the Washington Post and Los Angeles Times and these moderate percentages should remain consistent during an eight year period of science news coverage.

Table one reports that the percent of science news stories in the Washington Post that embed a motif of conflict, dispute and argumentation ranged from 2-10 percent. In the Los Angeles Times, the range of stories that embed a motif of conflict, dispute and argumentation ranged from 3-9 percent. These percentages are all low and challenge the research question.

Within this variable there are no differences across the four sampled, biennial time spans in either newspaper. Table two reports the mean percentages of reporting that embeds a motif of conflict, dispute and argumentation did not vary significantly in the Washington Post or the Los Angeles Times from 1989-1995. The latter results indicate there is some consistency in news approaches regarding reporting about conflict, as the research question suggests. However, the consistently low percentage of stories that embed a motif of conflict, dispute and argumentation among scientists challenges the research question and previous qualitative assertions.

Research question six says there should be a high percentage of stories that focus on pioneer and emerging science topics in the Washington Post and Los Angeles Times and these high percentages should be consistent during an eight year period of science news coverage.

Table one reports that the percent of science news stories in the Washington Post that focused on pioneer and emerging science topics ranged from 5-9 percent. In the Los Angeles Times, the range of stories that focused on pioneer and emerging science topics ranged from 5-8 percent. These percentages are all low and challenge the research question.

Within this variable there are no differences across the four sampled, biennial time spans in either newspaper. Table two reports the mean percentages of reporting that focused on pioneer and emerging science topics did not vary significantly in the Washington Post or the Los Angeles Times from 1989-1995. The latter results indicate there is some consistency in news approaches regarding reporting that focused on pioneer and emerging science topics as the research question suggests. However, the consistently low percentage of stories that focused on pioneer and emerging science topics challenges the research question and previous qualitative assertions.

Research question seven says there should be a low percentage of stories that focus on textbook science topics in the Washington Post and Los Angeles Times and these low percentages should remain consistent during an eight year period of science news coverage.

Table one reports that the percent of science news stories in the Washington Post that focused on textbook science topics ranged from 2-7.5 percent. In the Los Angeles Times, the range of stories that focused on textbook science topics ranged from .2-5 percent. These percentages are all low and are consistent with the research question.

Within this variable there are differences across the four sampled, biennial time spans in the Los Angeles Times. Table two reports the mean percentage reporting of stories that focus on textbook science topics did not vary significantly in the Washington Post, but varied significantly in the Los Angeles Times from 1989-1995 ($F=3.31$). The latter results indicate a shift in one news organization's editorial decisions regarding the percentage of stories that focus on textbook science topics. This finding marginally challenges the research question, but since the overall percentages of textbook science coverage remain low, the empirical difference does little to challenge previous qualitative assertions.

Conclusions

The data confirm some of the assertions found in the literature:

- * The percent of episodic and event oriented stories was high in the Washington Post and the Los Angeles Times during the four time spans sampled between 1989-1995.
- * The percent of reporting that focused on textbook science topics was low in the Washington Post and the Los Angeles Times during the four time spans sampled between 1989-1995.

The data also challenge many of the assertions found in the literature:

- * The percent of episodic and event oriented stories shifted in the Los Angeles Times during the four time spans sampled between 1989-1995. The finding implies that a news organization may vary in their coverage of events generated by news conferences, press releases, journal reports and the like.
- * The percent of stories generated by science issues in the Washington Post and the Los Angeles Times was higher than suggested within the literature. Table one adds that the total percentage of stories generated by science

issues declined in both newspapers during the four time spans sampled between 1989-1995. Table two additionally suggests that news organizations vary in the extent they raise issues within science news reporting.

- * The percent of stories in the Washington Post and the Los Angeles Times that embedded educational-informative content was higher than suggested within the literature. The findings also suggest that news organizations vary in the extent they embed educational-informative context within their science news reporting.

- * The percentage of stories that embedded human interest content in the Washington Post and the Los Angeles Times was lower than suggested within the literature. The findings also suggest that a news organization (the Los Angeles Times) may vary in the extent they embed human interest components within their science news reporting.

