

DIDN'T WE WANT TO KNOW? COMPARATIVE ANALYSIS OF LOCAL VS NATIONAL
FRAMING OF GMO LABELING

by

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Didn't We Want to Know? Comparative Analysis of Local vs. National Framing of GMO Labeling

Thesis directed by Professor Harsha Gangadharbatla

As the agriculture industry and biotechnologies grow and spread, it has become increasingly important to understand the science and policies surrounding it. Most recently the GMO labeling debate has had a high profile in the media and the public with three states having bills and initiatives up for vote on this issue. The research question presented was whether local news coverage of GMOs was framed more emotionally in comparison to coverage in major newspapers in the U.S. A content analysis was performed on both local and national newspapers articles on GMO labeling and GE technology during 2013 and 2014 to determine how GMO labeling was framed in each category.

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“Evidence suggests that the media play an active role in shaping and even constructing controversy rather than simply reporting it,” (Mazur, 1981).

CHAPTER 1

INTRODUCTION

“The intimacy of eating elicits a powerful desire to know that one’s food is safe,” (Opel, Johnston & Wilk, 2010). The concern for our food, its production, and origins should be considered a part of our nature. This includes the concern about ethical and sanitary conditions of food factories all the way to the introduction of the first genetically modified organism (GMO) product the Flavr Savr tomato in 1991 (Bruening and Lyons, 2000). Our relationship with food has constantly changed, and through the years become increasingly politicized and privatized. Today, genetically modified produce have proliferated both American farms and grocery chains, however, the opposition to these foods, along with issues like pesticide use, monoculture agriculture, and genetic engineering (GE) has been around for many years.

We should first address the question of what are GMOs and what is GE. It should be made clear that all living organisms are made up of different genes and carry copies of their genes in their cells. It is these genes that hold the information that determines that organism’s particular shape and its function. “Specific characteristics of an organism may be linked to particular genes or combinations of genes. GMOs, therefore, are organisms whose genes have been artificially altered to modify their characteristics in some way or another,” (What are GMOs?, n.d.) This is what is called genetic engineering, which is the process of altering the genetic material of an organism by a method that does not always occur in nature. “Often GE involves isolating and removing the DNA... from one organism, manipulating it outside the cell (in a laboratory) and reinserting it into the same organism or into the genetic material of another organism,” (What are GMOs?, n.d.) The aim of GE is to develop new or modified characteristics

within certain species of plants or sometimes, even animals. Many times the new characteristics generated help the organism develop resistance towards drought, flood or a specific pesticide. The issue of contention resides in people's ethics and values as to whether foods should be modified in these ways and, as is the focus of this study, labeled. However, the pro-labeling proponents often make it clear they are not trying to abolish GMOs but only ask that they be labeled, that the public has a right to know if a food or any ingredient has been genetically modified.

After World War II, with the introduction and usage of chemicals like DDT, the agriculture industry changed dramatically (Paull, 2010; Carolan, 2011). "It was an innovation that was rapidly adopted and it led to a transformation of agriculture," (Paull, 2010). It was then that the agricultural industry and large chemical corporations began to invest in the use of pesticides and other biotechnologies, like GE, to help maximize yields and deal effectively with unpredictable weather or pests (Carolan, 2011). With the adoption of these technologies becoming more common, many European and American farmers rejected their use pointing towards the danger such techniques could have on the environment and people (Paull, 2010; Carolan, 2011). Media coverage along with organizations against GE grew with people showing a growing concern over the threats conventional agriculture had on the environment, soil fertility, and wildlife diversity (Polacek & Diekmann, 2013).

Then the industry was transformed again in 1980, when the U.S. Supreme Court approved the patenting of living organism. Genetically modified organisms and genetically engineered seeds became the new defining terms of agriculture. Farmers and corporations worldwide began to see the use of GE and in 2008 there was a recorded 125 million hectares grown of genetically modified (GM) foods in over 25 countries. It should be made clear that GM

produce isn't terribly widespread. "In spite of the widespread international use of GM crops, the portfolio of available crop-trait combinations is still very limited. At present, only a few first-generation technologies have been commercialized. The dominant technology is herbicide tolerance (HT) in soybeans, which made up 53% of the global GM crop area in 2008," (Qaim, 2009). Many times GE seeds more profitable for farmers in the United States because they help reduce the amount of pesticides, herbicides, labor, machinery and fuel but in the cases of Bt cotton, they use of GE helps small-scale farmers in developing nations as well (Qaim, 2009).

The use of GE in food production is highly contested because of the large implications for the future of the food supply as well as people's relationship with nature (Sato, 2013). "GM food has become a major topic of contention in trade talks between Europe and the USA, and in food aid... In addition to its international stakes, the genetic engineering, or modification, of food lends itself well to iconic, visual representations of risk...With tremendous motivation on both sides of the controversy, the problem of agricultural biotechnology will not go away anytime soon," (Sato, 2013). The opposition and proponents of organic food responded with the development of their own movements and by helping the organic market grow. In the 1990s the organic foods industry grew around 20% and with it the increased visibility of food safety and environmental issues (Monk, 2011; Smith, 2004; Johnston, Biro and MacKendrick, 2009).

Since then, demand for organic food has increased with many businesses willing to invest in organic foods (Park, 2011; Carolan, 2011; Hauter, 2012). "Today's organic food sector has moved considerably beyond small-scale 'farm to table' distribution to a corporate model of large factory farms supplying distant supermarkets," (Johnston, Biro & MacKendrick, 2009). However, some have noted that with organic foods rising in popularity and in annual revenue it is possible that corporations with an interest in selling organic products will find loopholes, have

oversights in the production processes, or change standard setting processes (Monk, 2011; Smith, 2004; Johnston, Biro and MacKendrick, 2009). And so, the growth of the relationship between the agriculture industry and the biotechnology industry has increased awareness and fear about this issue. To combat this, GMO labeling initiatives began to surface first in European countries and then in countries like the United States. The first real attempts at GMO labeling measures began to emerge in the United States in Oregon in 2002 (Harkinson, 2014) and now in the last found years other states have joined in their efforts to label GMOs, some succeeding and others not.

GMO Labeling Globally vs. the U.S.

Despite how contested the GMO labeling debate is in the United States, as of 2014 there are 64 countries that mandate the labeling of genetically engineered foods (Davidson, 2010). The labeling of genetically modified foods in these other countries has not been without difficulties.

The EU enforced a moratorium on GMOs lasting from 1998 until 2004. The EU is considered to have the most stringent GMO regulations in the world (Davison, 2010). Since the lift of the ban, countries like Spain, Portugal and the Czech Republic have become the largest growers of GMOs in the European Union (Clive, 2002). In 2003 the United Kingdom had a government-sponsored debate about GMOs titled *GM Nation* publicized by national television that brought to the light many different opinions from the public, the government and private industry about this issue (Horlick-Jones *et al*, 2006). This debate was the first of it's kind and is a testament to the importance this issued had after the lift of the moratorium.

Meanwhile, France has had it's own share of problems regarding GMOs. After the lifting of the EU's GMO moratorium France had a very slow procurement of GM crops, which issued negative attention and warnings from the European Commission about their possibly illegal

approach to their use of GE and GMOs (Dunmore, 2011). A second problem they had was their illegal use of the safeguard measure, a clause within the European Commission's regulations, allowing them to ban the use of specific GMOs if the country could prove there are founded concerns over its safety. As of today, Austria, France, Germany, Luxembourg, Greece and the United Kingdom have invoked this safeguard clause on nine separate occasions. However more recently countries like Romania and Spain have moved to become big producers of GM foods (GMOs in a Nutshell, 2014). The history of the GMOs in the United States shows a different picture in terms of its regulation and introduction into the market. The use of genetically modified foods has slowly but surely dominated American fields and the market. The U.S. is by far the largest grower of GMO foods in the world. It dedicated 69.5 million hectares in 2012 (Clive, 2012).

Just recently, particularly with various labeling initiatives appearing on the scene, the GMO labeling debate gained momentum, with anti-GMO and pro-organic agriculture grassroots gaining prominence both in the news and in the public debate. Beginning with Oregon back in 2002, GMO labeling efforts have slowly began to gain traction within the political sphere and in public awareness despite their failure to pass. In 2012, the state of California voted against GMO labeling bill Proposition 37. Then in 2013, the states of Vermont, Maine, and Connecticut all passed laws mandating the labeling of genetically modified foods.

With the potential widespread effects of GE technology and their labeling on global agriculture, the food production system, and economies, it is important for the public to understand what these issues are and how they affect us. Therefore, knowing how the media portrays these issues is very important as well. Looking at public opinion surrounding the issue of GMOs and their labeling in the EU and United States, there has been an increase in the

amount of people concerned about the technology and demanding a form of labeling for them. Surveys reveal “an overall suspicion of GM foods amongst the European public. A high proportion, 70%, agrees that GM food is fundamentally unnatural. 61% of Europeans agree that GM food makes them feel uneasy. In addition, 61% of Europeans disagree that the development of GM food should be encouraged, 59% disagree that GM food is safe for their health and that of their family, and 58% disagree that GM food is safe for future generations,” (Biotechnology Report, 2010). When looking at polling and public opinion concerning GMOs in the United States, we see some similarities between American and European opinions on GMOs. Americans overwhelmingly support labeling foods that have been genetically modified, according to a New York Times poll conducted in 2013. In it, 93% of respondents said that foods containing such engineering should be identified (Kopicki, 2013). Meanwhile, “26% said these foods are not safe to eat, or are toxic, while 13% were worried about environmental problems that they fear might be caused by genetic engineering,” (Kopicki, 2013). In 2014, the issue of GMO labeling was again on two ballots in Oregon and Colorado, however they both failed. One has to ask, why and where did the discrepancy happen between voting and those polls if those similarities existed and they surveys revealed such high numbers of concern?

The debate on GMOs and their labeling is typically shrouded in confusion, skepticism and controversy. Not only is genetically engineering a debated technology but GE labeling also harnesses a very emotional debate. So how has the media influenced or portrayed this issue? “Research suggests that information, communicated effectively to the public, can increase public understanding, trust and confidence in policy decisions based on risk analysis and that environmental administrators are largely dependent on print and broadcast media to relay the justification for policy choices,” (Bacot, McCabe, Fitzgerald 1998). The surprising results at the

polls could point to two things: the big lack of understanding of what GMOs are, and secondly the role the media could have played in informing their readers. Framing and word choices of highly debated political issues are huge determinants of what is made salient in the news, and possibly to the public.

There is another factor that could have had an effect on public awareness and knowledge. Political advertising and campaign materials were widely distributed and could have helped or at least influenced the public's opinion on the labeling initiatives. Anti-GMO labeling campaigns spent more than \$15 million in Colorado and more than \$18 million in Oregon, making it the most expensive ballot initiative in Oregon's history (Runyon, 2014). Although an interesting direction that could yield interesting information on GMO labeling and GE, this is not the focus of this paper but research in this area could prove valuable.

The focus on this essay is to examine how the coverage of GMO labeling in the U.S., and how this might have possibly influenced or informed the public. Specifically, how did framing mediate and shape GMO labeling initiatives both locally and nationally? After seeing where the public generally stands on this issue, the hypothesis is that the media presented conflicting frames and messages that might have possibly contributed to the voting results in Colorado and Oregon. A second supposition, although impossible to prove with the scope of this project, is that with the exposure these terms and issues gained, the media could have played a powerful role in education, informing or at least piquing the curiosity of readers about the science of GMOs and in a sense lead them to change their own opinions. So, did the media facilitate a better understanding of what the labeling bills targeted or were they hindering their understanding and creating more uncertainty?

The issue of GMO labeling has existed and created controversy for many years, particularly since the late 1990s, with the EU's moratorium and then with the creation and awareness of new initiatives in the United States. Although the quantity of coverage of any issue is important, there is minimal research on how the U.S. media frames coverage on GMO labeling. Are themes or frames found in articles about this issue emotional, personalized? Or are they objective and educational in nature? And how could these journalistic or stakeholder voices contribute to the scientific controversy surrounding this issue? Also, what kind of differences would we see between local reporting versus national framing of this, if any at all?

CHAPTER II

REVIEW OF THE LITERATURE

Theory of Agenda-Setting

Beginning perhaps with Lippmann's 1922, *Public Opinion*, and then with McCombs and Shaw's 1972 experiment during the 1968 election, agenda-setting theory set the course for an area of research within the field of mass communication. Agenda-setting theory is defined as the creation of public awareness and concern of salient issues by the news media (McCombs & Shaw, 1972). The two basic assumptions underlying most research on agenda-setting are: (1) the press and the media do not reflect reality but instead they filter and shape it, and (2) media concentration on a few issues and subjects leads the public to perceive those issues as more important than other issues (McCombs and Shaw, 1972).

