Scholar Commons
USF University of South Florida

University of South Florida
Scholar Commons

Graduate Theses and Dissertations | Graduate School

November 2017

Framing Genetically-modified Foods Communication in China: A Content Analysis of News Coverage of People's Daily and Southern Metropolis

Linqi Lu
University of South Florida, linqilu@mail.usf.edu

Follow this and additional works at: http://scholarcommons.usf.edu/etd

 Part of the Mass Communication Commons

Scholar Commons Citation
Lu, Linqi, "Framing Genetically-modified Foods Communication in China: A Content Analysis of News Coverage of People's Daily and Southern Metropolis" (2017). *Graduate Theses and Dissertations.*
http://scholarcommons.usf.edu/etd/7054

This Thesis is brought to you for free and open access by the Graduate School at Scholar Commons. It has been accepted for inclusion in Graduate Theses and Dissertations by an authorized administrator of Scholar Commons. For more information, please contact scholarcommons@usf.edu.

Framing Genetically-modified Foods Communication in China:

A Content Analysis of News Coverage of People's Daily and Southern Metropolis

by

Linqi Lu

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
The Zimmerman School of Advertising and Mass Communications
College of Arts & Sciences
University of South Florida

Major Professor: Roxanne Watson, Ph.D.
Scott S. Liu, Ph.D.
Kelli Burns, Ph.D.

Date of Approval:
October 30, 2017

Keywords: Foods Safety, Labeling, Public Opinion, Media Security,
Chinese Officials, Media Position

Copyright © 2017, Linqi Lu

DEDICATION

This thesis is dedicated to my parents, Xiaoping Lu & Xingdi Lu

Thank you for supporting me when I was helpless,

lighting my hope when I was discouraged,

and loving me always.

ACKNOWLEDGEMENTS

I owe my sincere gratitude to my thesis chair, Dr. Roxanne Watson, for her infinite patience and excellent guidance throughout my study process. Without her warm encouragement, continuous support, and professional insight, this study would hardly have been completed.

I would also like to show my great gratitude to my thesis committee members, Dr. Liu and Dr. Burns, for academic guidance and selfless assistance. I will never forget the warmth that transferred to a kind of strength during the entire study process. It is also a pleasure to thank all USF professors I met during my graduate education and it has been a great pleasure learning from them. Especially, I would also thank Dr. William Sappenfield for giving me many conveniences in his class when I was anxious about schedule conflicts and study burdens.

Finally, I wish to express a deep sense of gratitude to my family for their encouragement and love. It has been a long learning journey and you are always the major power source who stand behind me, silently supporting me, and encouraging me.

TABLE OF CONTENTS

LIST OF TABLES.....iii

LIST OF FIGURES.....v

ABSTRACT.....vi

CHAPTER ONE: INTRODUCTION.....1

CHAPTER TWO: LITERATURE REVIEW.....3
- Frame and Framing Process.....3
- A Typology of Frames.....9
- History of Genetically Modified Food: Overview.....12
- The Uncertain Bio-Safety of GM Foods.....14
- The Polarization of GMO Debates in China.....15
- Legal Implications.....17
- Media Systems of China.....19

CHAPTER THREE: RESEARCH DESIGN.....23
- Research Questions.....24

CHAPTER FOUR: METHOD.....26
- News Sources.....27
- Data Collection and Procedure.....28
- Coding Scheme.....29
- Frames Explanation.....32
- Intercoder Reliability.....35

CHAPTER FIVE: RESULTS.....38
- The Overview of GM foods News Coverage.....38
- Research Questions Answering.....40

CHAPTER SIX: DISCUSSION.....62
- Significance 1: The basic condition of framing in GM-related online news coverage of People's Daily and Southern Metropolis.....62
- Significance 2: The major difference in framing use in the online news coverage by *People's Daily* and *Southern Metropolis*.....70
- Significance 3: The potential position (positive, neutral or negative) in GM-related news coverage of *People's Daily* and *Southern Metropolis*.....75

CHAPTER SEVEN: CONCLUSIONS.....77
- Limitations and Future Studies.....78

REFERENCE.....80

APPENDIX 1: CONTENT CODING SCHEME.....85

APPENDIX 2: NEWS ARTICLE.....89

LIST OF TABLES

Table 1. Source of Attribution.....29

Table 2. The Knowledge Statement Attributes.....31

Table 3. Coding Sample.....32

Table 4. Intercoder Reliability.....36

Table 5. Newspaper Crosstabulation by Year.....39

Table 6. Crosstab: Advanced Technology.....41

Table 7. Chi-Square Tests: Advanced Technology Frame.....41

Table 8. Crosstab: The Right to Know.....42

Table 9. Chi-Square Tests: The Right to Know.....42

Table 10. Crosstab: Worries & Potential Risk/Safety.....43

Table 11. Chi-Square Tests: Worries & Potential Risk/Safety.....43

Table 12. Crosstab: Environmental Concerns.....44

Table 13. Chi-Square Tests: Environmental Concerns.....45

Table 14. Crosstab: Rumor Clarification.....45

Table 15.Chi-Square Tests: Rumor Clarification.....46

Table 16. Crosstab: Supervision of GM Product.....46

Table 17. Chi-Square Tests: Supervision of GM Product.....47

Table 18. Crosstab: Economic Consequences.....48

Table 19. Chi-Square Tests: Economic Consequences.....48

Table 20. Crosstab: Educational Knowledge.....49

Table 21. Chi-Square Tests: Educational Knowledge.....49

Table 22. Crosstab: International Perspective.....50
Table 23. Chi-Square Tests: International Perspective.....51
Table 24. Crosstab: Others.....51
Table 25. Chi-Square Tests: Others.....52
Table 26. Crosstab: Theme.....54
Table 27. Chi-Square Tests: Theme.....55
Table 28. Crosstab: Routine.....56
Table 29. Chi-Square Tests: Routine 56
Table 30. Crosstab: Knowledge Attribute.....57
Table 31. Chi-Square Tests: Knowledge Attribute.....57
Table 32. Crosstab: News Source.....59
Table 33. Chi-Square Tests: News Source.....59
Table 34. Crosstab: Position.....60
Table 35. Chi-Square Tests: Position.....61
Table 36. News Story With Three Frames 71

LIST OF FIGURES

Figure 1. Analytic Model of Framing, Agenda-setting, and Priming..... 11

Figure 2. Inner Frame Structure Built by Each Facts.....12

Figure 3. The Rank of GMO Keywords.....17

Figure 4. Media in China.....20

Figure 5. Study Design Image.....24

Figure 6. People’ s Daily: Draw a Lesson from "Golden Rice" Event.....64

Figure 7. Part of News Coverage of ‘‘The crisis of 61 Academics’ Pro-GMO’’..... 65

Figure 8. Comments posted by Monsanto Official Website..... 66

Figure 9. The regulation related news coverage by *Peole’s Daily*, 2016..... 68

Figure 10. "Worries & Potential Risk/Safety" by *Southern Metropolis*..... 72

ABSTRACT

Grounded in framing theory, this thesis presents a qualitative content analysis of newspaper coverage of genetically modified foods by two Chinese newspapers- *People's Daily* and *Southern Metropolis*, in 2000-2017. The political, economic, public opinion and legal implications involved have made the reports of genetically modified (GM) foods present different framing, themes, and positions between People's Daily and Southern Metropolis. This study aims to examine the various frames used in the coverage of GM foods in two major Chinese newspapers that operate within different media frameworks.

Results of the content analysis illustrated that significant differences existed in the newspapers in their framing of GM foods, the themes of GM foods, the positions, news source, and media attributes. While the frames used by People's Daily and Southern Metropolis were similar in the emphasis on the importance of "Supervision to GM product", "Worries & Potential Risk/Safety" , and "International perspective", Southern Metropolis presented a significance of pluralistic standpoint than People's Daily whose attitude was likely to neutral and pro-GMO. People's Daily preferred to use the frames of "Advanced Technology", "International Perspective" or "Economic Consequences", whereas Southern Metropolis preferred to produce the framed stories of "Worries & Potential Risk/Safety".

CHAPTER ONE:

INTRODUCTION

After genetically modified organism (GMO) came on the market, even with much debate, it led to a controversial food technological innovation which is pushing a part of food industries to transfer into a different produce process all around the world. It is clear that GMO technology has been accepted rapidly by many countries, companies, and farmers because of the enormous benefits from its high quality and high yield (Lu, 2016). The announced advantages of GMO are valued by governments and elites who promote policy in a microscopic society perspective, such as enhanced taste, increased nutritional value, specific medicinal properties, greater cleanliness, big yield, and economy (Edwards, Faerber, Goenawan & Osawa, 2005). In recent years, some studies have shown that individuals' perceived risks might be enhanced when they are exposed to a chaotic and controversial environment with too much varying voices that are hard to understand, even where the official voice showing less risks (Klerck & Sweeney, 2007). Risk perception, and the subjective feeling of risk degree are the main reasons why the public reject genetically modified foods (Klerck & Sweeney, 2007). In this article, Klerck and Sweeney (2007) examined the effect of individuals' knowledge on the risk perception associated with how the final purchasing decision on genetically modified foods is made (Klerck & Sweeney, 2007).

In the early 1990s, China was the first nation in the world to commercialize a genetically modified (GM) crop, planting a virus-resistant transgenic tobacco variety on a relatively large scale, while other parts of the world were debating about the risks of GMO (Jia & Peng, 2002). Since that time, China has approved the commercialization of Bacillus

thuringiensis cotton and some locally-derived vegetables with biotechnology traits. In 2001, China enacted a series of rules which created serious disruptions to both the trade in agricultural commodities with biotechnology traits and in the development and commercialization of new traits. Under these new rules, the Minister of Agriculture established a new regulatory system under which imports would require certificates of safety, food products would require labeling and new rules were established for commercialization approvals. Since the new rules were established, considerable energy has been devoted to obtaining the approvals necessary for continued import of soybeans, canola, and corn from the U.S., Canada, and Latin America. As a result, China has made a commitment to the U.S. government not to allow the implementation of these rules to inhibit trade and certificates of safety have been issued for all three commodities valid through 20 September 2003. Until 2014, public attention was first widely attracted by the issue of GMO safety and there was public panic leading to the submission of a petition against GMO use in food. Interestingly, the blasting fuse was fired by Cui Yongyuan, a Chinese journalist and TV presenter, who talked about the danger and risk of GM foods on CCTV, which is the TV station with the highest level of government influence in China. After that, GMO was treated as a vital public issue and social event and the perspectives amongst academics and in food market are widely ranged .

CHAPTER TWO:

LITERATURE REVIEW

Media framing is considered to be "a tool of power that can be used in the struggle to define whose view of the world will predominate" (Hallah, 1999, p. 223). The proposed study is grounded in framing theory in which the literature review provides an overview of the theoretical framework of framing and presents previous studies of framing applications to international news coverage.

In order to provide a better understanding of frames in the coverage of genetic modified foods in China, the review then outlines major media systems and the environment in this country, explains the importance of news sources and presents a context for this study on genetic modified foods.

Frame and Framing Process

Framing theory is both a theory and a research paradigm. It is based on the assumption that the way that an issue is characterized in news reports can have an influence on how it is understood by audiences (Scheufele, 2007). There are three important stages in the development of the theory: first, the frame concept was proposed by Bateson in 1955; second, Goffman constructed the framing theory based on the frame concept in 1974; finally, after 1990, the framing theory has gradually been applied more in the communication field. Audience frames can be considered as "mentally stored clusters of ideas that guide individuals' processing of information" (Entman, 1993, p.53).

Media frames and audience frames are two concepts within framing that need to be defined. Media frames are focused on the essence of an issue and its controversial points, which can be recognized as "a central organizing idea or story line" (Gamson & Modigliani, 1987) that picture the meaning of the issue.

Framing is usually traced back to roots in sociology and psychology. The concept of "frame" was proposed by an anthropologist Gregory Bateson who proposed that the psychological frame is a set of information or meaningful actions formed by understanding the outside environment which differ in cognitive framework. In other words, one's mental framework is formed and altered by one's physical environment and social environment to some extent. Framing theory was first discovered by American sociologist Erving Goffman (1974), under the title of frame analysis. That was the first time this concept was applied in the context of communication. According to Goffman (1974), "each primary framework allows user to locate, perceive, identify, and label a seemingly infinite number of concrete occurrences" which can be described as guided doings presenting the psychological principles and subjective processes of individual or organizational activity (p. 21-22). In essence, Goffman (1974) defines two frameworks: natural and social, which both have the characteristic of interpreting data and which are tied very closely to agenda-setting tradition but expands the research by focusing on how media draws the attentions of audiences to specific issues. Before long, frame theory was frequently used in the study of sociology. Although Goffman hoped that frame analysis would become a new kind of paradigm, there is not a clear pattern constructed in his writings, which leaves a broad space for later explanations of the framing concept.

Todd Gitlin (1980), who introduced framing theory to the field of communication via "The Whole World Is Watching: Mass Media in the Making and Unmaking of New Left", defines frames as "persistent patterns of cognition, interpretation, and presentation, of

selection, emphasis, and exclusion, by which symbol handlers routinely organize discourse, whether verbal or visual" (p. 6). As Nelson, Clawson, and Oxley (1997) observe, "frames influence opinions by stressing values, facts, and other considerations, endowing them with greater apparent relevance to the issue than they might appear to have under an alternative frame" (p. 569). Similarly, Robert Entman (1993) suggests that framing involves two processes: selection and salience. Entman defined the concepts of "Boundary" and "Building Frame" which means the "range of materials" and "construction of meaning". In other words, it can be described as the selection of news materials representing the choice of source, and the production of news materials representing the presentation of the content. In Entman's word, "To frame is to select some aspects of perceived reality and make them more salient in the communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described" (p. 52). Salience is defined by Entman as "making a piece of information more noticeable, meaningful, or memorable to audiences" (p. 53). An increase in salience improves the probability that the audience will remember the information. In addition to selection and salience, previous studies also indicate that the influence on frame sensitivity and interpretation depends on the public's attitude and knowledge of the issue, the strength of the messages, and the amount of exposure one has to a frame (Chong & Druckman, 2007; Tewksbury & Scheufele, 2009).

