

NATIONWIDE NEWSPAPER COVERAGE OF EMBRYONIC STEM CELL RESEARCH:

A Community Structure Approach

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Abstract

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This study uses a “community structure approach” to explore the connection between city characteristics and nationwide newspaper coverage of embryonic stem cell research.

A sample of 350 articles, chosen from 21 newspapers across the nation, were coded for “prominence” and article “direction” (favorable, unfavorable, or neutral). The results were combined to calculate a single-score “Media Vector” for each newspaper. Pearson and regression analysis revealed that three variables accounted for 85% of the variance: “health care access” (number of physicians per 100,000 residents); “stakeholders” (% Catholic and % Republican); and “media access” (% cable-subscribers). Healthcare and media access are linked to favorable coverage of stem cell research.

INTRODUCTION

Embryonic stem cells hold enormous potential for research purposes and for the treatment of various diseases. They can help scientists more fully understand cell division and human development, which could help treat cancer, a disease resulting from abnormal cell specialization and division. Moreover, experimental drugs could be tested on stem cells before they are tested on animals or humans. Finally, embryonic stem cells could be stimulated to develop into specialized cells that would replace cells and tissues as part of the treatment of various diseases, including Parkinson's disease, Alzheimer's disease, spinal cord injuries, strokes, burns, heart disease, diabetes, osteoarthritis, and rheumatoid arthritis (National Institutes of Health, 2000a).

Because of the potential benefits offered by embryonic stem cells, on August 9, 2001, President Bush announced his decision that federal funding could be allotted for research on already existing embryonic stem cell lines (Gibbs & Duffy, 2001, p. 16). Bush stipulated that only those stem cells derived from embryos that were created for reproductive purposes (through In Vitro Fertilization) and obtained with informed consent, without monetary inducements, will be eligible for federal funding (National Institutes of Health, 2001b).

Bush's decision has stirred up controversy about the ethics of stem cell research. Some believe that experimenting on the human embryo is completely objectionable and accuse scientists and politicians of "playing God" (Gibbs & Duffy, 2001 p.16). In fact, "religious conservatives argue that using those stem cells means deriving benefit from the destruction of human embryos - fertilized eggs in the early stages of development - in their eyes no less a crime than abortion" (Lacayo, 2001, p. 17). Congressmen Dick Armey, Tom Delay, and J.C. Watts issued a joint statement: "It is not pro-life to rely on an industry of death" (Lacayo, 2001, p. 22). These opponents of embryonic stem cell research favor increased funding for research on adult stem cells and a complete ban on embryonic research. However, in reference to adult stem cells, the NIH cautions,

“There are some significant limitations to what we may or may not be able to accomplish with them” (National Institutes of Health, 2000a, paragraph 26).

Since embryonic stem cells seem to have more potential than adult cells, many individuals advocate increasing federal funding for this type of research. Rejecting the idea that fertilized eggs are human beings, some individuals believe that God has not yet breathed life into these cells, so experimenting upon them does not violate an ethical code. Others say that any type of embryonic stem cell research is pro-life, for the research could help find cures for various diseases. In addition, people such as James Thomson, who was among the first to isolate human stem cells in 1998, believe that since the embryos from which the stem cells are derived are slated for destruction, “I could not see that throwing them out was better” (Golden, 2001 p. 27). Those who support stem cell research believe that Bush’s decision did not go far enough, especially since the 64 cell lines eligible for federal funding may not be accessible because of legal issues and the high demand for the cells (Begley, 2001).

Clearly, a dichotomy of viewpoints has emerged regarding stem cell research. As a result, the media have reported extensively on this topic, and this coverage merits exploration for many reasons. As was observed by Weaver and Wilhoit, the media set the news agenda by telling the people what issues to consider (cited in Biagi, 1999, p.301). Furthermore, as George Gerbner theorized, media have the power to mainstream divergent viewpoints, thereby homogenizing opinions. Newspapers are particularly influential because they set the agenda for other media and accumulate more revenue than most other media (Biagi, 1999, p. 42). However, newspapers do not always present what most would consider to be the most relevant information about a topic. In fact, Jamieson and Capella found that when reporting about health care legislation of the early 90’s, the media emphasized “horserace” or “strategic” concerns instead of focusing on substantive health issues (Jamieson & Capella, 1995). Similarly, researchers found that in reference to health care legislative issues of 1993,

relatively little information presented by newspapers could be used by consumers, health professionals, and business owners (Walsh-Childers, et al., 1999, pp. 2-22).

Some researchers believe that media not only inform the public and set the news agenda, but they frame critical events as well. According to Entman, “framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Entman, 1993a, p. 52). Furthermore, Entman (1989), Entman & Page, in press, and Entman and Rojecki (1993) have found that journalists may “convey a dominant framing of the news text that prevents most audience members from making a balanced assessment of a situation” (cited in Entman, 1993a, p. 56). This frame is expressed through the journalist’s selection of metaphors, concepts, symbols, and visual images (Entman, 1991b, p. 7). Thus, news frames may influence an individual’s perceptions of important events, and at the same time, a city’s demographic characteristics may affect the way in which journalists frame critical issues.

The community structure approach examines the relationship between these city characteristics and nationwide newspaper coverage of critical issues (Frey, Botan, & Kreps, 2000, p. 238). This study will use the community structure approach to explore whether there is a link between city characteristics and the coverage (positive, negative, or neutral) of embryonic stem cell research. More specifically, it is expected that media coverage of embryonic stem cell research will be more favorable in cities with higher levels of privilege, media and healthcare access, and certain stakeholders, but will be less favorable in cities with other stakeholders.