There are three main levels of agenda-setting effects that have been the focus of most research, recently however, two more levels have been developed and been the subject of further study (McCombs, 2005). The first is "the influence of the media agenda of objects – issues, candidates, or whatever – on the public agenda is the first level of agenda-setting effects," (Lei, Hong Tien & McCombs, 2012), while the second level, called attribute agenda-setting, involves the transfer of this salience given to an object from the media to the public. The third level describes the psychological effects of agenda-setting, specifically the audiences' need for orientation. Agenda-setting research focuses on what audiences learn from the media, and this learning process is mediated by individual differences that in turn are mostly mediated by a need for orientation. This need for orientation is described as each individual's difference in the desire for orienting cues and background information (McCombs, 2005; Camaj & Weaver, 2013). The fourth level of agenda-setting theory can be summarized as the media agenda, which arises out of

the different journalistic norms, traditions, and the daily interactions of news organizations and their sources of information (McCombs, 2005). Finally, the fifth level, are the consequences and the effects of the transmission of salience to the public. The research done in this area has defined three distinct consequences: “forming an opinion, priming opinions about public figures through an emphasis on particular issues, and shaping an opinion through an emphasis on particular attributes,” (McCombs, 2005).

Agenda-setting within political communication and public policy has also wide much attention (Protest & McCombs, 1991; Graber, 1984; Shaw & McCombs, 1977). Research looking at the role of agenda-setting in politics and public policy has ranged from voter’s need for orientation, issue salience for votes, the influence of new coverage on the public and political agenda, presidential and senatorial elections, and many more.

Wolfe, Jones and Baumgartner stated, “Agenda setting from the policy processes approach is fundamentally about the politics of attention and attention dynamics at the level of the political system. As a consequence of this focus on information processing, media dynamics are intimately bound up with policymaking. Because the media play an important role in the process of allocating attention, the media can be understood as fundamental to an information-processing approach to policymaking,” (2013).

It would be difficult to ignore the work that has been done in this field towards the understanding of politics in media. There is little doubt that the field of agenda-setting has yielded important data on the nature of reporting particularly within politics.

Framing in the Media

Framing, much like agenda-setting theory, is an area that has been studied extensively as a whole as well as its role within particular events in history. Entman (1993) describes the uses

and possible effects of a frame in a cohesive way, stating, “Frames, then, *define problems* – determine what a causal agent is doing with what costs and benefits, usually measured in terms of common cultural values; *diagnose causes* – identify the forces creating the problem; *make moral judgments* – evaluate causal agents and their effects; and *suggest remedies* – offer and justify treatments for the problems and predict their likely effects.”

McCombs stated that framing is an attribute of agenda-setting, saying, “both framing and attribute agenda setting call attention to the perspectives of communicators and their audiences, how they picture topics in the news and, in particular, to the special status that certain attributes or frames have in the content of a message. A frame is an attribute of the object under consideration because it describes the object. However, not all attributes are frames,” (McCombs, 2005). Meanwhile, Scheufele (2000) maintains that framing should be a field separate from agenda-setting, saying, “agenda-setting and priming differ from framing with respect to their assumptions and premises...these three approaches to media effects should be taken for what they are: related, yet different approaches to media effects that cannot be combined into a simple theory just for the sake of parsimony,” (Scheufele, 2000). Although there is merit to this debate and whatever framing is part of, within or apart of, framing contains certain qualities that set it apart and that are helpful for and in studying the portrayal of GMO labeling.

The act of framing is to select certain aspects of a perceived object or topic and make it more salient in a communicating text, “to promote a particular problem definition, casual interpretation, moral evaluation and/or treatment recommendation for the item described,” (Entman, 1993). Houston, Pfefferbaum, and Rosenholtz (2012) wrote “framing is unavoidable because, at the institutional and individual journalist level, framing is necessary to interpret,

organize, and understand large amounts of information.” Framing’s focus on issue or object attribute makes this theory particularly useful for examining how policies and political issues are presented to the public. There are two distinct types of frames, media frames and audience frames that work by way of salience. Media frames have been defined as “a central organizing idea or story line that provides meaning to an unfolding strip of events. ... The frame suggests what the controversy is about, the essence of the issue” (Gamson & Modigliani, 1987, pg. 143). Essentially, they wrap up a complex message by focusing on certain interpretations over others. Thus this concept of framing consistently offers a way to describe the power of a communicating text. Audience frames are described by Gitlin (1980, pg. 7) as, “mentally stored clusters of ideas that guide individuals’ processing of information”. Aside from the effects framing may have on specific issues through salience, framing processes also have important effects on issues by way of marginalizing and entrenching them, (Boykoff, 2011, pg. 3). “Most frames are defined by what they omit as well as include, and the omissions of potential problem definitions, explanations, evaluations, and recommendations may be as critical as the inclusions in guiding the audience,” (Entman, 1993).

Equally accepted is that mass communications, in particular television, influences political and social attitudes (Tuchman, 1978). Knowing framing in news coverage works by highlighting certain aspects of the story by way of salience (Entman, 1993) is key in ultimately understanding how the formulation of scientific explanations and political issues like GMO labeling in media may affect the audiences’ opinions and receptions of these concepts that are more often than not, complex processes filled with their own uncertainties. One shouldn’t ignore however, that there are many other factors that act as drivers for people’s actions. Tuchman (1978) recognized that news may be of limited force in swaying public opinions or attitudes.

Framing and Public Policy

In his study, Robert Entman (1989) wrote, “scholarly research clearly establishes that, despite any improvements in access to news, Americans do not know more about politics than they did twenty years ago.” The public’s knowledge of facts or reality has actually deteriorated, so that more people are prone to political fantasy and myth transmitted by the same news media (Entman, 1989; Bennett, 1996; Iyengar, 1991). Each of the players, like the media, politicians and the public, are involved in the process of contextualizing, creating and influencing opinions on public policy. Some researchers focus on how the media influences public perception, others on how political actors shape and use the media to influence opinions on their policies, and other researchers devote time to understanding what role the public plays in affecting what policies matter. All in all, there is a complex and interdependent relationship between these three aspects within our society whose exploration would require a completely separate project altogether. For this project, the focus will stay on exploring the effects and role played by the theory of framing on issues of science and policy.

The effect and influence of framing and journalistic values on politics and public policy has been studied extensively over the last decades (Baumgarten and Voltmer, 2010; Bennett, 1996; Entman, 1989; Iyengar, 1991; Jacoby, 2000). The use of media framing in politics and on policies can have both negative and positive effects for politicians, institutions or political causes depending on the context and values represented. There are various ways the media chooses to frame politics and can sometimes be generalized to a few characteristics or themes.

Some of the words that may define the reporting of politics in the press are: novelty, conflict, and cynicism, (Schudson, 2005; Lawrence, 2000; Cappella and Jamieson, 1997). “The long shadow of Watergate also continues to color reporters’ perceptions of politics. The post-

Watergate culture in Washington journalism encourages reporters to seek out the next big story of official deceit and to “deconstruct” politicians’ strategies as a defense mechanism against continually being “spun” or, worse yet, against any perception that they are too easy on the politicians they cover,” (Lawrence, 2000).

As strategic political communication has become more professionalized, journalists see it as their job to uncover the strategies. This is also a defense mechanism against continually being ‘spun’ by parties or candidates, important because most journalists want to protect their autonomy and avoid being accused of taking sides politically. According to Aalberg *et al* (2011), one of the most important concepts in research on the media’s coverage of politics is the framing of politics as a form of game, a strategic game. “Broadly defined, the framing of politics as a strategic game is characterized by a focus on questions related to who is winning and losing, the performances of politicians and parties, and on campaign strategies and tactics,” (Alberg *et al*, 2011; Lawrence, 2000; Cappella and Jamieson, 1997). By focusing on the strategy of a political game, political reporters are then seemingly able to maintain a stance of both independence and objectivity (Aalberg *et al*, 2011).

There is also a second frame widely seen in political reporting which is the game frame, which stems from the same idea of strategic politics. “Game-framed coverage reflects journalism’s enduring focus on drama and conflict, placing political actors and events into a framework of simple, two-sided conflict, with the drama generated by the expectation of “winners” and “losers.” It also reflects American journalism’s tendency to “personalize” the news by treating politics as a series of discrete conflicts among individual politicians or parties,” (Lawrence, 2000). Then, once a bill successfully runs through the legislative process, the structure of political conflict around it becomes less controlled, predictable and much harder to

transform into a narrative of battle against “the good guys” and “the bad guys”. Conflict may continue at the federal or local levels but that type of conflict is not as likely to be structured around clear-cut outcomes or “victories” or markers of political ‘success’ (Lawrence, 2000; Cook, 1996).

“The tendency to personalize the news also gives the news audience a distorted view of power and its political consequences,” (Bennett, 1996, pg. 51). Boykoff and Laschever (2011) add that “political claims must pass through two filters before becoming news: cultural resonance and journalistic norms. If a group’s or individual’s claims resonate with established US political culture, it will more likely be converted into a media frame, especially if it coheres with the journalistic norms and values guiding news production.” Policy-making is most newsworthy, therefore, when it is marked by clear conflict that promises a resolution, what Cook (1996) describes as “conflict with movement.” Conflict without movement, in contrast, offers little that beat reporters recognize as news, since “the sine qua non of news is not conflict in and of itself, but an endless series of conflicts and momentary resolutions’ that move through the phases of the idealized policy-making process,” (Lawrence, 2000). Just like in any narrative or story, conflict is what pushes the plot forward, what entices readers to “keep with it” because without it, it becomes quite challenging for journalists to create imagery and newsworthiness.

As mentioned, when talking about framing and politics one can’t ignore the relationships that exists between the media and various interest groups and political players and the effect these relationships have on what is reported. Interest groups rely on the media to have their interpretations of reality inserted into the public debate. The final product and story citizens read is not the simple aggregation of interest group activities like events, the release of press releases, or media interviews, but the result of complex interactions between the media and interest

groups, which in turn is largely dependent on a series of media decisions about what constitutes news, news space, and reader interests. “The final outputs are a function of media-specific factors such as professional norms, journalists’ personal values, technical considerations, and marketplace constraints. This mix of elements serves to shape and refine the message citizens ultimately consume,” (Terkildsen, Schnell & Ling, 1998).

Another common and well-known tendency in political media framing, and general framing alike, is the use of ‘episodic’ frames that make use of momentary crises, disasters or discoveries in coverage of stories. Episodic framing almost always guarantees newsworthiness and prominence for those articles. Bennett (1996) points out that when reporting political issues using frames the vicious cycle of crises’ being dramatized and normalized without satisfactory political resolutions has contributed to public anger and mistrust with both the media and politicians, which then encourages cynicism towards them and their institutions.

Framing should be particularly significant as a determinant of choice when the choice problem involves politics. Political issues are typically complex, political discourse is ambiguous, and levels of public knowledge and interest in politics is low (Iyengar, 1991). Politicians seeking support from their constituents are thus compelled to compete over news frames and cyclical attention. To some authors such as George Lakoff (2004), the effective choice of frames that resonate widely with members of the public explains not only the direction of public policy but also the long-run dominance of the Democratic or Republican parties. By giving salience to specific aspects of a political or scientific issue, the media with the terms used to describe a problem, the sources cited, and the perceptions conveyed, can sometimes point blame, imply responsibility for remedial policies, and effectively create further conflict they profit from, in terms of readership.

Focusing how this is evident when reporting on science, we again turn to the example of the Flavr Savr tomato developed by Calgene in late 1991, the tomato was initially hailed as a marvel of technology and the media generated a lot of buzz on the wonders of high tech foods that could deliver leaner meat, celery sticks without stringer, and sweeter vegetables (Nelkin, 1995). “But then, as critics of biotechnology moved in, skepticism became fashionable, and journalists began to write about the tomato as a ‘frankenfood,’ a ‘killer tomato.’ There was a ‘tomato war’ and a ‘tomatogate’,”(Nelkin, 1995, pg. 59).

So, media frames are consistent, coherent bundles of information that journalists provide to infuse political events with structure and meaning. Media frames organize issues, pointing both backward at what happened and forward, offering informative clues for what it all means (Boykoff and Laschever, 2011). An important factor to consider when looking at the framing of public policy is the part risk and risk analysis play on how decisions are made. “Policy makers and experts have differing interests in media coverage and impacts work differently in different areas...Coverage of issues such as AIDS and the ‘flesh-eating bug’ had consequences for risk assessment and surveillance personnel at, for example, the Public Health Laboratory Service,” (Miller, 1998, pg. 222).

Summarizing, in settings where the public lacks interest in the topic being reported on, journalists rely on the use of framing to portray an issue or event in a manner that draws attention and creates newsworthiness or prominence. Meanwhile in situations where journalists have limited knowledge, they rely on reliable sources for a simplified recap of the events or information to help convey an event or issue. Overall, journalists tend to prefer episodic, conflict-based “game frames” or “strategic frames” in portraying issues to help draw readership. These framing tendencies also transfer to the framing of science, which will be discussed ahead.

Value-Framing and the Elaboration Likelihood Model

In terms of the GMO labeling polling done close to the 2014 elections, we know there was a high degree of support for labeling efforts and despite losing in both Oregon and Colorado, the margins were incredible close. The scope of a content analysis does not permit one to make inferences on how these frames could have affect the reasoning and attitudes of the public, but when trying to determine how frames could affect a population or how certain frames might set the course of public debate, it is important to note that frames do not affect each person the same way. Value-framing for example asserts that, “most people are internally conflicted with multiple, often opposing ‘considerations’ on most political issues and do no exhaustively search available considerations. Rather, individuals sample from their available cognitions, oversampling those that are easily brought into conscious thought,” (Shah, Domke, Wackman, 2001). By giving different issues salience over others in news coverage of any particular topic, certain people will resonate with that messaging more than others. Another method to describe these types of effects and individual differences is through the Elaboration Likelihood Model (ELM). Petty and Cacioppo (1983) describe ELM saying “the basic tenet is that different methods of inducing persuasion may work best depending on whether the elaboration likelihood of the communication situation (i.e., the probability of message- or issue-relevant thought occurring) is high or low.” Subtle shifts in message frames also have been found to influence process and outcome of a wide range of social and political evaluations (Shah, Domke, Wackman, 2001). This means that depending on how interested an individual might be on the specific issue, there is a higher or lower chance of the persuasive messaging working.

