

AT THE FRONTIERS OF FAITH AND SCIENCE:  
MEDIA FRAMING OF STEM CELL RESEARCH

Nicole Elise Smith

A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill  
in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the  
School of Journalism and Mass Communication.

Chapel Hill  
2007

Approved by:

Anne Johnston, chair

Rhonda Gibson

Laura Ruel

David Arant

George Noblit

©2007  
Nicole Elise Smith  
ALL RIGHTS RESERVED

## **ABSTRACT**

NICOLE ELISE SMITH: At the Frontiers of Faith and Science:  
Media Framing of Stem Cell Research  
(Under the direction of Anne Johnston)

At any given time, there are a number of issues on the media, and subsequent public, agenda. It is certainly arguable that, currently, stem cell research is one such issue. The ethical considerations surrounding stem cell research are fueling increasing debate in science, politics, and religion. Based on the ability of the media to set the public agenda, and given the fact that stem cell research provokes such vehement debate, it is crucial that we have a clear understanding of how the media frame stem cell research. The purpose of this study is not to attempt to solve the stem cell debate. Rather, this study is a framing analysis of both textual and photographic media coverage of stem cell research. The study examines both newspaper and newsmagazine coverage of stem cell research from 1998 through 2006. The results of the study show that the political strategy frame was the dominant frame of nearly half of all newspaper articles, which supports the findings of previous research that science news tends to focus on political maneuvering rather than substantive scientific context. However, for news photographs, the science frame and the politics frame were both largely prominent. Taken as a whole, the findings indicate that political exploitation of the topic may be overshadowing the medical potential and ethical dimensions of stem cell research. Further, the findings show that scientific context was not a dominant frame of the articles, indicating that the political aspects of the debate are not necessarily being placed within

sufficient scientific context to allow for the public to engage in informed public debate. Thus, the conclusion of the dissertation is that the media are tending to cast more heat (controversy) than light (understanding) on the subject of stem cell research.

## **ACKNOWLEDGEMENTS**

There are many people who have contributed to my work on this dissertation. I must first recognize my doctoral committee, chaired by Anne Johnston. Anne was continually enthusiastic about my work and provided invaluable feedback along the way. Thanks to my other committee members, Rhonda Gibson, Laura Ruel, David Arant, and George Noblit, for their time and expertise.

Thank you to the Triad Foundation and the Park family for their establishment of the Roy H. Park Doctoral Fellowship. I am grateful to have been a Park Fellow and appreciate the generosity of the Park family.

I must also express my gratitude to my family, not just for their support on this project, but for the unconditional love and encouragement they have given me throughout my life. I would specifically like to thank my mother, Jan O. Smith, and my father, Glenn W. Smith, for inspiring me and for believing in me. I would also like to thank my fiancé, William Dahmen, who has been patient with me when I have not always been patient with him. He has also been a constant source of support, from proofreading papers, to brainstorming ideas, and even accompanying me on countless trips to the library.

Finally, I must also thank the scientists who are working on stem cell research. Thanks for doing the hard work and for fighting the good fight.

## TABLE OF CONTENTS

LIST OF TABLES .....	viii
LIST OF FIGURES .....	ix
Chapter	
1. INTRODUCTION .....	1
Study Purpose .....	3
Media Coverage of Stem Cell Research .....	5
Stem Cell Research: Scientific, Political, and Religious Background.....	6
2. REVIEW OF THE LITERATURE .....	17
Framing Theory .....	17
Power of the Visual.....	23
Framing Theory in the Study of Visuals.....	24
Ethical Analysis of the News Media.....	28
Media Framing of Science News/Stem Cell Research .....	29
Summary and Research Questions.....	32
3. METHOD .....	35
4. FINDINGS AND DISCUSSION.....	45
Overview of Study Sample .....	46
Textual News Frames of Stem Cell Research.....	55
Ethical Analysis .....	63
Ethics/Morality Frame Language and Focus .....	64

The Theme of What it Means to “Be Alive” .....	66
The Theme of the Value of Human Life and the Impact on Stem Cell Research .....	68
The Theme of the Religious Perspective .....	72
The Theme of Abortion and the Stem Cell Connection .....	75
The Theme of the Consequences of Impeding Scientific Progress .....	77
Ethical Analysis Summary.....	79
Photographic News Frames of Stem Cell Research .....	80
5. CONCLUSIONS AND IMPLICATIONS.....	99
APPENDIX 1 .....	106
REFERENCES .....	109

## LIST OF TABLES

### Table

1. Abbreviated timeline of key scientific and political developments .....	13
2. Frame categories for article analysis.....	39
3. Intercoder data for the article analysis study variables .....	43
4. Intercoder data for the photo analysis study variables.....	44
5. Number of articles per year by news source .....	47
6. Word count by news source .....	49
7. Number of photos per year by news source.....	51
8. Placement of photos by news source .....	53
9. Size of photos by newspaper.....	53
10. Size of photos in the newsmagazine .....	54
11. Frame appearance in article, in article lead, and dominant frame for the 501 newspaper articles in the sample.....	56
12. Frame appearance in article, in article lead, and dominant frame for the 20 newsmagazine articles in the sample .....	57
13. Frame appearance in photos for newspapers and newsmagazines .....	82
14. Research questions and key findings .....	95



## LIST OF FIGURES

Figure

1. Number of articles per year by news source.....	47
2. Number of photos per year by news source.....	51

## **CHAPTER 1**

### **INTRODUCTION**

In 1922 Walter Lippmann made his now famous statement that the press is “like the beam of a searchlight that moves restlessly about, bringing one episode and then another out of darkness into vision” (p. 229). Lippmann’s assertion illustrates the profound ability of our mass media to call attention to certain issues, while obscuring others, thereby placing selected issues on our public agenda. In our democratic society, this places huge responsibility and power in the hands of media producers, as the media have the ability to define for the public the issues about which they should be thinking. As Lippmann said, “...what each man does is based not on direct and certain knowledge, but on pictures made by himself or given to him” (p. 16). In this case, those pictures come directly from the mass media.

At any given time, there are a number of issues on the media, and subsequent public, agenda. It is certainly arguable that, currently, stem cell research is one such issue. The ethical considerations surrounding stem cell research are fueling increasing debate in science, politics, and religion. In fact, research has shown that few science/technology issues have generated as much public opinion survey research as the stem cell debate (Nisbet, 2004). And this debate has largely been played out in the news media (Nisbet, 2005). But the question arises, how are the media covering the issue of stem cell research? More specifically, what frames are the media using when writing about stem cell research? Based on the ability of the media to set the public agenda, and given the fact that stem cell research provokes such

vehement debate, it is crucial that we have a clear understanding of how the media frame stem cell research.

In addition to setting the issue agenda, research has also found that journalists and media producers use literal and visual devices to organize and make sense of the news, which has an effect on how audiences perceive that news (Entman, 1993; Gitlin, 1980; Iyengar, 1991). These organizing devices, or frames, which can also be described as characteristics or properties, help audiences to formulate a complete picture—in Lippmann’s words—of the given issue or object. Given this understanding, the media have not only the power to define what issues are on the public agenda, but to define how the public thinks about those issues. McCombs (2004) refers to this as the “epitome of political power” (p. 82). He writes, “Controlling the perspective of the political debate on any issue is the ultimate influence on public opinion” (McCombs, 2004, p. 82).

In regard to the media, the process of framing, as first attributed to Goffman (1974) and Bateson (1972), refers to the process by which the media organize and make sense of the news. However, academic debate about the nature of framing as a theory stems, in part, from a lack of consensus over the actual conceptualization of framing (Entman, 1993; Scheufele, 1999). In an effort to establish framing as a research paradigm, Entman (1993) identified “common tendencies” among the various uses of the term framing in an effort “to suggest a more precise and universal understanding” (p. 52). Entman (1993) defines a research paradigm as “a general theory that informs most scholarship on the operation and outcomes of any particular system of thought and action” (p. 56). With a universal understanding of framing, Entman (1993) argues that it can operate within the realm of a research paradigm as a theory to inform scholarship. Entman (1993) suggested that frames have the ability to call

attention to some aspects while obscuring other elements, which could lead audiences to have different reactions. The nature of framing theory will be further explored within this research. However, a concise theoretical understanding of framing notwithstanding, media framing of issues affects the public agenda.

Previous research has indicated that the media use of frames is “particularly relevant when the way an issue is presented has potential social consequences” (Hardin, Lynn, Walsdorf, & Hardin, 2002, p. 344). Further, Iyengar (1991) concludes, “Framing should be particularly significant as a determinant of choice when the choice problem involves politics” (p. 13). It is certainly arguable that stem cell research is a political issue that will have unavoidable social consequences, possibly both positive and negative.

### Study Purpose

The purpose of this study is not to attempt to solve the stem cell debate. Rather, the purpose of this study is to seek to understand how the news media frame the issue of stem cell research. Specifically, this study is a framing analysis of both textual and photographic news media coverage of stem cell research. According to McCombs (2004), traditional media criticism is focused on understanding if news story content is “accurate and balanced” (p. 96). However, as McCombs (2004) eloquently said, “the public is not an automaton passively waiting to be programmed by the media” (p. 96). As such, a new approach to media criticism is needed. This new approach seeks to examine “the patterns of emphasis and tone in media messages and the consequences of these attribute agendas for public thought and behavior” (McCombs, 2004, p. 97). This new approach to media criticism, which can be studied from the perspective of framing, is what forms the basis of this study.

While the research will provide a complete framing analysis of both textual and photographic coverage, the study seeks to further understand, in-depth, how the ethical aspects of the stem cell debate have been framed. As such, media coverage of ethical aspects of news issues is one conceptual area that informs this research. Craig (1999) has devoted much work toward developing a framework with which to evaluate ethics. His framework can be applied to an ethical analysis of the news media. Craig (1999) states that the heart of ethical evaluation is the media attention to the ethical dimension of the news topic itself, and that at a minimum, ethical news coverage should pay some attention to duties and/or consequences. In terms of ethical analysis of science/medical news, previous research has indicated that the inclusion of the ethical dimension gives readers “handles” for understanding the potential impact of that news (Craig, 2000).

While framing studies traditionally focus on textual news coverage, this study expands the framing analysis to examine photographic news coverage of stem cell research. As such, a second conceptual area that informs this research is visual communication scholarship in regard to news photographs. Scholarly research has clearly demonstrated that photographs are powerful. In fact, research has shown that photographs can invoke a more powerful emotional response than can words alone (Goldberg, 1991; Lester, 1991; Perlmutter, 1999). As such, it is important for research to understand how photographs are used in framing the stem cell debate. Although the printed word still maintains a powerful position in our news media—and unarguably has the ability to effectively communicate information to an audience—scholars are beginning to show that the visual is also a dominant form of communication (Mitchell, 1994; Newton, 2001).

With these two key conceptual areas, this research seeks to understand how the news media are framing the stem cell research debate. It is first necessary to examine the relationship between stem cell research, public opinion, politics, and media coverage.

### Media Coverage of Stem Cell Research

Since the November 1998 announcement by scientists that they had successfully isolated embryonic stem cells, the news media have been quick to cover the story. In addition, the public has, at times, closely followed the story. During the August 2001 coverage of the Bush policy decision on stem cell research, 31% of people responding to Pew's survey on public news attentiveness stated that they followed the story "very closely" ("Public attentiveness," 2006, n.p.). More recently, in June of 2005 when Congress was debating stem cell legislation, 21% of people followed the story "very closely" ("Public attentiveness," 2006, n.p.).

While scientific research on stem cells is a highly technical and complex issue within itself, an additional complicating factor in the communication of an issue like stem cell research is the ethical dimension. In addition to the highly technical scientific aspects, a large portion of the discussion—within the scientific and political communities, and subsequently the media and the public—about stem cell research is based on the ethical aspects of the research. And unlike hard science, ethics is not black and white. As such, how the ethical dimension of an issue like stem cell research is positioned in the media could have a profound outcome on how the public perceives that issue.

The news media coverage of stem cell research has received mixed reviews. In April of 2005, Gareth Cook, a health and science staff reporter at *The Boston Globe*, received the Pulitzer Prize for explanatory journalism for his articles on stem cell research. Cook's work

was honored for its “clarity and humanity” by the Pulitzer board (Feeney, 2005, p. A1). Conversely, mainstream media coverage of stem cell research has also been criticized for being “starry-eyed, lopsided, and deceptive” (Munro, 2003, p. 23). This criticism comes, in part, from the acknowledgment that science and scientific breakthroughs are often highly technical. In addition, some scientists have argued that they have yet to learn how to adequately communicate with the media and with the public. According to a former head of the National Science Foundation, “With the exception of a few people... we don’t know how to communicate with the public. We don’t understand our audience well enough... We don’t know the language and we haven’t practiced it enough” (in Hartz & Chappell, 1997, p. 38).

Stem cell research is obviously a highly complex scientific issue; however, one does not need a medical degree to understand the basic scientific principles of the research. With this understanding, there are some key scientific and political developments in stem cell research that must be addressed.

#### Stem Cell Research: Scientific, Political, and Religious Background<sup>1</sup>

Stem cells, as opposed to other cells that make up the human body, are unique in that they have the ability to multiply indefinitely and create specialized cells. Blood stem cells, for example, work within the human body to continually replenish the red and white blood cells and platelets. Although progress is being made, medical technology has not yet found a way to use specialized stem cells, like blood stem cells, to create other types of cells. In November of 1998, two teams of researchers, one from the University of Wisconsin and one

---

<sup>1</sup> With a topic like stem cell research, the science and politics are evolving on a regular basis. Rather than giving a complete history or explanation of all the scientific breakthroughs and political milestones, this introduction simply intends to introduce the topic within a brief historical, scientific, political, and religious context.

from Johns Hopkins University, announced that they had successfully isolated and cultured human *embryonic* stem cells. Embryonic stem cells, unlike other stem cells, have the potential to create *all* specialized cells within the human body.

Many scientists believe that embryonic stem cells offer the potential to create replacement cells and tissues that could be used in treating numerous diseases and disabilities, including Parkinson's and Alzheimer's diseases, heart disease, strokes, burns, spinal cord injuries, diabetes, and arthritis (National Institutes of Health). The media have been quick to cover this aspect of the medical and scientific potential of embryonic stem cell research; however, this is an "incomplete picture" of the research potential (Mooney, 2005, p. 197). According to Lawrence S. B. Goldstein, a leading embryonic stem cell researcher from the University of California at San Diego, due to the unique nature of embryonic stem cells, research in this area has the potential to help researchers bypass four "bottlenecks" in the development of medical therapies (in Mooney). First, vast amounts of tissues for transplantation could potentially be grown from embryonic stem cells; at present there are not enough transplant tissues available to meet medical needs. Second, the length of time and associated costs in creating new drug therapies could potentially be greatly reduced if new drugs could be tested on embryonic stem cells rather than on human trials. Third, research on embryonic stem cells could potentially bring a greater understanding to the development of genetic diseases and thus suggest new possibilities for treating these diseases. Fourth, as there is a great difference in how individuals respond to drug and other therapies, embryonic stem cell research could potentially lead to specifically tailored therapies for individual patients. Goldstein calls embryonic stem cell research a "broad enabling technology," a point



that is frequently lost in the stem cell research debate (in Mooney). In effect, embryonic stem cells have the potential to prolong the lives and alleviate the suffering of countless people.

However, embryonic stem cell research is not without controversy. The controversy comes from how embryonic stem cells are obtained. Embryonic stem cells are derived at the blastocyst stage, an early stage of cell division in human development. Blastocysts consist of two layers, an inner cell mass and an outer layer. The inner cell mass later develops into the embryo, while the outer layer participates in the development of the placenta. Embryonic stem cells are obtained from the inner cell mass of the blastocyst. Although other options are under investigation, currently, embryonic stem cells can be obtained by two means: from embryos that are in excess at in vitro fertilization clinics and from fetal tissue obtained from terminated pregnancies (National Institutes of Health). In order to isolate the embryonic stem cells, the embryo must be destroyed.

In the case of embryos that are in excess from in vitro fertilization procedures, many argue that because the embryo is destroyed, the research is tantamount to abortion. As such, many anti-abortion supporters who believe that life begins at conception (many of those equated with the “Right to Life” movement) are strong opponents of embryonic stem cell research, such as Senator Sam Brownback (R-KS). Brownback recently said, ““It’s a very clear issue to the pro-life community. Is the youngest human a person or a piece of property?”” (in Stolberg, 2006a, p. 1-18). Those who share this viewpoint, including President George W. Bush, argue that excess embryos—rather than being destroyed for research purposes—can be “adopted” by couples who had no role in creating them and implanted in the adopting mother’s womb. Babies born from this form of adoption have been referred to as “snowflake” babies, the term snowflake being used to invoke the uniqueness of

each human life. On several occasions, President Bush has given news conferences about his position on embryonic stem cell research flocked by “snowflake” babies and their adoptive parents. During one such speech in May 2005, Bush said, ““The children here today remind us that there is no such thing as a spare embryo. Every embryo is unique and genetically complete, like every other human being. And each of us started out our life this way. These lives are not raw material to be exploited, but gifts”” (in Stolberg, 2005, p. A1). Advocates of embryonic stem cell research argue that associating “adoption” language with embryos erroneously suggests that embryos have the same status as a child. Currently, it is estimated that there are approximately 400,000 frozen embryos stored at in vitro fertilization clinics; to date, only 128 frozen embryos have been “adopted” (Babington, 2006, p. A1). Further, when a couple who has stored excess embryos for in vitro fertilization decides that they no longer need the embryos, the excess embryos are usually incinerated.

In an interesting development in the stem cell research debate, many other anti-abortion advocates, such as Senator Bill Frist (R-TN) and Senator Orrin Hatch (R-UT), have come out in support of embryonic stem cell research. The argument from this position is that embryonic stem cell research is, in fact, pro-life in that the research has the potential to prolong life. In a letter to the White House in 2001, Senator Hatch called the research ““consistent with bedrock pro-life, pro-family values”” because the ethical issues raised are ““fundamentally different”” from those surrounding abortion (in Sanger, p. A14). Hatch has further said, ““The most pro-life position would be to help people who suffer from these maladies. That is far more ethical than just abandoning or discarding these embryonic stem cells”” (in Connolly, 2001, p. A1). Senator Arlen Specter (R-PA) has been one of the most vocal Republican supporters of embryonic stem cell research. Specter said, ““It’s different

having an embryo in a dish than having one in a woman's womb. Having an embryo in a woman's womb is having a life. In a dish, it's just going to be discarded'" (in Sanger, 2001, p. A14).

In considering these various positions about embryonic stem cell research, the religious connection cannot be ignored. Religious organizations have maintained varying positions on embryonic stem cell research.<sup>2</sup> The Roman Catholic Church has been one of the most ardent opponents of embryonic stem cell research. The Roman Catholic Church believes in what it terms the "sanctity of life," a reference to the doctrine that maintains that life begins at conception; therefore, an embryo is viewed as a nascent form of human life. As such, destroying an embryo, even for the purposes of curing disease, is seen as immoral. Richard M. Doerflinger, associate director for pro-life activities at the United States Conference of Catholic Bishops, said, "'Destroying an embryo in the lab is morally the same as abortion in Catholic teaching'" (in Connolly, 2001, p. A1). However, by no means do all in the Catholic Church equate embryonic stem cell research with abortion.

The Jewish faith maintains a vastly different viewpoint. Traditionally, the Jewish faith believes that life begins at what is called the "quickening," or the first time a mother feels the movement of a fetus. According to Rabbi Gerald Wolpe, of the Jewish Theological Seminary,

"... an embryo outside the womb has no legal status in Judaism. Of course, it has a moral component, so you can't use it without sensitivity, but in this case there is a question as to whether the element that would be used for research can even be called an embryo. It is at such a primitive state" (in Friend, 2001a, p. 8D).

---

<sup>2</sup> Varying religious positions will be explored in more detail in Chapter 4. For the purposes of this introduction, the Catholic and Jewish perspectives are mentioned because they have been more widely covered in the media and because they maintain vastly different perspectives about embryonic stem cell research.

Further, Wolpe added, ““In Jewish law, healing is a religious obligation;” therefore, many in the Jewish faith view embryonic stem cell research as morally permissible (in Friend, 2001a, p. 8D).

In addition to the first successful isolation of stem cells in November 1998, there have been other scientific and political milestones along the way. On August 9, 2001, in a live 11-minute televised prime time speech, President George W. Bush declared that federal funding of stem cell research could only be used on existing stem cell lines and that federal money could no longer be used in creating new stem cell lines. Bush added that, at that time, more than 60 stem cell lines existed that met his criteria. However, it is now known that this number was greatly exaggerated. Mooney (2005) calls Bush’s nationally televised August 9 claim that “more than sixty genetically diverse” embryonic cells lines existed “one of the most flagrant purely scientific deceptions ever perpetrated by a U.S. president on an unsuspecting public” (p. 2). Bush’s claim has since been uncovered—in large part by journalists—as inaccurate (Mooney, 2005). As such, it is crucial that research not just understand what issues are presented in the context of the stem cell debate, but how those issues are presented.

Another scientific breakthrough in stem cell research occurred in November 2001 when scientists first successfully cloned embryonic stem cells, which could be used to generate replacement tissues that would not be rejected by patients’ bodies. This procedure, known as therapeutic cloning, has created additional controversy in the stem cell research debate. In November 2004, in an effort to sidestep the federal funding limitations for stem cell research, California voters passed legislation that allotted \$3 billion from state funds for stem cell research, making the state the first to fund such research. New Jersey, Connecticut,

Maryland, and Missouri have followed California's lead and are also now allotting state money for stem cell research.

One of the most controversial political developments occurred in July 2006 when the U.S. Senate passed a bill (63-37) to loosen the restrictions on federal funding for stem cell research that were put in place in August 2001. The bill, which had been previously passed by the House of Representatives in 2005, proposed to allow couples who had excess frozen embryos from fertility treatments to donate them to researchers rather than let them be destroyed. However, President Bush vetoed the bill—the first veto in his tenure as president—saying that the bill “crossed a moral boundary” (Bush, 2006). The House of Representatives then attempted to override the veto, but the vote was short of the necessary two-thirds majority. Table 1 provides an abbreviated timeline of key scientific and political developments regarding stem cell research. For a more detailed timeline, see Appendix 1.

Table 1. Abbreviated timeline of key scientific and political developments (modified from Godov & Palca, 2007, n.p.)