Frames have four locations in the communication process: author, text, receiver, and culture which respectively connect with four functions to define problems, to diagnose causes, to make moral judgments, and to suggest remedies (Entman, 1993). Authors make judgments and apply various frames to their texts. The receiver of the message is either sensitive to those frames and perceives them or is not. Culture can be described as a "set of common frames exhibited in the discourse and thinking of most people in a social grouping" (pp. 52-

53). This idea was probably built upon Goffman' s idea (1981) about the influence of cultural background on sensitivity to different frames.

Due to the difference in theory background and methodology which form the inconsistent explanation of framing concept, there are several conflicting idea within framing theory, especially in the transformation from anthropology to communication. Thus, in this fusion of different disciplines and conflict, framework theory formed a unique developmental path.

Tankard (2001) illustrates that frames provide a context, suggesting "what the issue is through the use of selection, emphasis, exclusion, and elaboration" (p. 100).

Scheufele (1999) emphasizes that framing theory is a type of media effect in his study, he systematically reorganized the fragmented framework in political communication and divided it into two dimensions - testing framework (media framework and audience framework) and operational framework (independent variable and nonindependent variable) in framing study (1999). Framing, therefore, is both a micro-level and a macro-level construct. In fact, Gans (1979) proposes that framing is a necessary tool to reduce the complexity of an issue, given the constraints of its respective media related to news holes and airtime (Scheufele, p.12). Gans (1979) also invented the model of framing process containing four key links that can be divided into frame constructing, frame setting, individual frame forming, and feedback segment.

In 2007, Scheufele and Tewksbury compared the operation of framing, agenda-setting, and priming. As they mention "Framing is based on the assumption that how an issue is characterized in news reports back to roots in both psychology and sociology differs significantly from these (agenda setting and priming) accessibility-based models" (p.11).

Apart from the elaboration of the framework theory itself, framing theory has been applied in a large number of journalism and communication literatures on empirical study.

For example, Semetko (2000) discussed the framework in European politics by analyzing the content of European newspaper and television news. According to Wu (2006), framing is "one way, and indeed a most important way, of uncovering the complexity of the social construction of reality" (p. 253).

In recent decades, there have been several studies which contributed to complete a detailed segment of framing theory. Van Gorp (2007) summarizes several elements that play an important role in framing: schemata, frame packages, framing devices, and reasoning devices. Schemata are "mentally stored clusters of ideas that guide the individual's processing of information" (Entman, 1993, p. 53). A frame package is an integrated structured kit for the frame that consists of the framing devices and reasoning devices. Framing devices include the word choice, the use of metaphors, exemplars, descriptions, depictions, catchphrases, and visual images (Gamson & Modigliani, 1989). In addition, some researchers indicate the importance of "the choices about language, quotations and relevant information" (Shah et al. 2002, p. 367), and even an evaluation of the newsworthiness of an event (Pan & Kosicki, 1993). Tankard has proposed the most comprehensive identification, which includes eleven framing mechanisms or devices: "(1) headlines, (2) subheads, (3) photos, (4) photo captions, (5) leads, (6) source selection, (7) quote selection, (8) pull quotes, (9) logos, (10) statistics and charts, and (11) concluding statements and paragraph" (Tankard, 2001, p. 101). Lastly, reasoning devices are explicit and implicit device that deal with justifications, causes and consequences of the issue being reported on.

The above information illustrates the brief process of framing its historical content. It is also necessary to understand how framing occurs in news.

Scheufele (1999) argues that framing occurs at both the macro-level and the micro-level in frame setting effect analysis. At the macro-level, framing refers to the way used to present information that provides audience with potential schemas. In other words, it is a

necessary approach to simplify an issue that shortens the distance between media and lay audiences. At the micro-level, it is a way to present "how people use information and presentation features regarding issues as they form impressions" (Scheufele, 2007). A microscopic approach aims to "examine frames as individual means of processing and structuring incoming information" (Scheufele, 2000). Also, there is another explanation of the two levels mentioned by de Vreese (2005) that "An individual level consequence may be altered attitudes about an issues based on exposure to certain frames. On the societal level, frames may contribute to shaping social level processes such as political socialization, decision-making, and collective actions" (de Vreese, 2005, p. 52).

Scheufele (1999) subdivides four stages in the framing process: frame building, frame setting, individual effects of framing, and journalists as audiences. Frame building relates to how media choose specific frames and negotiate with receivers via frames design. There are a variety of factors that could potentially influence how journalists frame a given issue, including sociological norms and values, organizational pressures and constraints, external pressures from interest groups and other policy makers, journalistic routines, and ideological orientation (Shoemaker & Reese, 1996; Tuchman, 1978; Bennett & Entman, 2001). Frame setting is the second stage of the framing process which underlines the effects of frames by examining the ways that media highlight different facts and values to make an issue appear more relevant (Scheufele, 1999, p. 116). Early in 1974 Goffman mentioned that journalists package news stories and in the process give stories meanings. And he distinguishes the natural and societal frames: "Natural frames help to interpret events originating from natural and non-intentional causes, whereas societal frames help to understand and label issues that stem from intentional action" (Scheufele, 2000). Media outlets are the main means of public expression in our society and frames help readers to understand the complex information available (McQuail, 2003). Tankard (2001) acknowledges "the power of framing comes from

its ability to define the terms of a debate without the audience realizing it is taking place" (p. 97). However, there is also the position that communicators also receive news from other sources and may also be influenced by the frames already in the system. Then Scheufele (1999) calls a fourth stage of the framing process.

The previous studies on framing news illustrates that the presentation by media is only a kaleidoscope of potential reality, but it helps the public simplify the process of decoding information delivered via "altering the way in which observations are framed and categorized" (Edelman, 1993). First, the core problem of framing theory focuses around media production, the way media reflect reality and normalize the audience's understanding. Second, textual construction, text interpretation or discourse production analysis has gained major attention in framing studies. Finally, media production is an unfolding process connected with specific context. Thus, framing can affect the individual and public knowledge of a news issue which goes through the proposed study.

A Typology of Frames

There are various ways of looking at and portraying events in the news media that generally indicates that the types of frames investigated depend on the types of issues.

Tewksbury and Scheufele (2009) summarized types of frames commonly used in media studies. They distinguish gains and loss frames (Kahneman & Tversky, 1979), episodic and thematic frames (Iyengar, 1991), strategy and issue frames (Capella & Jamieson, 1997), or human interest, conflict, and economic consequences frames (Price et al., 1997). In addition to conflict, human interest, and economic consequences frames, Semetko and Valkenburg (2000) identify the frame of attribution of responsibility and morality frame. However, mass communication studies have also examined issue-specific frames applicable only to specific topics or events (de Vreese, 2005). The News perception and interpretation can obviously be

influenced by issue-specific frames which “allows for a profound level of specificity and details relevant to the event or issue under investigation”(Semetko & de Vreese, 2004, p. 93). The studies of framing are usually examined in three processes: frame-setting, frame-building, or individual-level outcomes of framing (Scheufele, 2000). There are five factors that can be considered as potential inducement in news frame-building, “social norms and values, organizational pressures and constraints, pressures of interest groups, journalistic routines, and ideological or political orientations of journalists” (Scheufele, 2000). As for frame-setting, it not only focuses on examining audience frames as independent or dependent variables, but also discusses the impact on media frames or audience frames. In individual-level consequences of framing, it focuses on the link between audience frames and individual feedback. More specifically, it can be applied to interpret the impact on redeployment for collective action toward social change (Gamson, 1985, p.620).

The model in Figure 1 based on McLeod et al. (1974), presents the core analytic strategies of framing which are distinguished from these in agenda-setting and friming. According to Scheufele (2000), “it identifies the vital differences between the respective models as far as content characteristics, audience variables, and media effects are concerned”.

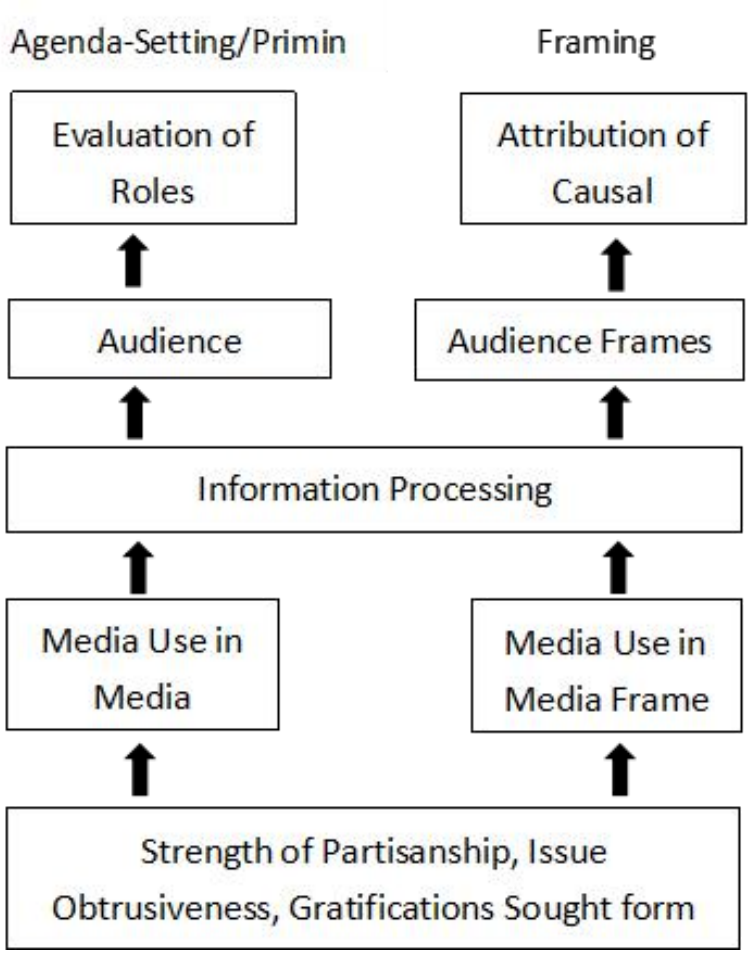


Figure 1. Analytic Model of Framing, Agenda-setting, and Priming (Scheufele, 2000, p.311).

Van Dijk and Walter (1983) propose the cognition of "Microposition" and "Proposition" as the base of text analysis what reveals the degree of proposition and forms semantic representation. Based on this thinking, Weiwen Zhong and Guoren Zang (1996) further subdivide the frame into high-level structure, middle-level structure, and low-level structure which makes up the news framework as showing Figure 2 (Guoren Zang, 1996).

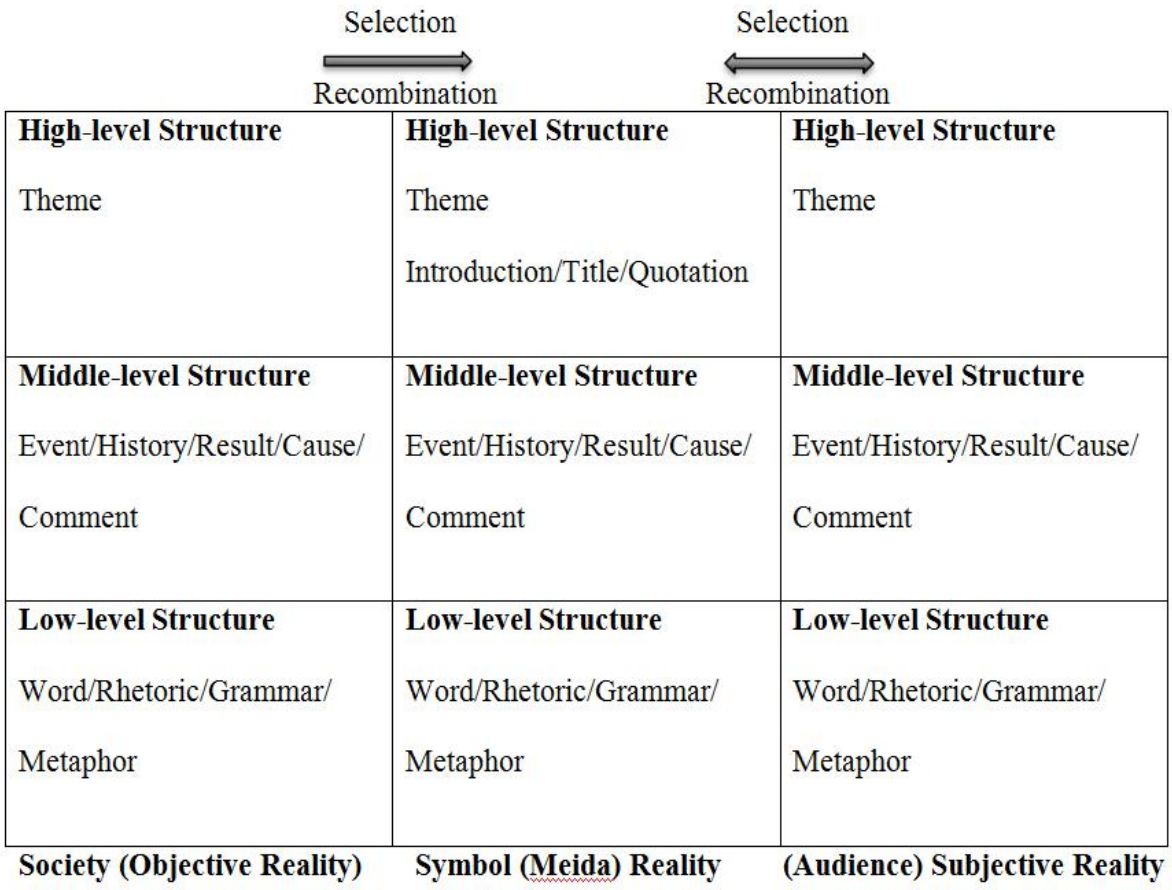


Figure 2. Inner Frame Structure Built by Each Facts (Weiwen Zhong al., 1996).