LITERATURE REVIEW

Embryonic stem cell research generated a great deal of during the summer of 2001. After President Bush made his decision regarding federal

funding of this research, the popular press devoted much attention to public policy pertaining to embryonic stem cell research. Articles about stem cells have reached the pages of magazines such as Newsweek, Time, and People. Moreover, for the past few years, scholars in various disciplines, including biology, nursing, and sociology, have published articles about embryonic stem cells. However, little is found on the topic in communication studies journals.

In the field of biology, scholars have written a plethora of articles about stem cells. Some articles have focused on the potential health benefits offered by embryonic stem cells (See, for example, McKay, 2000; Odorico, Kaufman & Thompson 2001). In "Debating Pros and Cons of Stem Cell Research," Friedrich explained the legal and moral controversies that surround embryonic research (Friedrich, 2000). Similarly, Defrancesco (2001) focused on the way in which medical advances resulting from stem cell research could improve the quality of life of individuals battling Parkinson's Disease. However, he also raises the question of whether cell therapy should be undertaken with people (Defrancesco, 2001). Clearly, while biologists generally support the continuation of embryonic stem cell research, they also recognize the complex moral questions that such research generates.

The nursing field has also focused attention on stem cell research. Pederson discussed the medical assets that could be obtained from embryonic stem cell research, stating, "Research on the cells could provide insights into fundamental questions that have puzzled embryologists for decades" (Pederson, 1999, p. 73). White delineated the legal and ethical controversies of this research, concluding that "there is no one moral stance in nursing about the status of the human embryo . . . Individual positions vary on whether it has the status of a person from the moment of conception and whether it should be a source of stem cells" (White, 2001, p. 116). Thus, while nursing scholars have discussed the ethics of embryonic stem cell research, they have come to no consensus as to whether or not it is morally acceptable.

The ethical issues raised by stem cell research have also been discussed by sociologists. In “Ethical Decisions in Manipulating the Human Germ Line,” Marc Lappe questioned the morality and acceptability of any type of research involving embryos (Lappe, 1991). More recently, Irving pondered the key question of whether life begins at conception in “When Do Human Beings Begin? Scientific Myths and Scientific Facts” (1999). In this article, Irving makes a distinction between the origin of a human being, which she determines is an embryological question, and the origin of a human person, a matter of philosophy (Irving, 1999). Though they came to different conclusions, Lappe and Irving both explored the moral dilemmas that are raised by conducting embryonic stem cell research. Therefore, it is evident that many scholars in different disciplines have recognized the importance of discussing embryonic stem cell research.

Though the popular press and many scholarly disciplines have devoted attention to embryonic stem cell research, a search of the databases CommIndex, CommSearch, and CIOS, *Communication Abstracts* as well as numerous other scholarly journals, reveals that the communication field has published virtually no scholarly literature to date on media coverage of stem cell research or cloning, another controversial health topic. However, communication scholars have researched media coverage of other health topics. In 1989, Payne, Ratzan, and Baukus found that there was a difference in the amount of coverage, headlines, topics, sources, and critical commentary among newspapers that covered the Harvard Medicare Project (Payne, Ratzan & Baukus, 1989). This study’s contribution to the field was that it showed that significant differences in newspaper coverage of health related issues do exist. Similarly, Fico and Soffin examined newspaper coverage of health topics such as abortion. These researchers “developed a content-based technique of assessing fairness and balance of newspaper coverage of controversial issues and applied it to 259 stories on 18 issues appearing in 18 newspapers during February 1991” (Fico & Soffin, 1995, p. 621). The researchers found that newspaper stories “favored pro-choice sources by a wide margin” (Fico &

Soffin, 1995, p. 627). In effect, this study showed that newspapers do not always present issues in a balanced, objective fashion, but rather a bias may exist.

Whereas Fico and Soffin focused on the variation in coverage from one newspaper to another, and Payne, Ratzan, and Baukus concentrated on the balance in a newspaper article's coverage, other researchers have investigated why these differences in coverage exist. Swisher and Reese examined the way in which regional economies affect newspaper coverage of tobacco-related issues.

This study found signs of regional economic influence from the tobacco industry in three areas: (a) a pro-tobacco spin on headlines for the David Burns story (b) comparatively less tobacco region coverage of the Great American Smokeout in 1998 and slightly more coverage of the "Great American Welcome," and (c) comparatively much more tobacco region coverage of the Tobacco Institute in 1990 and much less coverage of the American Cancer Society. (Swisher & Reese, 1992, p. 999-1000)

In short, this study showed that the nature of newspaper coverage of health topics, such as tobacco-related issues, has been linked to the economy of the sample newspaper's region.

Powers and Andsager (1999) had similar findings. These researchers analyzed national and regional newspaper coverage of silicone breast implants from 1992 - 1996, before and after Dow Corning's (the implant manufacturer) public relations campaign. "Results from this study indicated that media coverage of the breast implant controversy significantly changed during the two time periods under analysis" (Powers & Andsager, 1999, p. 560). Whereas coverage before Dow Corning's PR campaign focused on the health risks of silicone implants, the coverage after the campaign focused on the financial status of Dow Corning. Powers and Andsager believe that "one possible reason for differences in coverage between the two

time periods was the effect of Dow Corning's media campaign initiated in 1994, which heavily targeted the three newspapers analyzed and included information on studies which were funded by the manufacturers to imply that implants did not cause disease" (Powers & Andsager, 1999, p. 561). Thus, these researchers found that the way in which the media frame an issue can be influenced by the lobbying efforts of manufacturers.