Proximity and Ethical Decision-Making

An important part of this study is to look at the differences between local and national reporting on science-based and policy issues. In particular, this study aims at identifying the amount frames appear in each of the categories of newspapers and how they differ in terms of their emotional content. Does the local news present the issue of GMO labeling in a more emotional way? This paper tries to make connections and establish patterns on whether local journalism reports on GMO labeling more emotionally, as opposed to national newspapers, due to their proximity to the issue itself. Or could these results be influenced more by the topic itself regardless of where a publication is based off?

The process of ethical decision-making (EDM) is closely related to the issue of dealing with proximity in journalism and what role proximity plays on the publics' perceptions and decision-making processes. Widespread research has been done on the complex process of EDM and the role emotions play in that process. Within EDM literature, moral intensity has received wide attention and a construct of six issue-contingent factors within moral intensity has been developed: "(1) magnitude of the consequences; (2) social consensus; (3) probability of effect; (4) temporal immediacy; (5) proximity – the degree of closeness between the decision-maker and the victims/beneficiaries; and (6) concentration of effect," (Mencl and May, 2009; Jones, 1991). Of particular interest for this study is the proximity a decision-maker has to the issue with three types of proximity described: social, psychological and spatial. Mencl and May (2009) found that the physical dimension of proximity moderated "the relationships between magnitude of consequences and utilitarian evaluations as well as magnitude of consequences and moral intention," (Mencl and May, 2009). If proximity can have this effect on people making decisions on issues or bills that have could have a significant influence on their daily lives, what role does local media play in influencing does decisions?

Readers within the different states that proposed GMO labeling bills were most likely aware of the propositions and measures up for vote. Researchers have found that proximate events cause consumers of news to be much more active in the information-seeking process than do non-local events. A local connection, even with a non-local event, can influence readers' perceptions by causing the reader to become more active. Meanwhile, national news organizations have difficulty tapping into any local issue because their greater concern is for larger societal interests than toward a local community (DeLauder, DeLung, Majorescu and Magee, 2008). Although this study is not based on EDM principles, there is a lot of literature that could help journalism researchers make inferences as to how certain issues might affect people at the local level and how their locality might then in turn affect their decision-making processes.

Media, Framing and Science

Science and the scientific pursuit of knowledge and different technologies is undoubtedly one of the main, if not the most important, pursuits that has lead human-kind to where it is today. But despite the pivotal role science has played in shaping daily life few people are conscience or "in the loop" about the happenings within fields of science, which is why the media plays a crucial role in opening up these areas of research. In the present time the relationship between policy-makers, media, the public and scientists has evolved into a conflicting yet symbiotic relationship. In the United States, the relationship between science and politics can often times be strained and scientific discoveries often overlooked. We have as examples how different administrations from Clinton's to Reagan's, have mishandled events involving science and also how the media has helped only in creating further confusion.

Looking at the case of AIDS/HIV during 1981, the Center for Disease Control (CDC) and National Institutes of Health (NIH) released and commented on the emerging reports of a

new disease affecting young, gay males. However, President Reagan ignored the reports published by the CDC and the NIH and only made his first significant speech about it until 1987 (Snyder & Mayes, 2009). George Bush Jr. in 2007 signed an executive order requiring federal agencies to have a political appointee in charge of a regulatory policy office that reviews industry guidance documents. “The New York Times reported, ‘the White House will thus have a gatekeeper in each agency to analyze the costs and the benefits of new rules and to make sure the agencies carry out the president’s priorities,’ some of the agencies this targeted were the Environmental Protection Agency or Occupational Safety and Health Administration,” (Snyder & Mayes, 2009, pg. 141). Or we can recall Clinton ignoring the recommendations made by several institutions that needle exchange programs were an effective component to the fight against HIV and that they did not encourage illegal drug use went ignore by the Clinton administration that eventually cut the funding for such program (Snyder & Mayes, 2009). It’s clear that although science and the expertise of scientists is vital in creating sound, comprehensive policies, the game of politics can sometimes push it aside.

Meanwhile, an even more knotted relationship exists between the media and science, Lewenstein’s (1995, p. 419) states that the media plays a “catalyzing role in creating complexity” which is not at all surprising. There has been much research done on various areas and intersections of this relationship; research about the ethics of science journalism, why scientists need the media, the “politization” or “mediatization” of science, and the relationship between the public, media and science. Weingart (1998) does a great job at pinpointing some of the main reasons why this relationship is problematic. He summarizes what he calls the science-media coupling into three main configurations: “1) the detour of scientists to the media in order to secure priorities; 2) the media construction of prominence and how it differs from scientific

reputation; and 3) the competition of science for public attention through overbidding discourses.” Although these three configurations definitely are not the only reasons why this relationship tends to be complicated and multifaceted, they are useful in the delineation of the main problems encountered.

By focusing on Weingart’s three configurations we can touch upon the various ways in which science and media intersect. Presently, it is not uncommon for scientists to actively seek out the media as a way of declaring discoveries in their research. There are two major reasons for this shift in scientists’ prioritizing, one is because the more important the media are in the structuring of public discourse the more important it is for science to gain media attention. Or as Weingart (1998) states “the stronger the dependence of science on public consent, the more important is attention and consent of the media.” Phillips *et al* (1991) have shown that even within science, the media may indeed affect perception of scientific publications. The results of their study supported the assumptions that scientists use the media in their fight for priority. Science will become increasingly media-oriented because of the growing importance of media in shaping the public’s opinions and perceptions, and science itself becoming increasingly “mediatized” (Weingart, 1998). This leads the involvement of science and scientists in the media to shift from an educational purpose to a strategic one.

The second way in which the media has promoted a shift in the prioritization of scientific research is through the funneling of scientists into “hot fields”. Here, the term ‘hot’ refers to science fields in which “the research conducted and its results have implications that reach well beyond the borders of the specialty,” (Merton, 1973). Merton (1973) considers that, “the really interesting conditions which decide over the intensity of competition are to be seen in the quality of research areas, i.e., whether they are ‘hot’. This depends on whether they allow relatively

many original discoveries and or if they are socially, economically, politically, ethically, relevant.” Although, it would be unreasonable to assume the media is the sole purpose for funneling in new researchers in to “hot” fields to compete with other “hot” fields, there is some truth in terms of what the public understands as “hot”. With the public’s general lack of access to many areas of research in science, for a large majority the media is their only gateway. In these ways the media does play a significant role in deciding what science or developments gain traction and which don’t and turn could engender competition amongst fields for this attention.

The second of Weingart’s configuration deals with prominence and how the media defines and promotes issues they define as prominent. “The implicit criteria according to which journalists judge the ‘news value’ of a piece of information and according to which they process it to news have been decoded: actuality, sensation, personalization, and locality are among the most important ones,” (Weingart, 1998). Clearly, these criteria are different from those which structure communication in science, the frames that help the media select pieces of information for processing and structuring their knowledge are also different from the ‘disciplines’ within science. Basically, for journalists, novelty is determined and granted when there is a strong connection between a science issue and the environment around it. Weingart (1998) says, “although the media orients itself in their reporting on science to scientific reputation, which they take as a sign of reliability and competence of the scientists concerned, on the other hand they do not feel bound to scientific reputation and thus feel free to depart from it and highlight other features.” In other words, the media coupling may theoretically lead to a competition between media and scientific criteria of relevance and validation. Thus for these particular issues, and in reality, like most others, the media’s use of framing acts much like the source and broker of

information in the communication process, which should belong more so in the domain of science.

The politicizing of science within media is third configuration. Under certain conditions the effect of media-specific processing of scientific knowledge aids in the establishment of themes on the political agenda (Merton, 1973; Weingart, 1998). This process, oriented in the attainment of public attention, follows the logic of “discursive overbidding” and it is within this third configuration that the framing of science in news plays a large role. There exists countless examples in which seemingly well-meant research with goals to improve the environment, public health, or education are misconstrued for the benefit of a few political players (Nelkin, 1995; Martino, 2003). Due to the nature of framing and its tendencies towards being episodic, personalized, and to highlight prominent discoveries, science evolves and adapts to the nature of media framing and the ways in which journalists articulate science in their news stories. The sources for scientific information to the media and hence to the public are usually partisan to the controversy in question, such as spokespersons for one side or the other or experts who provide technical information and status reports.

As was stated, with science developing a need for public and political attention, scientists and researchers also adapt and take advantage of the media’s role. Nelkin (1995) for example describes how scientists adapt themselves to the increasing importance of media for the perception, evaluation and promotion of their work and how they develop strategies of information control in public relations work. With the necessity of selling results of research to influence politicians’ and other researchers’ strategies, it is a reasonable assumption that they have a potential media impact in mind. Goodell (1977) adds that these scientists “seek for the public especially in controversies in order to obtain public prominence even if this behavior does

not conform to the scientific ethos". Weingart (1998) agrees adding that scientists adapt to the media when addressing policymakers and the public. The results are simplified, dramatized pronouncements and prognoses calling for immediate action, which are taken up and amplified by the media. Often enough they become politically effective discourses, whether or not these calls to action are "actionable" enough or appropriate for handling complex cases and issues.

These changes that have occurred over time could be dual implications for political or policy-making actions. On the one hand, the prognoses amplified by the media often create a need for political action and thus focus on legitimacy. That means drawn out public debates on impending catastrophes have delegitimizing implications for politics and force it to binding declarations which ultimately must be implemented in tangible political measures especially if other social groups have entered the discourse. The strength and intensity of impacts thus created depend on the scope of the declared threats (Weingart, 1998; Lawrence, 2000; Miller, 1998). On the other hand it can be expected that the public may get used to scientific scenarios of this kind. It can then no longer be judged reliably whether the drama of declarations by scientists is justified or only construed with a view to their PR-effect (Nelkin, 1987). It may be that politics thus is in danger of losing an important basis of its legitimacy, namely certified expert knowledge.

Due to many of these reasons, a serious disconnect has been formed thanks to the conflicting, biased, personalized and dramatized media coverage on scientific issues. And although this is not the only factor that contributes to a lack of understanding of what genetically modified organisms are or genetically engineering is, it is overall a big contributing factor. Weingart (1998) in fact defines the media's role in the dramatization of certain issues as "central in the transfer of scenarios, their simplification, exaggeration and effective diffusion." These

reasons discussed only further emphasize the importance of understanding how the relationship between science-based issued and journalistic framing or agenda-setting affect audiences' understanding of genetically modified organisms, genetically engineering and other agricultural technologies that heavily impact our food systems.

Mazur (1981) writes, "Media coverage of scientific controversies may do more than define and amplify an event; it may have profound effects on public attitude, the precise nature of which is difficult to specify." The effect on public perception of science is one of the major consequences of the "processing" of scientific controversies or discoveries in the media. As of late researchers have noted on the fact that the public harbors a growing distrust of not only the media but science as well despite public polling heavily calling scientific knowledge an important aspect of understanding the world around us (Mazur, 1981; Nelkin, 1995). There are many examples of science controversies that were only further compounded with the help of the media. For example, the ozone controversy framed as a global catastrophe, the discovery of cyclamates and saccharin in sweeteners led to media frenzies on their harms, and finally the debate over biotechnology (Nelkin, 1995). Here we see again that the issue of GMOs is no different. With the development and refinement of genetic engineering and genetically modified organisms impacting multiple industries and the general public at large, there has not been a lack of outcry at the possibility that the government, political parties and most importantly corporations have pushed the use of GMOs for their benefit despite the consensus of what science may have to say about it.

Bauer et al (2001), explain that once taking into consideration the tendency of the media to personalize and dramatize events, media discourse over biotechnology contributes to the regulation of collective passions over an issue, which influences the manner in which we think

about it and how we come to solutions for future actions. The media offers a public space where various actors present a drama of public significance to a wider audience in order to entertain, to alert and focus attention, to raise passions, to inform, to distract and mislead, and to argue in order to educate. During 1999 for example, the media in the EU had a high frequency of coverage of biotechnology. Research done on this showed the public had greater concern over the production and consumption of GM food during this period. After 1999, in line with a reduction of media coverage and reporting, the climate of opinion towards food biotechnology improved. There was a divide between the public concern for GM food and between those who supported planting GM crops in the EU, the public then became split 50/50 on GM foods (Vilella-Vila & Costa-Font, 2008). Furthermore, Vilella-Vila and Costa-Font (2008) found that “between 1973 and 1996, in European countries in which ‘scientists’ enjoyed more coverage, biotechnology was framed in a more positive way than in those countries where ‘politicians’ captured the coverage of biotechnology.”

All in all, there is a general lack of understanding of science within the public, more specifically complex issues whose research spans over long periods of time like climate change or biotechnology (Miller, 1998). Emerging discoveries and findings that, are many times considered a normal part of the scientific process, are not clearly explained or articulated to the general public and often create even higher levels of distrust and confusion.