Date	Event
1981	Embryonic stem cells are first isolated in mice by two groups.
November 1995	Researchers at the University of Wisconsin isolate embryonic stem cells in primates, showing it is possible to derive embryonic stem cells from humans.
November 5, 1998	Researchers at the University of Wisconsin and Johns Hopkins University report isolating human embryonic stem cells.
August 23, 2000	The National Institutes of Health issue guidelines that allow federal funding of embryonic stem-cell research. Former President Bill Clinton supports the guidelines.
February 2001	The month after taking office, President George W. Bush requests a review of the NIH funding guidelines and puts a hold on federal funds for stem-cell research.
July 18, 2001	Senator Bill Frist (R-TN) and Senator Orrin Hatch (R-UT), a vocal abortion opponent, call for limited federal funding for stem-cell research.
August 9, 2001	President Bush announces his decision to limit funding to a few dozen lines of embryonic stem cells in existence at that date.
November 25, 2001	Scientists at Advanced Cell Technology in Massachusetts claim to have cloned a human embryo. However, the evidence proves controversial and not conclusive.
February 12, 2004	South Korean scientists announce the world's first successfully cloned human embryo, which is published in a prestigious, peer-reviewed journal, <i>Science</i> . The embryos were cloned not for reproductive purposes but as a source of stem cells.
June 25, 2004	New Jersey legislators pass a state budget that includes \$9.5 million for a newly chartered Stem Cell Institute of New Jersey. The move makes New Jersey the first state to fund research on stem cells.
November 2, 2004	California voters approve Proposition 71, which authorizes the state to spend \$3 billion on embryonic stem-cell research over 10 years.
May 24, 2005	The U.S. House passes a bill that would ease President Bush's restrictions on federal funding for stem-cell research.
May 31, 2005	Connecticut approves \$100 million in funding for adult and embryonic stem-cell research over the next 10 years.
July 13, 2005	Bypassing the Illinois state legislature, Democratic Gov. Rod Blagojevich creates a stem-cell research institute by executive order.
July 29, 2005	Senate Majority Leader Bill Frist (R-TN) announces his support of legislation to ease federal funding restrictions for stem-cell research.
September 19, 2005	Scientists in California report that injecting human neural stem cells appeared to repair spinal cords in mice.

September 21, 2005	Advocates of embryonic stem-cell research in Florida propose a ballot initiative that would give \$200 million in state funds toward the research over the next decade.
November 11, 2005	University of Pittsburgh researcher Gerald Schatten alerts editors at the journal Science that there may have been ethical lapses in a landmark cloning paper published in February 2004.
December 15, 2005	South Korean scientist Hwang admits that there are serious errors in his 2005 paper in Science and asks the journal to retract it.
December 29, 2005	The Seoul National University investigation concludes all of the data was fabricated in the 2005 paper that Hwang's team published in Science.
January 10, 2006	The Seoul National University investigation concludes that the landmark 2004 paper was fabricated as well. Two days later, Science formally retracts both Hwang papers.
March 29, 2006	Maryland becomes the fourth state to fund stem cell research, following final passage of legislation in the House of Delegates and a pledge from Gov. Robert L. Ehrlich Jr. (R) to sign the legislation.
April 6, 2006	Gov. Robert L. Ehrlich Jr. signs legislation, making Maryland the fourth state to fund stem cell research. The bill sets guidelines for awarding grants for research using both embryonic and adult stem cells.
May 12, 2006	Hwang is charged with fraud, embezzlement and violating the country's laws on bioethics. He faces up to 13 years in prison.
July 2006	The U.S. Senate considers a bill that expands federal funding of embryonic stem-cell research. The House passed its version of the bill in 2005.
July 19, 2006	The U.S. Senate passed (63-37) a bill that proposed to expand federal funding of embryonic stem-cell research.
July 19, 2006	President Bush vetoes the bill—the first use of his veto power in his presidency.
August 23, 2006	Researchers with the company Advanced Cell Technology say it is possible to remove a cell from an embryo without harming the embryo, which can be used to derive embryonic stem cells.
November 9, 2006	Missouri voters back a constitutional amendment that safeguards embryonic stem-cell research in the state. Missouri's legislature had been trying to ban such research in the state.

Based on these considerations, it is evident why stem cell research has become a point of contention within the scientific, political, and religious communities. Although there are many questions involved in this debate, the central ethical questions are: What is the value of a human embryo, and how does that value compare to the potential alleviation of the suffering of millions of people? Additionally, who gets to decide the answers to these questions?

With this basic understanding of the science of stem cell research and the ethical controversy surrounding it, it is necessary to return to the media's role in the debate and to consider media framing of the issue. To illustrate his approach to media framing, Entman (1991) said, "By providing, repeating, and thereby reinforcing words and visual images that reference some ideas but not others, frames work to make some ideas more salient in the text, others less so—and others entirely invisible" (p. 7). The implication, according to Entman (1993), is that media frames have the power to call attention to some aspects while obscuring other aspects, which could lead audiences to differing reactions. As related, the premise for Iyengar's (1991) framing research is based on the idea that "people are exquisitely sensitive to contextual cues when they make decisions, formulate judgments, or express opinions" (p. 11). Therefore, Iyengar (1991) concludes, "The manner in which a problem of choice is 'framed' is a contextual cue that may profoundly influence decision outcomes" (p. 11).

Framing research has shown that media framing of issues has real implications for both policy makers and audiences. As the ethical debate surrounding stem cell research presents a problem of choice to the American people, how that choice is framed in the media may be a fundamental determinant of what the American people think, and ultimately decide,



about the future of stem cell research. Although this research does not examine audience effects, understanding how stem cell research is framed by the media is a vital step.

As was previously mentioned, several conceptual areas inform this research. In addition to ethical news analysis and photographic news coverage, this research is guided by framing theory and previous studies of media coverage of science issues. Chapter 2 provides a review of the relevant literature.

## **CHAPTER 2**

### **REVIEW OF THE LITERATURE**

In conceptualizing the research study, the scholarly contributions of a number of key content areas must be considered. This study examines media framing of stem cell research from two dimensions—the visual and the ethical. As such, it is essential that the notion of the visual in news coverage and ethical analysis of the news media be examined. More specifically, the literature review will consider the place of the visual within the news media and previous studies examining the framing of news media visuals. In addition, the literature review addresses the place of ethics within news media coverage. Next, as stem cell research is a scientific issue, the literature review considers media coverage of scientific issues. Finally, the review addresses previous studies specifically examining media framing of science news and stem cell research.

#### Framing Theory

Framing theory is the theoretical basis for this investigation. An example of the effects of framing can be seen in the classic experiment by cognitive psychologists Kahneman and Tversky (1984). In this often cited experiment, the researchers framed a problem of choice in two different manners. Although the two scenarios would actually lead to the same outcome, participants showed overwhelming preference for the frame that positioned the issue in terms of “saving lives” over the frame that positioned the issue in terms of “causing deaths.” This experiment clearly demonstrates the potential for powerful effects in regard to media framing.

However, as was previously noted, based on a lack of consensus over the actual conceptualization of framing, there has been much academic debate as to the nature of framing as a theory. There are several leading scholarly definitions of framing theory that must be considered. In his study of the effects of political news, Gitlin (1980) acknowledges the abstract and often unintentional nature of frames by referring to them as “largely unspoken and unacknowledged” (p. 7). In his classic study, Gitlin (1980) showed that through media framing, American network television trivialized a major student political movement during the 1960s. Despite the abstract and often unintentional nature of media framing, Gitlin (1980) writes that media frames organize the world both for journalists and audiences. In Gitlin’s (1980) words, “Media frames are persistent patterns of cognition, interpretation, and presentation, of selection, emphasis, and exclusion, by which symbol-handlers routinely organize discourse, whether verbal or visual” (p. 7).

It could be argued that the most fundamental principle of journalism is to report facts. Yet, in consideration of framing theory, Gamson (1989) writes, “Facts have no intrinsic meaning” (p. 157). It is only when facts are “embedded in a frame or story line that organizes them and gives them coherence” that they obtain meaning (Gamson, 1989, p. 157). Working from this understanding, Gamson (1989) defines a media frame as “a central organizing idea for making sense of relevant events and suggesting what is at issue” (p. 157). Once a fact is placed within this structure of a media frame, it obtains meaning. Gamson (1989) and Gamson and Modigliani (1989) further assert that the media use specific framing devices—metaphors, exemplars, catchphrases, symbols, and visual cues—to tell stories. These framing devices suggest how audiences should think about the issue (Gamson, 1989; Gamson & Modigliani, 1989).

Framing theory has also been approached from the perspective of media effects, most notably by Iyengar (1991) and Scheufele (1999). Working from this perspective, Iyengar (1991) writes, “At its most general level, the concept of framing refers to subtle alterations in the statement or presentation of judgment and choice problems, and the term ‘framing effects’ refers to changes in decision outcomes resulting from these alterations” (p. 11). In application of his definition of framing, Iyengar (1991) proposed that news frames can be classified as either thematic or episodic. Episodic news framing “depicts concrete events that illustrate issues,” and thematic news framing “presents collective or general evidence” (Iyengar, 1991, p. 14). Also working from the media effects perspective, Scheufele (1999) positions framing as a theory of media effects and creates a typology of framing in which he suggests that framing research be classified along two dimensions. The first dimension is the type of frame examined (either a media frame or audience frame), while the second dimension is the way frames are operationalized (either as an independent variable or dependent variable).

Scheufele’s (1999) assertion is that his proposed typology can help to establish a common understanding with regard to the theory of framing as a research paradigm as advocated by Entman (1993). In returning to Entman’s (1993) approach, after identifying “common tendencies” in the various uses of framing and in an effort to establish framing as theory to inform scholarship, Entman defines the term as, “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” (p. 52). Further, Entman (1993) and

Gamson (1989) assert that frames are not only defined by what they include, but also by what they omit.

In additional explanation of framing theory, Scheufele (2000) said that framing theory is based on “prospect theory,” which is the assumption that “subtle changes in the wording of the description of a situation might affect how audience members interpret this situation” (p. 309). To clarify, he adds, “framing influences how audiences think about issues, not by making aspects of the issue more salient, but by invoking interpretive schemas that influence the interpretation of incoming information” (Scheufele, 2000, p. 309). A contributing factor is that media frames created by journalists aren’t necessarily conscious decisions, as originally noted by Gitlin (1980). Instead, another assumption of the theory is that framing tends to be based on “subtle nuances in wording and syntax” that are most likely unintentional and, therefore, difficult for journalists to predict and control (Scheufele, 2000, p. 309).

Researchers have also defined framing outside the scope of the media. In the prologue to his co-edited text on framing, Reese (2003) reviews definitions of framing and then proposes his own definition, by which he intends to suggest a series of research questions. Reese (2003) defines frames as “organizing principles that are socially shared and persistent over time, that work symbolically to meaningfully structure the social world” (p. 11). Reese’s (2003) definition, which goes beyond media framing, is “concerned with the way interests, communicators, sources, and culture combine to yield coherent ways of understanding the world” (p. 11).

As seen in the previous discussion of framing, although the essential notion may be the same, framing, as a theory, has been conceptualized in a number of ways. While there are

clearly many definitions and approaches to framing, Entman's approach will form the theoretical basis for this dissertation. As such, Entman's (1993) definition of framing, and his notion of counterframing, will be discussed in greater detail.

To review, Entman (1993) defines the term as, "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" (p. 52). As noted earlier by McCombs (2004), "Controlling the perspective of the political debate on any issue is the ultimate influence on public opinion" (p. 82). As such, McCombs (2004) refers to media framing as the "epitome of political power" (p. 82). When considering news media coverage, according to Entman (2004), "framing directly promotes interpretations that lead to evaluations" (p. 26). In other words, with a controversial and highly divisive issue like stem cell research, how that issue is positioned in the news media could have serious consequences on *what* the public thinks—and ultimately decides—about stem cell research.

In determination of how issues are positioned, or framed, in the news media, Entman's (2004) definition of framing considers how four basic functions—defining the problem, identifying causes, conveying moral judgment, and suggesting remedies—are addressed in news media coverage of political events, issues, and actors. Entman (2004) further asserts that frames are defined not only by what they include, but also by what they omit. Entman (2004) further distinguishes between two types of frames in the news media: procedural and substantive. Despite their prominent place in the news media, procedural frames are more narrow in focus and function and are sometimes thought of as "game" or "horserace" frames (Entman, 2004, p. 6). Entman (2004) formally defines procedural

framing as suggesting “evaluations of *political actors’ legitimacy*, based on their *technique*, *success*, and *representativeness*” (p. 6). According to Entman (2004), this type of framing “does little to motivate or equip the public to engage in political deliberation” (p. 6). In addition, when the news media emphasize the conflict within procedural frames, “journalists focus on the disagreements and jockeying among sides, and this is what they emphasize, rather than the substantive basis of the dispute or the considerable overlap in positions that might actually exist” (Entman, 2004, p. 26).

Conversely, substantive frames emphasize, aptly so, the substance of the news story. Based on Entman’s definition of framing (2004), when covering political events, issues, and actors, substantive frames emphasize at least two of the four basic news functions: defining the problem, identifying causes, conveying moral judgment, and suggesting remedies.

When analyzing news media coverage, the text and visuals that constitute a frame can be distinguished from other parts of the news by “their capacity to stimulate support or opposition to the sides in a political conflict” (Entman, 2004, p. 6). In Entman’s (2004) evaluation schema, this capacity can be measured through cultural resonance and magnitude. Words and images that are culturally resonant include those that are “highly salient in the culture, which is to say *noticeable*, *understandable*, *memorable*, and *emotionally charged*” (Entman, 2004, p. 6). Magnitude relates to the *prominence* and *repetition* of those words and images (Entman, 2004). In addition, Entman (2004) writes, “The sine qua non of successful framing is magnitude—magnifying those elements of the depicted reality that favor one side’s position, making them salient, while at the same time shrinking those elements that might be used to construct a counterframe” (p. 31). Further, Entman (2004) argues that without magnitude, the content of a frame has little impact.

Through the use of cultural resonance and magnitude, media frames emerge. These frames work to formulate a picture of any given issue in the minds of the American public. When specific frames are lacking in any of the four basic functions—defining the problem, identifying causes, conveying moral judgment, and suggesting remedies—audiences are left to fill in the gaps or ignore them.

Central to the current study, an additional aspect of Gitlin's (1980) definition of media framing must be further explored: his acknowledgment of the power of the visual frame. Although other researchers discuss the importance of visuals in regard to framing, Gitlin (1980) is the only one who specifically mentions visuals within the definition of framing. In recent years, scholarly research has begun to re-examine the importance of the visual within the media. In addition, researchers, including Gitlin (1980) and Entman (1993), have specifically addressed the power of visual frames.

#### Power of the Visual

Photographs are powerful. Goodwin (1983) said, "Their capacity to shock exceeds that of language" (p. 190). Although the publication of shocking images can certainly be sensational, shocking images can also generate positive change. According to Mallette (1976), "The frozen moment... remains. It can haunt. It can hurt and hurt again. It can also leave an indelible message about the betterment of society, the end of war, the elimination of hunger, the alleviation of human misery" (p. 120). In fact, some researchers argue that images are more powerful than words because they can be so shocking. Advocating the printing of shocking photographs, Ephron (1978) said, "That they disturb readers is exactly as it should be: that's why photojournalism is often more powerful than written journalism" (p. 62). Wischmann's (1987) central claim is that, although photographs are often thought to



be a complete and accurate representation of an event, they do not tell the whole story—rather, they present only a slice of the whole. Wischmann (1987) concludes, “Photographs are capable of not only obscuring issues but of overwhelming facts” (p. 70). This argument is key to the current study regarding the use of photographs in debate surrounding stem cell research in that the study is seeking to understand what frames are being presented in newspaper photos about stem cell research.

Given the fact that images can invoke a more powerful emotional response than can words alone (Goldberg, 1991; Lester, 1991; Perlmutter, 1999), it is important for research to understand the visual messages presented in the news media. In addition, according to Dauber (2001), when images are present within the context of news, “they tend to be read not as representation but as *evidence*” (p. 654). As such, news media consumers are susceptible to “the power of the image in photojournalism in a way we are not in other contexts” (Dauber, 2001, p. 654). Given this understanding, Dauber (2001), among others, argues that in our “media-saturated environment, ignoring visual imagery provides less and less satisfactory work” (p. 655). Since previous research has shown that visual images can function as stand alone arguments, Dauber (2001) further argues that media research is critically lacking when visuals are not examined. The function of visuals within the news media will now be further addressed within the context of framing theory.

#### Framing Theory in the Study of Visuals

Although it is not a heavily researched area, some scholars have used framing theory to study news images. Despite the lack of scholarly attention to this dimension of framing, it is a vital area of inquiry. As was previously noted, media consumers do not read images in the same way that they read text; therefore, in a news context, consumers tend to read photos

as “evidence” (Dauber, 2001). Based on these “distinctive qualities” of photographs, Messaris and Abraham (2003) argue that studying visual communication is “especially relevant to the concerns of framing theory” (p. 225).

Messaris and Abraham (2003) cite three distinct qualities of images: their “analogical quality,” their “indexicality,” and their “lack of an explicit propositional syntax” (p. 217). Unlike words, the meaning of visual communication is largely understood through analogy—images generally look like what they intend to represent. In fact, cognitive research has suggested that the brain can make sense of images that are not exact reproductions of the objects they represent, such as black and white line drawings (Messaris & Abraham, 2003). Given this analogical quality, Messaris and Abraham (2003) suggest that viewers tend to overlook the fact that all images are, in reality, “human constructions” (p. 217). As such, visual framing is potentially “less obtrusive” than verbal framing (Messaris & Abraham, 2003, p. 217).

The indexical quality of images relates specifically to photographs—due to nature of the photographic process, photographs have a “true-to-life” quality that other types of visual images do not have (Messaris & Abraham, 2003). Because photographs act as “direct pointers” rather than as “constructed representations,” they carry with them “an implicit guarantee of being closer to the truth than other forms of communication” (Messaris & Abraham, 2003, p. 217). In terms of framing, this quality leads Messaris and Abraham (2003) to conclude that “the use of photographic media in the framing process could diminish the likelihood that viewers would question what they see” (p. 217).

Also unlike words, visual images lack an explicit propositional syntax—with verbal language we have syntactic devices for making propositions, such as with the use of causality

(Messaris & Abraham, 2003). The relationship between visual images is often “loose, imprecise, and unsystematic” (Messaris & Abraham, 2003, p. 219). Consequently, in the visual framing process, viewers may be less aware that they have been presented with a set of propositions (Messaris & Abraham, 2003). Given these three distinct qualities of visual images, Messaris and Abraham (2003) argue that “viewers may be less aware of the process of framing when it occurs visually than when it takes place through words” (p. 225). Given this understanding, it is essential that research not underestimate the power of visual frames. In addition, it is equally essential that visual frames be understood in conjunction with verbal frames. Researchers have already begun to formulate an understanding of visual frames.

Research examining the political implications of visual framing has reached interesting conclusions, highlighting its powerful effects. Entman (1991) argues that it is crucial to compare news narratives because “frames are difficult to detect fully and reliably, because many of the framing devices can appear as ‘natural,’ unremarkable choices of words or images” (p. 6). This is one of the effects of visual frames that Messaris and Abraham (2003) warn of. Through his political communication research, Kornmiller (2002) suggests that the frames through which readers interpret visual images are often different than that which the editors and journalists intended. As these researchers indicate, the effects of visual framing can be powerful and can lead viewers to have varying reactions about a given issue.

The study of the visual frame of minorities in the media has also been fruitful. Lester and Ross (2003) cite pictorial stereotypes of minority groups in the media as an area of ethical concern for communications in as much as media stereotypes can help to perpetuate negative social views of minority groups. The problem of pictorial stereotypes—and the power of the media to create them—cannot be underestimated. As Alwood (1996) said, “The

capacity of the news media to create and perpetuate prejudice is one of the most unsettling and frightening aspects of American journalism” (p. 6).

Pictorial stereotypes in the media can occur through visual framing. In a study of the evening news in Chicago, Entman (1992) found that the visual data collected from the local television news suggest that “racism may still be indirectly encouraged by normal crime and political coverage that depicts blacks, in crime, as more physically threatening and, in politics, as more demanding than comparable white activists or leaders” (Entman, 1992, p. 341). In a second study of the framing of African Americans in the news, Entman (1994) found that network news maintained traditional racial stereotypes, portraying a broader range of positive roles for whites than for blacks. Entman (1994) concludes, “Representations of whites in network news are more varied and more positive than of blacks, not because of conscious bias, but because of the way conventional journalistic norms and practices interact with political and social reality” (p. 509). Again, as these studies indicate, the way an issue is visually framed can have an impact on how that issue is positioned and subsequently perceived.

As more central to the current study, framing theory has also been used to study visuals with regard to health information. A 2001 study examined the effects of framing on beliefs, attitudes, and behaviors related to cigarette smoking (Schneider et al.). In a study of video presentations, researchers found that visual images, as well as audio content, were framed as either emphasizing the benefits of adopting a health behavior or as emphasizing the risks of not adopting a health behavior (Schneider et al.). The researchers found that those images that emphasized the benefits of adopting a health behavior shifted smoking-related beliefs, attitudes, and behaviors in the direction of avoidance and cessation (Schneider et al.).

Based on this finding, the researchers conclude that health communicators should shift from emphasizing health risks associated with a certain behavior to using images as frames that emphasize the benefits of adopting a desired health behavior.

As was previously noted, photographs can be more emotionally powerful than words. Given that photos have the ability to produce powerful emotional responses in viewers, members of the media must show particular ethical sensitivity when including photos. In addition, a complicating factor in the communication of an issue such as stem cell research is the innate ethical aspects of the issue. As such, how photos are used and how the ethical dimension of an issue such as stem cell research is positioned in the media could have a profound outcome on how the public perceives that issue.

#### Ethical Analysis of the News Media

In the United States, Craig (1999) has devoted much work toward developing a framework with which to evaluate ethics. His framework can be applied to an ethical analysis of the news media. The framework provides a theory-based method with which to critique, and thereby improve, media coverage of the ethical dimensions of news (Craig, 1999). Harris's three types of moral judgment—morally impermissible, morally obligatory, and supererogatory—provide the overarching categories for Craig's framework. Within those categories, Craig (1999) presents four criteria for evaluation: levels of analysis; relevant parties; law and regulation; and ethical issues, questions, and themes. In conclusion, Craig (1999) states that the heart of ethical evaluation is the media attention to the ethical dimension of the news topic itself, and that at a minimum, ethical news coverage should pay some attention to duties and/or consequences. In addition, others have argued that "...ethical issues are key to journalistic excellence in general and to quality medical reporting in

particular” (Levi, 2001, p. 78). As such, this study will seek to understand if/how the ethical perspective is used in news media coverage of stem cell research.