Similarly, in 2000, Andsager examined whether media coverage of the late-term abortion debate of 1995 - 1996 was influenced by the positions of special interest groups. "This study's findings suggest that abortion rhetoric has a strong influence on the way in which journalists frame abortion issues. In the case of late-term abortion, the rhetorical positions of the pro-life and pro-choice interest groups clearly delineated their frames in newspaper coverage" (Andsager, 2000, p. 589). Again, Andsager found that special interest groups help shape the way that the media frame health issues.

It is evident that communication scholars have conducted important research about media coverage of health topics. However, the field is now falling behind in health communication research, as scholars in other disciplines, such as biology, nursing, and sociology, have focused on current, controversial issues, including cloning and embryonic stem cell research. Since newspapers are agenda-setters that frame issues, but at the same time are influenced by special interest groups and regional economies, it is important that communication scholars study newspapers. Furthermore, since scholars in many disciplines are discussing the ethics of embryonic stem cell research, communication scholars must do their part by examining media coverage of this issue. Thus, there is currently a gap in communication research of current health issues, and this study looks to fill in that gap by using the community structure approach to examine differences in newspaper coverage of embryonic stem cell research.

HYPOTHESES

Previous community structure approach studies have utilized general umbrella hypotheses as predictors of the way in which media coverage of a particular topic will vary from one city to the next. The hypotheses pertaining to media coverage of embryonic stem cell research are linked to the following three cluster groups: the “buffer” hypothesis, access (media and healthcare), and stakeholder hypotheses.

Buffer Hypothesis

The buffer hypothesis proposes that the higher the percentage of privileged individuals in a community who are “buffered” from economic uncertainty and poverty, “the more favorable the media coverage of those making human rights claims” (Pollock, cited in Frey, Botan, and Kreps, 2000, p. 239). Distribution of privilege in a community is linked systematically to variation in newspaper coverage of critical health-related issues, such as reporting on the FDA, the Master Settlement Agreement, and tobacco advertising toward children (Pollock, Caamaño, et. al., 2001; Pollock, Miller, et. al, 2001; Pollock, Nisi, et. al, 1999). More specifically, researchers found that in cities with high levels of privilege, there was favorable newspaper coverage of Cuban refugees, Anita Hill, whom many regarded as mistreated, non-celebrities with HIV/AIDS, and cloning (Pollock, Shier & Kelly, 1995; Pollock & Killeen, 1995; Pollock, 1997; Pollock, Dudzak, Richards, Norton & Miller, 2000). Similarly, in 1999, Pollock and Yulis found that “privilege in a city is associated with relatively favorable coverage of physician-assisted suicide, confirming hypotheses suggested that the larger the privileged population ‘buffered’ from uncertainty, the more favorable the coverage of human rights issues, in this case the right to choose whether to live or die” (Pollock & Yulis, 1999).

Consistently, the higher the education level in a city, the more likely newspapers were to express opposition to China’s bid for the 2000 Olympics because of China’s poor human rights record (Pollock, Kreuer & Ouano, 1997). Since embryonic stem cell research could advance human rights by providing treatments for numerous diseases, it is reasonable to assume that

many privileged individuals, when privilege is measured by income, education, or occupational status, will be in favor of embryonic stem cell research. Further, the higher the proportion of such privileged groups in a city, the more sympathetic the media coverage. Specifically:

H1 *The larger the percentage of college-educated students in a city, the more favorable the reporting on embryonic stem cell research* (Lifestyle Market Analyst).

H2 *The larger the percentage of people with professional occupational status in a city, the more favorable the reporting on embryonic stem cell research* (Lifestyle Market Analyst).

City size may also be correlated with favorable coverage of embryonic stem cell research. Keith Stamm found that cities with higher quality of life measures are the most likely to attract educated citizens, and newspapers in these cities are more likely to evaluate issues from a plurality of viewpoints (Stamm, *Newspapers and Community Ties: Toward a Dynamic Theory*, 1985). These findings are consistent with those of Tichenor, Donohue, and Olien in *Community Conflict and the Press* (Tichenor, Donohue & Olien, 1973, 1980), in which it was concluded that larger communities are believed to display a greater number of group interests and perspectives than is the case with smaller communities. Since media coverage in larger cities has been shown to reflect a more diverse spectrum of viewpoints, one can speculate that city size will be correlated with relatively favorable coverage of embryonic stem cell research.

H3 *The larger the size of a city, the more favorable the newspaper coverage of embryonic stem cell research* (<http://www.census.gov/population/estimates/metro-city/ma99-01.txt>).

Media Access

Closely associated with city size is media access. Tichenor, Donohue, and Olien found that the larger the city size, the greater the plurality of viewpoints presented by the media (Tichenor, et al., 1973, 1980). Moreover, previous studies have found that access to information can be linked not simply with a plurality of issue perspectives, but also with willingness to

promote social change. According to Hindman, the greater the access that individuals have to information (via the mass media), the greater the ability for social actors to undertake projects that encourage social change (Hindman, 1999, pp. 99-116). Similarly, Emanuel and Cecile Gaziano contend that communities that acquire more knowledge from media can be expected to be more effective when challenging elite groups or advocating change (Gaziano & Gaziano, 1999, pp. 197-226). Clearly, researchers have found that communities with a great deal of media access are generally more likely to favor social change. Experimenting on human embryos is a relatively new concept, and as a result, the newspapers in communities with a greater deal of media access may display more favorable coverage of embryonic stem cell research.