As stated by the European Commission in 2003, ‘for the greater majority of Europeans, biotechnology is not a part of everyday personal experience’. As a result, public understanding of conflicting issues draws on mediated information rather than personal experience. This mediated information as we have discussed is a combination of credible information, complex science and (sometimes) partisan sources wrapped up in personalized, dramatized conflict frames that are

then absorbed and digested (we think) by the public depending on their own need for cognition, their own values and available cognitions. The study of the framing of GMO labeling may help paint a better picture of how the issue of GMO labeling is being portrayed and framed however; it's fair to say that research into the roots, patterns and opinions of GMOs and GMO labeling is only in its initial stage.

Research Questions

Why did both GMO labeling bills in Colorado and Oregon fail to pass, when the polls show there was an overwhelming amount of support for those actions? What is due solely to the measures stated within the bill? Or could it have possibly been how the bills, its measures and effects were predominantly portrayed in the mass media? The analysis seeks to explore the way GMO labeling has been framed within major news publications as well as local or state newspapers, how they compare and how they differ during the last 2 years. The goal is to better understand what are the recurring, salient themes within the coverage but, most importantly, if local newspapers are framing GMO labeling more emotionally or dramatically than national newspapers.

RQ 1: With what frequencies were the frames found in both local and major newspapers?

RQ 2: What were the frequencies of “emotional” frames in local newspapers and in major newspapers?

RQ 3: Were frames in local newspapers predominantly more “emotional” in comparison to major newspapers?

CHAPTER III

METHODOLOGY

Context: GMO Labeling in the News

In the last 4 years the topic of GMO labeling has gained traction in the media and across public perceptions thanks to the various GMO labeling initiatives in states like Hawaii, Vermont, Maine, California, Connecticut and more (Bauer *et al*, 2001). These pushes by labeling proponents have given genetic engineering and GMOs in general, more and more scrutiny. In the United States the development of genetic engineering has been part of the agricultural landscape for a few decades, but the issue of labeling is fairly recent in the United States. Despite the steady increase of exposure, studying GMO labeling around a significant or particular event is somewhat difficult because of the lack of an “event”. For instance, when it comes to climate change, the release of the Intergovernmental Panels on Climate Change’s reports or the occurrence of natural disasters usually serve as an event for the focus of content analyses. In looking for the dates or events to research GMO labeling in the news, the most apt times for research on this topic to take place, surround the times when labeling measures are up for vote. In 2002, the first state, Oregon, tried to pass an initiative to label GMOs but failed, then in 2012, California tried with Proposition 37 and also failed. Both 2013 and 2014 were big years for GMO labeling initiatives. In 2013, Connecticut enacted the first GMO labeling law in the U.S. and was soon followed by Vermont and Maine. Meanwhile, in 2014 two states again had GMO labeling on their ballots, Colorado and for the second time, Oregon.

Therefore, for the purposes of this study the two most recent initiatives in Colorado and Oregon were selected for analysis. The two bills, Proposition 105 and Measure 92, in Colorado and Oregon respectively, were up for vote in November 2014. These bills were highly debated

locally and provide a great opportunity to measure the amount and type of framing they received compared to national attention.

Procedure and Sampling

In order to uncover and then analyze any emerging patterns surrounding the labeling of GMOs in media publications a content analysis was performed. Due to the nature of the research questions, this content analysis will focus on comparing frames from local and large-scale publications. The scope of this research project will focus on the five newspapers with the highest circulation in the United States and six local newspapers with the highest circulation from the states of Oregon and Colorado. The newspapers with the highest national circulations are sometimes considered part of the “elite press” in the United States (Boykoff and Boykoff, 2007; Carpenter, 2007) and although based off a particular state like *The New York Times* or *The L.A. Times*, a larger, national audience reads them. That being said these newspapers will be categorized as major newspapers throughout this paper.

It is important to note the difference between elite and non-elite newspapers, or in this case local newspapers. The status of a newspaper can alter how an event or an issue is covered and portrayed. Carpenter (2007), states that elite news publications can define the news agenda for other publications and that research has shown that elite newspapers are more likely to present balanced coverage of controversial issues. Meanwhile, “non-elite newspapers cover local issues to set themselves apart from elite newspapers. Content in non-elite newspapers is more likely to include how an issue affects citizens at the local and state level,” (Carpenter, 2007). This research project makes the distinction of these two types of newspapers in order to compare framing, themes and sources within each category of publication because of the different purposes and audiences they each serve.

The newspapers with the highest national circulation are: *The New York Times*, the *Wall Street Journal*, *USA Today*, the *Los Angeles Times*, and *The Washington Post*. The newspapers with the highest circulation in Oregon are *The Oregonian*, *The Bend Bulletin*, *The Register-Guard*, (in that order) while in Colorado: *The Denver Post*, *The Gazette*, and *The Daily Camera* (also in that order).

The database used to retrieve the content will be *ProQuest Newsstand*. The time period of the sample for the study will include articles from January 2013 to December 2014. With the focus of this research being on the framing of GMO labeling, GE labeling or the initiatives in Colorado and Oregon specifically the keywords used for a Boolean search were: *GMO labeling (or Proposition 105 or Prop 105) (or Measure 92) (or GE labeling) (or genetically modified organisms)*. Two searches were conducted with the exact same search terms, one including all major newspapers and a second with all the local newspapers. The sampling method then used to narrow down the articles to be coded was a stratified random sample, using a constructed weeks sampling method. There were a total of ten constructed weeks used.

The findings and resulting frames from this study can help visualize the coverage of GMO labeling during the selected time period in a clearer way. Although content analyses never demonstrate causation, they are very helpful in setting a good foundation for what contexts, frames, and patterns are being used and developed within the stories, reports and conversations about a particular issue.

Coding and Reliability

The content analysis for all the newspapers will focus on collecting information about the frames used in the articles, specifically information on emotional and non-emotional frames, their frequency, and what sources appeared. Basic information such as newspaper, date, and

format of the article was also collected. Coding sheets are located in Appendix A.

Two independent but trained coders, both graduate students, coded the content collected with the help of the coding guidelines (Appendix B). There were some discrepancies between how sources were coded, particularly coding certain variables of newspapers stories and articles from local newspapers. Any significant disagreements between coders were discussed during training sessions and were ultimately decided by a vote between the coder and the author.

Neuendorf (2002) wrote, "given that a goal of content analysis is to identify and record relatively objective (or at least intersubjective) characteristics of messages, reliability is paramount. Without the establishment of reliability, content analysis measures are useless," (pg. 141). Inter-coder reliability is the widely used term for the extent to which independent coders evaluate a characteristic of a message or artifact and reach the same conclusion. In establishing inter-coder reliability, the agreement between coders for each variable is what is being measured while the reliability of this agreement is what researchers try to determine (Lombard, Snyder-Duch, & Bracken, 2002). Due to our sample size and the number of coders, inter-coder reliability will be found using Krippendorff's alpha (KALPHA), which will be calculated using the SPSS software. This measure is considered one of the most reliable, is recommended for week-to-week diagnostics, for a wide range of sample sizes, and missing data is also not problematic for calculating KALPHA (De Swert, 2012; Joyce, 2013).

Krippendorff's alpha is a reliability measure created by Klaus Krippendorff to establish how reliable the analysis for each variable is, the reliability scale runs from 0 to 1. Krippendorff suggests the following for interpreting his coefficient: "[I]t is customary to require $\alpha \geq .800$. Where tentative conclusions are still acceptable, $\alpha \geq .667$ is the lowest conceivable limit," (Krippendorff, 2004, p. 241). This mean the close the reliability score is to 1 the agreement of

the variable between the coders is close perfect. The KALPHA statistic used for this study calculates reliability per variable coded, therefore each frame is its own variable for example. Here α equals the reliability score measured.

The total amount of articles used for reliability testing was 30% of the sample that equaled to 42 articles of the final sample used. These 42 articles were randomly selected and were each coded twice, once per each coder to establish reliability. Of those 42 articles selected, 21 were from local newspapers and another 21 were from major newspapers. Out of the variables that were coded in the analysis the ones of primary importance were the frame variables and the actor variables. The inter-coder reliability results were for all 7 variables (6 frames and 1 actor variable) achieved greater reliability value than $\alpha = .869$, this given, all reliability results were very satisfactory (De Swert, 2012; Krippendorff, 2004).

Table 1. *Inter-coder reliability results*

Variable	KALPHA
Pro-GMO Labeling Frame	0.937
Anti-GMO Labeling Frame	0.897
Conflict Frame	0.970
Critical-Rejected Frame	0.910
Accepted-Positive Frame	0.869
GMO Science & Policy Frame	0.930
Actors	0.887

Content Analysis

Each story was coded for their primary coverage frames. Of the 6 frames used, 4 were created based on a preliminary study done by the author using the same dates, publications and search terms. With the aim of this research being to uncover the frequency of emotional frames used in local and major newspapers, the preliminary study helped identify what seemed to be

appropriate emotional themes occurring within the content. The two other frames used in this study were taken and adapted from Shehata and Hoppman (2012) research, which he called the Critical-Rejected and the Accepted-Positive frames.

The frames used for this study and that were looked for during the content analysis are described below:

1. Pro-GMO Labeling Frame – *Emotional*: This frame includes the portrayal of GMO and GE science as harmful, lacking scientific research or ethically questionable. This frame is based on the sentiment that the public has a right not know what is in their food. This frame also contains criticism of agricultural corporations like Monsanto or DuPont. This frame is situated in ethical or moral opinion. With this frame there are very strong emotional, moral or ethical statements made and given salience in this type of frame. An instance in which an article would be coded with this frame would be:

For example, “Monsanto profits on both ends, by requiring that farmers buy new seed every year rather than using the centuries-old method of seed saving, and by selling them more and more glyphosate.... We can stop the madness! Let's join the 64 other countries around the world that already require GMO labeling,” (Opinion -A, *Daily Camera*, 2014).

2. Anti-GMO Labeling Frame – *Emotional*: This frame includes the portrayal of GMOs and GE science as safe, necessary and innovative while any of the GMO labeling initiatives as problematic. This frame portrays those opposing GMOs usually do so for unjustified fear of GMOs, being critical of pro-GMO labeling groups for using fear as a tactic to persuade or their lack of scientific evidence to support their opposing of genetic engineering technology.

Similar to the Pro-GMO Labeling frame there are very clear opinions or statements with this type of frame, for example, “People in wealthy countries can afford to live with this outcome. But in the long run, it will take important choices away from farmers and consumers in poor countries...The U.S. Food and Drug Administration has long opposed the mandatory labeling of GMO foods because it agrees with a scientific consensus that these foods so far bring no new risks to human health or the environment... Nonetheless, campaigns by activist groups such as Greenpeace have so scared consumers that most GMO food products have been kept out of the American marketplace,” (Paarlberg, 2013).

3. Conflict Frame – *Emotional*: This frame is critical of labeling campaign players like corporations or non-profits and funding both for and against labeling groups. It portrays opposing sides of the GMO labeling initiatives in each state as competing, using metaphors describing a competition or a battle, taking place. This frame might be accompanied by GMO information however there is an emphasis on this political fight happening posing any of the parties as either the “good or bad guys”.

An example of this frame would be, “Oregon's food fight is just getting started. A ballot measure that would require the labeling of genetically modified foods has already seen significant amounts of cash raised by businesses on both sides of the issue, according to campaign finance filings, even though the election is more than two months away... If recent history is any guide, the money in Oregon is just an appetizer. A group opposed to a similar measure in Washington last year, Initiative 522, won its fight, and along the way made that ballot measure campaign the most expensive in state history,” (Chokshi, 2014).

4. Critical-Rejected Frame: This frame focuses on the policy or bill itself as well as political players involved in pushing the bills forward or those opposed to it like Representatives or Governors. The frame portrays and describes GMO labeling as a problem due to being economically burdensome or targets the vagueness of the bill as a negative consequence it could have. There could also be a positive spin on the rejection of any of the labeling measures due to the consequences it could have had.

For example, “The Right to Know Colorado GMO mandates the labeling of GMO food products. Since consumers like to know what they eat, the idea of is appealing. However, the proposal is ill-conceived and poorly written. It creates more confusion than enlightenment, it will dramatically increase the costs of foods, and taxpayers will face huge legal bills defending the law. A recent analysis of GMO labeling costs by two Cornell University scientists pegged the costs at \$500 per family of 4 per year. Three similar studies carried out in California and Washington State have calculated price tags of \$400-800,” (Staelin, 2014).

5. Accepted-Positive Frame: Similar to the Critical-Rejected frame, this frame focuses on the policy process, the bill itself, and political actors involved in the legal processes. In this particular frame, there is a questioning of the funding and efforts going towards defeating the labeling bill by large-scale food and agricultural corporations. This frame also makes salient the possible positive outcomes of the labeling measure, the benefits it could have in international markets, local markets or the economy and farmers.

An example would be, ““this is not just a right-to-know issue. This is much bigger than foodies,’ said Trudy Bialic, a spokeswoman for PCC Natural Markets, a Seattle-based food cooperative pushing for the initiative’s passage. ‘This is about preserving export markets.’ Bialic said 62 countries ban, restrict or require labeling of genetically modified food, and that apple and

wheat farmers in Washington would face a loss of exports if those products turned out to be genetically altered without being so labeled,” (Kaminsky, 2013).