In Figure 2 the high-level structure reflects the qualitative essence of a specific event. The middle-level structure contains main event, previous event, history, outcomes, and evaluation, etc. The low-level structure is focused on text analysis that evaluates the use of tones, words, sentences, etc.

History of Genetically Modified Food: Overview

Pure DNA was first isolated by Russian scientist Andrei Nikolaevitch Belozersky in 1935. And after 28 years, the first recombinant DNA was run by Professor Herbert Boyer and a few of his biology colleagues. Boyer was also succeed in constructing a plasmid that coded for human insulin produced by genetically engineered E. coli bacteria in 1978. Eventually,

Humulin was approved by the FDA in 1982 and it became the first biotechnology product to appear on the market (Woolsey, 2012).

The issue of GM food safety was first discussed at a meeting of the Food and Agriculture Organization (FAO), the World Health Organization (WHO), and biotech representatives in 1990. At that time, market products were sold in the control without any safety or toxicology tests as long as they were not too different in chemical composition from the foods already on the market. The first genetically modified food crop to be marketed commercially following FDA approval in 1994, started when Flavr Savr tomatoes sold more than 9,000 pounds leading to controversial debates at that time. The modified tomatoes' lack of durability forced the fledgling Calgene to produce its crop year-round and deliver it more widely nationwide, adding to an already costly production process (Philippidis, 2016).

Before long, when genetically engineered crops hit the ground in 1996, farmers used the modified seeds resistant to glyphosate to plant approximately 4 million acres of land worldwide. Some research shows that the superweeds are 7 to 11 times more resistant to glyphosate than the standard susceptible population. By 2011 that number jumped to 400 million (Woolsey, 2012). Development of genetically modified crops is progressing at a much faster pace than has been the case for other innovations in plant varieties (Gómez-Barbero, Berbel, & Rodríguez-Cerezo, 2008). Also, genetically modified corns have been created in a laboratory to produce pesticides in its own tissue after a long time, which is regulated by the Environmental Protection Agency as an insecticide, but was sold unlabeled at that time. Last year, the Food and Drug Administration approved genetically-modified salmon that grows faster and larger than regular salmon, which incurred hot debates around the application and limitation of GMOs. And there are 64 countries around the world that have suggested the importance of GMO labeling.

The Uncertain Bio-Safety of GM Foods

The question of whether GM foods are safe for human consumption is the leading subject of public controversies. Consumers want to know about the short-term and long-term effects on human health of GMO consumption; among them, allergenicity, toxicity, and spread of transgene are common concerns (Wong & Chan, 2016). The unpredictable and hidden effects of foreign genes to the GM organisms and consumers may be one underlying reason for the public disquiet. First, at the gene level, it is not predictable "whether the new genetic material will be exclusive and precisely incorporated into the target object, and whether the genetic material will interfere with the recipient's biological system and produce any effects beyond expectations" (Wong & Chan, 2016). It has been demonstrated that DNA fragments from high-copy number genes can pass across through the gastrointestinal tract and go into the internal organs, tissues and blood of different animals (Nicolia, Manzo, Veronesi, & Rosellini, 2014), reflecting a possibility of incorporating foreign genetic material into the consumers' cells. So far there is no evidence showing the foreign gene absorbed from the gut can integrate into consumers' cells and lead to a germ line transfer (Wong & Chan, 2016).

At the protein level, the modifications may lead to new allergens or toxins that cannot be identified by current methodologies that screen for known toxins and allergens, and could put human health at risk (Wong & Chan, 2016). So far two GM crops have been reported on the potential allergenicity of transgenic protein (Alice & Albert, 2016). The FDA received 51 reports of adverse reaction to these corn products and among 28 individuals appeared to develop allergic reactions (Wong & Chan, 2016). However, the U.S. Centers for Disease Control (CDC) found no conclusive evidence of hypersensitivity to the Cry9C protein in these subjects (Centers for Disease Control and Prevention, 2001). Nonetheless, Aventis voluntarily dropped out the registration for StarLink corn in 2000. There are also animal

studies reporting that consumption of GM foods may lead to disruption to kidneys and livers, higher rates of infant mortality and infertility problems (C. Sarich, 2015), but more tests are needed for verification (Wong & Chan, 2016).

Risks of GMO to the environment is likely to show more apparent impact than human health. Generally, the biosafety concerns for environment can be associated with contamination of wild species, thereats to non-target species, reduction of biodiversity, out-break of antibiotic resistant bacterial strains and super-weeds, and deterioration of water and soil pollution (Wong & Chan, 2016). Some researches indicated that the potential negative effects of genetically modified plants on the safety of biology environment, since the selectable marker genes may be transfeered to weeds and pathogenetic microorganisms in the soil or gastrointestinal, which make them resistant to treatment with herbicides or antibiotics (Tuteja et al., 2012). Besides, from the biosafety authority viewpoint, transgenic sexual crossing also raises the problem of genetic expression because redundancy of GMO in the genome may stimulate homology-dependent gene silencing (Tuteja et al., 2012).

As for bio-safety regulations in China, the principle governing China's agricultural GMO bio-safety adopted a product-based GMO management system in 2002 (Huang & Wang, 2002). At the same time, China attempted to utilize labeling regulations on GM products which shifted the GM products regulation into a process-based GMO management system (Huang & Wang, 2002).

The Polarization of GMO Debates in China

There are variety of debates of GM foods among the society from Chinese officials, scientists, farmers and the public. China government has funding remarkable GM programs for decades because of its visible economic profits and positive yield increasing effect. Also, the Chinese government takes a relatively positive attitude towards allowing GMOs into the

food chain. In 2015, the Central Committee of Communist Party of China and State Council introduced several specific suggestions about fostering the development of agriculture and farmer's profit (Wong & Chan, 2016). One of these suggestions is to study GM technology in a deep-going way, and reinforce the GM-related public education and GMO safety management, which reflects the government's desire and interest (Wong & Chan, 2016).

A rank of GM-related key words (see Figure 3) shows that the public concerns on GMOs in China are mainly focus on the risks and uncertainty of GM foods. Indeed, China's food safety system leaves much problems and negative influence on its incomplete standards, weak inspection, and insufficiently followed regulations (Zhong, Marchant, Ding, and Lu, 201). The public were plagued by news about potential carcinogenic substances in GMO. These results reflect a series of underlying problems—citizens' widespread lack of basic understanding of GMO and the potential risks to human health (Ho & Vermeer, 2005). In addition, GMO agricultural application actually bring about two major impacts on farmers. First, the agricultural biotechnology contributes to the explicit benefits on reducing the application of pesticides and increasing agricultural yield based on a cheaper cost (Wong & Chan, 2016). These significant benefits make farmers surprised. However, with increasing GM imports, the representatives of farmers who produce non-GMO products with less competitive than imported products (Song Ying, 2005). Therefore, farmers started to steal the GM technology in private use before the Chinese government officially approved the GM-crops planting.

There are two respectively apparent position of China's scientific community that one is from who are deeply enthusiastic about biotechnological progress and its future economic benefits, whereas the other one from who are concerned about the irreversible impact of escaped GM crops on wild and domesticated varieties (Ho & Vermeer, 2005). Interestingly,

facing the huge debates around GMOs, these scholars did not pay much time to clarify the public's misunderstandings of GM foods safety and biosafety (Song Ying, 2006).

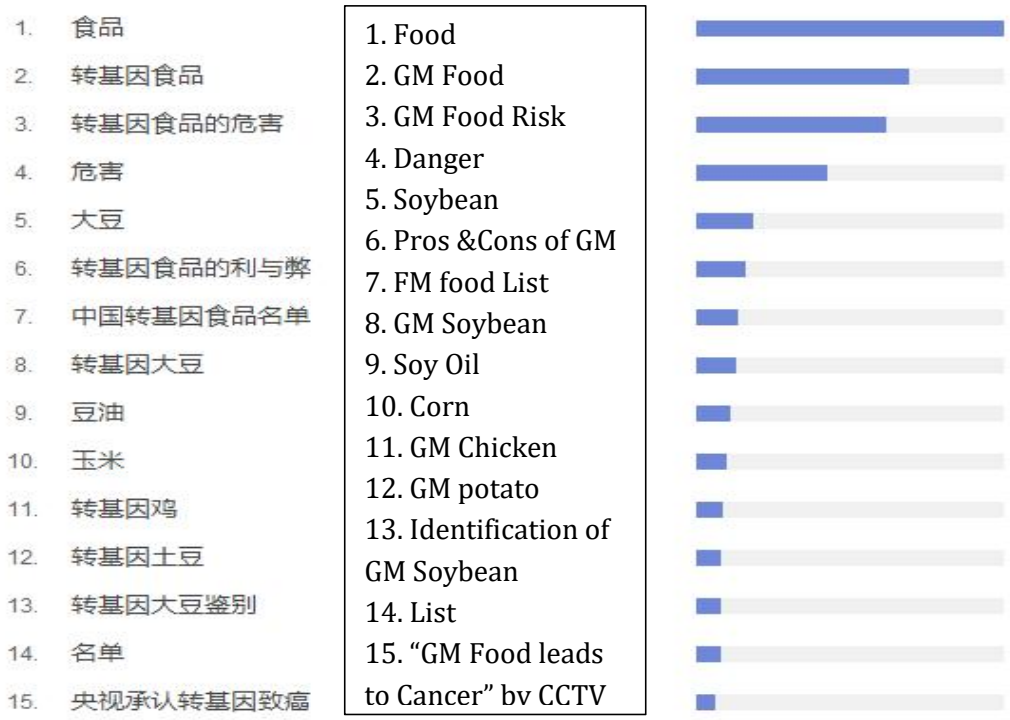


Figure 3. The Rank of GMO Keywords (Source: zhishu.baidu.com, 2017)

Legal Implications

Current administrative rules and regulations of genetically modified food in China are legally made for emergency and with poor maneuverability, which have not formed a comprehensive and systematic regulation system. Many voice are insisting to complete the regulation system of GM foods in China.

Over the past decade, Chinese officials fully applied agricultural technologies into produce, which improve quality and increase output amount of grain, vegetables, oil, crops, cotton, fruit, and other crops (Ho & Vermeer, 2005). Between 1996 and 2000, China approved 45 GM plant applications for field trials, 65 for commercial release, and 31 for

commercialization (Ho & Vermeer, 2005). By 2003, related department had approved wheat, soybeans, maize, potatoes, peanuts, rape, potatoes, rice, and cabbages for field trials (Huang et al., 2002).

The according regulation and policy for GM product management also have emerged with the use of GM technology. In December 1993, the National Science and Technology Commission issued the Genetic Engineering Safety Management Measures Act (Yang Hui, 2010). This regulation states that Science and Technology Commission is responsible for genetic engineering security, and another body the National Genetic Engineering Safety Committee takes charge of the related duties.

In May 2001, the State Council issued the Agricultural Genetically Modified Organisms Safety Management Regulations (Yang Hui, 2010). The regulations based on the original Genetic Engineering Safety Management Measures Act, extends the genetic modified organisms safety management from study to the production, processing, and import and export business.

In January 2002, the Ministry of Agriculture issued three measures: the Agricultural Genetically Modified Organisms Safety Assessment Measures, the Safety Measures for the Administration of Import of Agricultural Genetically Modified Organisms, and the Identification Measures for the Administration of Agricultural Genetically Modified Organisms.

In April 2002, the Ministry of Health issued "Genetically Modified Food Hygiene Management Method" (Order 28). This measure required declaration, examination and approval system toward genetically modified food produce and import, and identifying GM food labels as "Transgenic XX food" or "Genetically Modified XX food as raw material" to protect the health of consumers and the right to know (Hui Yang, 2010).

Chinese GM policy as “positive in research, careful in popularization, strengthening management, and safe promotion” (People’s Daily, 2003), is a central conclusion of the following instruction of related policy.

The argument among “right to know” advocate can be concluded in three points: 1) consumers have the right to know whether a food is genetically modified food; 2) consumers have the right to know the specifications of the genetically modified food, inspection standards and quarantine institutions, etc; and 3) consumers have the right to fully understand the possible consequences of eating genetically modified food (Hui Yang, 2010).

Media Systems of China

The classification of media systems can be divided into four types identified by Siebert and Schramm (1956) - authoritarian, libertarian, soviet communist, and social responsibility. In the authoritarian model direct governmental control is exercised over the media. The libertarian model allows attacks on the government and welcomes freedom of speech. In the soviet communist model media serves the interests of the working class and reflects the Marxist-Leninist view of reality. In the social responsibility model the freedoms under the libertarian model are subject to an understanding that news workers have certain obligations to provide information and balance society (Siebert, Peterson & Schramm, 1963; Oates, 2008). Even though the four models do not represent the full range of media systems in the world in the 21st century, it provides a simple differentiation of images to help understand the conflict between state control and freedom of the press. In China, the central government regulates the media close to an authoritarian system, and emphasizes the national benefit as first priority.

The media system in China is a relatively closed system which is shaped by Party forces, governmental forces, cultural forces, capital forces, professional forces, and individual

forces (Jun Luo, 2015). As visualised in Fig 4, party forces and governmental forces are power generated from The Chinese Communist Party embedded in regulations from the State Administration of Press, Publication, Radio, Film and Television (Jun Luo, 2015). Chinese media culture is the parental model which is used for teaching and announcing but communicating. Today, the concept of participatory knowledge management including equal engagement, communication, deliberative judgment, efficiency balance, and transparent criticism is an important part of media reporting (Jun Luo, 2015). The media try to attract the public's attention as it holds the concept of government policy in the limited space and time.