Newspaper

Since greater media access has been linked with the advocacy of social change, it is useful to study the relationship between newspaper circulation and media coverage of stem cell research. One can reasonably assume that a newspaper with a large circulation must provide a variety of perspectives for a diverse reading population, whereas a smaller newspaper with a more homogenous reading public may not be as compelled to offer a plurality of viewpoints. Previous studies have used the community structure approach to explore the correlation between newspaper circulation and the promotion of social change. Studies have found that the higher a city's newspaper circulation, the more favorable the coverage of Ryan White, the boy who contracted HIV/AIDS from a blood transfusion, and the more favorable the coverage of legalization of physician-assisted suicide (Pollock, McNeil, Pizzatello & Hall, 1996; Pollock & Yulis, 1999). Therefore, it is reasonable to conclude that a correlation between newspaper circulation and favorable coverage of embryonic stem cell research may exist.

H4 *The greater the level of newspaper circulation in a city, the more favorable the coverage of embryonic stem cell research* (Editor and Publisher International Yearbook).

Cable

According to the White House/Link Resources Corp., 67% of U.S. households have access to cable (cited in Biagi, 1999, p. 4). Furthermore, more than 60% of cable networks have at least one community access channel (Atkin & LaRose, 1991). Baldwin, Barrett, and Bates found that individuals with cable stations are more likely to depend on news from cable stations as opposed to news from local television stations (1992). Consequently, cable television is an important medium to study. Not only can cable stations present viewers with multiple perspectives on an issue, but they can also emphasize a specific agenda or news frame. For example, Thussu asserts that CNN framed the Kosovo conflict in a way that supported intervention in the region (Thussu, 2000). The same agenda-setting and framing may be found for other critical issues. Consequently, there may be a link between the percentage of households that subscribe to cable television in a city and newspaper coverage of embryonic stem cell research.

H5 *The greater the percentage of households that subscribe to cable television in a city, the more favorable the coverage of embryonic stem cell research* (Lifestyle Market Analyst).

Health Care Access

Health care access can be determined by the proportion of the municipal budget that a city spends on health care, in addition to the availability of hospital beds and physicians. The nursing and biology disciplines as well as the National Institutes of Health have published a significant amount of literature on embryonic stem cell research. Clearly, this issue is very relevant to health care professionals. Yulis and Pollock found that there was a positive correlation between access to health care (physicians per 100,000 residents) and favorable newspaper coverage of physician-assisted suicide (Yulis & Pollock, 1999). Since availability of medical care is one index of city support for medical efforts to reduce suffering, it is reasonable to assume that coverage would be more favorable in cities with a higher percentage of healthcare access.

H6 *The greater the number of physicians per 100,000 people in a city, the more favorable the coverage of embryonic stem cell research (County and City Extra).*

H7 *The greater the number of hospital beds per 100,000 people in a city, the more favorable the coverage of embryonic stem cell research (County and City Extra).*

Stakeholders

The prevalence of stakeholders in a community may influence whether media cover certain critical events. McLeod and Hertog have suggested that the larger the size of a protest group, the more attention and favorable coverage that group will receive from the mass media (McLeod & Hertog, 1995, 1999). Similarly, researchers have found that the most powerful predictor of whether the media reported on protest marches in Washington D.C. between 1982 and 1991, was the size of the demonstration (McCarthy, McPhail & Smith, 1996, p. 494). Moreover, the presence of stakeholders may contribute to variance in media coverage from city to city. As cited in the literature review, Swisher and Reese found that in pro-tobacco regions, media coverage of tobacco-related issues was more favorable than in other regions (Swisher & Reese, 1992, pp. 999-1000). In addition, Powers and Andsager found that media coverage of silicone breasts implants was more favorable after Dow Corning's PR campaign, and in 2000, Andsager concluded that media framing of the late-term abortion debate of 1996 was influenced by the lobbying efforts of pro-choice and pro-life groups (Powers & Andsager, 1999; Andsager, 2000). Similarly, previous research using the community structure approach has shown that the greater the proportion of businesses or organizations that market to the gay community in a city, the more favorable the coverage of efforts to legalize same-sex marriage (Pollock & Dantas, 1998). Finally, researchers found that the higher the percentage of women in the workforce, the more favorable the coverage of cloning and of the Eappens, the parents of the child who was shaken to death by a nanny (Pollock, Dudzak, et. al., 2000; Pollock, Morris, et. al, 1999). Clearly, the presence of stakeholders can influence media coverage

of critical events. The stakeholders in the embryonic stem cell controversy can be categorized under the following subdivisions: political affiliation, individuals who are Catholic, and individuals who engage in devotional reading.

Political Partisanship

Studies have indicated that there may be a link between the political viewpoints and voting patterns of the residents of a city, and newspaper coverage of critical events. For example, Pollock, Tanner, and Delbene found that the higher percentage of individuals voting Republican in the 1996 presidential election, the more favorable the coverage of the privatization of social security (Pollock, Tanner & Delbene, 2000). Newspapers in cities with larger populations voting Democratic in 1996 also displayed more favorable coverage of the Master Settlement Agreement reducing tobacco advertising, whereas newspaper in cities with a higher Republican population displayed more negative coverage of the MSA (Pollock, Miller & Caldwell, 2001). Similarly, researchers found more favorable coverage of the Patients' Bill of Rights in populations with a higher proportion of Democrats and more negative coverage in cities with higher proportions of Republicans (Pollock, Castillo, et. al., 2000). Other community structure studies found that there was more favorable coverage of trying juveniles as adults in cities with a higher proportion of Republicans, whereas newspaper coverage was less favorable in cities with a higher proportion of Democrats (Auletta, Hartwick, Pollock, et. al, 2001). Thus, media framing seems to be linked to the political perspectives of the majority of the citizens in a particular area. Since, according to an ABC News-Beliefnet poll, 76% of liberals support embryonic stem cell research, whereas only 44% of conservatives are in favor of it, one can then assume that newspaper coverage will reflect these differences (*Pittsburgh Post-Gazette*, 7/15/01).