In an application of his framework to science news coverage, Craig (2000) examined ethical language and themes in 31 broadcast and print news stories by major news organizations about genetic testing. The analysis was based on deontological/consequentialist perspectives. From the deontological perspective, some of the issues Craig (2000) considers are: faithfulness to commitments, sensitivity to human needs, and sensitivity to justice. Attention to consequences included issues of avoiding harm and doing good. Craig (2000) also content analyzed for broader ethical questions/themes and depth of ethical issues. Craig (2000) concludes that stories that either explicitly or implicitly addressed ethical themes have the potential to help foster public debate and understanding. He concludes that the inclusion of the ethical dimension, on either the personal or the institutional level, gives readers “handles” for understanding the potential impact of genetic testing (Craig, 2000).

#### Media Framing of Science News/Stem Cell Research

As is the case with most important topics, scientific discoveries and controversies are often first communicated to the public through the mass media (Brossard & Shanahan, 2003; Hornig, 1990; Yoon, 2005). As such, the media play an instrumental role in helping the public form ideas about science news (Ramsey, 1999; Yoon, 2005). Although there are certainly instances of quality scientific reporting in the media, the mass media are often heavily criticized when it comes to the quality of science news. Hartz and Chappell (1997) argue that despite the importance and impact of science news, “the media leave the public mostly ill-informed” (p. vii). In addition, the media are criticized for either making scientific claims appear more factual than they are or for making science appear more uncertain and

confusing than it actually is (Stocking, 1999). Because science is fundamentally about exploring the previously unknown, uncertainty is a “normal and necessary characteristic” of the scientific process (Zehr, 1999, p. 3). In addition to how scientists’ communicate this uncertainty, journalists play a large role in communicating scientific uncertainty. How journalists construct—or frame—their stories can “foster or downplay perceptions of uncertainty” (Friedman et al., 1999, p. xiii). And due to the persuasive power of the mass media, framing of science news and scientific uncertainty “can often have significant effects” (Friedman et al., 1999, p. xiii).

Previous framing studies of science controversies—specifically biotechnology controversies—in the U.S. media have found that government officials, industry members, and scientists dominate as sources (Nisbet, Brossard, & Kroepsch, 2003). As such, media coverage has focused on the development and economic impact of scientific technology, and coverage has been positive, emphasizing frames of scientific progress and economic prosperity. Only on occasion, such as in coverage of the cloned sheep Dolly, have nongovernmental, nonindustry, or nonscientist sources received significant amounts of coverage in the news media (Nisbet et al., 2003). In these cases, these sources tend to be religious, public interest advocates, or environmental groups. As a whole, biotechnology news has received far less coverage than other types of science news, such as environmental news. In fact, in a study of 1997 news coverage, Nisbet and Lewenstein (2002) found that biotechnology news received less media attention than did the deaths of Princess Diana and Mother Teresa. In science news coverage, frames tend to be overly episodic, rather than thematic, and focus on political strategy rather than substantive scientific context. Some

researchers have attributed this to the news media's interest in "drama" and narrative form (Nisbet et al., 2003).

Initial research has already begun to formulate an understanding of how the news media frame stem cell research. Williams, Kitzinger, and Henderson (2003) used narrative analysis to study rhetorical strategies and media reporting of the image (both text and visual) of the embryo in print and broadcast news coverage of stem cell research in the United Kingdom. Researchers began with the critical assumption that embryos are socially, culturally, and politically constructed and that the meaning changes based on media frames—an assumption that is a crucial foundation for the current research study. Williams et al. (2003) concluded that the stem cell debate in the United Kingdom has been primarily framed as a controversy between the status and the potential of the embryo itself. Although the research method had a visual analysis component, that component was not prominent in the research data and analysis. The researchers did, however, conclude that it was proponents of stem cell research that advocated for a "visualization" of the embryo (Williams et al., 2003). That visualization was of largely magnified embryos, which lost all recognition as a human form and were simply a "ball of cells" (Williams et al., 2003, p. 801).

While the findings of Williams et al. (2003) are certainly noteworthy, in the United States, Matthew Nisbet is clearly becoming the leading scholar in the area of stem cell research, media coverage, and public opinion. Nisbet et al. (2003) found that embryonic stem cell research is often linked to genetic engineering and cloning in the news media; thus, the media have the opportunity to present dramatic, vivid, and often sensational images and news—especially when presenting the position of the opposition. Examples of these types of media frames in biotechnology coverage include playing God, Dr. Frankenstein, and



Huxley's *Brave New World*. These frames also feature adjectives like “evil,” “murderous,” and “gruesome” (Nisbet et al., 2003, p. 44). In a previous framing study of stem cell research through 2001, Nisbet et al. (2003) found that the most prominent news frames were strategy/conflict, ethics/morality, policy background, and scientific background. In terms of sources, findings were in opposition to previous framing studies of biotechnology issues. While previous studies found that biotechnology issues were sourced as pro-progress and pro-research, stem cell research has been sourced in terms of pro-life and Catholic interests.

Taken as a whole, media coverage of stem cell research has been framed as leaning toward pro-research (Nisbet, 2005; Nisbet et al., 2003). However, beginning in 2002, negative aspects of coverage emerged as stem cell research was “subsumed within a broader debate over human cloning” (Nisbet, 2005, p. 95). Although Nisbet and his colleagues have already conducted numerous studies in the area, Nisbet maintains that it is essential that researchers continue to investigate the subject as the debate surrounding stem cell research evolves. In addition, in terms of framing, Nisbet's work has focused on text, and he advocates for research to pursue the visual dimension (personal communication, May 29, 2006).

### Summary and Research Questions

Framing theory asserts that journalists and media producers use literal and visual devices to organize and make sense of the news, which can have an effect on how audiences perceive that news. Media frames arise from all aspects of the news, including overall narrative, word choice, images, and exclusions. Given the combination of these factors, the audience may interpret the issues as important/unimportant based on media framing. What adds to this effect is that media frames created by journalists are not necessarily intentional

decisions. Instead, another assumption of the theory is that framing tends to be based on “subtle nuances in wording and syntax” that are most likely unintentional and, therefore, difficult for journalists to predict and control (Scheufele, 2000, p. 309). This literature review has shown that framing research is appropriate when examining a political issue with social consequences, such as stem cell research.

Previous research has already begun to formulate an understanding of how stem cell research has been framed in the news media. This dissertation built on this research by asking the following research questions:

RQ1. How does textual newspaper coverage of stem cell research frame the issue?

RQ2. How does textual newsmagazine coverage of stem cell research frame the issue?

In terms of ethical analysis of medical news, previous research has indicated that the inclusion of the ethical dimension gives readers “handles” for understanding the potential impact of that news (Craig, 2000). In addition, in their study of newspaper coverage of stem cell research, Nisbet et al. (2003) found that one of the most prominent news frames that emerged was ethics/morality. This research built on this finding by further examining how ethics/morality are framed in news coverage of stem cell research. From both a quantitative and qualitative perspective, several research questions were proposed:

RQ3. What is the magnitude of the ethics/morality frame in the news coverage?

RQ4. What is the language of the ethics/morality frame?

RQ5. What is the focus of the ethics/morality frame?

In addition to examining news texts, this dissertation further built on the work of Nisbet et al. (2003) by studying photographic news coverage of stem cell research. Previous research has indicated that examining news media photos is a valid way to understand how the media frame a particular issue. Photos are powerful and they have the ability to create a strong emotional response in a viewer. Based on their ability to produce strong emotion, ethical considerations exist for visual journalism. Newton (2005) states that visuals are powerful because they are the “arbiters of the reality we perceive,” which thereby affect the reality by which we live (p. 440). This concept is crucial to this research study because photographs in the news are central to human understanding of the news. Two research questions were proposed for analysis of news photographs:

RQ6. How does photographic newspaper coverage of stem cell research frame the issue?

RQ7. How does photographic newsmagazine coverage of stem cell research frame the issue?

## CHAPTER 3

### METHOD

This study employed a mixed methods research strategy. Data were collected through both quantitative and qualitative means. The intention is that a mixed methods approach provides a more complete account of the topic. Previous researchers have supported this assumption. Sanders (1982) suggests that collecting both quantitative and qualitative data allows for a stronger analysis than would be possible by only collecting one type of data.

Data for the study were collected through the content analysis research method. Content analysis is an effective method for this study because, put most simply, it provides an efficient way to analyze the content of the media. Riffe, Lacy, and Fico (2005) define quantitative content analysis as

the systematic and replicable examination of symbols of communication, which have been assigned numeric values according to valid measurement rules and the analysis of relationships involving those variables using statistical methods, to describe the communication, draw inferences about its meaning, or infer from the communication to its context, both of production and consumption (p. 25).

The Riffe et al. (2005) definition is based on the centrality of content to the processes and effects of communication.

The media for this study were newspapers and newsmagazines. Three newspapers were studied: *The New York Times*, *The Washington Post*, and *USA Today*. The decision to analyze *The New York Times* and *The Washington Post* was based on previous findings that these elite national newspapers of record tend to set the news agenda for regional newspapers (Gitlin, 1980). In addition, this study built on the work of Nisbet et al. (2003), and these are the newspapers analyzed in their study. *USA Today* was also selected for

analysis based on its national focus and wide circulation of more than two million (Bacon's Newspaper Directory, 2003). Moreover, as a large portion of this research is based on photographic analysis, *USA Today* is a fitting publication as the introduction of *USA Today* in 1982, with its colorful layout and heavy use of visuals, changed the trends in newspaper design (Utt, 1989).

This dissertation also examined newsmagazine coverage of stem cell research. The newsmagazine is worth examining in detail as it is a unique mass medium in that it operates on a more relaxed time frame than other print media. A more flexible deadline provides newsmagazines the luxury of examining the week's events and rearranging those events into neatly packaged news. Moreover, newsmagazines generally include a large numbers of photographs with their news stories, thereby providing a wide range of material to analyze. *Newsweek* magazine was the newsmagazine used for the study. *Newsweek* is commonly regarded as one of the leading weekly newsmagazines—it has a circulation of more than three million and is described as including reports and analysis of current events and news (Bacon's Magazine Directory, 2003).

The time frame under analysis began with the November 1998 announcement of the first successful isolation and culture of human embryonic stem cells and went through December 2006. As this study sought to examine a specific issue in the news, it was not appropriate to use a random sample. As such, a purposive sample was used. A guided news search in Lexis-Nexis was conducted to locate all relevant news articles beginning in November 1998. The phrase "stem cell" was used as a search parameter within the headlines for newspapers and within the headlines, lead paragraphs, and terms for the newsmagazine. These search parameters yielded a total of 835 newspaper articles (408 *New York Times*

articles, 303 *Washington Post* articles, and 124 *USA Today* articles) and a total of 119 newsmagazine articles. After analyzing these articles, 443 articles were removed from the sample for one or more of the following reasons: duplicate article; opinion, editorial, or letter to the editor; article not actually about stem cell research; and/or article from Internet, international, or local edition of news source. The final sample included a total of 521 articles (207 *New York Times* articles, 206 *Washington Post* articles, 88 *USA Today* articles, and 20 *Newsweek* articles). Each article served as the unit of analysis for the text analysis portion.

The 521 articles in the sample were read and coded from printouts made from the Lexis-Nexis database. The *New York Times*, *USA Today*, and *Newsweek* article printouts included descriptive information on any visual elements associated with the article; however, an image of the visual element was not included.<sup>3</sup> The newspaper articles that were stated to include visual elements were then physically located on microfilm. The newsmagazine articles that were stated to include visual elements were located in archived hard copies. Printouts and/or copies were made of all articles that included visual elements. Within the articles, all accompanying photos were analyzed. Each photo served as the unit of analysis for the photographic analysis portion. For this study, only photographs were analyzed; illustrations, diagrams, and other types of infographics were not analyzed. Photograph captions were analyzed only to clarify the photo content. Based on the methodological criteria, the final sample included 232 photos (112 *New York Times* photos, 72 *USA Today* photos, and 48 *Newsweek* photos).

---

<sup>3</sup> *Washington Post* articles printed from Lexis-Nexis beginning in 2000 did not include descriptive information on any visual elements associated with the article. As such, *Washington Post* photos were not included in the photographic analysis. However, this is not necessarily a limitation as photos from three news sources were coded, including an elite national newspaper.

The article content analysis consisted of several sections. First, the articles were coded for source, date, headline, author, placement, and word count. Second, the articles were coded for the framing categories considered by Nisbet et al. (2003). In addition to these categories, four frames were added: international, celebrity, election results, and snowflake. It was necessary to add these frames based on scientific and political developments in stem cell research since the publication of the Nisbet et al. article in 2003. For a complete description of the framing categories, see Table 2.

Table 2. Frame categories for article analysis

Frame	Detailed description
New research	Focus on new stem cell–related research released, discovery announced, new medical or scientific application announced, clinical trial results announced. Includes government study, scientific journal article, scientific meeting paper, science-by-press conference.
Scientific background	Focus on general scientific or medical background of stem cell–related research or applications. Includes description of previous research, recap of “known” results and findings, description of potential medical applications/uses.
Scientific/technical controversy or uncertainty	Focus on scientific uncertainty over efficacy or outcomes of stem cell–related research and applications, uncertainty over when stem cell–derived applications will be available or in use, dispute over medical or scientific advantages of embryo stem cells versus other types of stem cell sources, and uncertainty over number or viability of stem cell lines. Also includes discussion of controversy/uncertainty about how research was conducted.
Ethics and/or morality	Focus on the ethics or morality of stem cell–related research, focus on religious perspectives or “traditional” values, emphasis on bioethicist(s) perspectives, discussion of the consequences of impeding scientific progress, discussion of the nature and/or value of human life. Also includes discussion of following guidelines for conducting ethical research.
Political strategy and/or conflict	Focus on the strategy, actions, or deliberations of political figures, presidential administrations, members of Congress, other federal or state officials or government agencies, and the lobbying of interest groups in relation to stem cell research. Focus here is not on specifics, context, or background of policy or legislation but rather on maintaining, winning, or losing political and constituent support, or influencing the nature of political/policy decisions.
Policy and/or regulatory background	Focus on regulatory rules for stem cell–related research/framework for regulation/jurisdiction or oversight over research, advantages and/or disadvantages of proposed policy regimes. Includes discussion of legality of policy or research, international scientific regulatory panels or international agreements related to biomedical research, and European policy/regulation.
Market/economic prospects or international competitiveness	Focus on the significance of stem cell research for stock prices, growth/development of industry or company, reaction of investors, development of products for market, implications for domestic economy, global competitiveness for the United States, U.S. companies, or a potential scientific “brain drain.”
Patenting, property rights, ownership, and access	Focus on ownership of stem cell research techniques, patenting of stem cell–related procedures or products, ownership or access to stem cell lines. Includes discussion of intellectual property.



Public opinion	Focus on the latest poll results, reporting of public opinion statistics, general reference, and discussion of levels of “public support” or general reference to “public opinion” or the “battle” or contest for public opinion.
Political localization	Focus on reaction or opinion specifically from an “average man on the street” or an “outside the beltway” nonexpert or local community leader. Nonpatient. No apparent political ties to research.
Anecdotal personalization	Focus on a patient, or the families/friends of a patient, who is receiving stem cell–related treatment, suffering from stem cell–linked disease or affliction, or could benefit from stem cell research. Focus here is on personal narrative or testimonial.
International	Focus on stem cell related activities of other countries. Includes discussion of research, but not focused on new research. Not focused on political strategy or policy of other countries.
Celebrity	Focus on well known figures supporting stem cell research, including monetary donations, political interaction, development of non profit organizations, and vocal support announced. Includes figures such as the Reagans, Christopher and Dana Reeve, Michael J. Fox, and Carol Burnett.
Election results	Focus on the results of a public election as related to stem cell research.
Snowflake	Focus on the adoption of frozen embryos, the birth of babies born from this process, or the donation of embryos to snowflake programs.
Other	Focus on a topic not addressed above, including storing cord blood, support announced by an organization not tied to celebrity, and a profile of a scientific or political figure as related to stem cell research.

Each frame was coded as present, not present, or outstanding focus/appearing in the lead—a frame operationalization scheme employed by both Nisbet et al. (2003) and McComas and Shanahan (1999). For this study, to qualify for outstanding focus/appearing in the lead, the frame must have appeared within the first three paragraphs of the article. The dominant frame was then determined. The dominant frame was determined to be the frame that was the primary focus of the article, a measurement scheme also implemented by Nisbet et al. (2003). Third, if the ethics/morality frame was the dominant frame in the article, the article was further analyzed from both a quantitative and qualitative perspective to determine the magnitude, language, and focus of the ethics/morality frame. Based on methodological guidelines, the ethics/morality frame was the dominant frame of 32 articles (16 *New York Times* articles, 12 *Washington Post* articles, 3 *USA Today* articles, and 1 *Newsweek* article). For this study, magnitude was based on Entman's (2005) definition of magnitude as based on prominence and repetition. Prominence was defined as the paragraph number in which the first ethics/morality frame occurs. Repetition was defined as the total number of paragraphs in which the ethics/morality frame occurs. The language of the ethics/morality frames was studied using both Entman's (2005) definition of cultural resonance and Craig's (1999) framework for ethical analysis of the news media. Entman (2005) defines words that are culturally resonant as those words that are noticeable, understandable, memorable, and emotionally charged. Craig's (1999) framework examines if/how duties and/or consequences are covered. To study focus, inductive analysis was used to study emerging themes within the ethics/morality frame.

All accompanying news photos were then analyzed. The photo content analysis also consisted of several sections. First, photos were coded for source, date, size, location, page

placement, and color. It was the intention of the researcher to code all photos for color as either color or black and white; however, as the newspaper articles/photos were analyzed on microfilm it was not possible to determine whether the photos were color or black and white. As such, only the newsmagazine photos were coded for color. Second, photo content was analyzed for presence or absence of seven primary frames with related subcategories: science, politics, medical, religion, international, celebrity, and snowflake. Although each photo was the unit of analysis, the photo could contain more than one frame. Third, photos appearing on the front page of the newspapers and the cover page of the newsmagazine were analyzed from a qualitative perspective, considering subject and surrounding context.

The researcher served as the primary coder. A secondary coder was used to test for intercoder reliability for the quantitative analysis portion of both the text and photographic analysis. For the intercoder reliability test, the second coder coded a randomly selected 10% of both the articles and photos. The researcher conducted an initial and follow-up training session with the second coder. Scott's pi was used to test for intercoder reliability. For the article analysis portion, nine of the 35 quantitative variables had a perfect Scott's pi of 1, while Scott's Pi between .601 and .912 was found for 20 variables. Arguably one of the more important variables in the study, dominant frame, had a Scott's Pi of .714. Unacceptably low Scott's pi was initially found for six of the 35 article analysis variables. Consensus coding was done for those six variables. Following the consensus coding, those six variables had a Scott's Pi of between .631 and .790. For the photographic analysis portion, 21 of the 23 quantitative variables had a perfect Scott's pi of 1, while Scott's Pi of .760 and .930 was found for the other two variables. The Scott's pi for each study variable for the articles and photos are shown in Table 3 and Table 4.

Table 3. Intercoder data for the article analysis study variables

Study variable	Scott's pi
general	
article page number	1
article word count	1
frame presence/absence	
anecdotal	.705
celebrity	.807
election results	1
ethics/morality	.856
international	.654
market	.601
new research	.761
patent	.721
policy/legal	.805
political localization	1
political strategy	.650 <sup>a</sup>
public opinion	.766
science background	.695 <sup>a</sup>
snowflake	1
uncertainty/controversy	.631 <sup>a</sup>
other	.790 <sup>a</sup>
frame presence/absence in lead	
anecdotal	1
celebrity	.790
election results	1
ethics/morality	.799
international	.912
market	.623
new research	.892
patent	.812
policy/legal	.802
political localization	1
political strategy	.728 <sup>a</sup>
public opinion	.779
science background	.730
snowflake	1
uncertainty/controversy	.736
other	.657 <sup>a</sup>
dominant frame	.714

Notes: Superscript indicates that consensus coding was done on the variable.

Table 4. Intercoder data for the photo analysis study variables

Study variable	Scott's pi
general	
photo size	.760
front page placement	1
placement on page	.930
color	1
frame presence/absence	
science	
scientists	1
scientists in lab	1
embryo as ball of cells	1
stem cell lines or colonies	1
politics	
political figures – pro research	1
political figures – anti research	1
non-political figures – pro research	1
non-political figures – anti research	1
grass roots political activism	1
medical	
medical personnel	1
people who have benefited	1
people who hope to benefit	1
religion	
religious figures – pro research	1
religious figures – anti research	1
religious activism	1
celebrity	1
international	1
snowflake	1
other	1

## CHAPTER 4

### FINDINGS AND DISCUSSION

Randy and Julie McClure had three children who were long out of diapers and no plans for more when they heard about a program called Snowflakes, which arranges for women to become pregnant with embryos left over at fertility clinics....

Couples adopting or donating Snowflakes embryos are mostly Christian, and most embryo donors are white....

Couples must agree to adoption-like procedures: receiving families are screened and must undergo counseling, and Snowflakes allows donating and receiving families to designate criteria for each other, meet and maintain contact after birth. Adopting couples must agree not to abort any embryos.

Those conditions were fine with Bob and Angie Deacon of Virginia Beach, Va., who donated their 13 embryos after having twins and being discouraged from another pregnancy by a doctor. "With another program, to be honest with you, they could have been adopted by lesbian parents, and I'm totally against that," said Mr. Deacon, 35 (in Belluck, 2005, p. A1).

The closing quote in the previous paragraph is just one of the countless emotionally charged statements that have been touted in ethical discussions about stem cell research.

While opinions like this are inevitable in controversial issues, one is left to wonder if statements like this belong on the front page of the *New York Times*. And, yes, this article did appear on the front page of the *New York Times* with an associated color photograph of the McClure family. A color photograph of the Deacon family appeared on an inside page.

Chapter 4 explores the media frames of stem cell research. The data in this chapter are presented with the related research questions. In addition, in an effort to provide a more comprehensive and cogent narrative, this chapter integrates discussion with the study

findings. Chapter 5 then presents research conclusions and implications. This chapter begins by providing an overview of the study sample.