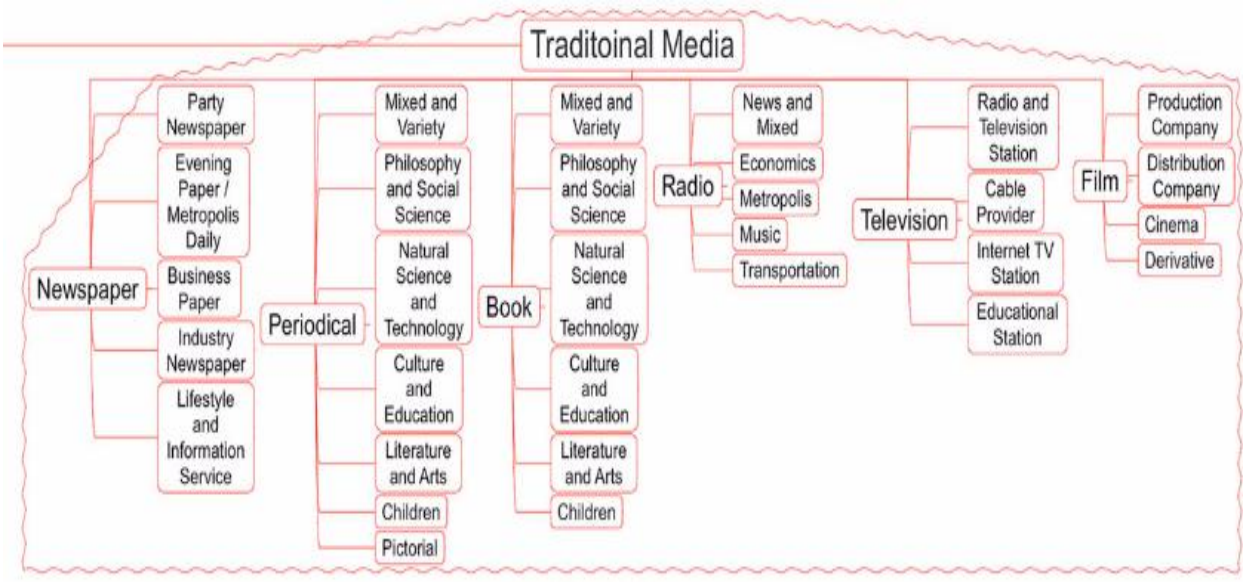


Figure 4. Media System in China (Jun Luo, 2015).

As the one of the biggest sources of publicly available information and formation, public cognition is based on the news media to some extent. In the issue of genetically modified foods, it disputes a kind of "uncertainty" and risk played a challenge and warning function, which makes the social public problem into a complex space requiring multiple negotiation from a purely scientific problem in society. Thus, it impacts the public decision

toward GM foods which is easily transformed to decision boundary. Therefore, the necessary media routine is vital to such public issues which could balance the strength and mitigate the public admission limit. There is a controversial event around genetic modified organisms again in China as the following news posted in *SupChina* by Jiayuan Feng in 2017:

> *"Cui Yongyuan 崔永元, a former CCTV anchor and a fervent opponent of genetically modified organisms (GMOs), said in an interview (in Chinese) that his activism has invited troubles for himself from some interest groups, and that he constantly receives death threats.*
>
> *The interview was the first time Cui talked to media after he resigned as the founder of an online store that only sells non-GMO food priced at around five times the cost of similar products with no GMO label or any apparent quality increase. The premium pricing stirred online discussions back in May, with many internet users accusing Cui of using his celebrity to bamboozle customers and make exorbitant profits. In response, Cui posted (in Chinese) on his Weibo account, "The quality of our food is by no means lower than that exclusively offered to government officials by the Ministry of Agriculture." As to the price, Cui wrote, "I will increase the price if you people keep making a fuss about it. I mean it."*
>
> *Speaking of his resignation, Cui said that he and the store had endured many malicious attacks, and his decision was to protect his friends' careers from being destroyed. "I am willing to take all sorts of slanders and death threats. Don't come after my store," he said. Cui also said that lobbyists had once offered him 200 million yuan ($29.8 million) to keep his mouth shut about GMOs, but he refused to do so. "I might sacrifice my life in this battle, but I am fully prepared," he said. "You want me to kneel and surrender, but it will never happen. I will fight until the last minute of my life."*
>
> *Online, Cui's tenacity was taunted by most internet users. "Who suggested the 200 million yuan offer? Tell me the name or I won't believe you," one commenter wrote (in Chinese). Given Cui's record of trolling for publicity, another wrote, "He is such a drama queen.""*
>
> (Cited from *upChina*, Jiayuan Feng, 2017)

This news describes the sensitive situation of the relevant issue of genetic modified organisms (GMOs), especially the utilization of foods that evokes a strong antagonistic social relation between pro-GMOs and anti-GMOs. In addition, the similar news reflecting the social arguments have booming from 2012 in social media. The typical example is the virtual battle from the representative of Fang Zhouzi (方舟子), a Chinese popular scientific Noble prize winner, a writer who is also well known for his campaign against pseudoscience and fraud in China and Cui Yongyuan a former CCTV anchor mentioned in the above-mentioned news article.

CHAPTER THREE:

RESEARCH DESIGN

In order to examine what themes, frames and news sources were used in the online coverage of *People's Daily* and *Southern Metropolis* the proposed study will use content analysis - a research method widely used in the field of media and mass communication (Neuendorf, 2002). According to Berelson (1952), content analysis is a research method used "for the objective, systematic, and quantitative description of the manifest content of communication" (p. 18).

Using Figure 5, this study will compare the text of *People's Daily* and *Southern Metropolis* by coding different attributes and characteristics in a three-level model (Guoren Zang, 1996): high, middle and low level to present each frame in online coverage.

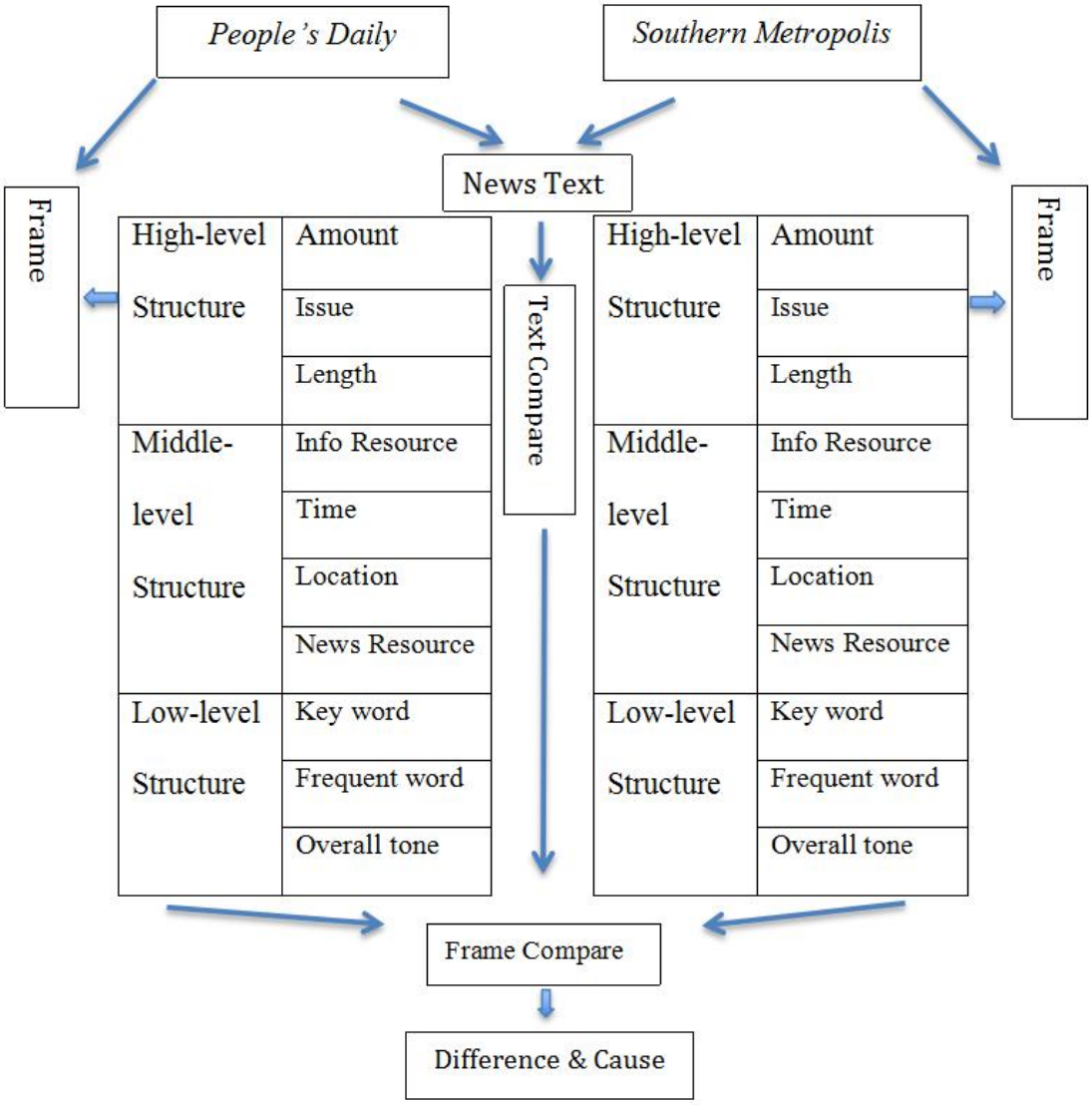


Figure 5. Study Design Image (Guoren Zang, 1996).

Research Questions

Based on the previous theoretical discussion about framing and media systems of China, the following research questions are proposed:

RQ1 What frames did *People's Daily* and *Southern Metropolis* use in online coverage of the genetic modified foods?

RQ2 Are there any major differences or similarities in the frames used in online coverage by *People's Daily* and *Southern Metropolis*?

RQ3 On what themes did *People's Daily* and *Southern Metropolis* focus in the online coverage of the genetic modified foods?

RQ4 Did the media attributes of *People's Daily* and *Southern Metropolis* affect their frame setting? What is the significance of influence.

RQ5 What sources did *People's Daily* and *Southern Metropolis* use in their online coverage of GM foods?

RQ6 What is the overall position (positive, neutral or negative) of *People's Daily* and *Southern Metropolis*?

CHAPTER FOUR:

METHOD

This research will combine a quantitative and qualitative analysis of the coverage by *People's Daily* and *Southern Metropolis* of the issue of GM foods. Quantitative analysis will mainly seek to identify two newspapers and whether the key words evoke positive or negative coverage via statistics. The qualitative aspect of the study focuses on the actual content of the news article to define and discuss the qualitative outcomes founded from the text of *People's Daily* and *Southern Metropolis.* The research will have two employed research methods.

Generally, the main research subjects are a variety of literature. Because of the systematic, objective and quantitative features, content analysis can be applied into categories of academic fields such as news communication, sociology, politics, etc. Content analysis is a method of determining "how sources of messages construct messages and have motivations underlying the messages sent and how a source's message is intended to influence a specific receiver" (Wrench et al., 2008, p. 276). The method allows for the systematic and objective analysis of message in all types of documents, speeches, media releases, scripts, and interviews (Wrech, Thomas-Maddox, Richomond, & McCrosky, 2008). In this proposed study, the researcher will code, analyze, compare and construct the collected data from literature materials of *People's Daily* and *Southern Metropolis.* She will also conduct a text analysis, which is an effective information-collection method which contributes to forming a basic knowledge of original information. In the proposed study, the aim is to collect, identify

and analyze previous literature about framing theory and genetically modified foods, to help construct a basic theoretical recognition.

News Sources

The topic of genetic modified foods (GM foods) itself is highly controversial in Chinese society which has led to dramatic conflict in news coverage. Thus, it obviously represents different news concepts and value among news media. The main question in this study is how these two different newspapers have framed the issue of GM foods.

People's Daily first published in 1948 in the province of Hebei is the organ of the Chinese Communist Party which represents the main opinion and policy of the Chinese government. Its news reports and commentary reveals the voice of the party and guides all subordinate press with strong political power, high authority and enormous influence. The first president of China, Mao Zedong, personally signed up for the *People's Daily*. With the development of the information era, *People's Daily* has begun to publish the official People's website that not only provides various new information but also enhanced its readability.

Southern Metropolis, one of a series at southern newspaper media groups founded in 1997, is also one of China's most respected newspapers. An independent newspaper, it has been responsible in revealing many social problems and unfair issues. Its average daily circulation at 1.75 million makes it is one of the largest four open daily circulation of newspapers in Guangdong province. Southern Metropolis adheres to the principle of objectivity and impartiality; its review section has become the banner of Chinese media public opinion.

These two newspapers have been selected an objects for further analyzing in this proposed study.

The selection was conducted through a search process involving the use of such keywords as “Genetically Modified Organism (转基因)”, “Genetically modified food（转基因食品）”, “Non-Genetically Modified Organism (非转基因)”, “Non-Genetically modified food (非转基因食品)”. According to the search results from CNKI (China National Knowledge Infrastructure), there are 135 related reports in *People’s Daily*, and 180 related reports in *Southern Metropolis* (Searched up to 10/01/2017).

Data Collection and Procedure

Each news story of GM foods was a unit of content analysis for this study. The total of 160 articles of GM foods were randomly collected from the results from the China National Knowledge Infrastructure (CNKI), which is the largest and most authoritative academic online library in China. Also, this study will examine the collected news coverage of GM foods in the database of *People’s Daily*, and Oeeee.com (an official website of *Southern Metropolis*).

Because of the limited total number of published news coverage of GM foods in *People’s Daily* and *Southern Metropolis*, preliminary research identified part of published reports of GM foods: 80 articles by *People’s Daily,* 80 articles by *Southern Metropolis.* In order to compare a relatively equivalent time period, the collection period was set from January 2000 to September 2017. In addition to the content analysis, this study plans to use SPSS (Statistic Package for Social Science) to inspect the situation of transgene via chi-square test, cross analysis, frequency analysis, charts and other statistics.

Coding Scheme

During the coding process, coders should read these chosen articles carefully, then take time to examine each one to ensure its accuracy, thus each article is coded with reference to the coding book (see appendix 1) and documented into SPSS database. In addition, some of typical articles with specific meaning that should be picked up in classification file to be used for further comparative analysis.

According to Figure 4, the categories of high-level, middle-level, and low-level are mainly used to investigate the content, resources, subject, strategy and knowledge nature of media produce.