H8 *The greater the proportion of those voting Democrat in the 1996 presidential election, the more favorable the newspaper coverage of embryonic stem cell research* (County and City Extra).

H9 *The greater the proportion of those voting Republican in the 1996 presidential election, the less favorable the newspaper coverage of embryonic stem cell research (County and City Extra).*

Catholics

Just as one's political beliefs are essential to his or her assessment of critical issues, one's religious beliefs, especially regarding embryonic stem cell research, are also important. A previous study using the community structure approach found that the higher the percentage of Catholics in a city, the lower the newspaper support for elective abortion (Pollock, Robinson & 1977; Pollock, Robinson & Murray, 1978). The Catholic Church is vehemently opposed to abortion, and Pope John Paul II urged President Bush to reject embryonic stem cell research, stating, "A free and virtuous society, which America aspires to be, must reject practices that devalue and violate human life at any stage from conception to natural death" (Yang, 2001, paragraph 1). Therefore, it would be reasonable to assume that many Catholics condemn embryonic stem cell research, and newspaper reporting in cities with high proportions of Catholics will be sensitive to these beliefs.

H10 *The greater the proportion of Catholics in a city, the more negative the newspaper coverage of embryonic stem cell research (2001 Catholic Almanac).*

Devotional Reading

Individuals who engage in devotional reading may have relatively traditional views regarding the beginnings of life. Since these individuals may have conservative viewpoints, they may be opposed to embryonic stem cell research.

H11 *The greater the proportion of individuals engaged in devotional reading in a city, the more negative the newspaper coverage of embryonic stem cell research (Lifestyle Market Analyst).*

THE COMMUNITY STRUCTURE APPROACH

Considering the great controversy surrounding embryonic stem cell research, it may be useful to use the community structure approach to

examine newspaper coverage of this issue for a variety of reasons. First, newspapers serve as forums for public discussion of vital issues (Tichenor, Donohue & Olien, 1980). More specifically, they function as community organizations that broadcast, distribute, negotiate, and discuss community concerns about critical issues (Pollock & Killeen, 1995; Pollock, Dudzak, et al., 2000; Pollock, Awrachow & Kuntz, 1994; Tichenor, Donohue & Olien, 1980). Secondly, "mainstream media are agents of social control for dominant institutions and value systems." At the same time, though, media have been increasingly receptive to change regarding issues that concern women, labor, minorities, environmentalists, and homosexuals (Demers & Viswanath, 1999, p. 419). The community structure approach can illuminate media receptivity to political and social change, linking varied newspaper coverage to demographic differences among cities.

Third, as was discussed in the introduction, newspaper reporting often encompasses a narrative "frame" (Pollock, Dudzak, et al., 2000). Media scholars have determined that newspapers are closely tied to their respective communities. According to Smith, "The media may be viewed as prominent subsystems within the larger social systems of the community; thus they tend to reflect the values and concerns of dominant groups in the community they serve" (Smith, 1984, p.260). The community structure approach builds on this premise, as it "focuses on the ways in which key characteristics of communities (such as cities) are related to the content coverage of newspapers in those communities" (Frey, Botan, and Kreps, 2000, p.238). In effect, this approach "suggests that community or city characteristics have a great deal to do with reporting on critical events that affect the nation," (Pollock, Coughlin, Thomas, Connaughton, 1996, p.122).

Initially developed by Tichenor, Donohue, and Olien in Minnesota (1973, 1980), and elaborated by Demers (1996a, 1996b), the community structure approach has been tested in nationwide studies by Pollock and colleagues (1977, 1978, 1994-2001). Previous community structure studies have focused on social and political issues including *Roe v. Wade* (Pollock, Robinson, & Murray, 1978); a 1976 Supreme Court abortion decision

(Pollock and Robinson, 1977); Magic Johnson's HIV announcement (Pollock, Awrachow, & Kuntz, 1994); physician-assisted suicide (Pollock & Yulis, 1999); cloning (Pollock, Dudzak, et al., 2000); the Patients' Bill of Rights (Pollock, Castillo, et al., 2000), and tobacco's Master Settlement Agreement (Pollock, Miller, & Caldwell, 2001). These studies have shown that there is a link between city characteristics and newspaper reporting on social and political issues. This link may be present due to the fact that a newspaper is "a business requiring the sale of product to stay in operation" (Pollock, Shier & Slattery, 1995, p.2). According to Swisher and Reese, "As businesses, newspapers are inextricably linked to the local economy; their two forms of financial support, advertising and issue sales, are largely functions of local economic health" (Swisher & Reese, 1992, p. 990). Because a business is based on profit, "perspectives that stray too far from public view points would be disadvantageous for newspapers as economically viable institutions"(Pollock, Shier, Slattery, 1995, p. 2). Since previous studies have shown a correlation between newspaper coverage of critical issues and city characteristics, this study will also use the community structure approach to examine nationwide variation in newspaper coverage of embryonic stem cell research and explore whether certain city characteristics affect the direction of the coverage on this topic.

METHODOLOGY

This study investigated the coverage of stem cell research across different US cities. During the pre-speech time period, November 1, 1998 to August 8, 2001 (the day before President Bush made his decision), a pilot study was conducted using 265 articles of at least 150 words, from 15 newspapers throughout the United States. Newspapers were selected based on their geographic diversity. The articles were collected from Lexis Nexis and the DIALOG Classroom Information Program newspaper database, from the following newspapers: *Milwaukee Journal Sentinel*, *The Times Union*, *The Commercial Appeal*, *Houston Chronicle*, *Dayton Daily News*, *Lexington Herald-Leader*, *Philadelphia Inquirer*, *Arizona Republic*,

Charlotte Observer, Boston Globe, Columbia State, The Advocate, Omaha World Herald, and St. Louis Post-Dispatch, Pittsburgh Post-Gazette. When no significant results were found using this pre-speech pilot sample, a second sample was studied.