6. GMO Science & Policy Frame: This frame focuses on the results of the polling, a critique of the measure or bill itself while trying to be balanced in its representations of opposing interesting groups. This could be done by providing quotes or opinions of both or displaying none. For this particular frame there are two types of example, one on GMOs and GE science and the other on information about policy processes. An example of an article surrounding policy processes would be, “If the group decides to go ahead with this new initiative wording, they'd have to go through the ballot title process again. That could delay signature gathering for several months and require the group to spend more on paid canvassers to be sure of making the ballot. (The group needs to collect 87,213 signatures by early July to qualify). At this point, Bates said he's not entirely which route he will go, although he said he is confident that he will aim for next November's ballot,” (Mapes, 2013).

Meanwhile, an example of a story with a salience on GE science, “In this country, roughly 90 percent or more of four major crops -- corn, soybeans, canola and sugar beets -- are grown from genetically engineered seeds, creating a challenge for companies seeking to swap to ingredients sourced from conventional varieties. A portion of the conventional varieties of those crops is exported, and much of the rest of those crops is already spoken for by organic and other companies here... Farmers have long crossbred plants to improve genetics in an effort to increase productivity and resistance to pests and diseases, and decrease the need for water, among other things. The type of genetic engineering done by Monsanto and its competitors, however, involves inserting genetic materials, sometimes from wholly different plant species and bacteria, directly into the DNA plants like corn or soybeans,” (Strom, 2013).

CHAPTER IV

RESULTS

The two related searches yielded a total of 489 of articles. Of those articles, 294 were from major newspapers and 195 were from local newspapers. The sample of 10 constructed weeks used was randomly selected based on the available dates from the search to create 10 full weeks of each the local and major newspapers. The final sample coded was then a total of 140 articles. The 82 articles coded to establish reliability were not included for analysis.

There were a total of 49 stories in 2013 and 90 in 2014 from all the outlets combined for each year. The database searches yielded more results for 2014 than 2013, which is understandable. As was stated earlier, 2014 was the year the two bills that are the focus of this study were on the ballots so there was an obvious increase in the amount of GMO labeling news stories during the months leading up to the elections in November in 2014 because of the two labeling initiatives. There was also an increase in the amount of stories published during the months of April-June both in 2013 and 2014. There are several reason this spike could be, for example: Vermont passing their GMO labeling bill in May 2014, Maine and Connecticut doing the same in June and December of 2013, the March Against Monsanto protests that took place in May and June of 2013 throughout the U.S., or the republishing of a very controversial paper that was previously retracted by Gilles-Eric S eralini in 2012 in summer of 2014. Figure 1 shows the number of articles published per year and month of all articles of all publications combined and Table 2 depicts how many articles per publication there were in the final sample.

Figure 1.

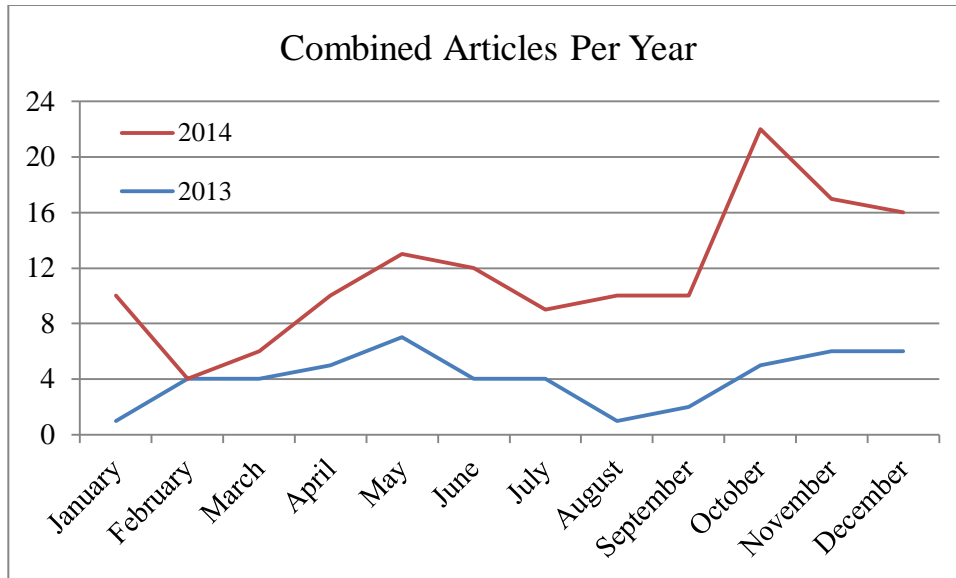


Table 2. *Articles per publication*

	Frequency	Percent
Local		
Denver Post	12	8.6
The Gazette	3	2.1
The Daily Camera	20	14.3
The Oregonian	12	8.6
The Bend Bulletin	5	3.6
The Register-Guard	12	8.6
Major		
New York Times	14	10.0
Washington Post	12	8.6
Wall Street Journal	17	12.1
L.A. Times	12	8.6
USA Today	4	2.9
Total	140	100.0

Overall, in terms of the types of articles coded there was a predominant amount of news reports, but there was also a high number of letters from the public that were published. Local sources published higher quantities of letters, opinion columns, and editorials when compared to the major publications.

Local newspapers published 32 news reports and 20 letters, quite a significant amount of letters. When adding in the local opinion columns and editorials, 16 all together, we see that there was a predominant amount of opinion pieces as opposed to news reports published locally. Meanwhile, within major publications news reports were without a doubt the most common form of content. Again, due to the nature of both of these types of publications and who their audiences are, the gap between the opinion pieces in local sources and news reports in major newspapers is not entirely surprising.

Table 3 and 4 show all results for the frequencies of the article types and the types found in both categories of newspapers.

Table 3. *Article formats for both local and major newspapers*

Type	Frequency	Percent
News Report	81	57.9
Editorial	18	12.9
Opinion/Guest Column	13	9.3
Feature	3	2.1
Letter	25	17.9
Total	140	100.0

Table 4. *Article formats for local newspapers*

Type	Local Newspapers		Major Newspapers	
	Frequency	Percent	Frequency	Percent
News Report	32	45.7	49	70.0
Editorial	8	11.4	10	14.3
Opinion/Guest Column	8	11.4	5	7.1
Feature	2	2.9	1	1.4
Letter	20	28.6	5	7.1
Total	70	100.0	70	100.0

Trends in Frame Types

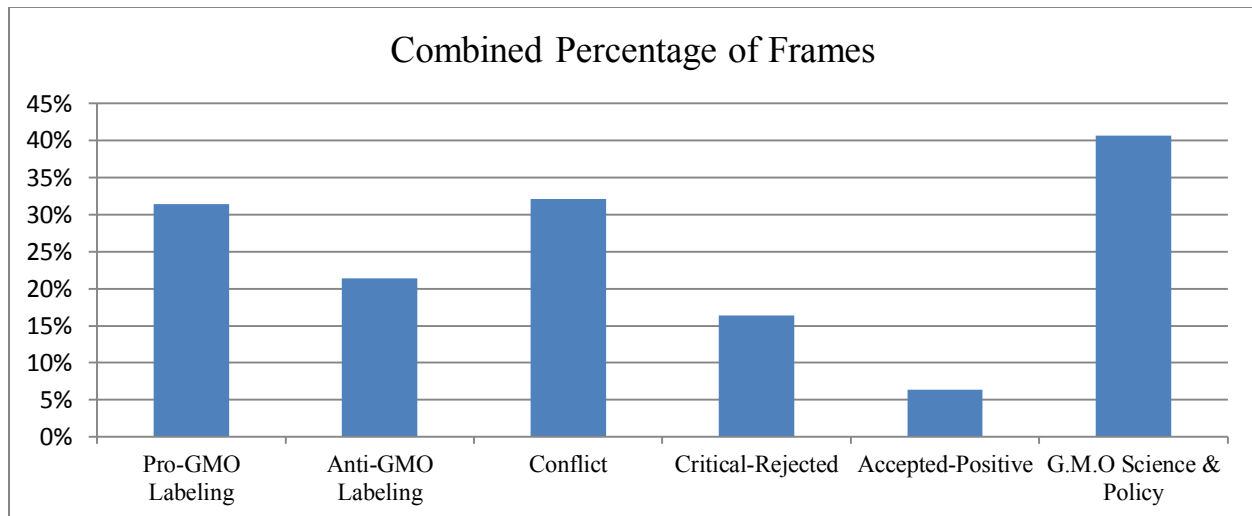
When analyzing the results it was found that the frames were found in a wide range of percentages ranging from as low as 6% to a high of 43%. The majority of frames present in the articles coded were, for the most part, emotional frames. However, the most commonly found frame in both local and major news publications was the last frame, GMO Science and Policy designated as the a non-emotional frame – educational or informational. The next two frames, Conflict and Pro-GMO Labeling, were found a similar amount of times and were at least 10-25% more common in occurrence than the three lowest frames Anti-GMO Labeling, Critical-Rejected and Accepted-Positive. It would be important to note that despite the patterns we see from what frames emerged we should take into consideration the general low frequencies of the results. Despite emotional frames tending to be more predominant in the articles coded, they only appeared 20-40% of the times.

Table 5 and Figure 2 below shows the frequency and percentage each of the frames was found in both categories of newspaper types. It should be noted that the percentages in Tables 5 through 11, should not add up to 100%. Each individual frame is has been calculated independently from the others and are instead each frame out of 100%.

Table 5. *Combined percentage of frames*

	Pro-GMO Labeling	Anti-GMO Labeling	Conflict	Critical-Rejected	Accepted-Positive	G.M.O Science & Policy
Frequency	44	30	45	23	9	57
Percent	31.4%	21.4%	32.1%	16.4%	6.4%	40.7%

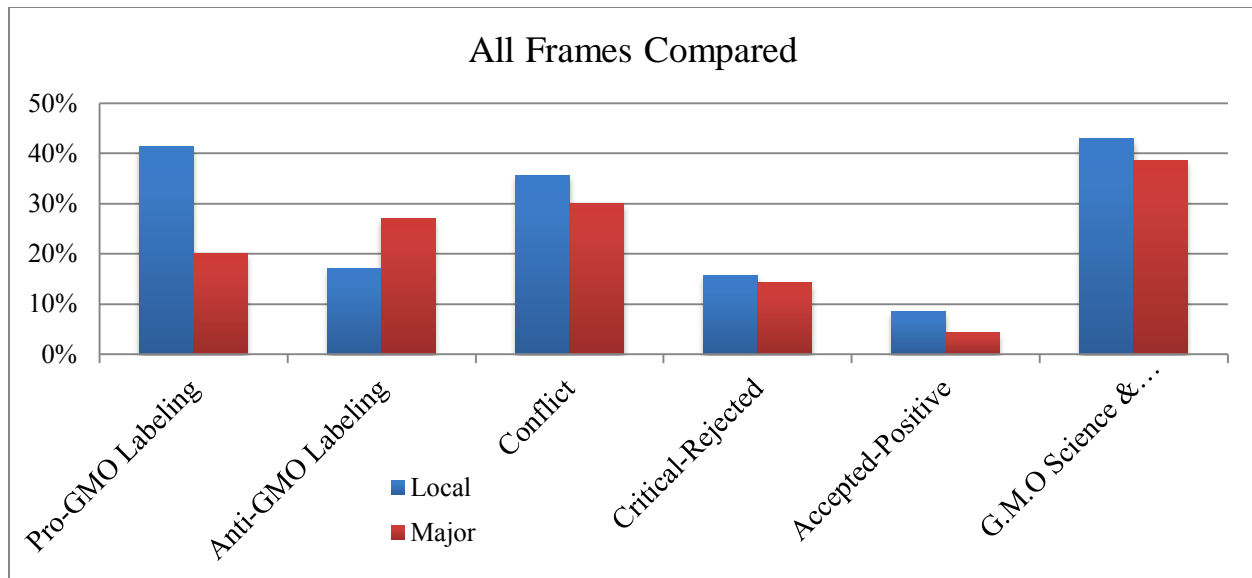
Figure 2. *Combined percentages of frames*



For answering the research questions posed for this study we take a look at the frequency of various frames and which of those frames were the most predominant in each of the different categories of newspaper. For research question 1 we specifically asked, with what frequencies were the frames found in both local and major newspapers? Research question 2 follows up and asking, what were the frequencies of emotional frames in both categories of newspapers?

The predominant frames that were found in local newspapers were the GMO Science and Policy frame with 42.9%, the Pro-GMO Labeling frame with 41.4%, and the Conflict frame with 35.7%. Similarly, the most common frames in the major newspapers were GMO Policy and Science with 38.6%, the Conflict frame with 30%, and Anti-GMO Labeling frame with 27.1%, however the Pro-GMO Labeling frame was close with 20%. Again, in line with the overall results in frame frequencies, the last frame was found in a majority of the articles coded both locally and nationally. Figure 3 helps visualize how all frames compared to one another.

Figure 3. *Local and major frames compared*



What quickly jumps out is the widespread use of Pro-GMO Labeling framing in local sources, the use of the Conflict frame in both categories of sources, and the overall low use of both the Critical-Rejected and Accepted-Positive frames. Also, we see that local news used all frames more than major newspapers with the exception of the Anti-GMO Labeling frame. The Pro-GMO Labeling and Conflict frame had high percentages of 41.4% and 35.7% respectively. Meanwhile, in major newspapers, the second and third most common frames were the Conflict frame and the Anti-GMO Labeling frame. In this category the Anti-GMO Labeling frame was seen with more frequency (27.1%) than the Pro-GMO Labeling (20%), although not by much. The appearance of the Accepted-Positive frame was very rare in the two categories with 8.6% in local newspapers and 4.3% in major newspapers.