### Overview of Study Sample

Based on the methodological guidelines for sample selection, 207 *New York Times* articles, 206 *Washington Post* articles, 88 *USA Today* articles, and 20 *Newsweek* articles were included in the sample for a total of 521 articles. While this research study did not specifically pose any research questions about differences among newspaper sources, the data in this first section are presented by specific news source in an effort to provide a more detailed overview of the study sample. For subsequent sections within this chapter, all newspaper sources will be considered together.

While the *New York Times* and the *Washington Post* each virtually had the same number of articles, *USA Today* had about half as many articles. *Newsweek* had only 20 articles.<sup>4</sup> The number of articles by year appears in Table 5, while the data are represented in chart format in Figure 1.

---

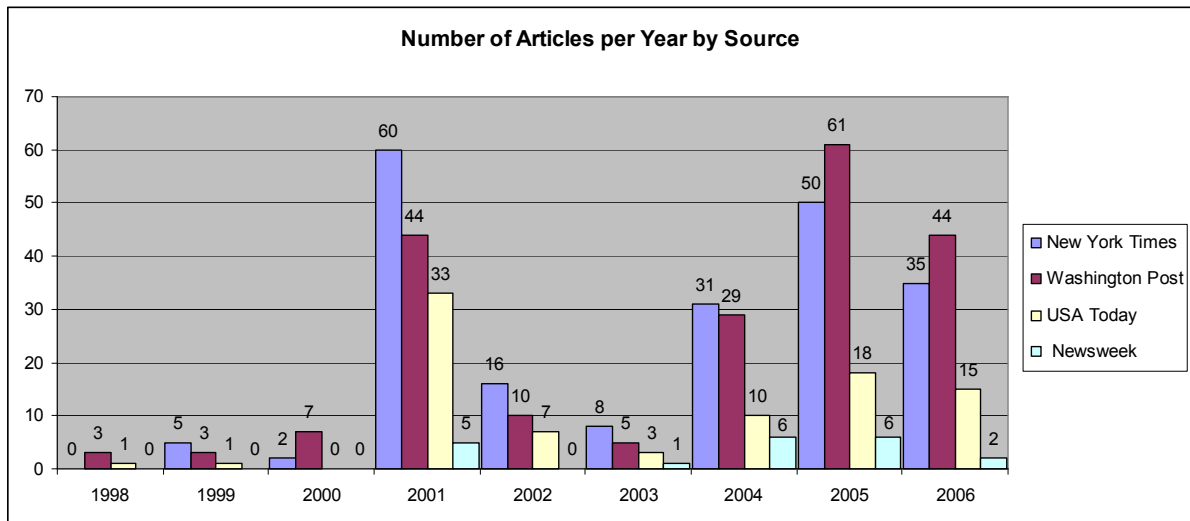
<sup>4</sup> It is highly likely that each of these publications included more articles on the subject of stem cell research—especially *Newsweek*—however, based on methodological guidelines these were the only articles included in the sample. In addition, as only 20 *Newsweek* articles were analyzed, no definitive conclusions can be drawn from this research about *Newsweek* content, which is a limitation of this study.

Table 5. Number of articles per year by news source

	<i>New York Times</i> (n=207)	<i>Washington Post</i> (n=206)	<i>USA Today</i> (n=88)	<i>Newsweek</i> (n=20)
Year				
1998	0.0% (0)	1.5% (3)	1.1% (1)	0.0% (0)
1999	2.4% (5)	1.5% (3)	1.1% (1)	0.0% (0)
2000	1.0% (2)	3.4% (7)	0.0% (0)	0.0% (0)
2001	29.0% (60)	21.4% (44)	37.5% (33)	25.0% (5)
2002	7.7% (16)	4.9% (10)	8.0% (7)	0.0% (0)
2003	3.9% (8)	2.4% (5)	3.4% (3)	5.0% (1)
2004	15.0% (31)	14.1% (29)	11.4% (10)	30.0% (6)
2005	24.2% (50)	29.6% (61)	20.5% (18)	30.0% (6)
2006	16.9% (35)	21.4% (44)	17.0% (15)	10.0% (2)

Notes: 1) Raw numbers shown in parentheses.

Figure 1. Number of articles per year by news source





As seen in Table 5 and Figure 1, print news coverage of stem cell research first peaked in 2001, specifically during the summer, during which time President Bush was deliberating stem cell legislation. Not surprisingly, following the events of September 11, 2001 and the ensuing war in Iraq, news coverage of stem cell research dropped off dramatically in 2002 and 2003. News coverage began to rise again in 2004 and then peaked in 2005 during which time the House of Representatives was debating—and subsequently passed—stem cell legislation. These findings reflect Pew survey data that was presented in the introduction of this research. As the Pew survey found, in August of 2001, 31% of people responding to Pew’s survey on public news attentiveness stated that they followed the coverage of the Bush policy decision on stem cell research “very closely” (“Public attentiveness,” 2006, n.p.). Again, in June of 2005 when Congress was debating stem cell legislation, 21% of people followed the story “very closely” (“Public attentiveness,” 2006, n.p.). It follows that given the sheer volume of the news coverage, it is not surprising that the public closely followed the story. News coverage also peaked during the summer of 2006 when the Senate passed stem cell legislation that President Bush promptly vetoed—the first veto in his tenure as president.

Data were also collected on word count and article placement—these are vital pieces of data to analyze in consideration of media framing of an issue. Article length and placement can indicate issue importance—for example, longer articles and articles in Section A of a newspaper are considered more important. Word count of the articles varied from a low of 83 to a high of 3,272. The mean word count was 890. High, low, and mean word count by source can be seen in Table 6.

Table 6. Word count by news source

	<i>New York Times</i> (n=207)	<i>Washington Post</i> (n=206)	<i>USA Today</i> (n=88)	<i>Newsweek</i> (n=20)
low	150	153	83	408
high	3,272	2,269	2,077	2,562
mean	920.74	914.73	683.92	1,223.95

It is not surprising that *Newsweek* articles had the highest mean word count. Featured newsmagazine articles tend to be longer than newspaper articles as newsmagazines operate on a more relaxed time frame. The *New York Times* and *Washington Post* had approximately the same length of news articles as seen by the respective mean word counts of 921 and 915. *USA Today* had shorter news articles with a mean word count of 683. The analyzed articles appeared in sections throughout the newspaper; however, about 75% of articles in the *New York Times* and *Washington Post* appeared in Section A. This is not surprising, considering that Section A is generally reserved for breaking national/international news. It is also not surprising that a large number of articles in the *New York Times* appeared in Section F, the newspaper's science section. For the *New York Times*, of the 146 articles that appeared in Section A, 26 of those articles appeared on the front page, clearly the most prominent place of a newspaper. For the *Washington Post*, of the 155 articles that appeared in Section A, 36 of those appeared on the front page. In *USA Today*, nearly 60% of the articles appeared in Section A, while 41% appeared in Section D, the Life section, indicating that the *USA Today* articles likely focused more on the personal side of the stem cell research. However, of the 49 articles that appeared in Section A in *USA Today*, 11 of those articles appeared on the front page. *Newsweek* data was not analyzed by section; however, during the analysis time period, *Newsweek* did publish three cover stories dedicated to stem cell research, clearly indicating

the prominence of the topic. In addition to analyzing news texts, the research study analyzed news photographs.

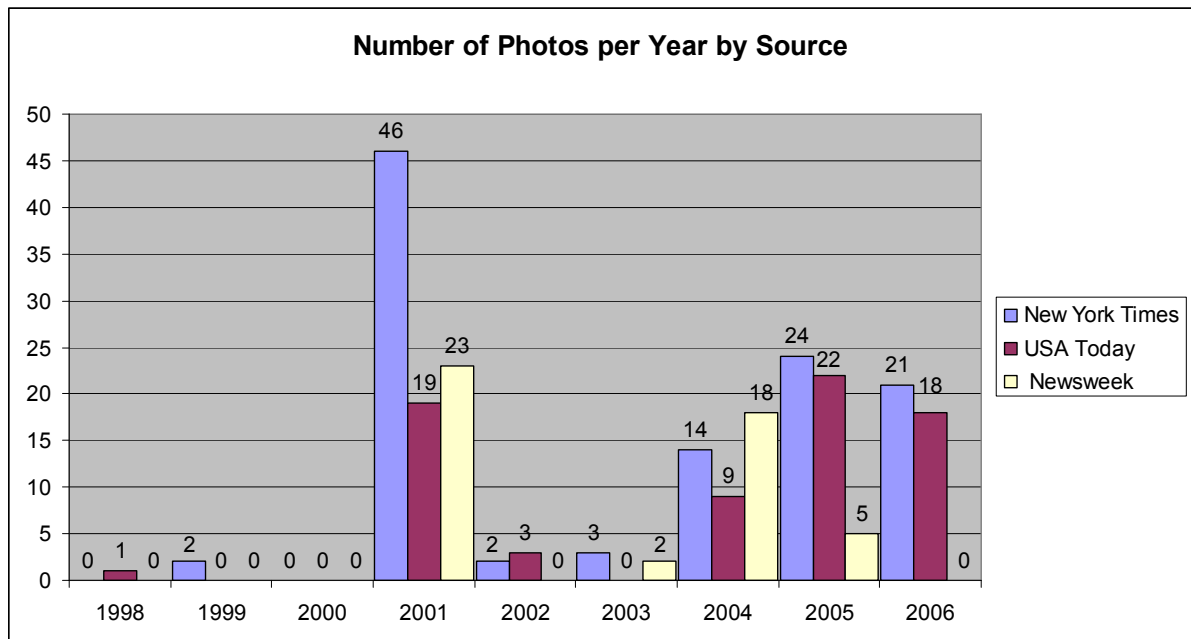
Based on the methodological guidelines for sample selection, 232 news photographs were analyzed (112 *New York Times* photos, 72 *USA Today* photos, and 48 *Newsweek* photos). Based on the number of articles analyzed for this study, the *New York Times* included about half as many photos as the number of articles, while *USA Today* included approximately the same number of articles and photos. Interestingly, while only 20 *Newsweek* articles were included in the sample, those 20 articles contained 48 photos—more than twice the number of photos as articles. The number of photos by year appears in Table 7. The data is represented in chart format in Figure 2.

Table 7. Number of photos per year by news source

	<i>New York Times</i> n=(112)	<i>USA Today</i> (n=72)	<i>Newsweek</i> (n=48)
Year			
1998	0.0% (0)	1.4% (1)	0.0% (0)
1999	1.8% (2)	0.0% (0)	0.0% (0)
2000	0.0% (0)	0.0% (0)	0.0% (0)
2001	41.1% (46)	26.4% (19)	47.9% (23)
2002	1.8% (2)	4.2% (3)	0.0% (0)
2003	2.7% (3)	0.0% (0)	4.2% (2)
2004	12.5% (14)	12.5% (9)	37.5% (18)
2005	21.4% (24)	30.6% (22)	10.4% (5)
2006	18.8% (21)	25.0% (18)	0.0% (0)

Notes: 1) Raw numbers shown in parentheses.

Figure 2. Number of photos per year by news source



As with the print coverage, the photographic coverage first peaked in 2001. And, not surprisingly, the photographic coverage became almost nonexistent in 2002 and 2003.

Coverage began to rise again in 2004, reaching a second peak in 2005. Interestingly, for the print coverage, overall print coverage peaked in 2005, while for photographs, coverage peaked in 2001. Not all articles in the sample contained photos. Of the 207 *New York Times* articles, 65 (31%) contained photos. Of the 88 *USA Today* articles, 37 (42%) contained photos, while a remarkable 80% (16 of the 20) of the *Newsweek* articles contained photos.

This is an interesting finding considering previous research indicating that a visual element in a story makes it more likely to be read (Moses, 2000). The number of photos per article ranged from 1 to 10. For the *New York Times*, 24 of the articles contained two or more photos. For *USA Today*, 16 of the articles contained two or more photos. Eight of the *Newsweek* articles contained two or more photos.

Again, as with the articles, the photos appeared in sections throughout the newspaper. Again, not surprisingly, like the print coverage, the majority of photographs appeared in Section A. The *New York Times* included eight photos on the cover page, while *USA Today* only included one photo on the cover page. *Newsweek* had a total of three cover images devoted to stem cell research. In addition to coding for section, photos were further coded for placement on the page, data for which can be found in Table 8. In visual communication theory, the top of the page (above the fold) is considered to be a more prominent page position, while the bottom of the page (below the fold) is the least prominent position.

Table 8. Placement of photos by news source

	Top	Middle	Bottom
<i>New York Times</i> (n=112)	50.9% (57)	32.1% (36)	17.0% (19)
<i>USA Today</i> (n=72)	62.5% (45)	20.8% (15)	16.7% (12)
<i>Newsweek</i> (n=48)	52.1% (25)	41.7% (20)	6.3% (3)

Notes: 1) Raw numbers shown in parentheses.

As seen in Table 8, the largest percent of photos for all sources appeared at the top of the page, while the smallest percent of photos for all sources appeared at the bottom of the page, indicating that the majority of photos were placed in a highly prominent position.

Another indicator of photo prominence is photo size.<sup>5</sup> As visual communication research has found, the larger a photo is, the more visually prominent it is. The size of photos by source can be found in Tables 9 and 10.

Table 9. Size of photos by newspaper

	Mug shot	Mug shot < x < 10 in <sup>2</sup>	10 in <sup>2</sup> ≤ X < 30 in <sup>2</sup>	30 in <sup>2</sup> ≤ X < 50 in <sup>2</sup>	More than 50 in <sup>2</sup>
<i>New York Times</i> (n=112)	14.3% (16)	47.3% (53)	34.8% (39)	1.8% (2)	1.8% (2)
<i>USA Today</i> (n=72)	43.1% (31)	44.4% (32)	12.5% (9)	0.0% (0)	0.0% (0)

Notes: 1) Raw numbers shown in parentheses.

<sup>5</sup> Since newspapers and newsmagazines are different sizes, the photos for each of these mediums were coded on different scales.

For the two newspapers, the distribution of sizes of photos varied greatly. The largest percent of photos for the *New York Times* was between mug shot size and 10 in<sup>2</sup>. Mug shot photos are usually of a person's head and are about the size of a postage stamp, while a 10 in<sup>2</sup> photo is about the size of a standard, yellow "sticky" note. A large percent of the photos were also between 10 in<sup>2</sup> and 30 in<sup>2</sup>. For reference, 30 in<sup>2</sup> is about the size of a postcard. For *USA Today*, the largest percent of photos were the mug shot size. In addition, *USA Today* had no photos larger than 30 in<sup>2</sup>. This is a surprising finding considering that *USA Today* is generally known for its large and numerous photos. The size of photos in *Newsweek* is shown in Table 10.

Table 10. Size of photos in the newsmagazine

	Mug shot	Mug shot < x < ¼ page	¼ page ≤ x < ½ page	½ page ≤ x < 1 page	1 page ≤ x < 2 pages
<i>Newsweek</i> (n=48)	35.4% (17)	20.8% (10)	20.8% (10)	8.3% (4)	14.5% (7)

Notes: 1) Raw numbers shown in parentheses.

The *Newsweek* photos were dispersed among the size categories, with the largest percent being mug shot size photos. However, about 15% of the photos were also at least one full page in size. *Newsweek* photos were also coded for color. Of the 48 photos in *Newsweek*, 46 were color and only two were black and white.

With an overview of the study sample, the data are now presented in association with the related research questions. The first two research questions related to textual news framing of stem cell research.

## Textual News Frames of Stem Cell Research

**How does textual newspaper coverage of stem cell research frame the issue? How does textual newsmagazine coverage of stem cell research frame the issue?**

To analyze media frames of stem cell research, the framing categories were coded for presence in the article, presence in the lead (defined as the first three paragraphs), and dominant frame of the article. Table 11 presents these three data sets for the 501 newspaper articles in the sample, while Table 12 presents this data for the 20 newsmagazine articles.



Table 11. Frame appearance in article, in article lead, and dominant frame for the 501 newspaper articles in the sample

Frame	Frame appearance in article n=(501)	Frame appearance in article lead n=(501)	Dominant frame n=(501)
anecdotal	17.4% (87)	5.6% (28)	1.0% (5)
celebrity	16.8% (84)	6.8% (34)	1.0% (5)
election results	5.8% (29)	3.2% (16)	0.4% (2)
ethics/morality	<b>87.6% (439)</b>	<b>43.9% (220)</b>	6.2% (31)
international	26.5% (133)	12.0% (60)	2.6% (13)
market	30.3% (152)	9.6% (48)	4.6% (23)
new research	24.6% (123)	20.4% (102)	<b>18.0% (90)</b>
patent	16.6% (83)	5.6% (28)	2.4% (12)
policy/legal	<b>75.4% (378)</b>	<b>41.1% (206)</b>	5.0% (25)
political localization	1.6% (8)	0.2% (1)	0.0% (0)
political strategy	<b>81.2% (407)</b>	<b>65.7% (329)</b>	<b>44.7% (224)</b>
public opinion	13.6% (68)	2.8% (14)	0.8% (4)
science background	<b>90.2% (452)</b>	<b>47.5% (238)</b>	3.8% (19)
snowflake	3.4% (17)	1.8% (9)	0.2% (1)
uncertainty/controversy	46.1% (31)	11.8% (59)	6.0% (30)
other	4.2% (21)	3.8% (19)	3.4% (17)

Notes: 1) Raw numbers shown in parentheses. 2) For the first two columns, raw numbers in cells do not equal to the value of n because only affirmative answers are presented in the table.

Table 12. Frame appearance in article, in article lead, and dominant frame for the 20 newsmagazine articles in the sample

Frame	Frame appearance in article n=(20)	Frame appearance in article lead n=(20)	Dominant frame n=(20)
anecdotal	45.0% (9)	25.0% (5)	0.0% (0)
celebrity	20.0% (4)	10.0% (2)	0.0% (0)
election results	5.0% (1)	5.0% (1)	0.0% (0)
ethics/morality	<b>70.0% (14)</b>	<b>65.0% (13)</b>	5.0% (1)
international	45.0% (9)	40.0% (8)	0.0% (0)
market	40.0% (8)	20.0% (4)	0.0% (0)
new research	15.0% (3)	15.0% (3)	10.0% (2)
patent	5.0% (1)	0.0% (0)	0.0% (0)
policy/legal	<b>60.0% (12)</b>	<b>55.0% (11)</b>	0.0% (0)
political localization	0.0% (0)	0.0% (0)	0.0% (0)
political strategy	<b>70.0% (14)</b>	<b>70.0% (14)</b>	<b>25.0% (5)</b>
public opinion	15.0% (3)	10.0% (2)	0.0% (0)
science background	<b>100.0% (20)</b>	<b>90.0% (18)</b>	<b>35.0% (7)</b>
snowflake	0.0% (0)	0.0% (0)	0.0% (0)
uncertainty/controversy	<b>75.0% (15)</b>	35.0% (7)	<b>15.0% (3)</b>
other	15.0% (3)	13.0% (3)	10.0% (2)

Notes: 1) Raw numbers shown in parentheses. 2) For the first two columns, raw numbers in cells do not equal to the value of n because only affirmative answers are presented in the table.

As seen in Table 11, when considering the newspaper data for “frame appearance in article,” the frames with the highest percentage of appearance are ethics/morality, policy/legal, political strategy, and science background. These four frames occurred in at least 75% of all the articles, with the science background frame occurring in 90% of the articles and the ethics frame occurring in 88% of the articles. It follows that these four frames also occurred in high percentages in the article leads. Political strategy had the highest percentage of appearance, occurring in 66% of all article leads. The ethics/morality frame appeared in 44% of the leads, while the policy/legal and scientific background frames appeared in 41% and 48%, respectively, of all newspaper article leads. These are not surprising findings considering the findings of Nisbet et al. (2003), who also found that the most prominent frames in textual newspaper coverage of stem cell research were strategy/conflict, ethics/morality, policy/legal, and scientific background.

These findings, however, do not extend to the dominant frames for the newspaper articles, except in the case of the political strategy frame, which was the dominant frame of 45% of the newspaper articles. The dominant frame with the second highest percentage of occurrence was the new research frame, which was the dominant frame of 18% of the newspaper articles. The highest percentage of appearance for any other dominant frame was only 6%.

For the newsmagazine data, as seen in Table 12, the strategy/conflict, ethics/morality, policy/legal, and scientific background frames occurred in at least 60% of all newsmagazine articles, with the science background frame occurring in all newsmagazine articles. However, unlike the newspaper articles, one other frame was also commonly occurring in the newsmagazine articles: the scientific uncertainty/controversy frame appeared in three-fourths

of all newsmagazine articles. In examining the newsmagazine article leads, as seen in Table 12, the strategy/conflict, ethics/morality, policy/legal, and scientific background frames were the most commonly occurring frames for the newsmagazine article leads, occurring in at least 55% of all newsmagazine leads.

The dominant frames of the newsmagazine articles must also be considered. The scientific background frame was the dominant frame for 35% of all newsmagazine articles and the political strategy frame was the dominant frame of one-quarter of all newsmagazine articles. However, the ethics/morality frame was the dominant frame for only 5% of all newsmagazine articles, while the policy/legal frame was not the dominant frame of any newsmagazine articles. In addition, other frames, including the scientific uncertainty/controversy frame and the new research frame, also had notable levels of occurrence as the dominant frame for the newsmagazine articles.

In an effort to begin discussion of these two research questions based on the findings, specific examples of instances of the strategy/conflict, ethics/morality, policy/legal, and scientific background frames from the analyzed articles follow in an attempt to provide a greater understanding of the language of these frames. The following quote from the *New York Times* is indicative of how the political strategy/conflict frame emerged:

With social conservatives imploring Mr. Bush to withhold federal support for [stem cell] research and moderates pushing him to permit it, he faces a decision that could fix his place on the political spectrum more firmly than anything he has done to date. Both Republicans and Democrats said that for many voters, the course Mr. Bush charts would be interpreted as an indicator of the extent to which he feels bound to the right or, alternately, is willing to reach toward the center. During a period when some polls have shown a drop in Mr. Bush's approval ratings and he could use more support from moderates than he seems to have, his decision could shape voters' attitudes toward him in crucial ways, analysts said (Bruni, 2001a, p. A10).

As seen in the previous quote, the article emphasizes the actions and/or deliberations of political figures, in this case President Bush, in regard to stem cell research. Additionally, this quote illustrates the political ramifications that he could face, regardless of his decision.