For this second sample, initially, researchers attempted to examine only those articles that were published between August 9, 2001 and September 10, 2001, the post-speech period. However, as this time period did not contain a sufficient number of articles of at least 150 words, a sample of pre and post-speech articles (a time period that overlaps with the pilot sample) was then examined as well, so that valid correlation analysis could be conducted. Thus, researchers examined 350 articles of at least 150 words from a second sample period of January 1, 1999 through September 10, 2001. During this time period, a broader range of newspapers contained articles about embryonic stem cell research so that researchers could study 21 major newspapers throughout the United States, representing a geographical cross-section of the nation. The following newspapers were utilized: *Atlanta Journal, Arizona Republic-Phoenix Gazette, Bismarck Tribune, Boston Globe, Buffalo News, Charleston Gazette, Chicago Daily Herald, Commercial Appeal, Fort Worth Star, Milwaukee Journal Sentinel, Oregonian, Pittsburgh Post Gazette, Portland Press Herald, Rocky Mountain News, San Diego Union-Tribune, Seattle Times, St. Louis Post Dispatch, Times Picayune, Times Union, The Omaha World-Herald, and Virginian-Pilot.*

Measures and Dependent Variables:

All articles were coded and assigned two scores. The first was a “prominence” score, which is a numerical rating from 3 to 16 points. This score was based on the placement of the article in the newspaper (front page of first section, front page of interior section, inside of first section, or other), the headline size (number of words in the headline), the length of article (number of words), and the presence of any photographs (two or more, or one). The articles that received a greater number of points were considered to receive a higher prominence score.

Table 1: Prominence Score*

(for coding databases)

Dimension	4	3	2	1
Placement	Front page of first section	Front page of inside section	Inside of first section	Other
Headline Size (# of words)	10+	8-9	6-7	5 or fewer
Length of Article (# of words)	1000+	750-999	500-749	Less than 500
Photos/Graphics	2 or more	1		

*Copyright John C. Pollock 1994-2001

After evaluating an article's content, a second score, the "directional score," was determined, and the researchers coded each article as favorable, unfavorable, or neutral/balanced. The researchers determined this nominal measurement based on the following:

Favorable Coverage: Articles were coded as "favorable" if their content was determined to be positive coverage of embryonic stem cell research. The article was considered "favorable" if it seemed to support Bush's decision to allow federal funding for research on existing stem cell lines. Furthermore, articles that emphasized the health benefits that could result from research using embryonic stem cells or encouraged the expansion of this research were considered to be "favorable."

Unfavorable Coverage: Articles were coded as "unfavorable" if they did not discuss any of the health benefits of embryonic stem cell research. These articles included content that did not support Bush's decision to allow federal funding for research on stem cell lines. In addition, these articles emphasized ethical questions as to whether it is "morally acceptable" to research on embryos. In effect, these articles focused on the ethics of stem cell research rather than the possible health benefits that could be reaped from it.

Neutral Coverage: Articles were coded as “neutral” if they appeared to report on embryonic stem cell research without direction. The content of the articles included equal information on the health benefits of stem cell research as well as information on the ethical debate. Articles that only included background information on Bush’s decision and stem cell research were given a “neutral” score as well.

After the articles were given a directional score by the researchers, the scores were used to test the intercoder reliability of the study. In the pilot sample, a Holsti's Coefficient of .864, or 86.4% was achieved, and in the pre and post-speech sample, a Holsti’s Coefficient of .75, or 75% was achieved.

Media Vector Calculated Using a Coefficient of Imbalance:

The prominence and directional scores were then combined, using psychology's Janis-Fadner Coefficient of Imbalance for each newspaper, to calculate a "Media Vector". The coefficient is called a Media Vector because the vector is similar to a vector in physics, which combines magnitude (the prominence) and direction to arrive at a measure of impact. The "Media Vector" is, in effect, a measurement of media “projection.”

This score varies from +1.00 to -1.00. This score allows for the comparison of each city’s newspaper coverage of stem cell research during the sampled time period. Scores between 0 and -1.00 indicated unfavorable coverage of stem cell research, while scores between 0 and +1.00 indicated favorable coverage. (See Table 2). Articles using the Janis-Fadner Coefficient of Imbalance, or Media Vector, in communication research have been accepted for publication in journals such as *Comparative Politics, Society, Journalism Quarterly, Newspaper Research Journal*, an edited, refereed collection, *Communication Yearbook, Mass Communication Review, The New Jersey Journal of Communication* (See respectively Hurwitz, Green & Segal, 1976; Pollock and Robinson, 1977; Pollock, Murray & Robinson, 1987; Pollock, 1995; Pollock, Coughlin, Thomas & Connaughton, 1996; Pollock, Kreuer & Ouano, 1997; Pollock & Whitney, 1997; and Pollock & Guidette, 1980) . Although coders were

aware of a wide range of hypotheses, they were also aware that researchers had no stake in any particular hypothesis. In addition, because the Media Vector formula is employed, there is no reasonable way a coder can anticipate the effect of individual coding decisions on the outcome of specific hypotheses.