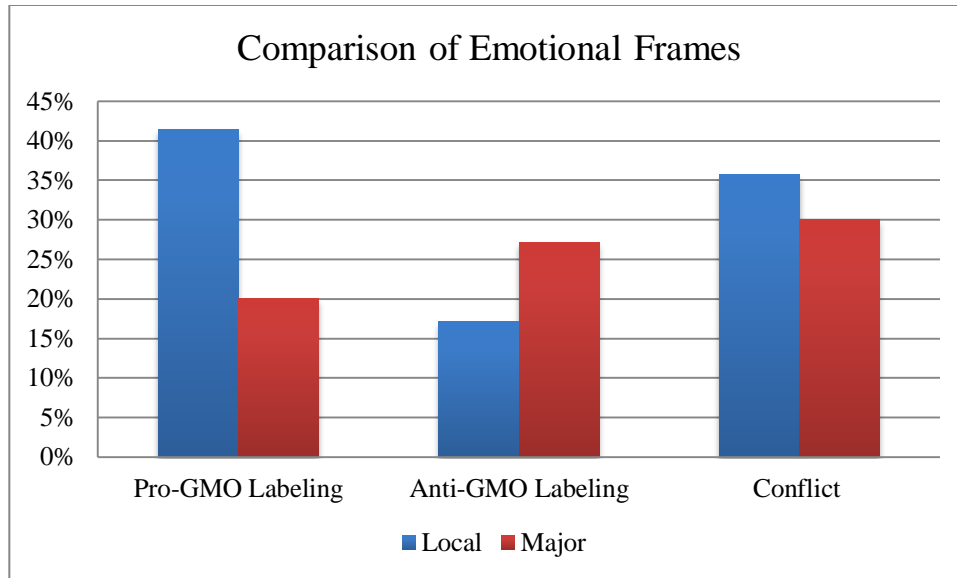
What is interesting to note however, is that despite the low percentages, when combining the frames that posit GMO labeling or any of the GMO labeling bills negatively or as a problem, there seems to be a negative, or at the very least, conflicted trend in the framing and portrayal of the GMO labeling initiatives. The amount of times the Anti-GMO Labeling frame and the Critical-Rejected frame were seen in the articles, in combination with the Conflict frame,

possibly places the pro-GMO labeling issue and its proponents at a disadvantage. However, as we read, the Conflict frame is being critical of the players and campaign funding, and it's being put to use when authors use language exaggerating the campaigning on both sides. So, in and of itself both the pro-GMO labeling initiatives and anti-GMO labeling initiatives could be at a disadvantage depending on how the readers decide to interpret these conflict articles.

This leads to the last two research questions that ask what the frequency of emotional frames and whether frames used in local newspapers are predominantly more emotional than those used in articles of major newspapers. As we stated, the three emotional frames defined and established for the content analysis were the Pro-GMO Labeling frame, the Anti-GMO Labeling frame, and the Conflict frame. There was a general predisposition for news articles to display any of the three emotional frames as shown earlier however, the GMO Policy and Science frame was the most common frame for both categories.

When comparing the use of emotional frames, local newspapers do employ them more frequently but not by a considerable amount. There was a majority of emotional frames in local newspapers with both the Conflict and Pro-GMO Labeling frames, while the Anti-GMO Labeling frame dominated in major newspapers. The frame with the biggest difference is the Pro-GMO Labeling frame, which is interesting. Could this possibly be because of issues of proximity? If so, why the Pro-GMO Labeling frame and not the Anti-GMO Labeling frame? Again, it's impossible to tell how accurately these frames represent the opinions of the citizen of those states but the trend itself is worth noting. Below Figure 4 shows the comparison of each of the emotional frames both locally and in major newspapers.

Figure 4. *Comparison of emotional frames*



As we can see more clearly with Figure 4, the use of emotional frames is more balanced in major newspapers while in local newspapers there is a heavy predominance of the first frame. When adding all the percentages local emotional frames earn a 94% and major receive 77%. However, the answer to the last research question is not so black and white. Despite the congregated percentages clearly showing local papers to be more dominantly emotional, by looking back to the breakdown of the overall coverage of this issue we see that emotional frames definitely dominate the conversation in both major and local news. So, despite seeing a heavier use of emotional framing in local news, the use of emotional framing within major news cannot be discarded.

Another interesting perspective for looking at this data is by breaking up the information to show the frames percentages *per paper* to more clearly see the framing trends within each state. Tables 6-8 depict how each of the emotional frames broke down per publication in local newspapers. Both the Pro-GMO Labeling and Anti-GMO Labeling frames were found significantly fewer times in the Oregon papers than those in Colorado. Here we see again that the Conflict frame played a meaningful role for both the Oregon and Colorado regions. Break down

the results this way also shows us that the *Denver Post* was the paper using the anti-GMO framing the most by a large degree.

Table 6. *Percentage of times Pro-GMO Labeling frame was found locally*

	The Denver Post	The Daily Camera	The Gazette	The Oregonian	The Register-Guard	The Bend Bulletin
Pro-GMO Labeling	50%	65%	66.7%	16.7%	41.7%	0%

Table 7. *Percentage of times Conflict frame was found locally*

	The Denver Post	The Daily Camera	The Gazette	The Oregonian	The Register-Guard	The Bend Bulletin
Conflict	58.3%	30%	0%	38.9%	33.3%	20%

Table 8. *Percentage of times Anti-GMO Labeling frame was found locally*

	The Denver Post	The Daily Camera	The Gazette	The Oregonian	The Register-Guard	The Bend Bulletin
Anti-GMO Labeling	47.1%	20%	0%	5.6%	16.7%	0%

Moving on to the use of emotional frames in major newspapers, we see there was quite a mix of results. First, there was a noticeable lack of Pro-GMO Labeling framing with all outlets with the exception of *USA Today* and the *L.A. Times* and although 25% and 50% for each respectively seem like a substantial quantity one must take into account that there were only 6 and 12 stories respectively for each of those publications. Therefore, in the grand scheme of things, the frequency of that frame was not exceptionally pronounced. Then the Conflict frame was used quite consistently with exception of *The Wall Street Journal*. Also the *L.A. Times* and the *Washington Post* steered clear of the Anti-GMO Labeling frame with 16.7% and 17.4%.

Overall, there were a wide variety of percentages for all of the emotional frames, and except for the *L.A. Times* and *USA Today*, the Pro-GMO Labeling frame received very little

attention. As was stated earlier, by observing the numbers presented one could say the portrayal of pro-GMO labeling initiatives or even its proponents are at a disadvantage. Tables 9-11 show the emotional frame breakdown for major newspapers.

Table 9. *Percentage of times Conflict frame was found in major papers*

	The New York Times	The Wall Street Journal	Washington Post	L.A. Times	USA Today
Conflict	42.9%	11.8%	30.4%	33.3%	50%

Table 10. *Percentage of times Anti-GMO Labeling frame was found in major papers*

	The New York Times	The Wall Street Journal	Washington Post	L.A. Times	USA Today
Anti-GMO Labeling	35.7%	35.3%	17.4%	16.7%	50%

Table 11. *Percentage of times Pro-GMO Labeling frame was found in major papers*

	The New York Times	The Wall Street Journal	Washington Post	L.A. Times	USA Today
Pro-GMO Labeling	7.1%	17.6%	13%	50%	25%

It was unexpected to see comparable trends in framing for both categories across the board. Emotional and non-emotional frames were used in generally similar frequencies with emotional frames dominating the tone of the reporting involved, with the exception of the use of the last frame. With the major newspapers selected considered part of the elite press, it was hypothesized there would be a noticeable lack of emotional frames when compared to local sources.

Trends in Framing and Article Formats

In addition to the trends we saw in the emotional and non-emotional frames, there was

another trend between frames and the format of the articles analyzed. This is important information because it gives insight into where these emotional frames are most commonly used. Although there wasn't a significant relationship between every frame and format, there were some notable ones.

Looking at content from both local and major newspapers combined, it was found that the Pro-GMO Labeling frame was seen in 88% of the total letters published, in 100% of the feature articles and in 46.2% of all the opinion columns. Similar results were found for the Anti-GMO Labeling frame, its highest percentages were found in opinion columns and editorial pieces with 46.2% and 44.4% respectively. The frame with the highest frequency, GMO Science and Policy was found in news reports by a large majority of 54.3%. All the other frames were not found in any other format with any large majority and were more or less evenly distributed throughout the article formats.

When breaking down the appearance of frames in different article types between major and local newspapers, we again see the emotional frames appear with more frequency in any and all types of opinion pieces while the last frame being concentrated in news reports. The similarities in the percentages are surprising, for example, the Pro-GMO Labeling frame was found in 40% of opinion columns in major newspapers while it was found 50% of the times in local opinion columns. The GMO Science and Policy frame was found 51% of times in major news reports and 59.4% in local news reports. Finally, the Conflict frame was found 34.7% of the times in major news reports and 40.6% in local news reports. Although finding emotional frames more frequently in opinion pieces might not be entirely surprising, it is striking to see these similarities not only in how the percentages of frames are distributed but how the various types of articles also display similarities in frequencies of frames used. Also interesting was the fact that the

Conflict frame was found a significant percentage of the time in news reports. While finding emotional frames in opinion pieces isn't surprising, to find the Conflict frame in both categories' to that extent goes to show how both local and major media habitually fall towards conflict narratives when it comes to science and/or policy.

Trends in Source Types

Although not critical information for answering the research questions for this study, in the coding of the articles we asked for information regarding sources within each of the articles. Sources were defined as important or influential entities in the story, for example they could be business entities, non-profits, experts, or governmental agencies. The sources that were coded for this analysis were:

1. Pro-labeling non-profit organization (e.g. Right to Know, Just Label It or Non-GMO Project)
2. Governmental agency (e.g. Food and Drug Administration or the Environmental Protection Agency)
3. Anti-labeling corporation or business entity (e.g. Monsanto, General Mills, DuPont)
4. Pro-labeling corporation or business entity (e.g. Whole Foods, Dr. Bronner's)
5. A person portrayed as an expert or person with authority (e.g. CEO, politician, researcher, expert, scientist)
6. Anti-labeling non-profit organization or other anti-labeling organizations (e.g. Grocery Manufacturers Association, the Council for Biotechnology Information)
7. Other (e.g. universities, policy research organizations)

Elite newspapers, or any newspaper in general strives to make themselves a trustworthy and credible source of information for their readers. "Credibility is a multifaceted construct that is relevant on different levels. It can refer to a whole medium, a source within a medium, or single messages...credibility is not an objective characteristic of a source or a message, but

rather the result of an attribution process by the recipient. Classic considerations of source credibility have at least two dimensions, competence and trustworthiness,” (Winter and Krämer, 2014). In order to establish credibility, competence and trustworthiness has to be established and sources or source cues are vital in creating all of these. “Research has largely shown that messages which are presented by sources that are seen as competent and trustworthy are more successful in influencing readers’ attitudes,” (Winter and Krämer, 2014). The use of sources is a highly common, well-looked upon practice within journalism that ensures a news report has information, statements or even opinions that can be “backed up” by professionals, authority figures or experts in that field.

Looking at the source types that were used as influential sources of information within each of the stories, it was noticeable that major newspapers more commonly employed their use. The fact that major or elite newspapers make more use of sources is not surprising since it is through these practices that trustworthiness and credibility is formed. This finding, although not specifically addressed in the research questions, does explain the relationship between the amount of emotional frames found in the articles and the amount of sources quoted in each of the stories to an extent. Table 12 shows the amount sources were found in major and local stories in percentages.

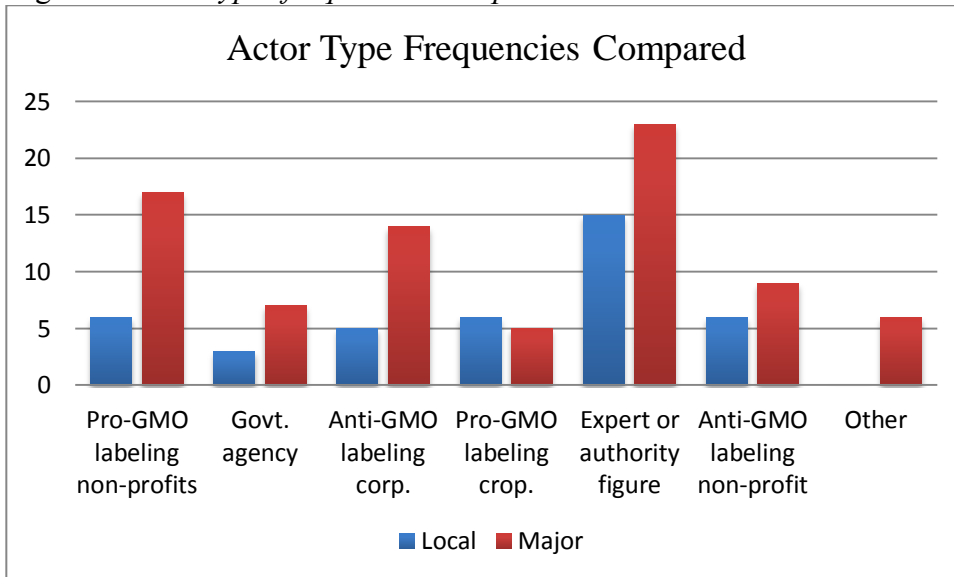
Table 12. *Actors in local and major newspapers*

Was a source used in the article?		
	Major	Local
Yes	64.3%	42.9%
No	35.7%	57.1%

Major news publications utilized sources in their articles 20% more times than local news stories. The most common type of source present in both local and major news was experts or authority figures, meanwhile major newspapers also made more use of pro-GMO labeling non-

profits and corporations. In Figure 5 we can see all the actor types and their frequencies.