This study divides the content into six key words. Code each publication into one of the seven theme categories: (1) new achievements & improvement; (2) economic, financial benefit; (3) ethics and risk; (4) the impact of GM product on individuals; (5) education and introduction; (6) supervision; (7) others. Only the dominant theme will be taken into account. The coder will identify the main theme of each news story: if more than half of the story is devoted to one of the five themes identified, then the overall story theme will be identified as such. If there is an exception, each article will be placed within no more than the two identified dominant themes.

Second, this study divides source of attribution into seven categories as below.

Table 1. Source of Attribution.

Source	**Yes/ Present**	**No/ Absent**
Chinese government officials (including presidents, prime ministers and other politicians)		

Table 1. (Continued)

Source	Yes/ Present	No/ Absent
Experts (such as health or biology commentators, professors, etc.)		
Celebrities in some specific fields		
Public (customers, farmers, housewives)		
Representatives of international organizations, NGO or welfare enterprises		
Other media outlets		
Unknown		

Third, this study identifies the overall stance of an article according to three types: (1) Pro-GMO; (2) Anti-GMO; (3) Neutral. The coder will examine the opening paragraph of each story for the presence of a stance identified in the preliminary study. Pro-GMO refers to a publication that supports the utilization of the GMO and/or approves the technology. Anti-GMO refers to a story that disagrees with the GMO-related technology and its utilization. Neutral refers to a story that does not express a clear perspective on the stance of Pro-GMO or Anti-GMO.

Fourth, news routine, also described as news convention, represents the professional production format of news coverage. The coder will mainly distinguish two opposing types of news routine (as Table 2). Meanwhile, the knowledge statement attributes will be classified as declarative knowledge and procedural knowledge. Declarative knowledge means explaining some concepts, characteristics, and status of an issue to enhance comprehension, which is mainly expressed by writing or oral expression. The core purpose of declarative

knowledge is to present the information about "what it is". Procedural knowledge represents the information guiding the implementation of an issue. The core purpose of procedural knowledge is to present the information about "how to do".

Table 2. News Routine (News Convention).

(1) Domestic vs Foreign	Making a comparison between China and other countries.
(2) Benefit vs Risk	Talking about benefit and risk of GMO.
(3) Interview	Interrogation reply system (presenting via questions and answers).
(4) Others	Cannot be placed within a specific category.

Finally, this study will code each article according to the presence or absence of the frames. The pre-test study also identified a set of frames used in the online news coverage of the GM products. In addition, there is a possibility that one story may contain multiple frames.

Ten main frames as below:

1. "Advanced Technology" frame.
2. "The right to know" frame.
3. "Worries & Potential Risk/ Safety" frame.
4. "Environmental Concerns" frame.
5. "Rumor Clarification" frame.
6. "Supervision of GM Product" frame.
7. "Economic consequences" frame.
8. "Education and Introduction" frame.
9. "Global/ international issue" frame.

10. Others.

Frames Explanation

The pre-test study identified a set of frames used in the online coverage of the GMO. News articles were content analyzed in terms of the main theme, presence and absence of sources, frames identified by the preliminary analysis of the GMO online coverage. A single news story may contain multiple frames. The coding sample for each frame is below:

Table 3. Coding Sample.

Frames	Translated News Coverage	Characteristic
1. "Advanced Technology" frame	"Biotechnology is a new engine of world economic development in 21st century, thus the Chinese government attaches great importance to agricultural biotechnology development."	This frame focuses on the positive character of GM technology and product as a fashionable trend, normal approach of agriculture and biology. The frame includes such keywords and phrases as "fashion",advantages", "popular technology", "surprising finding", "worthy discovery", "contribution", etc.
2. "The right to know" frame	" "I think GM foods must be labeled!", in the conference, Zheng Gongcheng believed that high attention is placed on GMO issue, it is necessary to face the problem and protect the customer's right to know and selection when there is much conflict. Also Sun Dafa supports the right to know when it is in a heated debates."	This frame includes such phrases as "the right to know the GM product", "label", "protect customers' right", "options", etc.

Table 3. **(Continued)**

Frames	Translated News Coverage	Characteristic
3. "Worries & Potential Risk/ Safety"	"someone mentioned that the safety of GM agricultural products have been proved, and most countries are extremely strict on GM agricultural products especially the Europe which shows a "0 tolerance" performance. Is this true?"	This frame includes such keywords and phrases as "an alarming/ a worrying technology", "challenge to public agreements", "a threat to the health of Chinese citizens", "potentially dangerous influence", "illegal/illegitimate", "safety problem", etc.
4. "Environmental Concerns" frame	"This technology in agricultural application is a short-term harmful way that soy with herbicide-resistant gene and herbicide-using will destroy the bio-environment. It controls the plant itself and eliminates the plant's original function, which is likely to diffuse. Also it may break the balance of the farmland bio-system"	This frame includes such keywords and adjectives describing the GM product connected with the "environment", "bio-pollution", "environmentally friendly", "environment pollution", etc.
5. "Rumor Clarification" frame	"Shred the potatoes peel unchanged after dark, is a genetically modified? The truth is: there is no planting genetically modified potatoes in China, the world also has no country approval for polyphenol oxidase rust resistance genes in potatoes planting industry. Some potatoes cut wire or whether black (browning) and varieties and environmental conditions have a lot to do. Black fast Slow and degree mainly depends on the content of phenolics and polyphenol oxidase activity, and whether through low temperature cold storage and so on.	This frame emphasizes the examination or evidence to clarify some rumors about GM product. The frame includes such keywords and phrases as "It's not an American's ruse/trick", "misleading", "misunderstanding", "the evidence of..." "Rumor", etc.

Table 3. **(Continued)**

Frames	Translated News Coverage	Characteristic
5. “Rumor Clarification” frame	China's massive imports of transgenic soybeans, tofu, soy milk are genetically modified (gm)? The truth is: importing genetically modified soybean with high fat and low protein content, which is suitable for oil. The materials in making tofu, beans products are from domestic non-gmo soybean production.”	This frame emphasizes the examination or evidence to clarify some rumors about GM product. The frame includes such keywords and phrases as “It’s not an American’s ruse/trick”, “misleading”, “misunderstanding”, “the evidence of...” “Rumor”, etc.
6. “Supervision of GM Product” frame	“As for genetically modified (gm) rice, genetically modified corn diffusion, this kind of problem, Xiyuan Liao replied: “the agriculture department attaches great importance to genetically modified (gm) supervision and strict supervision according to law, investigates illegal genetically modified (gm) crops. There is no such thing as a phenomenon of GMO abuse. But individual regions scattered planting is illegal, we shall be control it.”	This frame outlines legal definition, regulations concerning the GM product. The frame includes such keywords and phrases as “Policy making”, “government responsibility”, “ approval process”, “Law/ Regulation”, etc.
7. “Economic consequences” frame	“As prices of agricultural products overseas have remained low for quite a long time, prices in the domestic market have been falling too.” “In recent years, there has been a quick development of the global area of GM crops and GM agricultural products international trade t. Statistically, since the large-scale world industrialization of GM crops in 1996, the cultivation area has increased 52 times around the world in 10 years, while the total accumulative planting area reached 475 million hectares.”	This frame emphasizes the economic consequences of the genetic modified products. The frame includes such keywords and phrases as “Profits”, “economic benefits/ ”, “suspension of exports or imports”, “impact on the economy”, “Price”, etc.

Table 3. **(Continued)**

Frames	Translated News Coverage	Characteristic
8. "Education and Introduction" frame	"What is a genetically modified organism? Today we invite famous biotechnology experts to help us better understand this new technology."	This frame focuses on the introduction of GM knowledge to Chinese civilians, such as journalists' experiences, experts' recommendations, Academic analysis and so on.
9. "Global/ international issue" frame	"In recent years, there has been the quick development of the global area of GM crops and GM agricultural products international trade t. Statistically, since the large-scale world industrialization of GM crops in 1996, the area under cultivation has increased 52 times around the world in 10 years, while the total accumulative planting area reached 475 million hectares."	This frame recognizes the GM technology and application as a global trend which should evoke international relative cognition and actions. It presents a comparison between two or more than two countries or a reference to other country.

Intercoder Reliability

In content analysis, intercoder reliability refers to the extent to which independent coders agree on the coding of the content of interest with an application of the same coding scheme. In order to assess the intercoder reliability of the present study the following steps will be taken. First, the author (coder 1) will code the 160 news articles that appeared in the selected online newspapers, according to the coding scheme. Using the same coding scheme, another graduate student (coder 2) at USF will code 40 stories randomly selected from the pool of 160. According to Neuendorf (2002), percentage agreements "of .90 or greater are nearly always acceptable, .80 or greater is acceptable in most situations, and .70 may be appropriate in some exploratory studies for some indices" (p. 145). Krippendorff's alpha (α) is generally considered the most reliable measure of intercoder reliability. The general form

of the measure is: $\alpha = 1 - D_o/D_e$, where D_o is observed disagreement and D_e is expected disagreement based on an interpretation of chance. According to Krippendorff (2011, p. 1), "when observers agree perfectly, observed disagreement $D_o=0$ and $\alpha=1$, which indicates perfect reliability. When observers agree as if chance had produced the results, $D_o=D_e$ and $\alpha=0$, which indicates the absence of reliability." To interpret alpha, Krippendorff (2004, p. 241) suggests that "It is customary to require $\alpha \geq .800$. Where tentative conclusions are still acceptable, $\alpha \geq .667$ is the lowest conceivable limit." Table 3 shows that all but one of the twelve coding categories generated alphas greater than or equal to .80, with an overall alpha of .83 among the two coders.

Table 4. Intercoder Reliability.

Coding Category	Agreement among 2 Coders	Krippendorff's Alpha
Theme	85.7	.80
Source	89.9	.82
Position	85.7	.80
Frames		
1."Advanced Technology"	86.1	.82
2."The right to know"	91.7	.86
3."Worries & Potential Risk/ Safety"	88.9	.83
4."Environmental Concerns"	86.7	.81
5."Supervision of GM Product"	91.7	.86
6."Rumor Clarification"	91.7	.86
7."Economic consequences"	88.9	.83

Table 4. (Continued)

Coding Category	Agreement among 2 Coders	Krippendorff's Alpha
8.“Education and Introduction”	80.6	.80
9.“Global/ international issue”	83.5	.80
Overall	88.3	.83

CHAPTER FIVE:

RESULTS

The number or proportion of GM-related reports directly represent the degree of attention to a particular issue, and it also reflects the gatekeeper's guidance and perspective. The research explored what sources the two newspapers relied on, what themes were discussed in the online articles about the GMO related issue, and the frames applied in the online coverage of *People's Daily* and *Southern Metropolis* respectively. Six research questions guided the data collection and analysis via SPSS.

The Overview of GM foods News Coverage

The amount of coverage of genetically modified foods was relatively less than other issues in the publications perhaps because of the sensitive nature of the topic, possibly evoking public controversy and public panic. Total number of news coverage related to GM foods by *People's Daily* and *Southern Metropolis* during 2000-2017 was over 290. And the highest publishing frequency of GMO reports was among 2012-2016. According to the collected news coverage of *People's Daily* and *Southern Metropolis*, there were 10 articles (6.3%) in 2011; 18 articles (11.3%) in 2012, 18 articles (11.3%) in 2013; 21 articles (13.1%) in 2014; 30 articles (18.8%) in 2015; and 25 articles (15.6%) in 2016 (see Table 4 below). The data show, however, that the frequency of coverage by *People's Daily* and *Southern Metropolis* differed. *People's Daily* published more articles between 2012-2014, while *Southern Metropolis* had a higher frequency between 2015-2016. Compared with the amount of total published news coverage of GM foods, the number of collected articles published

during 2012-2016 was significant enough that it influenced the trend of public attention on the topic and the media framing.

Table 5. Newspaper Crosstabulation by Year.

Year			Newspaper		Total
			People's Daily	Southern Metropolis	
	2000	Count	1	0	1
		% within Newspaper	1.3%	0.0%	0.6%
	2001	Count	0	0	0
		% within Newspaper	0.0%	0.0%	0.0%
	2002	Count	3	0	3
		% within Newspaper	3.8%	0.0%	1.9%
	2003	Count	5	0	5
		% within Newspaper	6.3%	0.0%	3.1%
	2005	Count	4	0	4
		% within Newspaper	5.0%	0.0%	2.5%
	2006	Count	4	1	5
		% within Newspaper	5.0%	1.3%	3.1%
	2007	Count	1	0	1
		% within Newspaper	1.3%	0.0%	0.6%
	2008	Count	2	0	2
		% within Newspaper	2.5%	0.0%	1.3%
	2009	Count	5	0	5
		% within Newspaper	6.3%	0.0%	3.1%
	2010	Count	3	2	5
		% within Newspaper	3.8%	2.5%	3.1%
	2011	Count	5	5	10
		% within Newspaper	6.3%	6.3%	6.3%
	2012	Count	13	5	18
		% within Newspaper	16.3%	6.3%	11.3%
	2013	Count	10	8	18
		% within Newspaper	12.5%	10.0%	11.3%
	2014	Count	13	8	21
		% within Newspaper	16.3%	10.0%	13.1%

Table 5. (Continued)

Year			Newspaper		Total
			People's Daily	Southern Metropolis	
	2015	Count	4	26	30
		% within Newspaper	5.0%	32.5%	18.8%
	2016	Count	4	21	25
		% within Newspaper	5.0%	26.3%	15.6%
	2017	Count	3	4	7
		% within Newspaper	3.8%	5.0%	4.4%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Research Questions Answering

RQ1 What frames did *People's Daily* and *Southern Metropolis* use in online coverage of the genetically modified foods?

In order to answer RQ1, the researcher followed a two-step procedure. First, Pearson's Chi-square test was used to test against the null hypothesis that the distribution of the "Advanced Technology" frame is the same across both newspapers. The Chi-square test results (see Table 7) in a p-value are smaller than .05 (p=.000), which means that there is strong evidence to suggest that there is a difference in the "Advanced Technology" frame distribution across these two newspapers. Second, a set of pairwise z-tests of differences in proportion was performed in order to determine whether any particular theme significantly differed in online coverage of *People's Daily* and *Southern Metropolis*. The distribution of the "Advanced Technology" frame is shown in Table 6. As presented in Table 6, *People's Daily* (n=26, 32.5%) published significantly more positively framed stories about "Advanced Technology" than *Southern Metropolis* (n=7, 8.8%) did.