Table 2: Calculating the Media Vector*

f = sum of the prominence scores coded "favorable"

u = sum of the prominence scores coded "unfavorable"

n = sum of the prominence scores coded "balanced/neutral"

r = f + u + n

If $f > u$ (the sum of the favorable prominence scores is greater than the sum of the unfavorable prominence scores), the following formula is used:

Favorable Media Vector:

$$FMV = \frac{f^2 - fu}{r^2} \quad (\text{Answer lies between 0 and +1.00})$$

If $f < u$ (the sum of the unfavorable prominence scores is greater than the sum of the favorable scores), the following formula is used:

Unfavorable Media Vector:

$$UMV = \frac{fu - u^2}{r^2} \quad (\text{Answer lies between 0 and -1.00})$$

*Media vector copyright John C. Pollock, 2000-2001

Procedures

Two statistical procedures were used to explore the relationship between city characteristics and the coefficient of imbalance, Pearson correlations and regression analysis. In order to measure which city characteristics were most strongly associated with the coefficients of imbalance, Pearson correlations were conducted. In addition, regression analysis was utilized to determine the relative strength and importance of each independent variable. These two procedures clearly demonstrate the strong association between specific city characteristics and coverage of embryonic stem cell research.

RESULTS

Newspaper coverage of embryonic stem cell research varied from January 1, 1999 to September 10, 2001 (the pre and post-speech sample). All Media Vectors were favorable and ranged from +.043 to +.732. Table 3 offers a complete listing of these scores.

Table 3: Media Vector Coefficients (Pre and Post Speech, 1/99 - 9/11/01)

City	Newspaper	Media Vector
Portland, Maine	<i>Portland Press Herald</i>	.732
Seattle	<i>Seattle Times</i>	.401
Oregon	<i>Oregonian</i>	.274
Milwaukee	<i>Milwaukee Journal Sentinel</i>	.242
Boston	<i>Boston Globe</i>	.241
Atlanta	<i>Atlanta Journal</i>	.221
Memphis	<i>Commercial Appeal</i>	.218
San Diego	<i>San Diego Union Tribune</i>	.207
Norfolk	<i>Virginian-Pilot</i>	.163
Phoenix	<i>Arizona Republic</i>	.154
Buffalo	<i>Buffalo News</i>	.154
Omaha	<i>Omaha-World Herald</i>	.149
New Orleans	<i>Times Picayune</i>	.133
Albany	<i>Times Union</i>	.119
Denver	<i>Rocky Mountain News</i>	.116
Bismarck	<i>Bismarck Tribune</i>	.114
Charleston	<i>Charleston Gazette</i>	.075
St. Louis	<i>St. Louis Post- Dispatch</i>	.056
Fort Worth	<i>Fort Worth Star</i>	.055
Chicago	<i>Chicago Daily Herald</i>	.049
Pittsburgh	<i>Pittsburgh Post- Gazette</i>	.043

In order to determine the nature of the link between city characteristics and variation in coverage, the newspapers were ranked

according to their Media Vectors, and then Pearson correlations were conducted. (See Table 4).

Table 4: Pearson Correlation Results

Hypothesis	Pearson Correlation	Significance Level
Physicians per 100,000	.559	.004
% Professional	.479	.014
% Subscribe to cable TV	.340	.066
% voting Republican	-.323	.082
% Engage in devotional reading	-.263	.125
% with a college education	.247	.141
% voting Democrat	.246	.148
% Catholic	-.219	.176
Newspaper circulation	-.213	.191
City Size	-.082	.361
Hospital beds per 100,000	-.077	.370

Though Media Vectors and Pearson correlations were calculated for the pilot sample, they were not included because no significant results were found. However, it should be noted that 14 of the 15 media vectors were positive.

Buffer Hypothesis Supported: Pre and post-speech sample

The Buffer Hypothesis expected more favorable coverage of embryonic stem cell research among cities in direct proportion to the percentage of citizens who are more privileged economically, educationally, and professionally. Indeed, the Pearson correlations ($r = .479$; $p = .014$) revealed that technical/professional occupations were significant at the .05 level, thereby confirming that the greater the percentage of technical/professional occupations in a city, the more favorable the coverage of embryonic stem cell research. Perhaps these professionals feel more comfortable with technology and have more faith in its potential. In addition, because of their higher educational status ($r = .247$; $p = .141$), they may also be more aware of the ways in which embryonic stem cell research could improve the quality of life for many individuals.

Healthcare Access Hypothesis Supported: Pre and post-speech sample

It was also expected that more favorable coverage of stem cell research would be found in cities with a higher number of physicians per 100,000 residents, and the Pearson correlation ($r = .559$; $p = .004$) confirmed this hypothesis. As is the case with other professionals, physicians recognize the potential benefits associated with emerging medical technologies, such as embryonic stem cell research. This finding is consistent with those of Pollock and Yulis, whose study showed a positive correlation between access to health care (physicians per 100,000 residents) and favorable newspaper coverage of physician-assisted suicide (Yulis & Pollock, 1999). Perhaps physicians support efforts to reduce suffering, and physician-assisted suicide and embryonic stem cell research both have the potential to accomplish this task.

Stakeholders and Media Access Show Directional Relationship: Pre and post-speech sample

It was expected that the higher the percentage of stakeholders in a city, the more favorable the media coverage of that group's interests would be. In addition, it was hypothesized that the greater the percent of families subscribing to cable, the more favorable the coverage of embryonic stem cell research. Pearson correlations show that percent of Republicans ($r = -.323$; $p = .082$) and percent of families subscribing to cable ($r = .340$; $p = .066$) have directional correlations. Perhaps Bush's decision to provide federal funding for embryonic stem cell research activated those conservative Republicans who have moral objections to this practice. Moreover, cable stations may have provided an increased amount of coverage of this issue directly before and after Bush made his announcement, which may have increased public awareness of embryonic stem cell research.