While the ethics/morality frame emerged in a number of ways (which will be discussed in subsequent sections of this research), the following quote from *USA Today* is clear evidence of how the religious aspects of the ethical debate about stem cell research framed the news coverage:

Father Dennis Kleinmann opened his homily Saturday at St. Mary's Catholic Church in Alexandria, Va., by asking parishioners to imagine headlines in their Sunday morning newspapers declaring that a cure for cancer had been discovered. He told them to consider that the cure for cancer arose from research using human embryonic stem cells. Then he asked: Is the potential cure for cancer worth the destruction of human embryos? Might that cure be found by other means? Kleinmann reminded parishioners that the Catholic Church believes life begins at conception. The destruction of embryos is against the church's view of the sanctity of life, and it is regarded as equal to abortion. And therefore the church can't condone any type of research that results in the destruction of human embryos (Friend, 2001a, p. 8D).

Following Bush's August 2001 decision about stem cell research, many articles focused on the policy/legal frame. The following quote from the *Washington Post* illustrates the policy/legal frame:

The new policy will replace guidelines issued by the National Institutes of Health a year ago under the Clinton administration that would have allowed the first federal subsidies of human embryo cell research. Those rules did not permit the use of federal funds to destroy human embryos directly, but it would have allowed the government to sponsor studies involving stem cells taken from embryos by privately financed researchers. The policy said the embryos had to be slated for destruction at fertility clinics, frozen and used in research with donors' consent (Goldstein & Allen, 2001, p. A1).

Finally, the scientific background frame is seen in this quote from the same *Washington Post* article:

Stem cells can develop into many other types of tissue, which scientists believe could create new treatments for diabetes, Parkinson's and Alzheimer's diseases, and other afflictions. Researchers consider stem cells from embryos to be especially promising, although similar cells can be found in some adult tissues (Goldstein & Allen, 2001, p. A1).

As the quote illustrates, the science background frame was used to provide a greater explanation of the promise of—and science behind—stem cell research. With an understanding of the language of these most commonly occurring frames, implications of the textual news frames of stem cell research can now be considered.

In considering the newspaper articles as a whole (based on the data in Table 11), the political strategy, ethics/morality, policy/legal, and scientific background frames appeared in at least three fourths of all newspaper articles. These were the most commonly occurring frames in the leads of the newspaper articles as well, appearing in about half of the newspaper article leads. Based on these findings, these were the most commonly occurring frames in the newspaper articles. However, the dominant frame of the articles must also be considered. Without question, the political strategy frame had the highest percentage of appearance (45% of all newspaper articles) as the dominant frame. However, the ethics/morality, policy/legal, and scientific background frames occurred much less frequently as the dominant frame of the newspaper articles. The new research frame had the second highest percentage of appearance as the dominant frame, occurring in nearly one-fifth of all newspaper articles, while the ethics/morality frame was the third most commonly occurring dominant frame, occurring in only 6% of all the newspaper articles. The policy/legal and scientific background frames were the dominant frames in only 5% and 4%, respectively of all newspaper articles. This finding endorses the findings of previous researchers that science news tends to focus on political strategy rather than substantive scientific context.

This could be considered disturbing news for the American public in regard to the quality of newspaper media content about the issue of stem cell research. Recall Entman's (1991) argument: "By providing, repeating, and thereby reinforcing words and visual images that reference some ideas but not others, frames work to make some ideas more salient in the text, others less so—and others entirely invisible" (p. 7). The political strategy frame clearly dominated the newspaper articles about stem cell research, thus emphasizing the deliberations and actions of political figures—and the related political ramifications—in the stem cell research debate.

While the political aspects of the stem cell debate are an inevitable spoke in the wheel, based on the nature of the subject, the scientific aspects should receive equal billing. Within the coding schema, three frames emphasized the science: science background, scientific uncertainty/controversy, and new research. While the scientific background frame was present in 90% of newspaper articles, it was clearly not a dominant frame of the newspaper articles. In addition, another frame emphasizing the scientific aspects, the scientific uncertainty/controversy frame, was also present in about half of the articles; however, it was also clearly not a dominant frame of the newspaper articles. The new research frame, however, received a considerable amount of coverage, appearing in about one-fourth of all articles and appearing as the dominant frame of nearly 20% of all newspaper articles. Taken as a whole, the scientific frames occurred considerably less than the political strategy frame in the newspaper articles.

Entman (2004) further distinguishes between procedural and substantive frames in the news media. Entman (2004) has shown that procedural frames, also thought of as "game" or "horserace" frames, while more narrow in focus and function, dominate the news media (p.

6). The findings of this research that the political strategy frame prevailed as the dominant frame in the newspaper coverage of stem cell research echo Entman's (2004) ominous conclusions that focusing on the conflict in a debate, rather than the substantive basis of the issue, "does little to motivate or equip the public to engage in political deliberation" (p. 6). While this has shown to be true for newspaper framing of stem cell research, the study also considered newsmagazine framing of stem cell research.

The scientific background frame and the political strategy frame were the dominant frame of more than half of all newsmagazine articles. Based on these findings, it could be argued that newsmagazine coverage of stem cell research was more comprehensive than newspaper coverage, focusing on both the political and scientific aspects. However, again, it is important to take into account that only 20 newsmagazine articles were included in this sample based on methodological guidelines for newsmagazine sample selection. Future research should certainly consider including greater numbers of newsmagazine articles before any definitive conclusions can be drawn.

While the ethics/morality frame did not occur in high percentages as a dominant frame for the articles, it was a commonly occurring frame within the entirety of the articles, appearing in nearly 90% of all articles analyzed. The articles in which the ethics/morality frame was the dominant frame were analyzed in-depth to learn more about how the ethics of stem cell research are being framed by the news media.

### Ethical Analysis

#### **What is the magnitude of the ethics/morality frame in the news coverage?**

Based on methodological guidelines, the ethics/morality frame was the dominant frame of 32 articles (16 *New York Times* articles, 12 *Washington Post* articles, 3 *USA Today*



articles, and 1 *Newsweek* article). Previous research has indicated that the inclusion of the ethical dimension gives readers “handles” for understanding the potential impact of that medical news; as such, the 32 articles with ethics/morality as the dominant frame were analyzed in-depth to gain a greater understanding of how the ethics/morality frame was presented (Craig, 2000).

Magnitude was based on Entman’s (2005) definition in which he considers prominence and repetition. For this study, prominence was defined as the paragraph number in which the ethics/morality frame first appears; repetition was defined as the total number of paragraphs in which the ethics/morality frame appears. In regard to prominence, for all 32 articles, the ethics/morality frame first appeared within the lead (the first three paragraphs), thus indicating that the ethics/morality frame was highly prominent. The ethics/morality frame was also repeated throughout the 32 articles analyzed. For all of the sources, the ethics/morality frame was present in at least 55% of all paragraphs, indicating a high level of repetition. Thus, for these 32 articles, the ethics/morality frame had a high magnitude in terms of prominence and repetition. This finding is not necessarily surprising, considering that these 32 articles were analyzed in-depth *because* the ethics/morality frame was the dominant frame. To further understand how the ethics/morality frame was positioned in regard to stem cell research, these 32 articles were analyzed from a qualitative perspective to understand language and frame focus.

#### Ethics/Morality Frame Language and Focus

**What is the language of the ethics/morality frame? What is the focus of the ethics/morality frame?**

According to Stanford University biologist and U.S. Nobel Laureate Paul Berg, research on embryonic stem cells is a “no-brainer” (in Weiss, 2001a, p. A2). Berg’s ethical justification for his position is: “The cells exist and they’re being destroyed and you have to decide whether you are going to just let that happen without getting any of the potential benefits” (in Weiss, 2001a, p. A2). Berg’s quote illustrates just one of the many considerations that make-up the ethics/morality frame within media coverage of stem cell research.

To understand how the ethics/morality frame emerged, this section of the research explores the specific ethics/morality frame language and frame foci within the overarching ethics/morality frame. To study the language of the articles with ethics/morality as the dominant frame, Entman’s (2005) definition of cultural resonance and Craig’s (1999) framework for ethical analysis of the news media were employed. To review, Entman (2005) defines words that are culturally resonant as those words that are noticeable, understandable, memorable, and emotionally charged. Craig’s (1999) framework examines if/how duties and/or consequences are covered. To determine frame focus, qualitative text analysis was conducted from an inductive perspective to see what themes emerged within the ethical discussion. Discussion of the specific language will be integrated within discussion of the specific ethics/morality themes. Qualitative analysis of the data found that the ethics/morality frame emerged in several key ways: the theme of what it means to “be alive,” the theme of the value of human life and the impact on stem cell research, the theme of the religious perspective, the theme of abortion and the stem cell connection, and the theme of the consequences of impeding scientific progress. While there is inevitable overlap in these key

areas, through the process of media framing each of these five areas emerged as themes within the ethics/morality frame; each will be addressed independently.

### The Theme of What it Means to “Be Alive”

One of the key ethical arguments used by both stem cell research advocates and opponents addressed the seemingly simple concept of what it means to “be alive.” In fact, the Bush administration policy decision to limit federal funding and Bush’s subsequent veto of stem cell legislation was based on the viewpoint that life *begins* at conception. However, this is hardly a universal viewpoint: there is no scientific or religious consensus on what it means to be alive or, for that matter, what it means to be human. An article from the *New York Times* emphasized this theme. The article, titled, “Defining the undefinable: Being alive,” by Natalie Angier, focused on the scientific perspective of what it means to be alive, quoting leading researchers and scientists. Although lengthy, these perspectives are worth including in full detail in order to illustrate the lack of scientific consensus on what it means to be alive:

Some say that the economy and the Internet, for example, are alive in the same sense that an ant colony is alive; all are super organisms, with the individual functions widely distributed yet intimately connected, mutually responsive, dynamic and ever-changing. “There are lots of variations on the idea that computers, if not already alive, are on their way to becoming alive, and that for better or worse they will be a successor species to the human race,” said Jaron Lanier, a computer scientist and pioneer in virtual reality. “I’ve always objected to that, which has made me the black sheep at a lot of computer conferences.”...Ultimately, in Mr. Lanier’s view, the experience of being alive is a subjective one that may not be amenable to definition or algorithmic recapitulation. “Science studies repeatable phenomena and empirical things that can be tested,” he said. “But the experience of being alive is not detectable by instruments, and at some point we may have to admit it’s a big question mark that we’re never going to be able to answer” (Angier, 2001, p. F1).

At the other end of the *scala natura* is the virus, a source of many lively scientific debates. To live means to use energy, some have argued, to metabolize, to eat. Viruses do none of these things. “They show no properties of life,” said Dr. Lynn Margulis, a professor of biology at the University of Massachusetts. “No metabolism, no self-maintenance. They’re about as alive as is sugar or salt.” ... Yet some virologists defend the animate nature of their subjects by pointing out that viruses

secondarily metabolize, by forcing their host cells to devote most of their metabolic energy to the production of new viruses...The pathogens are all too clever at getting around, and they even evolve. "Viruses are smart enough to direct their own reproduction," said Dr. Arnold Levine, a virologist and the president of Rockefeller University in New York. "I've always thought of them as alive, although in a dormant state" (Angier, 2001, p. F1).

The article, of course, also included scientific perspectives on the nature of an embryo. Several viewpoints were highlighted:

As Dr. Lawrence M. Krauss, the chairman of the physics department at Case Western Reserve University, sees it, an embryo floating in a petri dish is little more than a chemical factory, not so much alive as prelude to life, and no worthier of being considered a mini-human being than a block of uncarved marble is worthy of being called Michelangelo's *Pieta*. "The distinction between organic material that has potential one day to do something, and something already functioning as human being, is very great," said Dr. Krauss, who often writes about the effects of science on society. "I'm amazed when people view the potential as if it's real" (Angier, 2001, p. F1).

In his [Dr. Mark A. Bedau, a philosopher of biology at Reed College] view, the key to life is something he calls "supple adaptation," the capacity of populations or groups to respond to changing circumstances by continually creating new adaptations. Thus, the dinosaurs died out not because they expired one by one, but because their population somehow lost all capacity to respond to shifting conditions.... In this vein, some experts say, the current stem cell debate, by focusing on human embryos afloat in the laboratory and divorced from their ordinary biological and evolutionary context, ignores the connectivity of the human race, the social, emotional and ultimately physical link among people that is epitomized in the relationship between the mother and her gestating fetus. "Until very recently in human history, the moment when somebody was said to be there was with the quickening," said Dr. Barbara Katz Rothman, a bioethicist and professor of sociology at the City University of New York. "The moment a woman felt movement, when the baby communicated itself to the woman and she communicated the quickening to others, was the moment that the baby entered the social world. It was an inherently social act: thud! I'm here." A days-old embryo in a petri dish, or frozen away in a fertility clinic, she said, makes no thud and has no umbilicus to the world around it. It must of necessity await definition by the lives that flicker around it, who are themselves caught up in the uncertainties and disputes that are life's most assured gifts (Angier, 2001, p. F1).

While these two scientific perspectives do both concur that an embryo in a petri dish is not considered living as is an embryo in a woman's womb, there is no scientific consensus

on the nature of life itself. Angier (2001) further emphasized this point by the inclusion of an additional quote by Dr. Bedau on the nature of life: “The question is especially interesting now that science and technology are continually pushing the boundaries of what living systems or lifelike systems exist, and what they may look like in the future” (p. F1). In considering culturally resonant language, the theme of what it means to “be alive” made many references to the “moral status” of embryos, thus enforcing the notion that embryos are, in fact, equal and deserving of full political and social consideration. Another phrase used in conjunction with embryos was “human commodity.” This language was most often used in discussion of economics and patenting issues, thus invoking fear that profit could be made from the buying and selling of humans.

Science consensus notwithstanding on what it means to be alive, a discussion of this nature is inextricably linked to the theme of the value of human life and the impact on stem cell research.

#### The Theme of the Value of Human Life and the Impact on Stem Cell Research

As the primary ethical objection of most opponents to embryonic stem cell research relates to the destruction of the embryo, a large portion of the ethics frame in the analyzed articles related to the theme of the value of human life and the impact on stem cell research. A *USA Today* article quoted Thomas Murray of the Hastings Center for Bioethics about this very point. Murray (2001a) said, ““The debate is raising fundamental questions about the beginning of life and how we as a society will think about the embryos”” (in Friend, p. 8D). In terms of Craig’s (1999) framework for ethical analysis and his recommendation that ethical discussion should, at a minimum, consider duties and/or consequences, the primary duty highlighted in this ethical theme could be referred to as the duty to *protect* life.

Following his announcement of his embryonic stem cell research policy in August 2001, President Bush wrote an op-ed piece, which was published in the *New York Times*. Bush (2001) wrote, “We do not end some lives for the medical benefit of others. For me, this is a matter of conviction: a belief that life, including early life, is biologically human, genetically distinct and valuable” (p. 4-13). Bush’s statement emphasizes the viewpoint that life begins at conception; therefore, it is unethical to sacrifice one life for the sake of another.

In an effort to sidestep this ethical dilemma some scientists are working on ways to create embryos other than from traditional means—those made from fused egg and sperm. One possible method is to create “disabled embryo-like entities” for research purposes (Weiss, 1998, p. A3). The goal of this research is to create embryos that are healthy enough within their first few days to provide stem cells, yet are “crippled” to the extent that they could never develop into a person (Weiss, 1998, p. A3). However, according to the ethics/morality frame, this is adding to the “bioethical controversy,” specifically what it means to be “human” (Weiss, 1998, p. A3). John Fletcher, an emeritus professor of bioethics at the University of Virginia in Charlottesville, was quoted as saying that procedures like this bring up the ethical issue of “‘wrongful life’ – the controversial legal and ethical doctrine that says it is immoral to bring a fatally defective life into existence” (in Weiss, 1998, p. A3). Another possible way to create embryos is through a process called parthenogenesis, from the Greek word meaning “virgin birth.” In this method, scientists use chemicals to “mimic a sperm’s arrival” (Weiss, 2001b, p. A11). Embryos created in this manner are called “parthenotes,” rather than embryos, clearly in an attempt to avoid ethical debate about the moral status of the entities. As with all issues involved in this debate, there were mixed reactions to the scientific creation of these entities.

In the theme of the value of human life and the impact on stem cell research, there were several notable examples of Entman's (2004) culturally resonant language. In reference to the debate itself, culturally resonant phrases such as "bioethics controversy" and "emotional debate" were used throughout the articles. Positioning the issue as a "controversy" clearly played up the fact that stem cell research has become a wedge issue in many groups, including the Republican Party, the Pro-Life movement, and the Catholic Church. The quantitative data further suggest this to be true as the political strategy frame was the dominant frame of nearly half of the newspaper articles analyzed. In addition, framing the debate as "emotional" reinforces the fact that this is a highly personal issue, in that lives—either lives already in existence or lives in their earliest stages of human development—are at stake. Further, stem cell related research was framed as a "moral minefield" and as "intrinsically evil," a finding echoing that of Nisbet et al. (2003).

In another perspective within the theme of the value of human life, in considering embryos obtained from in vitro fertilization procedures, the embryos in question were created as part of a "life-giving process—that of helping infertile couples conceive" (Wade, 2001, p. F3). As such, it can be morally acceptable to use embryos for research purposes if the excess embryos are going to be destroyed anyway, and the research could potentially help countless others. To illustrate with an example from the analyzed articles: "human embryos should be treated with respect, but the saving of lives through medical research is also a strong moral imperative" (Wade, 2001, p. F3). This ethical viewpoint in the theme of the value of human life represents the classical philosophic means to an end argument. On this point, the *Washington Post* included a quote from former House Leader Tom DeLay, "who condemned 'the moral catastrophe of means-justifying-the-ends morality'" (in Milbank, 2005, p. A4).

The theme of the value of human life and the impact on stem cell research also addressed the issue from the “slippery slope” perspective. As one article explained,

If embryonic stem cell research is permitted, the door may be opened to many further steps demeaning to human life. Scientists have a long research agenda, starting with the creation of embryos specifically for research purposes. If an absolute line is not drawn to protect the embryo, many grave abuses may follow (Wade, 2001, p. F3).

The quote illustrates another facet of the value of human life and the impact on cell related research: human cloning.

Distinction must be made between two types of cloning. These two types of cloning are “reproductive cloning,” cloning for the purposes of duplicating a human, which is seen as highly immoral by most, and “therapeutic cloning,” cloning embryos for the sole purpose of research, which is viewed by some as a moral endeavor. From the article analysis, two diverse perspectives of therapeutic cloning emerged. On one side, C. Ben Mitchell, a senior fellow with the Center for Bioethics and Human Dignity in Chicago and a consultant to the Ethics and Religious Liberty Commission of the Southern Baptist Convention, was quoted as saying, “It’s biotechnological cannibalism. We are using human embryos, tiny human beings, for someone else’s goals” (in Grossman, 2001, p. 8D). An included quote by Dan McGee, a professor of Christian ethics at Baylor University and a consultant to the more liberal Baptist Center for Ethics, illustrates the other perspective:

Banning therapeutic cloning “reduces our definition of personhood to a few cells. That cheapens human life. I can’t think of a morally justifiable reason to clone a person today. But just because I cannot imagine one now doesn’t mean that sometime in the future there might not be a reason. However, growing specialized human cells for therapeutic purposes is not the same thing, and (if it could cure diseases), I would do that as quickly as I could” (in Grossman, 2001, p. 8D).

In returning to ethical language (Craig, 1999), the duty that emerged in this theme was the duty to protect life. This duty has a long standing tradition in the evolution of



civilized humankind and has been a contentious point of debate on countless issues, from abortion, to war, to capital punishment, to euthanasia: the argument reasons that we, as a civilized society with the ability to create life, have a duty to protect life. In the case of media coverage of stem cell research, this duty was very much positioned in terms of consequences: the question of when does the duty to *protect* life conflict with the duty to *preserve* life. These two duties dominated the theme of the value of human life and the impact on stem cell research and can be found throughout the ethics/morality frame. It is inevitable that the ethics/morality frame was inextricably linked to the theme of the religious perspectives of life and subsequently religious perspectives of stem cell research.

#### The Theme of the Religious Perspective

Religious perspectives on the moral status of an embryo and the ethics of stem cell research were clearly at hand in the analyzed articles; however, religious perspectives were not equally represented among the various faiths. Without question, the Roman Catholic perspective—that life begins at conception; therefore, destroying embryos even for the purpose of curing a disease is immoral—dominated the ethics frame. In addition, in considering culturally resonant language, the phrase “sanctity of human life” was used throughout the articles when referring to positions on the embryo, reinforcing the religious link in stem cell research. This phrase is a pillar of the Catholic perspective on human life, in both reference to abortion and embryonic stem cell research.

One of the most vocal Catholic opponents of embryonic stem cell research, Richard M. Doerflinger, associate director for pro-life activities at the United States Conference of Catholic Bishops, dominated as a source. In fact, Doerflinger, among others, criticized President Bush’s 2001 policy in regard to embryonic stem cell research. Doerflinger felt that

the president should not have allowed *any* federal funding for embryonic stem cell research.

The following quote is indicative of the instances in which Doerflinger was used as a source for the ethics frame:

“[President Bush’s] moral principle seems to be, if the killing has already been done, we can fund this research,” Mr. Doerflinger said. “But by the time the scientists come forward with the next group of cell lines, that destruction will already have been done, too. And on we go. Where is the moral limit? On what basis will the president say no? I think it is an untenable and unstable policy” (in Goodstein, 2001, p. 1-1).

Although the Catholic perspective dominated, the Jewish perspective also received coverage. As was stated in the introduction of this research, the Jewish perspective maintains that an embryo outside of the womb has no legal status. Though Jewish faith acknowledges that research using embryos has a moral component, stem cell research is viewed as a real hope for treating diseases. This perspective was also shown to be the view of other faiths. Paul Root Wolpe, of the Center for Bioethics at the University of Pennsylvania, was quoted as saying, “Some Protestants, many Jews and some Islamic theologians accept the destruction of a very early embryo for its lifesaving potential.... They may argue that a minority should not be allowed to stop progress that the majority feels is legitimate” (in Niebuhr, 2001, p. A12).