Table 6. Crosstab: Advanced Technology.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Advanced Technology	Yes/Present	Count	26_a	7_b	33
		% within Newspaper	32.5%	8.8%	20.6%
	No/Absent	Count	54_a	73_b	127
		% within Newspaper	67.5%	91.3%	79.4%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 7. Chi-Square Tests: Advanced Technology.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.782[a]	1	.000		
Continuity Correction[b]	12.369	1	.000		
Likelihood Ratio	14.495	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	13.696	1	.000		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.50.

b. Computed only for a 2x2 table

The Chi-square test results (see Table 9) in a p-value are greater than .05 (p=.658), which means that there is no statistical difference in "The Right to Know" frame distribution across these two newspapers. The distribution of "The Right to Know" frame is shown in Table 8. As presented in Table 8, *People's Daily* (n=13, 16.3%) published few framed

stories about “The Right to Know”, a result that is similar to *Southern Metropolis* (n=11, 13.8%).

Table 8. Crosstab: The Right to Know.

			Newspaper		
			People's Daily	Southern Metropolis	Total
The right to know	Yes/Present	Count	13_a	11_a	24
		% within Newspaper	16.3%	13.8%	15.0%
	No/Absent	Count	67_a	69_a	136
		% within Newspaper	83.8%	86.3%	85.0%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 9. Chi-Square Tests: The Right to Know.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.196[a]	1	.658		
Continuity Correction[b]	.049	1	.825		
Likelihood Ratio	.196	1	.658		
Fisher's Exact Test				.825	.413
Linear-by-Linear Association	.195	1	.659		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.00.

b. Computed only for a 2x2 table

The Chi-square test results (Table 11) in a p-value are smaller than .05 (p=.031), which means that there is a statistically significant difference in the “Worries & Potential

Risk/Safety" frame distribution across *People Daily* and *Southern Metropolis*. The distribution of the "Worries & Potential Risk/Safety" frame is shown in Table 10. As presented in Table 10, *People Daily* (n=15, 18.8%) published fewer framed stories about "Worries & Potential Risk/Safety" than *Southern Metropolis* (n=27, 33.8%) did. It also reflects that *Southern Metropolis* was concerned about whether the GM foods presented some potential problems affecting public safety, whereas *People's Daily* placed less attention upon this aspect.

Table 10. Crosstab: Worries & Potential Risk/Safety.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Worries & Potential Risk/Safety	Yes/Present	Count	15_a	27_b	42
		% within Newspaper	18.8%	33.8%	26.3%
	No/Absent	Count	65_a	53_b	118
		% within Newspaper	81.3%	66.3%	73.8%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 11. Chi-Square Tests: Worries & Potential Risk/Safety.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.649[a]	1	.031		
Continuity Correction[b]	3.906	1	.048		
Likelihood Ratio	4.699	1	.030		
Fisher's Exact Test				.047	.024

Table 11. (Continued)

Linear-by-Linear Association	4.620	1	.032		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 21.00.

b. Computed only for a 2x2 table

The Chi-square test results (Table 13) in a p-value are greater than .05 (p=.173), which means that there is no statistical difference in the "Environmental Concerns" frame distribution across these two newspapers. The distribution of the "Environmental Concerns" frame is shown in Table 12. As presented in Table 11, *People's Daily* (n=4, 5.0%) published few framed stories about "Environmental Concerns" similar to the statistics for *Southern Metropolis* (n=1, 1.3%). Interestingly, it seems like the environmental concerns about the GMO issue (n=5, 3.1%) was less likely to be reported in both *People's Daily* and *Southern Metropolis.* However, environmental concerns have been identified as one of the most serious risks evaluated by many studies indicating that the bio-population of environment within the GMO growing area is out of control.

Table 12. Crosstab: Environmental Concerns.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Environmental Concerns	Yes/Present	Count	4[a]	1[a]	5
		% within Newspaper	5.0%	1.3%	3.1%
	No/Absent	Count	76[a]	79[a]	155
		% within Newspaper	95.0%	98.8%	96.9%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 13. Chi-Square Tests: Environmental Concerns.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.858[a]	1	.173		
Continuity Correction[b]	.826	1	.363		
Likelihood Ratio	1.986	1	.159		
Fisher's Exact Test				.367	.184
Linear-by-Linear Association	1.846	1	.174		
N of Valid Cases	160				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.50.

b. Computed only for a 2x2 table

The Chi-square test results (Table 14) in a p-value are greater than .05 (p=.668), which means that there is no statistical difference in the "Rumor Clarification" frame distribution across these two newspapers. The distribution of the "Rumor Clarification" frame is shown in Table 13. Specifically, *People Daily* (n=14, 17.5%) published a certain number of framed stories about "Rumor Clarification" similar to these published by *Southern Metropolis* (n=12, 15.0%).

Table 14. Crosstab: Rumor Clarification.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Rumor Clarification	Yes/Present	Count	14_a	12_a	26
		% within Newspaper	17.5%	15.0%	16.3%
	No/Absent	Count	66_a	68_a	134
		% within Newspaper	82.5%	85.0%	83.8%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 15. Chi-Square Tests: Rumor Clarification.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.184[a]	1	.668		
Continuity Correction[b]	.046	1	.830		
Likelihood Ratio	.184	1	.668		
Fisher's Exact Test				.831	.415
Linear-by-Linear Association	.183	1	.669		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 13.00.

b. Computed only for a 2x2 table

The Chi-square test results (Table 17) in a p-value are greater than .05 (p=.511), which means that there is no statistical difference in the "Supervision of GM Product" frame distribution across these two newspapers. The distribution of the "Supervision of GM Product" frame is shown in Table 16. Specifically, *People's Daily* (n=31, 38.8%) published a similar number of framed stories about "Supervision to GM Product" similar to these published by *Southern Metropolis* (n=27, 33.8.0%). It also reflects that there was a relatively higher proportion in the framed stories about "Supervision of GM Product", which has been urged by Chinese officials and the public in recent years.

Table 16. Crosstab: Supervision of GM Product.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Supervision to GM Product	Yes/Present	Count	31_a	27_a	58

Table 16. (Continued)

			Newspaper		
			People's Daily	Southern Metropolis	
Supervision to GM Product	Yes/Present	% within Newspaper	38.8%	33.8%	36.3%
	No/Absent	Count	49_a	53_a	102
		% within Newspaper	61.3%	66.3%	63.7%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 17. Chi-Square Tests: Supervision of GM Product.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.433[a]	1	.511		
Continuity Correction[b]	.243	1	.622		
Likelihood Ratio	.433	1	.511		
Fisher's Exact Test				.622	.311
Linear-by-Linear Association	.430	1	.512		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.00.

b. Computed only for a 2x2 table

The Chi-square test results (Table 19) in a p-value are smaller than .05 (p=.003), which means that there is a statistically significant difference in the "Economic Consequences" frame distribution across *People's Daily* and *Southern Metropolis*. The distribution of the "Economic Consequences" frame is shown in Table 18. As presented in Table 18, *People's Daily* (n=28, 35.0%) published many more framed stories about "Economic Consequences" than *Southern Metropolis* (n=12, 15.0%) did. It also reflects that

People's Daily, which represents an official desire to emphasize the merits of GMO, paid much more attention to the economic benefits and outcomes brought by GMO products whereas *Southern Metropolis* paid less attention to this aspect.

Table 18. Crosstab: Economic Consequences.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Economic Consequences	Yes/Present	Count	28_a	12_b	40
		% within Newspaper	35.0%	15.0%	25.0%
	No/Absent	Count	52_a	68_b	120
		% within Newspaper	65.0%	85.0%	75.0%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 19. Chi-Square Tests: Economic Consequences.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.533[a]	1	.003		
Continuity Correction[b]	7.500	1	.006		
Likelihood Ratio	8.722	1	.003		
Fisher's Exact Test				.006	.003
Linear-by-Linear Association	8.480	1	.004		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.00.

b. Computed only for a 2x2 table

The Chi-square test results (Table 20) in a p-value are greater than .05 (p=.105), which means that there is no statistical difference in the "Educational Knowledge " frame distribution across these two newspapers. The distribution of the "Educational Knowledge" frame is shown in Table 19. Specifically, *People Daily* (n=19, 23.8%) published a similar number of framed stories about "Educational Knowledge" to that published in *Southern Metropolis* (n=11, 13.8.0%).

Table 20. Crosstab: Educational Knowledge.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Educational Knowledge	Yes/Present	Count	19_a	11_a	30
		% within Newspaper	23.8%	13.8%	18.8%
	No/Absent	Count	61_a	69_a	130
		% within Newspaper	76.3%	86.3%	81.3%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 21. Chi-Square Tests: Educational Knowledge.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.626[a]	1	.105		
Continuity Correction[b]	2.010	1	.156		
Likelihood Ratio	2.652	1	.103		
Fisher's Exact Test				.155	.078
Linear-by-Linear Association	2.609	1	.106		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.00.

b. Computed only for a 2x2 table

The Chi-square test results (see Table 23) in a p-value are smaller than .05 (p=.001), which shows that there was a significant statistical difference in the "International Perspective" frame distribution across *People's Daily* and *Southern Metropolis*. The distribution of the "International Perspective" frame is shown in Table 22. As presented in Table 22, *People's Daily* (n=36, 45.0%) published many more framed stories about "International Perspective" than *Southern Metropolis* (n=17, 21.3%). The table reflects that international information about GMO achievement, application and related research had been widely adopted by editors of *People's Daily* whereas *Southern Metropolis* was less likely to use international information to form a comparison in their news coverage. Even so, the total number of "International Perspective" frames (n=53, 33.1%) reached relatively higher proportion among all of these frames being applied.

Table 22. Crosstab: International Perspective.

			Newspaper		
			People's Daily	Southern Metropolis	Total
International Perspective	Yes/Present	Count	36_a	17_b	53
		% within Newspaper	45.0%	21.3%	33.1%
	No/Absent	Count	44_a	63_b	107
		% within Newspaper	55.0%	78.8%	66.9%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 23. Chi-Square Tests: International Perspective.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.185[a]	1	.001		
Continuity Correction[b]	9.141	1	.002		
Likelihood Ratio	10.357	1	.001		
Fisher's Exact Test				.002	.001
Linear-by-Linear Association	10.121	1	.001		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 26.50.

b. Computed only for a 2x2 table

The Chi-square test results (see Table 25) in a p-value are smaller than .05 (p=.004), which shows that there is a significant statistical difference in the "Others" frame distribution between *People's Daily* and *Southern Metropolis*. As presented in Table 24, *People's Daily* (n=4, 5.0%) published fewer framed stories about "Others" than *Southern Metropolis* (n=16, 20.0%) did. Interestingly, *Southern Metropolis* presented a significant proportion of framed stories in the "Others" category, when compared to the other newspaper. According to the coding process, the inconspicuous or insignificant frame was defined as the "Others" frame in this study. This classification may be a kind of limitation to this study that is worthy of future investigation.

Table 24. Crosstab: Others.

			Newspaper		Total
			People's Daily	Southern Metropolis	
Others	Yes/Present	Count	4_a	16_b	20
		% within Newspaper	5.0%	20.0%	12.5%
	No/Absent	Count	76_a	64_b	140

Table 24. (Comtimued)

			Newspaper		Total
			People's Daily	Southern Metropolis	
Others	No/Absent	% within Newspaper	95.0%	80.0%	87.5%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 25. Chi-Square Tests: Others.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.229[a]	1	.004		
Continuity Correction[b]	6.914	1	.009		
Likelihood Ratio	8.740	1	.003		
Fisher's Exact Test				.007	.004
Linear-by-Linear Association	8.177	1	.004		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.00.

b. Computed only for a 2x2 table

RQ2 Are there any major differences or similarities in the frames used in online coverage in *People's Daily* and *Southern Metropolis*?

The total proportion of frames between *People' Daily* and *South Metropolis* was distributed sequentially as follows: "Supervision to GM Product" (n=58, 36.3%), "International perspective" (n=53, 33.1%), "Worries & Potential Risk/Safety" (n=42, 26.3%), Economic consequences (n=40, 25.0%), "Advanced Technology" (n=33, 20.6%), "Educational Knowledge" (n=30, 18.8%), "Rumor Clarification" (n=26, 16.3%), "The Right to Know" (n=24, 15.0%), "Other" (n=20, 12.5%), and "Environmental Concern" (n=5, 3.1%). These newspapers combined were likely to design many more framed reports of

"Supervision to GM Product", "International perspective", or "Worries & Potential Risk/Safety" than to use the other categories.

Connected with the above data analysis, there are major differences in framing used between *People's Daily* and *Southern Metropolis* as discussed below.

First, there were significant differences in the number of framed stories about "Advanced Technology" (p=.000), "International Perspective"(p=.001), "Economic Consequences"(p=.001), and "Worries & Potential Risk/ Safety" (p=.031) between *People's Daily* and *Southern Metropolis.* Specifically, *People's Daily* published significantly more framed stories about "Advanced Technology" (n=26, 32.5%) than *Southern Metropolis* (n=7, 8.8%) did; *People's Daily* (n=36, 45.0%) published many more framed stories reflecting "International Perspective" than *Southern Metropolis* (n=17, 21.3%) did; *People's Daily* (n=28, 35.0%) published many more framed stories of "Economic Consequences" than *Southern Metropolis* (n=12, 15.0%) did; *People's Daily* (n=15, 18.8%) published fewer framed stories about "Worries & Potential Risk/Safety" than *Southern Metropolis* (n=27, 33.8%) did. Therefore, these statistics reflect that *People's Daily* preferred to use the frames of "Advanced Technology", "International Perspective" or "Economic Consequences", whereas *Southern Metropolis* preferred to produce the framed stories of "Worries & Potential Risk/Safety".

RQ3 On what themes did *People's Daily* and *Southern Metropolis* focus in the online coverage of genetically modified foods?