Regression Analysis

Upon running a regression of the variables, it was discovered that the following variables accounted for 85% of the variance in their association

with the Media Vector: number of physicians per 100,000 residents, % of Catholics, % of Republicans, and % of cable television subscribers. More specifically, the number of physicians per 100,000 residents has a correlation of .61, which accounts for 37% of the variance and illustrates the strongest relationship. (See Table 5).

Table 5: Regression Analysis

Model	R (equation)	R Square (cumulative)	R Square Change	F Change	Significance of F Change
Number of Physicians	.608	.369	.369	9.373	.007
Number of Physicians, % Catholics	.790	.624	.254	10.132	.006
Number of Physicians, % Catholic, % Republican	.869	.754	.131	7.449	.016
Number of Physicians, % Catholic, % Republican, % Cable Subscribers	.923	.852	.098	8.569	.012

CONCLUSION AND IMPLICATIONS FOR FUTURE RESEARCH

Clearly, media coverage of embryonic stem cell research varied across the two time periods studied. During the pre-speech, pilot sample (November 1, 1998 to August 8, 2001), no significant results were found. This absence of significant results could be attributed to the fact that embryonic stem cell research was not high on the media or public policy agenda, so in general, it would be difficult for newspaper owners or journalists to be fully aware of the viewpoints of their readers. Since an ABC News-Beliefnet poll showed that the majority of Americans (60%) believed that the federal government should fund embryonic stem cell research, newspapers may have been sensitive to the general opinion of the American public, which is reflected in the 14 positive media vectors

(*Pittsburgh Post-Gazette*, 7/15/01). Moreover, because many people were not yet fully educated about the ethical and medical ramifications of conducting such research, the city characteristics that were discussed in the Hypothesis Section may not have had a chance to become significantly aligned with emerging public opinion.

After President Bush made his decision, embryonic stem cell research was high on the national media agenda, which is reflected in the numerous articles found during the pre and post speech period (January 1999 to September 10, 2001). Pearson Correlations from this sample show that the greater the percentage of technical/ professional occupations in a city, and the higher the number of physicians per 100,00 residents, the more favorable the coverage of embryonic stem cell research. Regression analysis further reveals that the number of physicians per 100,000, (who make up a part of the larger grouping of professionals) is strongly correlated with favorable newspaper coverage of embryonic stem cell research. In addition, percent of Catholics, percent of Republicans, and percent of cable television subscribers, along with the number of physicians per 100,000, accounted for 85% of the variance in their association with the Media Vector.

Though the results of the Pearson correlations and regression analysis varied greatly during the two time periods examined, one major similarity must be noted: the presence of the favorable Media Vectors. In the pilot sample, there was only one unfavorable Media Vector, and none were found during the pre and post-speech period. President Bush may have been influenced somewhat by the viewpoints of the American public and the media when he made his decision to provide limited federal funding for this research. At the same time, he put embryonic stem cell research on the national agenda. Not until the months leading up to and following his decision was there a great deal of media coverage of this topic. Before this topic was debated in a national forum, there might not have been enough awareness or knowledge for stakeholders to take a strong position. However, once the President addressed the issue, the stakeholders, especially physicians, professionals, Catholics, and Republicans, appeared

to understand the importance of this issue. In addition, those who subscribe to cable television may have watched the Congressional testimony on this issue, which also may have influenced their opinions. Thus, not until Bush put embryonic stem cell research on the national agenda were stakeholders fully aware of the complexity of this issue, and their heightened sense of knowledge and support for this research may have been reflected in newspaper coverage.

Future research on this topic should focus specifically on the time period immediately following President Bush's decision to gain a more accurate understanding of the variation in coverage before and after Bush's announcement. In addition, studies should be conducted on other health-related topics and should examine the role of the President in setting national health agendas. This research should deal with media coverage before a presidential decision regarding a specific policy and then compare that coverage to reporting after the decision.

Though there may be a link between Bush's decision and increased media coverage of embryonic stem cell research, as well as a correlation between the aforementioned city characteristics and coverage of this topic, this paper does not assert causality. While certain patterns linking city characteristics with reporting on critical events have been observed, the reasons for these patterns deserve further exploration. The driving force behind these patterns could be a multitude of factors, including shifting social values, changing newsroom recruitment patterns, changing demographics in specific cities, or an evolving sense of a journalist's "interpretive community" (Selizer, 1993; Berkowitz & TerKeurst, 1999). While any combination of these factors, or any others not mentioned, could have contributed to the variation in newspaper coverage of embryonic stem cell research, there is a clear link between city characteristics and newspaper coverage of this issue.

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A community structure analysis compared community characteristics and newspaper coverage of rape and rape culture on college campuses in a nationwide cross-section sample of 21 leading metropolitan newspapers, sampling all 250+ word more. A community structure analysis compared community characteristics and newspaper coverage of rape and rape culture on college campuses in a nationwide coverage " See: fixed charge coverage ratio * * * coverage covâ€\$erâ€\$age [É`kÉœvî€...rÉªdÉ'] noun [uncountable] 1. TELECOMMUNICATIONS the area served by a broadcaster or mobile phone company: " one 2 one now has nationwide coverage with its network " Financial and business terms. Nationwide Building Society " Type Building Society (Mutual) Industry Banking and Financial Services Founded merger of societies dati " Wikipedia. Nationwide Series " Category Stock car racing Country or region " Wikipedia. Nationwide Vision | nationwidevision.com. Providing quality eye exams, vision-correction surgery, and specialized medical attention for any eye condition throughout Arizona - Since 1985. Login - Nationwide MemberNet. Nationwidemember | nationwidemember.com. NIB Blog - Insurance, Govt Schemes, Banking and Business.