- * The percentage of stories in the Washington Post and the Los Angeles Times that embedded a conflict orientation among scientists was lower than suggested within the literature.

- * The Los Angeles Times varied in the extent they focused on textbook science topics or issues slightly more than suggested within the literature.

- * The percentage of stories in the Washington Post and the Los Angeles Times that focused on pioneer science topics or issues was lower than suggested within the literature.

The data indicate the perspective that can be gleaned by quantitative approaches to analyzing science news content over time. The findings are insufficiently generalizable to the full seven year period within both newspapers to overturn assertions about tendencies to cover staged events; a dearth of issue-orientation; embedding human interest news angles; little educational-informative context; focusing on scientific conflicts; an attentiveness to pioneer science and an inattentiveness to textbook science (which are all raised in the literature.)

However, the findings are especially interesting regarding the low percentage of stories with a pioneer science focus, the low percentage of stories with a motif that focuses on conflicts among scientists and the variation in news reporting, writing and news selection judgments that occurred in the Los Angeles Times and the Washington Post during the sampled period.

The study raises the utility of empirical replication and underscores the challenges in extrapolating from case studies to generalizations about the news media's science news performance. The study indicates the potential value of content analysis to raise new questions and challenge qualitative assertions, as well as the limitations of a

method where sampling is a practical necessity. Future researchers are encouraged to analyze underlying reporting, writing and news selection motifs in science writing, similar to the proposed criteria. Methodologically, the study reinforces the practical difficulties to sample sufficient dates to generate generalizable findings and the challenges of maintaining intercoder reliability within a large data set.

However, the study reinforces the inconsistencies between qualitative criticisms of the news media reporting, writing and news selection tendencies and actual performance, which has been pointed out recently by Friedman, Villamil, Suran and Egolf (1996) and Pellechia (1997). The criticisms derived from individual case studies do not always reflect broader science writing, reporting and news selection trends.

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Table 1 - Percentages by year

Percentage of stories generated by episodic and/or event-orientation

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	78.9	87.3	63.6	80
LA Times	82.2	85.2	84.4	84.4

Percentage of stories that focus on science issues

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	66.5	82.9	45.5	20
LA Times	59.3	71.4	23.4	27.5

Percentage of news with an embedded human interest component

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	29.2	25.3	10.9	26.5
LA Times	20.7	31.2	7.03	26.26

Percentage of news with an embedded educational/informative component

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	49.9	77.9	29.09	42.5
LA Times	35.3	61.3	24.22	39.38

Percentage of news with an embedded conflict-oriented component

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	8.7	4.43	1.82	10
LA Times	9	3.01	7.03	5.62

Percentage of stories with a pioneer science news focus

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	9.3	5.7	5.45	7.5
LA Times	5.8	4.5	4.69	8.13

Percentage of stories with a textbook science news focus

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	1.9	5.7	5.45	7.5
LA Times	0.2	1.9	1.56	5

Table Two - Mean percentages by year

Mean percentage of stories generated by episodic and/or event-orientation

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	78	86	65	83*
LA Times	79	85	83	83

Mean percentage of stories that focus on science issues

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	65.3	82.9	41	24*
LA Times	57	70	28	26*

Mean percentage of news with an embedded human interest component

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	27	26	19	23
LA Times	21	32	7.03	23*

Mean percentage of news with an embedded educational/informative component

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	48	77.9	26	53**
LA Times	37	59	25	40*

Mean percentage of news with an embedded conflict-oriented component

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	11	5	1	7
LA Times	9	2.9	6	9

Mean percentage of stories with a pioneer science news focus

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	9.9	6	5	6
LA Times	8	4.6	5	7

Mean percentage of stories with a textbook science news focus

	<u>1989</u>	<u>1991</u>	<u>1993</u>	<u>1995</u>
Washington Post	1.9	5	11	5
LA Times	0.2	2	1	6**

F, or one way analysis of variance, was used to determine statistical significance
d.f.=3 between groups; 52 within groups

* <.01

**<.05

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