A theme is different than a frame in its characteristics. A theme is the central point and value of one news story, whereas various frames could be simultaneously presented in one news coverage.

In order to answer RQ3, the researcher followed a two-step procedure. First, Pearson's Chi-square test was used to test against the null hypothesis of the distribution of

themes across *People's Daily* and *Southern Metropolis* is similar. The Chi-square test results shown in Table 27 indicate that the hypothesized difference between these two newspapers reached statistical significance (df=7, p=.031), which means that there is a statistical difference in theme distribution across these two newspapers. Second, a set of pairwise z-tests of differences in proportions were performed in order to determine which particular theme significantly differed in online coverage of *People's Daily* compared to that provided by *Southern Metropolis*. The distribution of themes shown in Table 26 indicates that the theme of "Education & Introduction" was more likely to be adopted by *People's Daily* than by *Southern Metropolis,* and supervision was a popular theme in both newspapers.

In addition, the presence of "Others" theme was much more frequently seen in *Southern Metropolis* than *People's Daily* , which needs to be further analyzed.

Table 26. Crosstab: Theme.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Theme	new achievement & improvement	Count	11_a	5_a	16
		% within Newspaper	13.8%	6.3%	10.0%
	economic, financial benefit	Count	6_a	5_a	11
		% within Newspaper	7.5%	6.3%	6.9%
	ethics and risks	Count	9_a	14_a	23
		% within Newspaper	11.3%	17.5%	14.4%
	impact of GM product on individuals	Count	1_a	4_a	5
		% within Newspaper	1.3%	5.0%	3.1%
	education and introduction	Count	13_a	3_b	16
		% within Newspaper	16.3%	3.8%	10.0%

Table 26. (Continued)

			Newspaper		Total
			People's Daily	Southern Metropolis	
Theme	supervision	Count	22_a	18_a	40
		% within Newspaper	27.5%	22.5%	25.0%
	label	Count	4_a	6_a	10
		% within Newspaper	5.0%	7.5%	6.3%
	others	Count	14_a	25_b	39
		% within Newspaper	17.5%	31.3%	24.4%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 27. Chi-Square Test: Theme.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.380[a]	7	.031
Likelihood Ratio	16.107	7	.024
Linear-by-Linear Association	2.501	1	.114
N of Valid Cases	160		

a. 2 cells (12.5%) have expected count less than 5. The minimum expected count is 2.50.

RQ4 Did the media attributes of *People's Daily* and *Southern Metropolis* affect their frame setting? What is the significance of the influences?

The Chi-square test results shown in Table 29 indicate that the difference between the conventions of *People's Daily* and *Southern Metropolis* in general reached statistical significance (df=3, p=.040), which means that there is a statistical difference in media convention distribution across these two newspapers. Interestingly, *People's Daily* uses more "Other" conventions than *Southern Metropolis* does*, w*hich is not addressed in this article

because some vague conventions containing political, commercial or other significance were not divided into a specific category, which could also offer a new direction of study. Second, a set of pairwise z-tests of differences in proportion were performed in order to determine which particular convention significantly differed in online coverage of *People's Daily* to that by *Southern Metropolis*. The distribution of conventions shown in Table 28 indicated that along with "Others", "Interview" was a high-frequency routine in both *People's Daily* and *Southern Metropolis.*

In addition, there was no significant statistical difference in knowledge attribute (see Table 31). The declarative attribute was highly adopted in both newspapers.

Table 28. Crosstab: Routine.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Routine	Domestic vs Foreign	Count	6_a	2_a	8
		% within Newspaper	7.5%	2.5%	5.0%
	Benefit vs Risk	Count	3_a	1_a	4
		% within Newspaper	3.8%	1.3%	2.5%
	Interview	Count	34_a	23_a	57
		% within Newspaper	42.5%	28.7%	35.6%
	Others	Count	37_a	54_b	91
		% within Newspaper	46.3%	67.5%	56.9%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 29. Chi-Square Tests: Routine.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.299[a]	3	.040
Likelihood Ratio	8.470	3	.037
Linear-by-Linear Association	7.586	1	.006
N of Valid Cases	160		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 2.00.

Table 30. Crosstab: Knowledge Attribute.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Knowledge	Declarative	Count	75[a]	73[a]	148
		% within Newspaper	93.8%	91.3%	92.5%
	Procedural	Count	5[a]	7[a]	12
		% within Newspaper	6.3%	8.8%	7.5%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 31. Chi-Square Tests: Knowledge Attribute.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.360[a]	1	.548		
Continuity Correction[b]	.090	1	.764		
Likelihood Ratio	.362	1	.547		
Fisher's Exact Test				.765	.383
Linear-by-Linear Association	.358	1	.550		
N of Valid Cases	160				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.00.

RQ5 What sources did *People Daily* and *Southern Metropolis* use in their online coverage of GM foods?

The Chi-square test results shown in Table 33 reflect that the difference between *People's Daily* and *Southern Metropolis* reached statistical significance (df=5, p=.000), which means that there is a statistical difference between how these newspapers use their sources.

A series of pairwise z-tests of differences in proportion were performed in order to determine what sources were used in the coverage of both newspapers in order to examine whether there is a significant difference in source attribution between *People's Daily and Southern Metropolis.* The results (see Table 32) showed that there was a significant difference in utilization of quotes and statements among the government officials, experts, celebrity in some specific field, public, and foreign media. The most quoted sources for *People's Daily* were government officials (n=57, 35.6%), experts (n=35, 21.9%), and public (n=35, 21.9%), while the dominant sources for *People's Daily* were the government officials (n=37, 46.3%), followed by the experts (n=17, 21.3%) that statistically are similar to *Southern Metropolis* (n=18, 22.5%). It also should be noted that the news coverage in *Southern Metropolis* was more likely to rely on quotations from the public (n=25, 31.3%), followed by Chinese government officials (n=20, 25.0%) and experts (n=18, 22.5%), while public sources were the fourth most quoted source for *People's Daily* (n=10, 12.5%). Interestingly, the citations from a celebrity in some specific field appeared in 0.0% of *People's Daily* news stories but in 8.8% of *Southern Metropolis* reports. Both newspapers used foreign media sources, but *People's Daily* did so more often than *Southern Metropolis.*

According to these results, we may assume that *Southern Metropolis* offered a greater diversity of opinions with differing perspectives on the GM foods than *People's Daily* did.

Table 32. Crosstab: News Source.

			Newspaper		
			People's Daily	Southern Metropolis	Total
Source	Chinese government officials	Count	37_a	20_b	57
		% within Newspaper	46.3%	25.0%	35.6%
	Experts	Count	17_a	18_a	35
		% within Newspaper	21.3%	22.5%	21.9%
	Celebrity in some specific fields	Count	0_a	7_b	7
		% within Newspaper	0.0%	8.8%	4.4%
	Public (customer, farmer, housewife, individual)	Count	10_a	25_b	35
		% within Newspaper	12.5%	31.3%	21.9%
	Other foreign media outlets	Count	13_a	4_b	17
		% within Newspaper	16.3%	5.0%	10.6%
	Unknown	Count	3_a	6_a	9
		% within Newspaper	3.8%	7.5%	5.6%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 33. Chi-Square Tests: News Source

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.292[a]	5	.000
Likelihood Ratio	27.558	5	.000
Linear-by-Linear Association	1.833	1	.176
N of Valid Cases	160		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 3.50.

RQ6 What is the overall position (positive, neutral, or negative) of *People's Daily* and *Southern Metropolis*?

The Chi-square test results shown in Table 35 indicated that there was a statistical difference between *People's Daily* and *Southern Metropolis* (df=2, p=.001). Pairwise z-tests results presented in Table 35 significantly show that more stories in *People's Daily* (n=31, 38.8%) appeared with a "Pro-GMO" position than those that appeared in *Southern Metropolis* (n=18, 22.5%). The distribution of positions shown in Table 34 indicate that the position of "Pro-GMO" was more likely to be implied by *People's Daily* than by *Southern Metropolis,* whereas the position of the "Anti-GMO" side was more likely to be implied in *Southern Metropolis* than in *People's Daily.* Besides, the position of "Neutral" was common in both *People's Daily* (53.8%) and *Southern Metropolis* (47.5%). Interestingly, the news coverage of *Southern Metropolis* held a statistically equal proportion of positions in "Pro-GMO" and "Anti-GMO". The statistics reflect that, despite the fact that mostly it took a neutral position, *Southern Metropolis* presented a significant amount of pluralistic standpoints.

Table 34. Crosstab: Position

			Newspaper		
			People's Daily	Southern Metropolis	Total
Stance	Pro-GMO	Count	31_a	18_b	49
		% within Newspaper	38.8%	22.5%	30.6%
	Anti-GMO	Count	6_a	24_b	30
		% within Newspaper	7.5%	30.0%	18.8%
	Neutral	Count	43_a	38_a	81
		% within Newspaper	53.8%	47.5%	50.6%
Total		Count	80	80	160
		% within Newspaper	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Newspaper categories whose column proportions do not differ significantly from each other at the .05 level.

Table 35. Chi-Square Tests: Position

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.558[a]	2	.001
Likelihood Ratio	15.364	2	.000
Linear-by-Linear Association	.515	1	.473
N of Valid Cases	160		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.00.

CHAPTER SIX:

DISCUSSION

The purpose of this study was to explore how the media use frames to present their news stories to the public under the theoretical framework of framing theory. It still explored how media exposes its potential position toward genetically modified foods based on the context of economy, political environment, bio-safety, legal provisions, and social functions of GMOs. This chapter discusses the significant findings from the results and explains the influential factors connected with the specific examples picked up from news coverage in *People's Daily* and *Southern Metropolis*.

Significance 1: The basic condition of framing in GM-related online news coverage of *People's Daily* and *Southern Metropolis*.

The heated debates around the GMO issue has become the most popular public scientific problem in recent years. At the same time, the Chinese government has proposed many documents emphasizing the importance of its scientific research and has offered financial funds that have exceeded a thousand billion dollars (Jing Yujing, 2012). However, the total number of reports are fewer than those written on other relevant scientific issues that did not receive such high funding: 135 related reports in *People's Daily* and 180 related reports in *Southern Metropolis* (Searched up to 10/01/2017). In addition, *People's Daily* as the organ of the Chinese Communist Party led the discussion about GM foods beginning from 2000, while *Southern Metropolis* started to attempt to bring attention to GM foods issues after 2010. The highest frequency of related reporters published in *People's Daily* and

Southern Metropolis was a little bit different. *People's Daily* had the highest frequency of published news stories between 2012-2014, while *Southern Metropolis* had its highest frequency of news coverage between 2015-2016 (Table 4).

The reasons for this discrepancy can be explained by a series of important events that have led to public panic.

In 2012, a bombshell shocked the Chinese public that, according to an article published online in the *American Journal of Clinical Nutrition*, some Chinese primary school children aged six to eight were being given meals containing "golden rice", spinach or β-carotene capsules for lunch every week day without any notification to their parents (Qiu, 2012). Even though the development of genetically modified rice had received strong government support in China, the public still rejected GM foods by arguing and complaining on the social networks. Therefore, the government had to provide an explanation to the public by reporting relevant news in *People's Daily* (see Figure 6). Although there was a problem among the illegal procedure of the golden rice test, breaking scientific ethics, *People's Daily* evaded some important questions like "How did the study group get permission?", " Who permitted it?", " Why not tell the parents?", and published several announcements about the punishment, along with an apology and official comments. One of these reports (Figure 6) noted, "although there is no evidence that the 'golden rice' is harmful to human body and the consequences are not as terrible as people are saying, ignoring scientific research programs and the public's right to know should not be an appropriate attitude toward science", aggravating the anger of the public (*People's Daily*, 2012). Meanwhile, a few weeks later, the first announcement that was anti-GM foods in China was proposed by Baiquan county government and Nourishment Institute of Sichuan province (*Southern Metropolis*, 2012).

人民日报：记住黄金大米风波教训

2012年12月07日 07:00 人民网-人民日报

记住“黄金(1288.50,5.50,0.43%)大米”风波的教训(短评)

肖潘潘

“违背了科学精神，再伟大的科学成果也会黯然失色。”科学精神是开展试验必须恪守的前提，它不仅要求严守科研诚信、职业道德、医学伦理，还意味着尊重科学、遵守程序、服从规则。虽然尚无证据表明“黄金大米”对人体有害，其后果也不像有些人说得那么可怕，但罔顾科研程序和公众知情权的“试验无害”论，不是科学研究者的应有态度，更不能成为推卸责任的挡箭牌。

在开展科学试验之前，充分尊重公众知情权，严格遵守科学伦理，认真履行相关程序，这是“黄金大米试验”风波带来的最大教训。在社会生活的其它方面，如何加强管理、完善制度、遵守程序，同样值得我们思考。

People's Daily: Draw a Lesson from "Golden Rice" Event

2012.12.07 People's Daily

"Violating the scientific spirit, even a great scientific achievement would be eclipsed." Scientific spirit is the premise of a scientific test that we must obey. It not only requires scientific integrity, professional ethics, medical ethics, but also means respecting science, abiding by procedures, obeying rules. Although there is no evidence showed the "golden rice" is harmful to human body and the consequences is not as terrible as people saying, ignoring scientific research program and the public's right to know should not be an appropriate attitude of science. Researchers can't deny the responsibility even with shield of "harmless test theory".....

Figure 6. *People's Daily*: Draw a Lesson from "Golden Rice" Event.

In 2013, there was an official document titled "Notice on organizing the implementation of the construction and industrialization of biological breeding capacity ([2012] 607) " (Chinese National Development and Reform Commission, 2013), which promised the commercialization of GM foods with 76 billion dollars initial funding. In order to accelerate the process of GM foods commercialization, 61 Chinese academics wrote to the national leadership about their "Pro-GMO" stance, which was reported by *Southern Metropolis* (see Figure 7). This crisis was a negative attack on the commercialization of GMO in China that temporarily suspended the plan of GM food commercialization. Besides, media such as *Times Weekly* revealed that some academics involved in this event were members of the Dupont Pioneer Seed Company belonging to Monsanto, which is one of the largest agricultural companies selling GMO seeds in the world.