Figure 5. *Actor types frequencies compared*



All in all, although the types of actors and sources used in local and major publications was not directly address in the research questions for this project they convey meaningful information about how news stories are shaped and what each type of publication gives credence to when dealing with such a controversial political issue.

Overall Portrayal of Frames

The overall portrayal of GMO labeling initiatives seems to fall into a conflicting category. Although with this being a content analysis, it is impossible to make any observation as to what the opinions of the general public are before judging just by the content analyzed. The frames used for this issue lean towards sharing information on this complex issue but with a twist that leads it again towards conflicting narratives. The emotional frames are also only one side of the argument, a large percentage of the GMO Science and Policy frame was found in both local and major news sources. Due to the controversial nature of the topic itself and not to mention the

strong opinions the public frequently forms with this types of issues, it is not entirely surprising to see many of the articles trying to impart knowledge on either the nature of GMOs, the agricultural industry or the processes these policies were expected to go through and its results.

The issue here lies in how journalists and newspapers report and contextualize complex issues of science. Despite the certainty and consensus there seems to be on GMOs and their effects, the status of GMOs are still uncertain. There is an undercurrent of fear and doubt among the general public surrounding the issue of GMOs and with these emotions continuously surfacing, an unbiased debate on this topic is near impossible. Although, it is pleasing to see there was a prevalent use of the last frame, journalists and other channels of communication only further compound the problem by allowing conflicting and emotional frames to lead the discussion.

Limitations and Future Research

As with all research, this study has several limitations. We examined only a portion of the total amount of news articles about this specific topic therefore the portrayal of GMO labeling could be somewhat different. The sample size for this study, compared to the overall scale of information and content coming out on this issue in all channels is quite small. However, for the purposes of this study was more focused towards comparing large-scale publications with regional publications from two particular states that had labeling initiatives up for vote to narrow down and somewhat concentrate the content. This method proved to be a good way of narrowing down such large amounts of content in a useful manner.

A second limitation that was briefly touched upon earlier in the results section was the overall low frequencies or percentages that the frames appeared in the articles coded. Although

not a severe limitation, this could point towards the need to update and revise the coding scheme used. This, with the help of a more general but wider sample, might help in gathering an even better picture as to how any GMO labeling initiative is framed. Or this could also point to the complexity of this issue and the difficulties that arise from reporting on science-based problems.

Lastly, as was mentioned towards the beginning of this paper, this is a content analysis therefore it is very difficult to make any real inferences on the affect these patterns noted here may have on the opinions, attitudes and voting behavior of the general public. Further research would be needed in the forms of more content analysis, textual analysis and more importantly interviews to gather more information and a better perspective as to how these issues are viewed by the public and what sort of link exists between the media and people's voting behavior concerning GMOs and GMO labeling.

Future research should examine coverage of GMO labeling measures and policies in other sources, such as radio, television, and the Internet because this could also be very telling of the public influence these political decisions have and vice versa. Not to mention the many research possibilities existing within these media. For example, research could examine how different GMO legislation pieces are depicted in Internet blogs, television advertisements, on video Internet sites like YouTube, or on social media such as Facebook and Twitter. The framing schemes described in the current study could be utilized, and updated if need be, thus providing for a more comprehensive cross-study understanding of how these issues are depicted.

CHAPTER V

DISCUSSION OF RESULTS

The study of GMO labeling, like any controversial issue is important, particularly when polling data shows citizens greatly agreed genetically engineered food should be labeled but then voting results show a different picture. Didn't the public want to know whether their foods are genetically modified? Did the media help researchers make the science about GMOs clearer to the public or did the media help uncover the idiosyncrasies with the bill itself? Was it an effect caused by confusion? The results of the content analysis showed that the predominant themes and framing in both local and major newspapers were similar. Between both categories of newspapers the predominant frames were the GMO Science and Policy, Conflict, and Pro-GMO Labeling and Anti-GMO Labeling frames. The frequency in which the emotional frames appeared in both papers ranged from 17% to 42% and both categories of newspapers used the emotional frames with similar tendencies. The main difference between the two was the heavy use of the Pro-GMO Labeling frames in local papers with 42% vs. 17% for Anti-GMO labeling. Meanwhile, major newspapers used the two frames more equally with 20% for the Pro-GMO Labeling frame and 27% for the Anti-GMO Labeling frame. Lastly, we compared the use of emotional frames. Looking at the numbers alone, local newspapers definitely used emotional framing more often than major newspapers, however the overall use of emotional framing was relatively high for both categories, especially when compared to the use of the non-emotional frames.

There were a few trends and results that stood out and that should be discussed. Of these, the first is the high use of the Conflict frame and its comparison between major and local newspapers as well as the other two emotional frames. Again, both categories of newspapers

exhibited similar trends in their use of frames but local papers definitely used all of the frames more frequently than national ones. Also, local papers exhibited more pronounced distinctions between the frames they used and those they didn't while major newspapers had a more equivalent use of their frames. The fact that emotional frames and Conflict frame were found with more frequency than most non-emotional frames falls in line with much of the research done on media-framing of science and public policy (Nelkin, 1987; Entman, 1989; Cappella and Jamieson, 1997). Reporters and their journalistic values often drive the coverage of these issues to be dramatized and it has been found that their most common framing themes fall under the categories of "strategic-framing", "game-framing", or conflict framing (Lawrence, 2000; Aalberg *et al*, 2011; Cappella and Jamieson, 1997). Despite the differences in the definitions of the frames used in this study compared to the studies done by Lawrence (2000) or Aalberg *et al* (2011) the frames used in this study have characteristics and definitions that are alike. Just like Aalberg *et al* considered the game frame and the strategy frame as two equal but different dimensions of the larger strategic game frame. For them the distinction was in "the conceptual origins of the two frames: one taking a starting point in the use of polls and the horse race; the other taking a starting point in the interpretative nature of journalism," (Aalberg *et al*, 2011). In this study both the conflict and emotional frames fall under similar parameters and reflect a combination of the game frames and strategy frames. In this case, the Conflict frame shares stronger resemblances with the game frame and the two emotional frames with the strategy frame. Similarly, here all three frames were considered emotional frames as Lawrence (2000) and Aalberg *et al* (2011) considered their frames to fall under the strategic umbrella. With this in mind, it is not surprising that there was a heavy amount of emotional frames used.

There are a couple of explanations as to why the GMO labeling debate lends itself to large amounts of conflict and dramatization, that are backed up by the results from this study, and it is a compounded issue. The first reason could be because the history of GMO labeling and the processes it has gone through in the political field can be defined as a conflict in movement. Journalists often judge the newsworthiness by the issue's implicit relationship to a larger narrative linked by a series of ongoing events. Political scientist Timothy Cook (1996) has argued that many "daily news stories are episodes of larger continuing sagas.... Simply put, for news to be produced routinely, journalists must be able to visualize events as part of a larger, broader storyline and must move the plot along from one episode to the next," (p. 474). The GMO labeling debate is a perfect example of this. Since the early 2002, various labeling initiatives have made their way to the forefront in different states and suddenly in 2012 this issue gained large amounts of attention, publicity, and campaigning with Proposition 37. Since then, you could say that this issue has become a perfect example of a long "saga" that has evolved with individual battles in different states that have either been victorious or failed.

Moreover, the research that tries to explain or understand what some of the effects strategic, or in this case emotional framing, could have on the knowledge and opinions of the public could potentially help explain why many of the labeling initiatives in the United States have failed. Cappella and Jamieson (1997) argue that although strategic news also carries some information about policy problems and solutions, "strategic news frames predispose the audience to attend to and recall strategic rather than substantive information. Even if some substantive information is offered, people are purportedly less likely to absorb it," (pg. 73). This happens because conflict frames distract readers from the substance of the story. In other words, it is argued that emotional frames have negative implications for democracy as they depress and

reduce a politically informed citizenry. Those who are exposed to emotionally framed coverage of politics are significantly more prone not only to psychologically adopt the emotional frame in their interpretations of political behavior, campaign processes and issues, and they also prove more cynical as a result of the exposure (Aalberg *et al*, 2011).

The data collected from the content analysis displayed the use of these two variations of what Aalberg *et al* (2011) called strategic frames. For example, “But a pair of ballot measures, known as Proposition 92 in Oregon and Proposition 105 in Colorado, represents the latest attempt to require labels on genetically modified food after similar efforts failed in California and Washington. Vermont is the only state that has a labeling mandate. Its law, scheduled to go into effect in 2016, first must overcome a court challenge,” (*Wall Street Journal*, Tracy, 2014). This displays what would be a strategy frame or a form of an emotional frame. An example showing a ways in which reporting on this issue reflected “game framing” or a dramatized framing was that both Colorado and Oregon news made clear the amounts of money the campaigns brought for these issues, particularly from the anti-labeling proponents. Or this headline in the *Denver Post* “Big businesses out front in campaign spending” where Raabe (2014) reported, “Supporters of GMO labeling have raised \$334,297, according to campaign finance reports filed Sept. 29. Opponents, led by agribusiness giant Monsanto's \$4.7 million and PepsiCo's \$1.15 million, collected \$9.7 million. The fundraising disparity explains why airwaves have been saturated with ads opposing 105, while supporters have no budget for TV commercials. Major food and agribusiness companies may now have a sharper focus -- and bigger budget -- for fighting 105 after they suffered a defeat earlier this year, when a similar measure was passed by Vermont lawmakers.”

The second factor that makes reporting and framing on GMO labeling a complicated issue is because the essence of this issue lies in the domain of science. Because of this the reporting and framing of this issue becomes muddled and packed with commonly used frames that are personalized and emotional in order to entice readers. For example, “when reporting on science, journalists have been shown to favor imagery over content, cover research as a series of dramatic events, and report on provocative theory as if it were fact,” (Saguy et al, 2008; Winsten, 1985). Unfortunately, both the media and scientists often produce simplistic framing and dramatized framing in order to gain prominence, priority or simply more readership. Nelkin (1987) once stated, “scientists are often sources with a mission.” Additionally the media can often use sources for scientific information that are themselves partisans in the controversy in question (Mazur, 1981). Or also there are times when newspapers use guest that are clearly partisan. A few of the articles coded were guest columns that were commonly guests from either side of the debate using their own sources of data that corroborated what they believed in.

These partisan groups are important especially with a debate like GMO labeling. Schmitt, Gunther & Leibhart (2004) stated, “partisan groups and their members are important beyond their numbers. Their viewpoints can powerfully influence public opinion and public policy; they are the ones who campaign and lobby, who demonstrate, parade, and picket, who promote their viewpoints in countless ways.” Within the GMO debate there are most definitely defined partisan groups, but is the science really that black and white? Apart from the use of the Conflict frame, both major and local newspapers made significant use of both the Pro-GMO Labeling and the Anti-GMO Labeling frames. Not only that but even within individual stories there were very few articles (there were 6 occurrences for a total of 14%) that overlapped in their use of both pro-labeling and anti-labeling frames. Meaning that, for the most part, there was a clear divide in the

opinions and portrayals of the stories. These different groups play a large role in how this issue is portrayed in the media because of the framing tendencies already described. Different interest groups compete to have their opinions gain more prominence in news. Nisbet (2007) describes how these groups aim to gain prominence very clearly and his statement almost perfectly describes what was seen in this study's findings.

Nisbet stated, "if an interest group is favored by the status quo...it is in their best interest to frame issues in highly technical and instrumental ways, since these interpretations deflect attention...on the other hand, if an interest group is disadvantaged by the status quo...it is in their best interest to re-frame the issue in dramatic and often moral ways since these interpretations catalyze attention and mobilize a diversity of groups to take action," (2007).

His conclusions apply to the findings of this study quite aptly. First, our coding and our results demonstrated that the Pro-GMO Labeling frame was rooted in morality and toned in a more dramatic way, using "we have the right to know" argument as a large basis for their support of labeling. Meanwhile, the Anti-GMO Labeling frame's main reasoning was based on several technical factors such as: the general consensus that GMOs and GE is safe often mentioning institutions that declared them so, in the case of Colorado the ambiguity of the measure itself, being critical of proponents use of fear mongering to turn voters off GE technologies, and finally many GE proponents likewise mentioned the many beneficial uses of GE such as increasing yield and health benefits specifically tied to developing countries. For example, "These genetically engineered (GE) crops, or so-called 'GMOs,' allow our farmers to produce higher yields with less water while using fewer pesticides and less fuel to produce enough food for an ever-growing population," by Don Ament (2014) for the *Denver Post* or "Although Golden Rice was ready to go in the early 2000s, it is not in use anywhere due to opposition to GM foods. A recent article in the journal *Environment and Development Economics* estimated that this

opposition resulted in about 1.4 million life years lost over the past decade in India alone,” (OpinionB, Daily Camera, 2014). With the overall trends found in this project deviating towards commonly used frames in science reporting there were other trends that demonstrated a different angle in the reporting of this issue. This leads us to our findings in the GMO Science and Policy frame.