As President Bush is a member of the United Methodist Church, there was some coverage addressing the Methodist position on stem cell research; however, the coverage illustrated that there are mixed opinions of the issue within the Methodist faith as there are mixed opinions within other faiths. One particular *Washington Post* article included excerpts from a letter written to Bush by Jim Winkler, general secretary of the United Methodist Church’s General Board for Church and Society. The *Post* article quoted Winkler as writing to Bush that his policy decision ““can maintain the current prohibition on such funding or

take us further down a path to the ultimate commodification of human life” (in Broadway, 2001, p. B9). In sharp contrast to this viewpoint, the article further included excerpts from a letter written to the Methodist Church’s public policy board by 43 members of Bethesda United Methodist Church. The letter called Winkler’s interpretation of the Methodist position on embryonic stem cell research ““morally wrong,”” adding, ““We pray that Mr. Winkler will reconsider the position he has taken on behalf of the church, publicly retract his letter to President Bush and instead extend his support for embryonic cell research within the carefully considered boundaries established in the previous administration”” (in Broadway, 2001, p. B9)

The Mormon perspective on embryonic stem cell research also received some coverage, likely because four key Republican senators, including Senator Orrin G. Hatch of Utah and Gordon H. Smith of Oregon, who have supported federal funding for embryonic stem cell research, are Mormon. Mormon faith believes that abortion is immoral; however, as of 2001, the Mormon Church had no official position on embryonic stem cell research, thus “the church sidestepped the more sensitive question of whether body and spirit merge at conception or later in the development of the fetus” (Janofsky, 2001, p. A16). In a unique viewpoint seen only in one article, the *Washington Post* quoted Reverend Archie LeMone, assistant pastor at Shiloh Baptist Church in Northwest Washington and board member of a minority transplant education program at Howard University Hospital. LeMone is also a member of the Progressive National Baptist Convention, which is a predominantly African American domination. Citing the religious African American perspective, LeMone referred to slaves as the ““first form of human commodity”” with the concern, ““We don’t want stem cell research to go awry for profit”” (in Broadway, 2001, p. B9). The position of other

religions, including the Unitarian-Universalist Association, the Episcopal Church, and the Evangelical Lutheran Church received minimal coverage. Eastern religions, including Hinduism and Buddhism also received minimal converge. One of the pillars of Entman's (2004) definition of framing theory is that perspectives will be judged as important/unimportant based on magnitude—thus the sheer dominance of the Catholic perspective in the religious theme indicates that audiences could be lead to assume that the Catholic perspective is the correct—and thus ethical—perspective.

Given the ethical focus on the moral status of the embryo and the religious perspectives, the inevitable connection to abortion was a key theme that emerged within the ethics/morality frame.

#### The Theme of Abortion and the Stem Cell Connection

As was mentioned in the introduction of this research, embryonic stem cell research has become a wedge issue within the conservative, pro-life movement. While there are those staunch anti-abortion advocates, including President Bush and Senator Brownback, who argue that embryonic stem cell research is immoral, quite a few other staunch anti-abortion advocates have come out in support of embryonic stem cell research, including Senator Hatch and Senator Frist. This split was first highlighted by the media following Bush's August 2001 policy announcement in regard to stem cell research. The *New York Times* quoted several prominent pro-life allies as being pleased with Bush's policy decision:

...the National Right to Life Committee, the largest anti-abortion group, announced that it was "delighted" with Mr. Bush's speech. So did the Rev. Jerry Falwell, the founder of the Moral Majority, a conservative religious group, and Dr. James C. Dobson, the president and founder of Focus on the Family, a ministry based in Colorado. Pat Robertson, founder of the Christian Coalition, proclaimed Mr. Bush's compromise "an elegant solution to the thorny issue of stem research by firmly protecting the rights of the unborn" (Goodstein, 2001, p. 1-1).

However, the same article also included the perspective of those pro-life advocates, including Richard M. Doerflinger, who condemned Bush's decision to allow *any* federal funding to support embryonic stem cell research:

"The president's position contradicts the Nuremberg Code," said Wendy Wright, the communications director of Concerned Women for America, a conservative public policy group. "We should be horrified at the prospect of participating in research on embryos who are deliberately killed for the same reason that we are horrified that gold fillings were taken from the teeth of Holocaust victims." Lauren Newell of the Savior's Alliance for Lifting the Truth, a Christian youth group, said: "I am ashamed of our president, who compromises and gives my generation the disposable human life mentality that human life can be picked apart, abused and destroyed. If the president wants to be a strong man and a moral man, then I urge him to reconsider his decision." This disappointment was echoed by leaders of several organizations supported by evangelicals and Catholics. They include Human Life International; the Christian Legal Society; the Traditional Values Coalition; the Eagle Forum, led by Phyllis Schlafly; the Prison Fellowship, headed by Charles W. Colson, whom the president has praised for his ministry; and the Family Research Council, founded by Gary L. Bauer, who opposed Mr. Bush in the Republican primaries last year. All are conservative Christian groups with sizable followings (Goodstein, 2001, p. 1-1).

While this particular article did not elaborate on root causes for the split, a later *Washington Post* article did. The article considered the perspective of Gene Outka, an ethicist at Yale University. The article stated: "Outka frames the issue partly as one of urgency—saying that abortion involves a pressing conflict between a pregnant woman and a fetus, whereas limits on stem cell research merely affect patients who in theory might reap medical benefits at some future time" (Ostling, 2005, p. B9). Further, the article added, Outka "also notes that extraction of stem cells can be considered less morally difficult because it destroys embryos at the very earliest stage, while abortion terminates fetuses that are more developed" (Ostling, 2005, p. B9). The article further considered Outka's personal perspective in the book *God and the Embryo*, in which he argues that "in the possible benefits of an outcome, you cannot ignore the means used to achieve it. Moral opponents of the Hiroshima bombing

use the same argument” (Ostling, 2005, p. B9). Thus, he returns to the means to an end argument, citing the consequences.

Moving from religious perspectives and the abortion connection, the final ethical theme that emerged was the theme of the consequences of impeding scientific progress.

#### The Theme of the Consequences of Impeding Scientific Progress

While it was a clear theme, surprisingly, the theme of the consequences of impeding scientific progress was not overly prevalent in the analyzed articles. However, based on media framing of the analyzed article, scientists clearly support embryonic stem cell research and believe it to be a moral endeavor as illustrated in this quote: “The prevailing view among scientists is that it is acceptable to destroy embryos for medical research as long as the embryos are destined to be destroyed anyway” (Friend, 2001b, p. 7A).

A second facet of this theme related to the effects on research protocol. This theme emerged in two primary ways. The concern was that a lack of federal oversight (due to limited federal funding) could lead to scores of cases of unethical research procedures and could lead to research conducted purely for financial gain. Two particular articles referenced proposed ethical guidelines created by the National Academy of Sciences. The report stated that some form of regulation ““is essential to assure the public that such research is being conducted in an ethical manner”” (in Wade, 2005, p. A1). Highlighting the research protocol aspect, the *Washington Post* article included a quote from Harvey V. Fineberg, president of the Institute of Medicine, who states that the guidelines ““are intended to provide the way that will enable freedom of inquiry to flourish”” (in Weiss, 2005, p. A2). However, the article also showed that reaction to these guidelines was not all positive. The *Washington Post* article further quoted Senator Sam Brownback as saying, ““These so-called ‘guidelines’ for

destructive human embryonic stem cell research try to put a good face on an unethical line of research. We should not be destroying young human lives for the benefit of others” (in Weiss, 2005, p. A2).

Ethical concern over research for purely financial gain emerged as a second concern related to research protocol. United Church of Christ minister Ronald Cole-Turner was quoted as saying, ““And, don’t forget, how much money will change hands? What might be patented? It’s morally problematic to create wealth by destroying embryos”” (in Grossman, 2001, p. 8D). Further explanation of the concern was clearly illustrated in one *USA Today* article:

Leading ethicists and medical advocacy groups say that lack of public funding will allow the private sector to conduct the research on its own terms, and that will give a small number of biotechnology companies and the largely unregulated fertility industry a monopoly or oligopoly on future medical therapies (Friend, 2001a, p. 8D).

While this aspect of the theme illustrates concern regarding a lack of federal regulation over stem cell research, by far the greatest amount of content related to the theme of impeding scientific progress appeared as a response to President Bush’s August 2001 policy announcement. This aspect of the theme centered on the number of stem cell lines in existence, as of August 2001, and whether or not those existing lines would be sufficient to advance research. In September 2001, the *New York Times* carried a front page article analyzing a report from the National Academy of Sciences, an organization of the nation’s leading scientists. In this report, scientists conclude that “new colonies, or lines, of human embryonic stem cells will be necessary if the science is to fulfill its potential” (Stolberg, 2001b, p. A1). In addition, the report stated that “federal financing, and the government oversight that comes with it, ‘offers the most efficient and responsible means of fulfilling the

promise of stem cells to meet the need for regenerative medical therapies” (in Stolberg, 2001b, p. A1). Hence, the restrictions put in place by President Bush are a serious impediment to scientific progress. Although this article was printed on the front page of the *New York Times*, it appeared in the September 11, 2001 issue; thus, it likely received little, if any, attention from policy makers or from the public.

### Ethical Analysis Summary

Qualitative analysis of the data found that the ethics/morality frame emerged in several key areas: the theme of what it means to “be alive,” the theme of the value of human life and the impact on stem cell research, the theme of the religious perspective, the theme of abortion and the stem cell connection, and the theme of the consequences of impeding scientific progress. In terms of duties and/or consequences, Immanuel Kant’s categorical imperative was invoked in reference to the means to an end argument. In this classic philosophical argument, Kant’s categorical imperative speaks in absolutes; it is immoral to use something in order to achieve a certain end. As such, we have a duty to *protect* life. Within the stem cell debate, opponents argue that it is immoral to sacrifice an embryo, even if the intention is to save lives—it is unethical to use something even to obtain a beneficial end. Although not as prominent, John Stuart Mill’s Utilitarian perspective was also invoked in philosophical discussion: although the embryo is deserving of moral consideration, the potential benefit of helping countless people outweighs the harm done to any one embryo. The argument was most commonly seen in framing of the Jewish perspective on embryonic stem cell research—we have a duty to *preserve* life by searching for ways to heal the ill, the suffering, and the dying.



In returning to the theoretical basis for this research, one of the central facets of framing theory argues that the process of media framing occurs not just through the frames that are included, but through the frames that are excluded. To review, Entman (2004) writes, “The sine qua non of successful framing is magnitude—magnifying those elements of the depicted reality that favor one side’s position, making them salient, while at the same time shrinking those elements that might be used to construct a counterframe” (Entman, 2004, p. 31). In the analysis of the ethical frames, the theme of the consequences of impeding scientific progress received considerably less coverage than did, say, the religious theme. Thus, media audiences could be left to conclude that the ethical reservations regarding stem cell research from the religious perspective (the duty to *protect* life) deserve far more consideration—and are thus more significant—than the scientific interest in conducting research (the duty to *preserve* life).

In addition to analyzing the text component of the stem cell research debate, news photographs were also analyzed in an effort to further understand how the news media are framing the issue of stem cell research.

#### Photographic News Frames of Stem Cell Research

**How does photographic newspaper coverage of stem cell research frame the issue? How does photographic newsmagazine coverage of stem cell research frame the issue?**

In addition to examining news texts, this dissertation also sought to understand the visual frames, as created through news photographs, of news coverage about stem cell research. Based on the methodological guidelines for sample selection, 232 news photographs were analyzed (112 *New York Times* photos, 72 *USA Today* photos, and 48 *Newsweek* photos). For the *New York Times* and *USA Today*, about half of all the photos

appeared in the A section of the paper, while *Newsweek* included three cover photos. In addition, more than half of all photos appeared at the top of the newspaper or newsmagazine page. Both of these factors indicate that the issue received high visual prominence in regard to framing. However, the majority of the photos were in the two smallest size categories, indicating a smaller degree of visual prominence.

As with the articles, photos were coded for presence or absence of frame categories. Table 13 presents this data for both newspapers and the newsmagazines.

Table 13. Frame appearance in photos for newspapers and newsmagazines

	Newspapers n=(184)		Newsmagazines (n=48)	
Frame				
science	<b>39.7%</b>	<b>(73)</b>	<b>41.7%</b>	<b>(20)</b>
scientists	15.2%	(28)	0.0%	(0)
scientists in lab	15.8%	(29)	20.8%	(10)
embryo as ball of cells	3.3%	(6)	8.3%	(4)
stem cell lines or colonies	5.4%	(10)	12.5%	(6)
politics	<b>51.2%</b>	<b>(94)</b>	<b>48.0%</b>	<b>(23)</b>
political figures – pro research	20.1%	(37)	8.3%	(4)
political figures – anti research	12.5%	(23)	14.6%	(7)
non-political figures – pro research	8.2%	(15)	14.6%	(7)
non-political figures – anti research	8.7%	(16)	4.2%	(2)
grass roots political activism	1.6%	(3)	6.3%	(3)
medical	10.3%	(19)	<b>23.0%</b>	<b>(11)</b>
medical personnel	0.5%	(1)	2.1%	(1)
people who have benefited	1.1%	(2)	0.0%	(0)
people who hope to benefit	8.7%	(16)	20.8%	(10)
religion	1.6%	(3)	<b>27.1%</b>	<b>(13)</b>
religious figures – pro research	0.5%	(1)	0.0%	(0)
religious figures – anti research	0.5%	(1)	6.3%	(3)
religious activism	0.5%	(1)	4.2%	(2)
celebrity	4.3%	(8)	<b>16.7%</b>	<b>(8)</b>
international	4.9%	(9)	2.1%	(1)
snowflake	4.3%	(8)	0.0%	(0)
other	11.4%	(21)	4.2%	(2)

Notes: 1) Raw numbers shown in parentheses. 2) Raw numbers in cells do not equal to the value of n because only affirmative answers are presented in the table.

As seen in Table 13, the vast majority of the photographic frames either emphasized science or politics. The science frame, found in about 40% of all photographs, was primarily represented in three ways: highly magnified photographs of human embryos; blood/stem cells in test tubes; or photographs of scientists or scientists working in labs. As the central ethical dilemma in the stem cell debate is about the moral status of the embryo, the highly magnified photographs of human embryos warrant additional discussion. The highly magnified photos of embryos were generally taken when the embryo was between four to eight cells. In no way was the human form recognizable in these photographs of embryos. This finding echoes the finding of Williams et al. (2003) in which the embryo was represented as a “ball of cells.” In no photographs was the embryo pictured as a recognizable human form in the articles about stem cell research.

As mentioned in the introduction, stem cells can come from either excess embryos from in-vitro fertilization procedures or from the fetuses of terminated pregnancies, which is where the religious component of the debate enters. Previous research has indicated that those who support stem cell research advocate the embryo pictured as a cluster of cells, while those who oppose stem cell research advocate the embryo pictured as a developing, recognizably human fetus (Williams et al., 2003). The current research found that a large percentage of the visual news frames for science was devoted to highly magnified photos of embryos. Again, in every photo of this nature in all publications, the embryo was pictured as a cluster of cells. In no photos was the embryo pictured as a fetus with recognizable human forms. In the case of stem cells being obtained from excess embryos from in-vitro fertilization procedures, the representation of the embryo as a cluster of cells is highly accurate. The case of obtaining stem cells from the fetuses of aborted pregnancies is a

different matter. The pro-life campaign is strongly advocating against stem cell research by connecting stem cell research with abortion. Yes, stem cells can be obtained from terminated fetuses, but the bottom line remains—abortion and stem cell research are different issues. However, the abortion (pro-life) connection was clearly a component of the stem cell debate as seen in both the text and photographic coverage.

The political frame was present in about half of all the analyzed photographs. The political theme was largely represented by photographs of politicians, specifically photos of President Bush. Photos of other political figures included Karl Rove, Tom DeLay, Orrin Hatch, Sam Brownback, Arlen Specter, and Tom Daschle. The political theme was also represented by images of non-political figures. For example, there were a number of photographs of Christopher Reeve and Michael J. Fox, who have both used their own medical conditions as a political lobbying tool to advocate for stem cell research. Former first lady Nancy Reagan can also be included in this group. Prior to and following her husband's death, she has advocated for stem cell research as a potential cure for Alzheimer's disease. In regard to political figures, in the newspaper photos, political figures supporting stem cell research outweighed opponents almost 2 to 1. The opposite was true for *Newsweek*—political opponents of stem cell research outweighed political proponents. The political frame was also represented through photographs of non-prominent people. An interesting photo of this nature appeared in *Newsweek*. The photo was of a woman standing in front of the U.S. Capitol holding a sign that read, "Stem cell research is pro-life—My daughter's life." The photo represents grassroots political activism. The photo also brings up a key point in the ethical debate surrounding stem cell research—the connection to the pro-life campaign. However, this photo primarily emphasizes stem cell research—the pro-life comment is used

peripherally. Within the articles about stem cell research, in only one photo was the pro-life campaign clearly the focus. A half-page color photo in *Newsweek* was of a number of activists holding pro-life rally signs surrounding a statue of the Virgin Mary.

The medical frame—or that of the potential of stem cell research to alleviate human suffering and save lives—also emerged through the photographs as a news frame. The photo mentioned in the previous paragraph about the woman holding the sign that read, “Stem cell research is pro-life—My daughter’s life” represents the political frame, but it also represented helping people as a frame. The sign emphasizes the potential of stem cell research to save human life. There were a few photographs like this one that emphasized helping people. However, most of the photographs that fell into this news frame were of individuals who believe that stem cell research can help them or their loved ones. As was already mentioned there were a number of photographs of Christopher Reeve, Michael J. Fox, and Nancy Reagan. Photos of these people were considered under both the theme of politics and of helping people. There were also photos of non-prominent people under the theme of helping people. The implication in the photos of this nature was that of giving a human face to many of the illnesses that could potentially be cured through stem cell research. The medical frame of stem cell research was nearly invisible in the newspaper photos, appearing in only 10% of all photos, while it appeared in nearly one-fourth of all *Newsweek* photos.

The final primary news frame that emerged from the photographs was religion. Like the previous frames discussed, the religious frame emerged, in part, through the people featured. *Newsweek* included a photo of Pope John Paul II as a conservative religious figure opposed to stem cell research. *Newsweek* also included a photo of Rev. Jerry Falwell and a

photo of a Catholic archbishop, both of whom oppose stem cell research. In addition, *Newsweek* featured a full page photo of protestors of stem cell research praying in front of the White House. The religious frame also emerged in the pro-life photos, which were previously discussed. The pro-life movement is openly associated with the Roman Catholic Church and Protestant Fundamentalism. Interestingly, the religious frame was present in only 1.6% of all newspaper photos, while it was present in a startling 27% of all newsmagazine photos. This finding could reflect the fact that newsmagazines operate on a more relaxed time frame: since they have more time, they may be able to cover additional angles—such as the religious perspective—of a subject. This finding could also reflect differences in readership demographics or it could simply reflect the fact that newsmagazines have room to include a greater number of photos with their news stories. As these are only speculations and the difference is so great, the finding certainly merits future study.

Since the work of Nisbet et al. (2003) a new concept in this debate has become more readily apparent: the celebrity advocate. While this frame was nearly invisible in the newspaper photos, it appeared in 17% of *Newsweek* photos. The celebrity frame in association with stem cell research deserves further consideration. While celebrity endorsement of products is not a new issue for the media, media coverage of celebrity association—and the subsequent public reaction—with health/medical issues is relatively new. Arguably, the most notable instance has been seen in what has been termed the “Katie Couric Effect” (Cram et al., 2003). Following a series of cancer-awareness segments by the *Today Show*, specifically one in which Couric underwent a colonoscopy on live television, colonoscopy rates among the public increased (Cram et al., 2003). Brown, Basil, and Bocarnea (2003) argue that through “celebrity branding” of health communication

campaigns, audiences are able to develop a sense of intimacy and identification with the celebrity personality (p. 55). In the case of stem cell research, while most Americans personally know someone with a disease/disability thought to be potentially alleviated through stem cell research, celebrity advocates, such as Christopher Reeve, Michael J. Fox, and Nancy Reagan, help to personalize the issue. This has especially been true within a political context. As was seen in the photos in *Newsweek*, many instances of the celebrity photos occurred within a political strategy frame. Interestingly, again, the celebrity frame was nearly invisible in the photographic newspaper coverage of stem cell research.

Another relatively new aspect in the stem cell debate is the snowflake baby. Although the snowflake frame appeared in only 4% of newspaper articles and in no newsmagazine photos, it is a central facet of the ethics of the debate and, it too, warrants additional discussion. As discussed in the introduction, many pro-life supporters are opponents of stem cell research because they argue that life begins at conception. Many of these supporters argue that excess frozen embryos can be “adopted” by another couple and implanted in the “adopting” mother’s womb. Babies born in this manner are termed “snowflake” babies.

President George W. Bush has been one of the strongest proponents of the snowflake program, appearing flocked by snowflake babies and their parents on a number of occasions. Using these snowflake babies in this way clearly represents a highly politicized use of these children. By positioning these children around Bush, as in the case of his July 2006 veto announcement, the Bush White House created its own anti-stem cell research frame. In the photographic media coverage of Bush’s 2006 veto, the *New York Times* included two front page photos: one of Bush flocked by snowflake children and one of a man who has been paralyzed, sitting in his wheelchair. *USA Today* did not include a front page photo, but a



photo of Bush flanked by the snowflake children was included on an inside page with the related article. In this case, the Bush White House won the framing war as both the *New York Times* and *USA Today* included the Bush photo-op. Returning to McCombs (2004), in this example, the Bush White House was the “epitome of political power” in controlling the stem cell debate (p. 82). The media picked up the White House frame. However the *New York Times* included a visual counter frame: the photo representing the pro stem cell research position. Using the Bush photo alone provided an incomplete photographic frame. To represent Bush’s highly charged political and emotional decision in a more balanced manner, it was more appropriate to use two photos—one of the Bush position and one of the pro-stem cell research position. And, this was the decision made by the *New York Times*.

The international frame also emerged in the news photos, appearing in 5% of newspaper photos and 2% of newsmagazine photos. This frame largely emerged through coverage of stem cell related research in other countries and in coverage of the South Korean scientist scandal. Interestingly, the other frame occurred in about 10% of all newspaper photos and in about 4% of newsmagazine photos. The other frame included photos of scientific buildings and photos of animals.

To further understand the story told by the photographic news frames, all front page photos for the *New York Times* and *USA Today* and all cover photos from *Newsweek* were analyzed in-depth to understand photo content and surrounding context. The *New York Times* included eight photos on the cover page, while *USA Today* included only one photo on the cover page. *Newsweek* had a total of three cover images devoted to stem cell research.

The first two *New York Times* cover photos appeared on the July 18, 2001 issue, under the headline “Stem cell debate in house has two faces, both young” (Stolberg, 2001a,

p. A1). The first photo was of a couple and their twin sons, both of whom were born from “adopted” embryos, thus representing the snowflake frame. The second photo was of a couple and their daughter, who is suffering from Rett syndrome, a syndrome which scientists believe may be curable through future stem cell research, thus representing the medical frame of helping people. In addition, both of these photos were taken of the couples and their children at a House of Representatives hearing debating stem cell legislation. Therefore, the photos also represent both the non-political opponents and proponents frames. While the photos are the same size, the snowflake frame photo was placed on top of the helping people frame photo, indicating that the former has greater visual prominence.

The third *New York Times* cover photo was dramatically different—a full-body shot of President Bush on his Texas ranch. The photo appeared on the August 14, 2001 cover page under the headline “Bush says he will veto any bill broadening his stem cell policy” (Bruni, 2001b, p. A1). The photo appeared at the top of the page, thus giving strong visual prominence to the opponent political figure frame. While the *New York Times* did not publish another stem cell front page photo until May 25, 2005, the image was another photo of President Bush. In this photo, under the headline, “House approves a stem cell bill opposed by Bush,” President Bush is pictured holding a snowflake baby amid cheering parents (Toner & Stevenson, 2005, p A1). As such, the photo illustrates the opponent political figure frame and the snowflake frame. Interestingly, while the article is about political figures passing a bill to expand federal funding, the photo represents the opposite frame. Just eight days later, the *New York Times* published another cover photo illustrating the snowflake frame. Under the headline, “From stem cell opponents, an embryo crusade,” the photo pictured a family of

six, their youngest child born of an “adopted” frozen embryo (Belluck, 2005, p. A1). In this case, the photo accurately represented the article content.

The next two front page photos related to stem cell research appeared together on the July 20, 2006 issue, under the headline, “First Bush veto maintains limits on stem cell use” (Stolberg, 2006b, p. A1). The first photo was another photo of President Bush flocked by snowflake babies and their parents. The second photo was of Senator Harry Reid, a stem cell research supporter, and Jeff McCaffrey, who is paralyzed and was sitting in a wheel chair. In this case, while the two photos do balance each other in regard to frame content, the first photo is physically on top of the second photo, thus giving the opponent position greater visual prominence. The final cover photo related to stem cell research was a photo of a highly magnified embryo, resembling a “ball of cells.” This mug shot size photo appeared on the August 24, 2006 issue under the headline, “In new method for stem cell, viable embryos” (Wade, p. A1). Interestingly, this was the only *New York Times* cover photo to emphasize the science frame. Further, of the eight *New York Times* cover photos related to stem cell research, an unsettling four of those photos represented the snowflake frame. Thus, in Entman’s (2004) argument, the “snowflake” aspect of stem cell research had a clear and prominent visual position in the *New York Times*.

The one *USA Today* front page photo appeared on August 8, 2001 with the article “Stem-cell debate hits home for lawmakers” (Kiely & Hall, p. A1). This photo appeared the day prior to President Bush’s prime-time televised speech outlining his stem cell policy. The photo was of Rep. Jim Langevin (D-R.I.). An accidental gunshot at the age of 16 left Langevin almost completely paralyzed; he is confined to a wheel chair. In the *USA Today* photo, Langevin is pictured in his wheelchair in the halls of the U.S. Capitol. The caption,

along with the body text, identifies Langevin as a pro-life advocate who supports federal funding for embryonic stem cell research. Thus, the photo illustrates the proponent political figure frame and the medical helping people frame. The article also included a second photo, but the second photo is included on an inside page. Incidentally, the inside photo was also of a representative supporting federal funding of stem cell research. The inclusion of two photos representing the same visual frame could also be considered unbalanced coverage.

In total, there were three *Newsweek* cover stories about stem cell research—each used a full page cover photograph with the story. In magazines, a cover story is clearly understood to be the most prominent story within the issue. Additionally, as the cover of a magazine could be considered one visual element in that the headline text usually overlaps or is tightly connected with the photograph, headline text was also considered with the three cover photographs.

The first cover photograph in *Newsweek*, for the July 9, 2001 issue, was of a highly-magnified human embryo, thus representing the science frame. The image, however, had no recognizable human characteristics. Rather, the image of the embryo was that of a cluster of about eight cells. The headline read, “The Stem Cell Wars,” thus making quite clear the polarized debate surrounding stem cell research. Additional accompanying text read, “Embryo Research vs. Pro-Life Politics: There’s hope for Alzheimer’s, Heart Disease, Parkinson’s and Diabetes. But will Bush cut off the money?” The text highlighted the ethical debate between science, religion, and politics, while additionally emphasizing the potential of stem cell research to lead to the alleviation of some of the most life-threatening diseases facing humankind today. However, with the large-sized, highly-magnified cluster of cells, the emphasis was clearly on science.

The second cover photograph in *Newsweek* appeared on the cover of the June 21, 2004 issue. The full-page photograph was a close-up of former first lady Nancy Reagan kissing the flag-draped coffin of her late husband, former President Reagan. The headline read, “Nancy’s Story, Her stem-cell crusade: Can we cure Alzheimer’s?” The photograph exemplifies Mrs. Reagan’s pain from the loss of her husband to Alzheimer’s disease, thus emphasizing the medical potential of stem cell research to alleviate human suffering from disease. As Mrs. Reagan has publicly campaigned to expand federal support for embryonic stem cell research, the photograph carries political overtones in the stem cell debate. Additionally, as former President Reagan and Mrs. Reagan are long time conservatives and Republicans, the photograph also highlights the divide in the current Republican Party regarding stem cell research. Further, given her prominent status, but not as a political figure herself, the photo highlights the celebrity frame.

The October 25, 2004 issue of *Newsweek* focused its cover story on the death of Christopher Reeve and his tireless work as an advocate for stem cell research. As a highly recognized victim of a spinal cord injury, Reeve and his wife, Dana, became a visual icon in the fight to support stem cell research. The *Newsweek* cover carried a full page photograph of Reeve with his wife by his side. The couple were draped with a blanket, thus hiding the breathing tube keeping Reeve alive and most of his wheelchair to which his body was confined. The headline read, “The Battle Over Stem Cells, After Christopher Reeve: The Medical Promise and the Political Minefields.” Visually, the *Newsweek* cover highlighted the non-political proponent frame as well as the medical potential frame in the ethical debate about stem cell research. Given the social status of the Reeve’s, the celebrity frame was also present in this photo. Interestingly, none of the three *Newsweek* covers emphasized religion

as a theme. While *Newsweek* included no photos of snowflake babies, it could be argued that editors at *Newsweek* choose to use two highly emotional photos that both represented the pro stem cell research position on the cover: the Nancy Reagan photo and the Christopher and Dana Reeve photo.

In discussion of the photographic news frames of stem cell research, it is vital to understand that the photographic analysis was based on the understanding that photos are powerful. In turn, it follows that photographs can have a powerful framing effect—especially given the understanding that photos can evoke a more emotional response than can words. As such, previous research, notably that of Dauber (2001) and Messaris and Abraham (2003), has indicated that because of their true to life quality, photos tend to be read by audiences as *direct evidence*, rather than as *constructed reality*. This theoretical underpinning has direct implications based on the findings of the current research study.

First, for both newspapers and newsmagazines, the science and politics frames were clearly dominant, appearing in about half of all photos analyzed. The findings for the remaining frames varied greatly for newspapers and newsmagazines. While the medical frame and the religion frame were nearly nonexistent in newspaper photos, they both appeared in about one-fourth of newsmagazine photos. Further, the celebrity frame also appeared in a large percent of newsmagazine photos. And, while the snowflake frame was absent in newsmagazine photos, it appeared in 4% of newspaper photos. Based on these findings, it could be argued that like the findings from the textual analysis, the political frame dominated the photographic coverage. However, unlike with the textual news coverage, the photographic science frame also received a large percentage of the coverage, which would

indicate a positive finding for the quality of photographic coverage based on previous discussions of framing of issues, events, and actors (Entman, 2004).

However, before the research questions can be answered in full, another aspect of Entman's (2004) framing work must be considered: that of magnitude. Entman (2004) argues that successful framing is based on magnitude, defined as prominence and repetition. While repetition of frames in the photos can be understood based on the data presented in Table 13, the qualitative framing data must be reconsidered in regard to photo prominence. For this study, photographic prominence was based, in part, on placement within the publication. To review, the *New York Times* included eight front page photos, *USA Today* included one front page photo, and *Newsweek* included three cover photos. While a photo is complex and has many layers of meaning, based on the previous analysis and discussion of the photos, of the nine front page newspaper photos, five represented the anti-stem cell position, three represented the pro-stem cell research position, and one was neutral. Based on Entman's (2004) definition of magnitude and relation to media framing, newspapers photographically represented the anti-stem cell research position as more favorable. However, newsmagazines took the opposite framing position, photographically representing the pro-stem cell research position as more favorable.

Table 14 presents a brief summary of the findings of the research questions. The final chapter of this work then attempts to put the study findings in context within the current scientific and political perspectives of stem cell research and what this means for the media.

Table 14. Research questions and key findings

Research questions	Key findings
RQ1. How does textual newspaper coverage of stem cell research frame the issue?	The frames with the highest percentage of appearance within the entirety of the articles are ethics/morality, policy/legal, political strategy, and science background. These four frames occurred in at least 75% of all the articles, with the science background frame occurring in 90% of the articles and the ethics frame occurring in 88% of the articles. For the dominant frame, the political strategy frame was the dominant frame of 45% of the newspaper articles. The dominant frame with the second highest percentage of occurrence was the new research frame, which was the dominant frame of 18% of the newspaper articles. The highest percentage of appearance for any other dominant frame was only 6%.
RQ2. How does textual newsmagazine coverage of stem cell research frame the issue?	The strategy/conflict, ethics/morality, policy/legal, and scientific background frames occurred in at least 60% of all newsmagazine articles, with the science background frame occurring in all newsmagazine articles. However, unlike the newspaper articles, one other frame was also commonly occurring in the newsmagazine articles: the scientific uncertainty/controversy frame appeared in 75% of all newsmagazine articles. The scientific background frame was the dominant frame for 35% of all newsmagazine articles and the political strategy frame was the dominant frame of 25% of all newsmagazine articles. The ethics/morality frame was the dominant frame for only 5% of all newsmagazine articles, while the policy/legal frame was not the dominant frame of any newsmagazine articles. In addition, other frames, including the scientific uncertainty/controversy frame and the new research frame, also had notable levels of occurrence as the dominant frame for the newsmagazine articles.
RQ3. What is the magnitude of the ethics/morality frame in the news coverage?	The ethics/morality frame was the dominant frame of 32 articles. In regard to prominence, for all 32 articles, the ethics/morality frame first appeared within the lead (the first three paragraphs), thus indicating that the ethics/morality frame was highly prominent. The ethics/morality frame was also repeated throughout the 32 articles analyzed. For all of the sources, the ethics/morality frame was present in at least 55% of all paragraphs, indicating a high level of repetition. Thus, for these 32 articles, the ethics/morality frame had a high magnitude in terms of prominence and repetition.



RQ4. What is the language of the ethics/morality frame?	<p>In considering culturally resonant language, the theme of what it means to “be alive” made many references to the “moral status” of embryos, thus enforcing the notion that embryos are, in fact, equal and deserving of full political and social consideration. Another phrase used in conjunction with embryos was “human commodity.” This language was most often used in discussion of economics and patenting issues, thus invoking fear that profit could be made from the buying and selling of humans. In the theme of the value of human life and the impact on stem cell research, there were several notable examples of culturally resonant language. In reference to the debate itself, culturally resonant phrases such as “bioethics controversy” and “emotional debate” were used. Positioning the issue as a “controversy” clearly played up the fact that stem cell research has become a wedge issue in many groups, including the Republican Party, the Pro-Life movement, and the Catholic Church. In addition, framing the debate as “emotional” reinforces the fact that this is a highly personal issue, in that lives—either lives already in existence or lives in their earliest stages of human development—are at stake. Further, stem cell related research was framed as a “moral minefield” and as “intrinsically evil,” a finding echoing that of Nisbet et al. (2003).</p> <p>In returning to ethical language (Craig, 1999), one duty that emerged was the duty to <i>protect</i> life. This duty has a long standing tradition in the evolution of civilized humankind and has been a contentious point of debate on countless issues, from abortion, to war, to capital punishment, to euthanasia: the argument reasons that we, as a civilized society with the ability to create life, have a duty to protect life. In the case of media coverage of stem cell research, this duty was very much positioned in terms of consequences: the question of when does the duty to <i>protect</i> life conflict with the duty to <i>preserve</i> life. These two duties dominated the theme of the value of human life and the impact on stem cell research and can be found throughout the ethics/morality frame.</p>
RQ5. What is the focus of the ethics/morality frame?	<p>The ethics/morality frame emerged in several key ways: the theme of what it means to “be alive,” the theme of the value of human life and the impact on stem cell research, the theme of the religious perspective, the theme of abortion and the stem cell connection, and the theme of the consequences of impeding scientific progress. In the analysis of the ethical frames, the theme of the consequences of impeding scientific progress received considerably less coverage than did, say, the religious theme.</p>

---

Thus, media audiences could be left to conclude that the ethical reservations regarding stem cell research from the religious perspective (the duty to *protect* life) deserve far more consideration—and are thus more significant—than the scientific interest in conducting research (the duty to *preserve* life).

Entman's (2004) framing definition argues that frames have four key functions: defining the problem, identifying causes, conveying moral judgment, and suggesting remedies. Embryonic stem cell research presents a central ethical problem: What is the value of a human embryo, and how does that value compare to the potential alleviation of the suffering of millions of people? As seen in the ethical frame discussion, multiple viewpoints and perspectives emerged; however, taken as a whole, the ethics/morality frame existed in political terms. From the media frames, the problem was political: Who gets to decide the answer to the central ethical problem. In terms of identifying causes, the issue was framed as a jockeying between factions, with political motivation outweighing scientific fact. Moral judgment existed as mudslinging between sides, but what was notably absent from the media frames was moral judgment related to the fact that current political guidelines are based on religious beliefs. What was also notably absent from the media frames was a clear indication of a remedy. Thus, based on Entman's (2004) understanding of media framing, the public are left to themselves to decipher a remedy in the stem cell debate. Granted, it is not the job of the news media—nor would we ever want our media—to dictate doctrine. However, a central component of a successful democracy is a media able to provide insight into the complex issues of our times, rather than hiding behind the politics.

---

RQ6. How does photographic newspaper coverage of stem cell research frame the issue?

The science frame was present in 40% of all newspaper photos, while the politics frame was present in 51% of all newspaper photos. The medical frame was present in 10%, the religion frame was present in 2%, and the snowflake frame was present in 4% of all newspaper photos. While a photo is complex and has many layers of meaning, of the nine front page newspaper photos, five represented the anti-stem cell position, three represented the pro-stem cell research position, and one was neutral. Based on Entman's (2004) definition of magnitude and relation to media framing, newspapers photographically represented the anti-stem cell research position as more favorable.

---

---

RQ7. How does photographic newsmagazine coverage of stem cell research frame the issue?	For the newsmagazine photos, the science frame was present in 42% of photos, while the politics frame was present in 48% of photos. The following frames were present in the stated percentages in the newsmagazine photos: medical, 23%; religion, 27%; celebrity, 17%; and snowflake, 0%. While <i>Newsweek</i> included no photos of snowflake babies, it could be argued that editors at <i>Newsweek</i> choose to use two highly emotional photos that both represented the pro stem cell research position on the cover: the Nancy Reagan photo and the Christopher and Dana Reeve photo. Thus, based on magnitude, the newsmagazine photos framed the pro-stem cell research position as more favorable.
-----------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

---

## **CHAPTER 5**

### **CONCLUSIONS AND IMPLICATIONS**

This research is based on the understanding that the media have the profound ability to define for the public how we should be thinking about the key issues of our times, whether they are political, social, or, in this case, scientific. In the case of embryonic stem cell research, the issue goes beyond science to encompass politics and religion. This research sought to provide a framing analysis of the stem cell research debate as it is presented in the news media. The framing analysis focused on both textual and photographic media coverage. The decision to go beyond a traditional textual framing analysis to include photographs is based, in part, on the understanding that photographs are powerful. Photographs have emotional power that words alone cannot convey. It could certainly be argued that stem cell research is a highly emotional issue—emotion attached to what we, as a society, define as “life.” The split between those who support stem cell research (with the understanding that it could potentially alleviate human suffering) versus those who are opposed to stem cell research (with the understanding that stem cell research destroys existing life) is adding fuel to the fire of our already polarized nation.

Stem cell research is a particularly fitting issue to study from a framing perspective as previous scholars have indicated that framing is especially relevant when the topic is political and/or social (Hardin et al., 2002; Iyengar, 1991). The current research proceeded with the understanding that stem cell research is a political issue that will have unavoidable social consequences, possibly both positive and negative. Iyengar (1991) further argued that

because people are highly sensitive to contextual cues within the mass media, how an issue is framed within the media can have a profound impact on the decision-making process. As such, how the media frame stem cell research could have real consequences on how the American public interpret, and eventually vote for or against, stem cell research. From the study, several key findings emerged.

While the scientific frame appeared in nearly all newspaper articles analyzed, the political strategy frame was the *dominant* frame for nearly half of all newspaper articles. The political strategy frame was also a frequently appearing dominant frame for the newsmagazine articles. For the photographs, the political strategy frame also appeared in about half of all photos analyzed. However unlike with the newspaper articles, the science frame was also largely present, appearing in about 40% of all photographs. The medical frame of helping people through stem cell research (with related scientific context) became somewhat lost in the media framing.

Taken as a whole, the findings of this study indicate that political exploitation of the topic may be overshadowing the medical potential of stem cell research. Further, the findings show that scientific context was not a dominant frame of the articles, indicating that the political aspects of the debate are not necessarily being placed within sufficient scientific context to allow for the public to engage in informed debate.

The findings from the in-depth study of the ethics/morality frame must be considered based on Entman's (2004) framing definition in which he argues that frames have four key functions: defining the problem, identifying causes, conveying moral judgment, and suggesting remedies. Embryonic stem cell research presents a central ethical problem: What is the value of a human embryo, and how does that value compare to the potential alleviation

of the suffering of millions of people? As seen in the ethical frame discussion, multiple viewpoints and perspectives emerged; however, taken as a whole, the ethics/morality frame existed in political terms. From the media frames, the problem was political: Who gets to decide the answer to the central ethical problem. In terms of identifying causes, the issue was framed as a jockeying between factions, with political motivation outweighing scientific fact. Moral judgment existed as mudslinging between sides, but what was notably absent from the media frames was moral judgment related to the fact that current political guidelines are based on religious beliefs. What was also notably absent from the media frames was a clear indication of a remedy. Thus, based on Entman's (2004) understanding of media framing, the public are left to themselves to decipher a remedy in the stem cell debate. Granted, it is not the job of the news media—nor would we ever want our media—to dictate doctrine. However, a central component of a successful democracy is a media able to provide insight into the complex issues of our times, rather than hiding behind the politics.

Although it is undeniable that stem cell research has a political component, the question lies in how that political component is being used and what influences, such as religion, are driving that component. This is most clearly seen in my research finding of the prominence of photos of snowflake babies. Nearly half of the front page newspaper photos included the snowflake frame, while the newsmagazine cover photos emphasized the pro-stem cell research position. However, it is also vital to re-consider the highly magnified images of the embryo. Recall that in all photos of this nature, the embryo was seen as a highly magnified “ball of cells;” in no photo was the embryo pictured with any recognizable human characteristics. It could be said that photo editors showed great ethical responsibility

in printing the “ball of cells” photos rather than printing more marketable photos of dismembered fetuses, which would be sensational and also inaccurate.

At this point, politicians (and the public at large) are fiercely divided in regard to stem cell research, but not along strict party lines. In fact, as some political analysts have projected, stem cell research is causing a great divide in the Republican Party. In returning to the theory of framing, issues are framed both by the content that is included and by the content that is excluded. The quantitative data clearly show the presence and absence of frames in the stem cell debate; however, the qualitative analysis of the ethics frame found that two key points within the stem cell debate were either invisible or nearly invisible in the media coverage.

First, within the ethical theme of impeding scientific progress, which was shown to be nearly invisible, was a discussion of the implications of the current limits of federal funding of stem cell research. While some implications were present, such as the scientific brain drain and selected state actions, what was missing was the day to day impact on federally funded research labs across the country. Most policy discussion simply indicated that federal guidelines require that *no* federal funding be used for embryonic stem cell research on stem cell lines created after August 8, 2001. However, the articles did not address the day to day impact on federally funded research labs: based on current policy, labs conducting embryonic stem cell research cannot use Petri dishes that are bought with federal money; they cannot use light bulbs that are bought with federal money; they cannot clean the floors with cleaning products bought with federal money; and they cannot employ graduate students receiving federal money. In essence, fully separate labs must be set up in order to conduct embryonic stem cell research. This practical implication was nearly non-existent in the analyzed articles.

Second, as was previously discussed, the snowflake frame played a central role in both the analyzed articles and photos. However, at no point was a discussion raised about the reality of what it takes for a “ball of cells” to become a child. While data analysis showed that embryos at the earliest stages of life were often framed as nascent human beings, the reality is that, within itself, a “ball of cells” is not the key determinant in creating a new life. The frame that was missing was that the key determinant in creating a new life is the commitment of a woman to bear that child and the subsequent dedication of society at large to support that woman and child. Absent from media coverage of the snowflake discussion was the reality of child care, food, clothing, housing, employment, and education.

Discovering the absence of these frames in the findings of the current study opens the door for future research in this area. While the study provided an understanding and analysis of how the media have framed stem cell research, the study also uncovered additional directions for future research. First, research should continue to ask questions about the media coverage itself. Given that the political strategy frame was so largely prominent in the analyzed media, future research should explore this frame from a more in-depth perspective, focusing on language and sourcing. This frame could also be further understood by looking at both texts and photos.

Additional mediums should be considered. While a limitation of this study was the small sample size for newsmagazines, the study did find that for this sample, there was a difference in how mediums framed stem cell research. Future research should certainly consider broadcast media coverage of the topic as well as additional newsmagazines. Further, regional news coverage could be compared to national news coverage to test for possible differences in regional news based on political make-up of a given region. A study of this



nature could also yield interesting results given the prominence of the political strategy frame in the national print newspaper coverage. To continue to examine media frames, science-focused news mediums, such as *Discovery* and *Scientific American* magazines, should be explored. As these magazines target a niche audience, it would be interesting to see if their coverage was more focused on the science, rather than political, frames.