A second important and surprising result from the study was the finding that the GMO Science and Policy was the most common frame used in news reports in both local and major newspapers. This framing was defined as containing information on either or both GMO science or policy-making processes. Although not in the majority by a wide margin it was a frame that stood out. At first, it was surprising to see the last frame being used in such high percentages in both local and major newspapers. Once a closer look was taken it was found that there was high correlation between the Conflict and GMO Science and Policy frame. When found alone this frame is non-emotional however in 45% of cases this frame was found in conjunction with the Conflict frame. There was a significant relationship between them and this does show that the times when a non-partial, purely information frame is used are small.

Because we know this last frame wasn't used 100% of the time in conjunction with the conflict frame there could be a few reasons why this frame could have been used as well. One reason why this frame was used with such frequency was already alluded to earlier, as Nisbet said, those interest groups or issues that go with the status quo usually use technical ways to make their arguments. A second reason why this frame was used with higher frequencies could be purely for informative reasons. Again, although journalists tend to dramatize science or the policy-making processes, with the high visibility on the issue many reporters took to recanting the history of GMOs and genetically engineered foods. Unfortunately, because the purpose of

this study was to find and compare the use of emotional frames within specific papers the structuring of the coding procedures didn't ask the coders to dig too deeply into the use of this last frame. Meaning, the coding of this frame didn't differentiate between what type of information was being given and a textual analysis wasn't conducted to get in-depth information. Therefore, from the results alone it is very hard to make any distinctions or specifications as to how this frame was used and how the science of GE was portrayed.

Most importantly, these results and the use of emotional frames in both local and major newspapers show the real complexity of this issue. It's not black or white, when big labeling issues like these are on the stand in different states the general trend in both categories is to give the readers information on GMOs, genetic engineering or the policy process but unfortunately in a primarily conflicting and dramatized fashion. Reporting on topics like GMOs, climate change or other science-based topics is often difficult for reporters to write about in a straightforward manner for readers to comprehend and interpret on their own. Not to mention, the cynicism towards government or large corporations and general lack of knowledge and policy-making processes compound the complexities of reporting GMO labeling initiatives.

In addition to these main findings, there were other results that helped shed a bit more light on how this issue was portrayed. Apart from the frames, the results looked at the article types and the most noteworthy result was the wide appearance of opinion pieces yielded from the database searches. Although the number of news reports was still high, there was a sizeable number of letters, opinion columns and editorials. The higher number of opinion pieces was published in local newspapers. The number of letters published locally was 28.6% while all other opinion pieces equaled 25.7%, meanwhile all opinions pieces combined in major newspapers total to 29.9%.

These types of articles most often portray very clear opinions and emotions about the issue at hand. For example, we saw that 88% of the total letters analyzed and coded made use of Pro-GMO Labeling frame. In local newspapers the Pro-GMO Labeling frame was given salience as opposed to the Anti-GMO Labeling frame, while major newspapers gave salience to Anti-GMO Labeling framing. These letters used the Pro-GMO Labeling frame more frequently than any other frame. This finding is quite telling of where these emotional frames made their appearance and could also point towards the reason why some of these GMO labeling initiatives might have been unsuccessful. It should be noted that many of these opinions pieces do not use any other frame or sources. This piece of information further substantiates the idea that pro-labeling interest groups would best use their resources if they build their cause around moral or personal arguments. With the complexity of GMO science, its dangers, benefits, and history, it is not entirely surprising that despite the substantial amount Pro-GMO Labeling opinions without clarity on what GMOs are or an explanation of what the repercussions of labeling them could be those opinion pieces shed very little light on these issues.

Furthermore, although the breakdown of the newspapers articles and their framing didn't provide critical information on GMO labeling, it did show interesting results as to how each state depicted the issue. For example, local stories from Colorado use the Pro-GMO Labeling more than those from Oregon, while Oregonian papers preferred the use of the Conflict frame. One result that was of interest was how the *Denver Post* used the emotional frames. The *Denver Post* widely used all frames but even more specifically it used the Anti-GMO Labeling frame more than any other local newspaper. A clue as to why there could be such a large gap in the appearance of the frame could be in the circulation numbers. The circulation numbers for the *Denver Post* are 416,676 daily and 626,875 on Sundays (Lulofs, 2013) and it is worth

mentioning that it is considered a tier one newspaper by Alliance for Audited Media (Lulofs, 2013). The circulation numbers are high when compared to the circulation numbers of the other five local newspapers. The next closest is *The Oregonian* with 228,909 daily and 303,495 on Sundays (BurrellesLuce, 2013). With this in mind, the *Denver Post*, despite designated local newspaper, it might be more accurate to say it behaves and falls under other major newspapers judging by used the anti-labeling framing. Although not a conclusive analysis it could offer insight as to why the *Denver Post* showed behaviors similar to that of major newspapers.

And finally, there was the lack and minimal use of the non-emotional frames in particular, the Accepted-Positive frame. The lack of objective, non-dramatized framing of any of the labeling initiatives in the articles coded shouldn't come as a surprise. It would be interesting in this case to do a study on the local reporting with the states that passed GMO labeling resolutions to see what difference a successful labeling initiative makes in the portrayal of these frames.

This report gathered the beginning threads of a much bigger issue that still requires extensive analysis in order to determine what the public's opinion is on GMO labeling and how the media influences and shapes food policy, not only the policy issues themselves but also of genetic engineering and GMOs. Measuring and understanding how the media affects public opinion and to what extent is a difficult project to undertake, and a content analysis is only the beginning. As the focus of this project was centered on framing from a local and a national perspective, the goal was to see if there were any major differences or similarities in how the issue of GMO labeling was framed in both categories of publications. The categorization of emotional and non-emotional frames was done so to help identify how local news articles and publications generally shaped and portrayed the issue.

One also can't ignore the attention, heated debate and controversy the issue of GMOs has stirred for some years now. As Mazur (1981) stated, "the quantity of coverage of a technical controversy can have as much effect on public attitudes as the semantic content of the stories that are presented. The public takes seriously any suggestion that a technology may be risky, particularly if the suggestion is repeated often enough." Overall, due to the attention and recognition this issue has caused among the public, government and big industry, it is also prudent for any researcher to take on the task of painting a proper picture and gathering relevant information as a form of supporting data in the hopes of informing citizens and government alike. As Andrew Kimbrell, Director of the Center for Food Safety stated, "every single person in Colorado and Oregon knows what a GMO is now," (Gasparro and Bunge, 2014). But do they really?

Once again it is very difficult to make any substantiated inferences on how any of these trends in framing could have affected public opinion and policy-making, especially when the issue of GMO labeling is a compounded topic both pertaining to politics and science. However, all in all, the research and results did demonstrate some interesting patterns and relationships within local and major newspapers, more specifically they displayed again that regardless of location when it comes to issues of science or politics there will be general similarities in the framing of them. "These organizing devices are especially useful when journalists are thrust into unfamiliar territory. Framing strategies, however, can lead to 'pack journalism,' with journalists adopting similar frames across coverage," (Nisbet and Lewenstein, 2002). Unfortunately, one would hope that despite unfamiliar territory the media would instead of relying on comfortable, proven safe-to-publish frames and perspectives, they would venture out and make science an undeniable factor that shapes our daily lives. But reporters are not the ones solely to blame in the

portrayal of science and politics. These issues, science and policy-making, are surrounded in the trifecta of confusion that is the public, the media and science or government. Each of these three areas is responsible for bringing their own values, traditions, and procedures that instead of coming together within the public space of the media clash for priority, attention and prominence.

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APPENDIX A.

Coding Sheet

1. Date of publication:

____ / ____ / ____ _____

2. Newspaper:

State Newspapers (Local)					
1. Denver Post	2. The Oregonian	3. The Gazette	4. The Daily Camera	5. The Register-Guard	6. The Bend Bulletin
Newspapers with Largest Circulation (National)					
7. New York Times	8. Wall Street Journal	9. USA Today	10. Washington Post	11. L.A. Times	

3. Format of article:

4. Article framing:

1. Anti-GMO interest group	2. Pro-GMO interest group	3. Conflict frame
4. Critical-rejected frame	5. Accepted-positive	6. Policy process

5. Actors:

Do actors appear in the article? (*circle one*) Y or N

Actors in article:

1. # _____ Name: _____

a. Is this actor used as a source of credible information?	
b. Is this actor being portrayed positively?	
c. Is this actor being criticized?	
d. Other	

2. # _____ Name: _____

a. Is this actor used as a source of credible information?	
b. Is this actor being portrayed positively?	
c. Is this actor being criticized?	
d. Other	

3. # _____ Name: _____

a. Is this actor used as a source of credible information?	
b. Is this actor being portrayed positively?	
c. Is this actor being criticized?	
d. Other	

4. # _____ Name: _____

a. Is this actor used as a source of credible information?	
b. Is this actor being portrayed positively?	
c. Is this actor being criticized?	
d. Other	

APPENDIX B.

Coding Directions and Guidelines

1. Date of Publication

For date of publication **enter date as mm/dd/yyyy** for the article. In the case when multiple articles were published on the same date, the first article from the master list of results was selected for coding.

2. Newspaper

From the options given select the correct newspaper being coded.

3. Format of article

In the space provided write numerical code for the format the article is presented as. Definitions for each are provided below. Only select *ONE* option.

1. News report
2. Editorial
3. Opinion column
4. Feature
5. Letter
6. Weekly news summary
7. 'News in brief'

4. Framing

Select all frames that appropriately describe the salient themes and issues in the article content.

Frame Definitions:

1. Pro-GMO Labeling Frame – *Emotional*: This frame includes the portrayal of GMO and GE science as harmful, lacking scientific research or ethically questionable. This frame is based on the sentiment that the public has a right not know what is in their food. This frame also contains criticism of agricultural corporations like Monsanto or DuPont. This frame is situated in ethical or moral opinion. With this frame there are very strong emotional, moral or ethical statements made and given salience in this type of frame.

2. Anti-GMO Labeling Frame – *Emotional*: This frame includes the portrayal of GMOs and GE science as safe, necessary and innovative while any of the GMO labeling initiatives as problematic. This frame portrays those opposing GMOs usually do so for unjustified fear of GMOs, being critical of pro-GMO labeling groups for using fear as a tactic to persuade or their lack of scientific evidence to support their opposing of genetic engineering technology.

3. Conflict Frame – *Emotional*: This frame is critical of labeling campaign players like corporations or non-profits and funding both for and against labeling groups. It portrays opposing sides of the GMO labeling initiatives in each state as competing, using metaphors describing a competition or a battle, taking place. This frame might be accompanied by GMO information however there is an emphasis on this political fight happening posing any of the parties as either the “good or bad guys”.

4. Critical-Rejected Frame: This frame focuses on the policy or bill itself as well as political players involved in pushing the bills forward or those opposed to it like Representatives or Governors. The frame portrays and describes GMO labeling as a problem due to being economically burdensome or targets the vagueness of the bill as a negative consequence it could have. There could also be a positive spin on the rejection of any of the labeling measures due to the consequences it could have had.

5. Accepted-Positive Frame: Similar to the Critical-Rejected frame, this frame focuses on the policy process, the bill itself, and political actors involved in the legal processes. In this particular frame, there is a questioning of the funding and efforts going towards defeating the labeling bill by large-scale food and agricultural corporations. This frame also makes salient the possible positive outcomes of the labeling measure, the benefits it could have in international markets, local markets or the economy and farmers.

6. GMO Science & Policy Frame: This frame focuses on the results of the polling, a critique of the measure or bill itself while trying to be balanced in its representations of opposing interesting groups. This could be done by providing quotes or opinions of both or displaying none. For this particular frame there are two types of example, one on GMOs and GE science and the other on information about policy processes.

5. Actors

For the purposes of this analysis, actors are considered to be any person, agency, organization, governmental entity, or corporation named or mentioned in the article. Actors are important factors to note within news stories for their use in credibility.

For question: *Does a type of character appear in the article?* 1= Yes; 2= No.

For actors found in the article, choose the numerical value of the possible character identified as well as the name of the actor. Choose up to four actors written about in the article. If an actor is mentioned only in passing and plays no part in the content of the article, do **not** enter into analysis.

1. Pro-labeling non-profit organization (e.g. Right to Know, Just Label It or Non-GMO Project)
2. Governmental agency (e.g. Food and Drug Administration or the Environmental Protection Agency)
3. Anti-labeling corporation or business entity (e.g. Monsanto, General Mills, DuPont)
4. Pro-labeling corporation or business entity (e.g. Whole Foods, Dr. Bronner's)
5. A person portrayed as an expert or person with authority (e.g. CEO, politician, researcher, expert, scientist)

6. Anti-labeling non-profit organization or other anti-labeling organizations (e.g. Grocery Manufacturers Association, the Council for Biotechnology Information)
7. Other (e.g. universities, policy research organizations)

After selecting the type of article, questions a-c in section 5 ask you to determine how the actor was used or portrayed in the article. In the tables provided, write in either Yes (Y)=1 or No (N)=2 to answer each of the three questions on how any of the actors were described or portrayed.