Additional visual aspects of media coverage of stem cell research should be explored. As a supplement to photographs, infographics and video should be analyzed. Today, visual communication research runs the risk of being remiss if Web coverage is not included. This is especially true with a complex issue like stem cell research. The technological capability of the Web provide an ideal environment within which to present the highly technical aspects of stem cell research—the Web allows for multimedia storytelling in a way that other mediums do not.

Second, with a full understanding of media coverage of the stem cell issue, research can move from content studies to audience studies with the goal of examining framing effects on audiences. Within this genre of research, theory building can begin. With this goal, differences in framing among media can be tested as well as differences between text and photographic frames. While this research does certainly encourage future studies, the current study has yielded considerable conclusions in its own right.

In terms of implications, first, the research study confirmed that framing theory is a valid way of understanding how the media operate. The collected data, as verified through intercoder reliability tests, confirmed the presence of predicted media frames.

Second, given the understanding that framing theory provides us as to media content, researchers are then in a better position to judge media quality as suggested by McCombs

(2004), which was a stated goal of this dissertation. The findings of this research indicate that in media coverage of stem cell research, the media de-emphasized the scientific perspective that research may lead to cures in favor of focusing on the political strategy and the ethical reservations rising out of one particular political and religious perspective. It appears that in the stem cell issue, the media are choosing to focus on the controversy rather than providing scientific understanding. Thus, in returning to Lippmann's (1922) searchlight analogy, the conclusion that one reaches based on this scholarship is that the media, indeed, are tending to cast more heat (controversy) than light (understanding) on the subject of stem cell research.

## Appendix 1:

Timeline of key scientific and political developments (modified from Godov and Palca, 2007, n.d.)

Date	Event
1981	Embryonic stem cells are first isolated in mice by two groups: Gail Martin at the University of California, San Francisco, and Martin Evans, then with the University of Cambridge.
November 1995	Researchers at the University of Wisconsin isolate the first embryonic stem cells in primates, rhesus macaque monkeys. The research shows it is possible to derive embryonic stem cells from primates, including humans.
November 5, 1998	Researchers at the University of Wisconsin and Johns Hopkins University report isolating human embryonic stem cells. The cells have the potential to become any type of cell in the body and might one day be used to replace damaged or cancerous cells. But the process is controversial: one team derived their stem cells from the tissue of aborted fetuses; the other from embryos created in the laboratory for couples seeking to conceive by in vitro fertilization.
August 23, 2000	The National Institutes of Health issue guidelines that allow federal funding of embryonic stem-cell research. Former President Bill Clinton supports the guidelines.
February 2001	The month after taking office, President George W. Bush requests a review of the NIH funding guidelines and puts a hold on federal funds for stem-cell research.
July 18, 2001	Senator Bill Frist (R-TN) and Senator Orrin Hatch (R-UT), a vocal abortion opponent, call for limited federal funding for stem-cell research.
July 29, 2001	House Speaker Dennis Hastert (R-IL) and other Republican House leaders come out in opposition to federal funding for research.
August 9, 2001	President Bush announces his decision to limit funding to a few dozen lines of embryonic stem cells in existence at that date. Many of the approved lines later prove to be contaminated, and some contain genetic mutations, making them unsuitable for research.
November 25, 2001	Scientists at Advanced Cell Technology in Massachusetts claim to have cloned a human embryo. However, the evidence proves controversial and not conclusive.
February 12, 2004	South Korean scientists announce the world's first successfully cloned human embryo. Unlike other past cloning claims, the scientists report their work in a prestigious, peer-reviewed journal, Science. The embryos were cloned not for reproductive purposes but as a source of stem cells. The news reopens the contentious debate over somatic-cell nuclear transfer, which is sometimes referred to as therapeutic cloning. Scientists say cloning offers a unique way to

	produce cells that may someday be used to treat diseases. But critics argue that any form of cloning is morally repugnant and should be banned.
June 25, 2004	New Jersey legislators pass a state budget that includes \$9.5 million for a newly chartered Stem Cell Institute of New Jersey. The move makes New Jersey the first state to fund research on stem cells, including those derived from human embryos.
November 2, 2004	California voters approve Proposition 71, which authorizes the state to spend \$3 billion on embryonic stem-cell research over 10 years. The measure is a response to federal funding restrictions put into place in 2001. It puts California ahead of the federal government and many other nations in promoting the research.
May 19, 2005	The same South Korean researchers who reported cloning a human embryo in 2004 announce another milestone: they say they've created a streamlined process that uses far fewer human eggs to produce usable embryonic stem cells—a major step toward mass production. Their work is published in Science.
May 24, 2005	The U.S. House passes a bill that would ease President Bush's restrictions on federal funding for stem-cell research.
May 26, 2005	A version of the bill passed in the House is introduced in the Senate. Among Senate sponsors of the bill are two prominent Republicans, Sen. Arlen Specter of Pennsylvania and Sen. Orrin Hatch of Utah. Their support comes despite President Bush's promise to veto any legislation lifting the restrictions on funding he put in place in 2001.
May 31, 2005	Connecticut approves \$100 million in funding for adult and embryonic stem-cell research over the next 10 years.
July 13, 2005	Bypassing the Illinois state legislature, Democratic Gov. Rod Blagojevich creates a stem-cell research institute by executive order. The institute will be funded through a line item in the state budget that gives the Public Health Department \$10 million to fund research.
July 29, 2005	In defiance of President Bush, Senate Majority Leader Bill Frist (R-TN) announces his support of legislation to ease federal funding restrictions for stem-cell research.
September 19, 2005	Scientists in California report that injecting human neural stem cells appeared to repair spinal cords in mice. The therapy helped partially paralyzed mice walk again.
September 21, 2005	Advocates of embryonic stem-cell research in Florida propose a ballot initiative that would give \$200 million in state funds toward the research over the next decade. Two days later, opponents of the science file a petition to amend Florida's state constitution to ban state funding for embryonic stem-cell research.
November 11, 2005	University of Pittsburgh researcher Gerald Schatten alerts editors at the journal Science that there may have been ethical lapses in a landmark cloning paper published in February 2004. In that paper, South Korean scientists claimed they had made an embryonic stem-cell line from a cloned human embryo. Schatten alleged that some of

	the egg donors in that study had been paid, and some were junior colleagues of the lead author, Hwang Woo Suk. Schatten also says there were minor technical errors in one of the tables in a 2005 paper by the same group, a paper on which Schatten was senior author. In that paper, Hwang et. al. claimed to have made 11 cloned stem-cell lines. At the same time, Schatten severs his collaboration with the South Korean scientists.
December 15, 2005	South Korean scientist Hwang admits that there are serious errors in his 2005 paper in Science and asks the journal to retract it. The admission comes three weeks after Hwang apologized for ethical lapses and stepped down as head of the stem-cell program at Seoul National University.
December 29, 2005	The Seoul National University investigation concludes all of the data was fabricated in the 2005 paper that Hwang's team published in Science.
January 10, 2006	The Seoul National University investigation concludes that the landmark 2004 paper was fabricated as well. Two days later, Science formally retracts both Hwang papers.
March 29, 2006	Maryland becomes the fourth state to fund stem cell research, following final passage of legislation in the House of Delegates and a pledge from Gov. Robert L. Ehrlich Jr. (R) to sign the legislation.
April 6, 2006	Gov. Robert L. Ehrlich Jr. signs legislation, making Maryland the fourth state to fund stem cell research. The bill sets guidelines for awarding grants for research using both embryonic and adult stem cells.
May 12, 2006	Hwang is charged with fraud, embezzlement and violating the country's laws on bioethics. He faces up to 13 years in prison. In 2004, Hwang and his research team claimed they had created the world's first cloned embryos and extracted stem cells from them. An investigation concluded the research was fabricated.
July 2006	The U.S. Senate considers a bill that expands federal funding of embryonic stem-cell research. The House passed its version of the bill in 2005.
July 19, 2006	The U.S. Senate passed (63-37) a bill that proposed to expand federal funding of embryonic stem-cell research.
July 19, 2006	President Bush vetoes the bill—the first use of his veto power in his presidency.
August 23, 2006	Scientists unveil a new technique they claim could break the political deadlock over human embryonic stem cells. Researchers with the company Advanced Cell Technology say it is possible to remove a cell from an embryo without harming the embryo and then grow the cell in a lab dish. That single cell can be used to derive embryonic stem cells.
November 9, 2006	Missouri voters back a constitutional amendment that safeguards embryonic stem-cell research in the state. Missouri's legislature had been trying to ban such research in the state.

## REFERENCES

- Alwood, E. (1996). *Straight news: Gays, lesbians, and the news media*. New York: Columbia University Press.
- Angier, N. (2001, December 18). Defining the undefinable: Being alive. *The New York Times*, p. F1.
- Babington, C. (2006, July 19). Senate passes stem cell bill; Bush vows veto. *The Washington Post*, p. A1.
- Bacon's Magazine Directory. (2003). Chicago: Bacon's Information Inc.
- Bacon's Newspaper Directory. (2003). Chicago: Bacon's Information Inc.
- Bateson, G. (1972). *Steps to an ecology of the mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. New York: Ballantine.
- Belluck, P. (2005, June 2). From stem cell opponents, an embryo crusade. *The New York Times*, p. A1.
- Broadway, B. (2001, August 4). Faith is a force on both sides of stem cell debate; religious communities split sharply on permitting embryonic research. *The Washington Post*, p. B9.
- Brossard, D., & Shanahan, J. (2003). Do citizens want to have their say? Media, agricultural biotechnology, and authoritarian views of democratic processes in science. *Mass Communication & Society*, 6(3), 291-213.
- Brown, W. J., Basil, M. D., & Bocarnea, M. C. (2003). The influence of famous athletes on health benefits and practices: Mark McGwire, child abuse prevention, and Androstenedione. *Journal of Health Communication*, 8, 41-57.
- Bruni, F. (2001a, July 14). Unexpected priority: Stem cell research's rise as a test for Bush. *The New York Times*, p. A10.
- Bruni, F. (2001b, August 14). Bush says he will veto any bill broadening his stem cell policy. *The New York Times*, p. A1.
- Bush, G. W. (2001, August 12). Stem cell science and the preservation of life. *The New York Times*, p. 4-13.
- Bush, G. W. (2006, July 19). *President discusses stem cell research policy*. Retrieved August 16, 2006, from <http://www.whitehouse.gov/news/releases/2006/07/20060719-3.html>.

- Connolly, C. (2001, July 2). Conservative pressure for stem cell funds builds; Key antiabortionists join push for embryo research. *The Washington Post*, p. A1.
- Craig, D. A. (1999). A framework for evaluating coverage of ethics in professions and society. *Journal of Mass Media Ethics*, 14(1), 16-27.
- Craig, D. A. (2000). Ethical language and themes in news coverage of genetic testing. *Journalism and Mass Communication Quarterly*, 77(1), 160-174.
- Cram, P., Fendrick, A. M., Inadomi, J., Cowen, M. E., Carpenter, D., & Vijan, S. (2003). The impact of a celebrity promotional campaign on the use of colon cancer screening: The Katie Couric effect. *Archives of Internal Medicine*, 163, 1601-1605.
- Dauber, C. (2001). The shots seen 'round the world: The impact of the images of Mogadishu on American military operations. *Rhetoric & Public Affairs*, 4(4), 653-687.
- Entman, R. M. (1991). Framing U.S. coverage of international news: contrasts in narratives of the KAL and Iran Air incidents. *Journal of Communication*, 41(4), 6-27.
- Entman, R. M. (1992). Blacks in the news: Television, modern racism, and cultural change. *Journalism Quarterly*, 69(2), 341-361.
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51-58.
- Entman, R. M. (1994). Representation and reality in the portrayal of blacks on network television news. *Journalism Quarterly*, 71(3), 509-520.
- Entman, R. M. (2004). *Projections of power: Framing news, public opinion, and U.S. foreign policy*. Chicago: The University of Chicago Press.
- Ephron, N. (1978). *Scribble scribble notes on the media*. New York: Alfred Knopf.
- Feeney, M. (2005, April 5). Globe reporter Cook wins Pulitzer; Honored for work on stem cell issues. *The Boston Globe*, p. A1.
- Friedman, S. M., Dunwoody, S., & Rogers, C. L. (1999). Introduction. In Sharon M. Friedman, Sharon Dunwoody, and Carol L. Rogers (Eds.), *Communication Uncertainty: Media Coverage of New and Controversial Science* (pp. xi-xiv). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Friend, T. (2001a, July 19). From tiny stem cells, large life issues. *USA Today*, p. 8D
- Friend, T. (2001b, August 8). Stem-cell debate mixes science, religion, politics. *USA Today*, p. 7A.

- Gamson, W. (1989). News as framing. *American Behavioral Scientist*, 33(2), 157-161.
- Gamson, W., & Modigliani, A. (1989). Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology*, 95(1), 1-37.
- Gitlin, T. (1980). *The whole world is watching*. Berkeley: University of California Press.
- Godov, M., & Palca, J. (2007). A brief timeline of the stem-cell debate. [online] (available at <http://www.npr.org/templates/story/story.php?storyId=5252449>). Accessed on January 13, 2007.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Boston: Northeast University Press.
- Goldberg, V. (1991). *The power of photography: How photographs changed our lives*. New York: Abbeville.
- Goldstein, A., & Allen, M. (2001, August 10). Bush backs partial stem cell funding. *The Washington Post*, p. A1.
- Goodstein, L. (2001, August 12). Abortion foes split over plan on stem cells. *The New York Times*, p. 1-1.
- Goodwin, H. E. (1983). *Groping for ethics in journalism*. Ames, Iowa: Iowa State University.
- Grossman, C. L. (2001, November 27). Furor echoes the questions on stem cells. *The New York Times*, p. 8D.
- Hardin, M., Lynn, S., Walsdorf, K., & Hardin, B. (2002). The framing of sexual difference in *SI for Kids* editorial photos. *Mass Communication & Society*, 5(3), 341-359.
- Hartz, J., & Chappell, R. (1997). *Worlds apart: How the distance between science and journalism threatens America's future*. Nashville, TN: First Amendment Center.
- Hornig, S. (1990). Science stories: Risk, power and perceived emphasis. *Journalism Quarterly*, 67(4), 767-776.
- Iyengar, S. (1991). *Is anyone responsible? How television frames political issues*. Chicago and London: University of Chicago Press.
- Janofsky, M. (2001, August 17). Utah, in poll, backs stem cell money. *The New York Times*, p. A16.
- Kahneman, D., & Tversky, A. (1984). Choices, values and frames. *American Psychologist*, 39, 341-350.



- Kiely, K., & Hall, M. (2001, August 8). Stem-cell debate hits home for lawmakers. *USA Today*, p. A1.
- Kornmiller, D. (2002). Images lead to varying perceptions. *Nieman Reports*, 74-76.
- Lester, P. M. (1991). *Photojournalism: An ethical approach* (Hillsdale, NJ: Lawrence Erlbaum Associates, 1991) [online]; available at <http://commfaculty.fullerton.edu/lester/writings/pjethics.html>.
- Lester, P. M., & Ross, S. D. (Eds.). (2003). *Images that injure: Pictorial stereotypes in the media*. Westport, CT: Prager Paperback.
- Levi, R. (2001). *Medical journalism: Exposing fact, fiction, fraud*. Ames, Iowa: Iowa State University Press.
- Lippmann, W. (1922). *Public opinion*. New York: Free Press.
- Mallette, M. (1976). Should these news pictures have been printed? *Popular Photography*, 120.
- McComas, K., & Shanahan, J. E. (1999). Telling stories about global climate change: measuring the impact of narratives on issue cycles. *Communication Research*, 1, 30-57.
- McCombs, M. (2004). *Setting the agenda: The mass media and public opinion*. Malden, MA: Blackwell Publishing Inc.
- Messaris, P., & Abraham, L. (2003). The role of images in framing news stories. In Stephen D. Reese, Oscar H. Gandy, Jr., and August E. Grant (Eds.), *Framing Public Life: Perspective on Media and Our Understanding of the Social World* (pp. 215-226). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Milbank, D. (2005, May 29). Bush's Jewish allies demur on stem cells. *The Washington Post*, p. A4.
- Mitchell, W. J. T. (1994). *Picture theory: Essays on verbal and visual representation*. Chicago: University of Chicago Press.
- Mooney, C. (2005). *The Republican war on science*. New York: Basic Books.
- Moses, M. (2000, April). Consumer mentality. *The American Editor*, 6-7.
- Munro, N. (2003). Is stem cell reporting telling the real story? *Nieman Reports*, 57(2), 23-25.

- National Institutes of Health. (2005). Stem cell information [online] (available at <http://stemcells.nih.gov/index.asp>).
- Newton, J. H. (2001). *The burden of visual truth: The role of photojournalism in mediating reality*. New Jersey: Lawrence Erlbaum Associates, Inc.
- Newton, J. H. (2005). Visual ethics theory. In Ken Smith, Sandra Moriarty, Gretchen Barbatsis, and Keith Kenney (Eds.), *Handbook of Visual Communication: Theory, Methods, and Media*. (pp. 429-443). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Niebuhr, G. (2001, August 27). Religions ponder the stem cell issue. *The New York Times*, p. A12.
- Nisbet, M. C. (2004). The polls—Trends: Public opinion about stem cell research and human cloning. *Public Opinion Quarterly*, 68(1), 131-154.
- Nisbet, M. C. (2005). The competition for worldviews: Values, information, and public support for stem cell research. *International Journal of Public Opinion Research*, 17(1), 90-112.
- Nisbet, M. C., Brossard, D., & Kroepsch, A. (2003). Framing science: The stem cell controversy in an age of press/politics. *Press/Politics*, 8(2), 36-37.
- Nisbet, M. C., & Lewenstein, B. V. (2002). Biotechnology and the American media: The policy process and the elite press, 1970 to 1999. *Science Communication*, 4, 359-391.
- Ostling, R. N. (2005, June 4). A balance of benefits in stem cell debate; divisions among religious groups suggest theological thicket in life-or-life questions. *The Washington Post*, p. B9.
- Perlmutter, D. D. (1999). *Visions of war: Picturing warfare from the Stone Age to the Cyber Age*. New York: St. Martin's Press.
- Personal communication. Matthew C. Nisbet. May 29, 2006.
- Public attentiveness to news stories. (n.d.). The Pew Research Center. Retrieved May 29, 2006, from <http://people-press.org/nii/>.
- Ramsey, S. (1999). A benchmark study of elaboration and sourcing in science stories for eight American newspapers. *Journalism & Mass Communication Quarterly*, 76(1), 87-98.
- Reese, S. D. (2003). Prologue—Framing public life: Bridging a model for media research. In Stephen D. Reese, Oscar H. Gandy, Jr., and August E. Grant (Eds.), *Framing Public*

- Life: Perspective on Media and Our Understanding of the Social World* (pp. 7-31). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Riffe, D., Lacy, S., & Fico, F. G. (2005). *Analyzing media messages: Using quantitative content analysis in research*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Sanders, P. (1982). Phenomenology: A new way of viewing organizational research. *Academy of Management Review*, 7, 353-360.
- Sanger, D. E. (2001, June 22). Bush leans against support for stem-cell research, aides say. *The New York Times*, p. A14.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*, 49(1), 103-122.
- Scheufele, D. A. (2000). Agenda-setting, priming, and framing revisited: Another look at cognitive effects of political communication. *Mass Communication & Society*, 3(2&3), 297-316.
- Schneider, T. R., Salovey, P., Pallonen, U., Mundorf, N., Smith, N. F., & Steward, W. T. (2001). Visual and auditory message framing effects on tobacco smoking. *Journal of Applied Social Psychology*, 31(4), 667-679.
- Stocking, S. H. (1999). How journalists deal with scientific uncertainty. In Sharon M. Friedman, Sharon Dunwoody, and Carol L. Rogers (Eds.), *Communication Uncertainty: Media Coverage of New and Controversial Science* (pp. 23-41). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Stolberg, S. G. (2001a, July 18). Stem cell debate in house has two faces, both young. *The New York Times*, p. A1.
- Stolberg, S. G. (2001b, September 11). Scientists urge bigger supply of stem cells. *The New York Times*, p. A1.
- Stolberg, S. G. (2005, May 25). House approves a stem cell bill opposed by Bush. *The New York Times*, p. A1.
- Stolberg, S. G. (2006a, July 16). Senate appears poised for a showdown with the president over stem cell research. *The New York Times*, p. 1-18.
- Stolberg, S. G. (2006b, July 20). First Bush veto maintains limits on stem cell use. *The New York Times*, p. A1.
- Toner, R., & Stevenson, R. W. (2005, May 25). House approves a stem cell bill opposed by Bush. *The New York Times*, p. A1.

- Utt, S. (1989). How they look: An updated study of American newspaper front pages. *Journalism Quarterly*, 66(3), 621-627.
- Wade, N. (2001, July 24). Grappling with the ethics of stem cell research. *The New York Times*, p. F3.
- Wade, N. (2005, April 27). Scientists draft rules on ethics for stem cells. *The New York Times*, p. A1.
- Wade, N. (2006, August 24). In new method for stem cell, viable embryos. *The New York Times*, p. A1.
- Weiss, R. (1998, December 14). Can scientists bypass stem cells' moral minefield? *The Washington Post*, p. A3.
- Weiss, R. (2001a, February 22). Nobel Laureates back stem cell research; Group of 80 recipients sends letter asking Bush not to block U.S. funding for studies. *The Washington Post*, p. A2.
- Weiss, R. (2001b, December 10). 'Parthenotes' expand the debate on stem cells. *The Washington Post*, p. A11.
- Weiss, R. (2005, April 27). Stem cell guidelines issued; report recommends a ban on paying women for eggs. *The Washington Post*, p. A2.
- Williams, C., Kitzinger, J., & Henderson, L. (2003). Envisaging the embryo in stem cell research: Rhetorical strategies and media reporting of the ethical debates. *Sociology of Health & Illness*, 25(7), 793-814.
- Wischmann, L. (1987). Dying on the front page: Kent State and the Pulitzer Prize. *Journal of Mass Media Ethics*, 2, 67-74.
- Yoon, Y. (2005). Examining journalists' perceptions and news coverage of stem cell and cloning organizations. *Journalism & Mass Communication Quarterly*, 82(2), 281-300.
- Zehr, S. C. (1999). Scientists' representations of uncertainty. In Sharon M. Friedman, Sharon Dunwoody, and Carol L. Rogers (Eds.), *Communication Uncertainty: Media Coverage of New and Controversial Science* (pp. 3-21). Mahwah, New Jersey: Lawrence Erlbaum Associates.