61位院士“挺转基因”风波

院士联名上书称“再迟缓就是误国”却被骂为“卖国”，口诛笔伐让院士们选择沉默

2013-12-06 00:00:00 浏览量：326 评论（0）

字号：T T 手机看南都网

摘要：61名院士联名上书，呼吁国家支持转基因作物产业化，引发热议。但事发一月有余，没有院士愿意谈及此信，信的内容也始终是谜。信息未明，对峙已出，这一直是转基因争议中的恶性循环，院士闭门上书，民间口诛笔伐，始终缺乏良性透明的交流氛围。这正是去执意寻找联名信的初衷。

61名院士联名上书，呼吁国家支持转基因作物产业化，引发热议。但事发一月有余，没有院士愿意谈及此信，信的内容也始终是谜。信息未明，对峙已出，这一直是转基因争议中的恶性循环，院士闭门上书，民间口诛笔伐，始终缺乏良性透明的交流氛围。这正是去执意寻找联名信的初衷。

“今天不谈信”

谈“信”色变。

“你问我有没有在联名信上签名，还问哪些院士签了名，就像组织部门来调查一样。”一位院士拒绝谈信。

“今天不谈信！”记者数日来联系了十几名研究领域与转基因相关的院士，几乎都谨慎拒绝。

The crisis of 61 Academics “Pro-GMO”

2013.12.06, *South Metropolis*

Abstract: 61 Pro-GMO academics wrote to urge the commercialization of GMO product, which led a heated debates among society. However no one wanted to talk about the content of that letter. The information is unknown, while the stand-off occurred. There is always a lack of efficient transparent communication between the public and these academics. So it is why we need to find the content of the letter.

“Today no discussion around letter”

Bad face when talked the “letter”.

.....

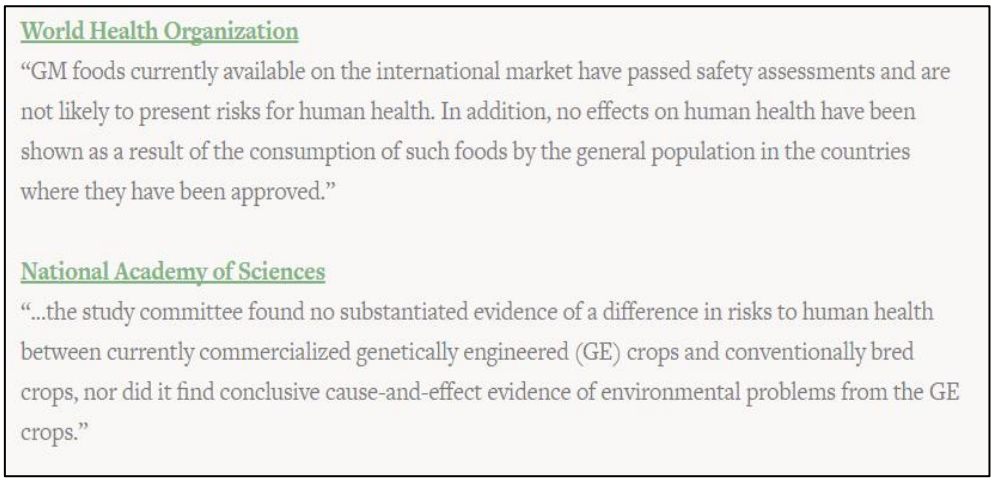
Figure 7. Part of News Coverage of “The crisis of 61 Academics’ Pro-GMO”.

A statement posted on Monsanto’s homepage of its official website briefly explains the role of genetically-modified organisms:

“Humans have been using plant breeding techniques to improve our food and crops for thousands of years. Farmers and scientists have been using traditional plant breeding to create plants that have beneficial characteristics, like drought tolerance. In the 1980s, scientists began using biotechnology, a method of transferring genes directly into a plant without the long process of trial and error. These products are called genetically modified organisms, or GMOs” (cited from Monsanto Offical Website).

One of the academics of the Chinese Academy of Sciences (CAS), Li Jiayang, mentioned that the population of China will increase by more than 200 million in 2030, leading to a food shortage that could be solved by reliance on GMO technology to solve the food problem (*Chinese Social Sciences Weekly*, 2013). After the conference on GMO products, the information about the implements and application of accelerating GMO commercialization was secretly sent to the Monsanto company. The Monsanto company would quote the part of comments form World Health Organization (WHO) and National

Academy of Sciences (NAS) to present as evidence of these innocence of GMO foods (Source: Monsanto official website). However, these positive descriptions of GMO neither improve the impression of these products, nor help the public to understand or tolerate these pro-GMO speeches. More and more network users have scolded these academics as "traitors", who were more concerned about commercial benefits than the safety of China and its civilians.


World Health Organization

"GM foods currently available on the international market have passed safety assessments and are not likely to present risks for human health. In addition, no effects on human health have been shown as a result of the consumption of such foods by the general population in the countries where they have been approved."

National Academy of Sciences

"...the study committee found no substantiated evidence of a difference in risks to human health between currently commercialized genetically engineered (GE) crops and conventionally bred crops, nor did it find conclusive cause-and-effect evidence of environmental problems from the GE crops."

Figure 8: Comments posted by Monsanto Official Website.

At the beginning of 2014, a series of public events led by some famous celebrities in China pushed many Anti-GMO movements to speak out. For example, Cui Yongyuan, the famous host of CCTV (mentioned in the introduction part of this study), spent 100 million yuan on making a GMO related video to debate the conflict and argument of GMOs by interviewing related experts, customers, and farmers in America. Also, a CCTV program named "Investigation of the Transgenic Rice" hosted by Chinese journalist Wang Zhian discussed how three of five randomly purchased rice products had the GMO related element-Bt63-a kind of protein in them. However, the government had not permitted any planting or importing of GMO rice products before 2014.

In 2015, to strengthen the popularization of transgenic science, it was reported that China wanted to push forward with the large scale planting of GM crops, according to the first policy document of 2015 (*People's Daily, 2015*). This news incurred a new round of debates on the network accompanied by a verbal battle between Cui Yongyuan (Anti-GMO) and Fang Zhouzi (Pro-GMO).

In 2016, with the ouslaught of negative news, media companies started to expose the chaotic phenomena of implementation of the GMO regulation (see Figure 9), and urged the government to enforce GMO supervision. So the theme "Supervision" was dominant in news coverage both in *People's Daily* and *Southern Metropolis*, especially popular during 2012-2016.

Along with public opinion, the issue of need to update regulation and policy of GMOs management also acknowledged the reporting. The implementation of regulation of GMOs actually have some problems in actual implementation. For example, one of the selected articles mentioned that labeling punishment does not play a role in related practice even the regulation was published by related administration. The regulation titled "Food safety fraud investigation method" (2017), published by the State Food and Drug Administration (CFDA), is aimed at providing supervision in the chaotic food market. Specific policies referring to GM foods (as below):

> *"Article 9 [label instruction fraud] any of the following circumstances, belongs to food labels, instruction fraud:*
> *(a) false labeling food name, specification, net content and ingredient or ingredients, standards, codes, and storage conditions and other information;*
> *(2) of the false labeling enterprise name, product registration card number, production license, the processing technology, origin, production address, contact information.*
> *(3) the false label production date, shelf life;*
> ***(4) the false labeling pollution-free food, organic food, green food, etc;***
> *(5) false labeled "brew" and "pure food" "solid-state fermentation" "fresh" "squeeze" and other words;*
> *(6) the nutrients in the label of product and product reality.*

The name of the traditional diet and food and its raw materials do not match the generic names, but not unless it is misleading to the public.
Article 10 [food advertising fraud] network, telephone, television, radio, seminars, conferences and other ways to promote food, one of the following circumstances, belongs to food advertising fraud:
(a) food the performance, function, origin, specifications, composition, producers, standard, shelf life, inspection reports and other information does not accord with the actual situation;
(2) the use of fiction, forge or unverifiable scientific research, statistics, survey results, documents and other information as evidence materials;
(3) the ordinary food express, implied or special medical use, or use the "treatment" and "curable" medical terminology;
(4) food promotion information relating to the function of disease prevention and treatment;
(5) health food publicity information contains unsubstantiated efficacy, or hide appropriate crowd, not appropriate crowd, etc;
(6) use the "pure green" and "pollution-free" exaggerated claims;
(7) to genetically modified foods, pretend to be not genetically modified (gm) food."
(Food safety fraud investigation method, 2017)

CFDA is a relatively new organization initiated in 2013 born from the Chinese food safety system. This related regulation still does not accord with the executive standard, therefore the aforementioned illegal behaviors like fraudulent labeling, and fraudulent advertising within the range of GM foods always ends with a financial penalty. This phenomenon was reported by *Southern Metropolis* in the article titled "The commercialization of transgenic irregularities has been exposed, illegal GM corns still in market".

Connected with coding result and specific collected news coverage, the news articles themed "labeling" (n=10), consisted of one third of the total proportion of news articles themed "supervision" (n=25). This result reflected the correlation between "labeling" and "supervision", which also fell within the heated topic related to GM foods regulation in the summit of selected time frame (2012-2016).

China to step up regulation on GM crops

Updated: 2016-04-19 02:03

(Xinhua)

Print Mail Large Medium Small Share 0

BEIJING -- The Ministry of Agriculture on Monday vowed to beef up its supervision over genetically modified (GM) crops in order to protect human health, ecology and the environment.

Agricultural authorities at all levels should strengthen the control of testing, production, processing, labeling and marketing of GM seeds and crops, according to a statement posted on the ministry's website.

Conducting GM crop research or breeding secretly must be strictly prohibited, the statement said, adding that all experimental material should be traceable.

Figure 9: The regulation related to news coverage by *People's Daily, 2016*

The above information not only illustrated the change in public attention around the GMO during the summit period of GM-related reports in *People's Daily* and *Southern Metropolis*, also explained why "Supervision" was a popular theme in both *People's Daily* and *Southern Metropolis* in the past decades.

Sometimes it is easy to confuse theme and framing in the coding process. However, there is some significant difference between themes and frames in articles.The theme is the central point and value of a specific news coverage, whereas frames can be designed as an approach that helps to deliver the major information around the theme of news coverage. Also, different categories of frames can simultaneously present in one news story. For example, the effectiveness of how a social problem presenting a specific theme is cast can vary based on the choice of frames used to depict it (Reese, 2007). Thus, in order to modify and organize the scattered information-also described as "fractured paradigm" (Entman, 1993), it is necessary to organize framing within a "theory of media effects" (Scheufele, 1999). In this study, "Supervision of GM Product" (n=58, 36.3%), "International

perspective" (n=53, 33.1%), and "Worries & Potential Risk/Safety" (n=42, 26.3%) were three major frames connected with the aforementioned context including the change and characteristics of public environment, political background, and commercial factors among selected period.

Significance 2: The major difference in framing use in the online news coverage by *People's Daily* and *Southern Metropolis*.

According to the previous results, *People's Daily* (n=36, 45.0%) utilized much more frames reflecting the "International Perspective" than *Southern Metropolis* (n=17, 21.3%); *People's Daily* published many more framed stories depicting "Economic Consequences" (n=28, 35.0%) than *Southern Metropolis* (n=12, 15.0%); *People's Daily* (n=26, 32.5%) published significantly more stories framing GMO within the context of "Advanced Technology" than *Southern Metropolis* (n=7, 8.8%); *Southern Metropolis* (n=27, 33.8%) reported much more framed stories about "Worries & Potential Risk/Safety" than *People Daily* (n=15, 18.8%). Therefore, it reflected that *People's Daily* preferred the framing of "Advanced Technology", "International Perspective" and "Economic Consequences", whereas *Southern Metropolis* preferred to "Worries & Potential Risk/Safety".

One article in *People's Daily* (see Table 36), included all three frames of "Advanced Technology", "International Perspective" and "Economic Consequences" aimed at introducing the benefits of GM foods to the public and emphasized the international popularity of the pro-GMO position.

Whether the GM foods are safe? How to guarantee the safety of agricultural GMO? Please see the exclusive interview----
Improving the Bio-safety of Transgenosis

Feng Hua 07.11. 2016

Interviewee:

Wei Chaoan, Vice Minister of Agriculture

Xu Rigan, President of Inner Mongolia University, Vice President of Chinese Academy of Engineering, Academician

Table 36 .A News Story With Three Frames.

"Advanced Technology"	"Biotechnology is a new engine of world economic development in 21st century, thus the Chinese government places great importance on agricultural biotechnology development. 'National medium and long-term science and technology development plan outline' clearly points out that the biotechnology is one of the forefront technologies that supports development and leads future direction, and considers genetically modified organisms breeding as one of the major projects."
"International Perspective"	"In recent years, there has been a quick development in the global arena of GM crops and GM agricultural products international trade. Statistically, since the large-scale world industrialization of GM crops in 1996, the area of land under cultivation around the world increased 52 times in 10 years, while the total accumulative planting area reached 475 million hectares. The number of countries planting GM crops has increased from 6 to 21."
"Economic Consequences"	"By 2005, domestic cotton has been extended to 100 million mu, accounting for 73% of the national cotton acreage, which contributed more than 150 million yuan to social and economic benefits."

The results also indicate that *Southern Metropolis* preferred the "Worries & Potential Risk/Safety" frame to *People's Daily*. Figure 10 indicates an example of an article from *Southern Metropolis* which reflects the frame "Worries & Potential Risk/Safety". In this news coverage by *Southern Metropolis* (see Figure 10), the journalist asked interviewee Luo some questions focused on the safety of GM foods, such as "someone mentioned that the safety of GM agricultural product has been proved...Is this true?". Luo Yunbo is a professor of food science and nutrition engineering in China Agricultural University, also is a member

of The State Committee for the Safety of Agricultural Transgenic Living Things. And the Luo's response was therefore framed in accordance with the article about GM foods safety.

The Ministry of Agriculture : It's a rumor that GM foods caused sterilization

Huang Kai, 10.17.2013

记者：有人说转基因农作物的安全性未得到确认，世界各国对转基因农作物商业化严加限制，欧盟甚至实行“零容忍”，是真的吗？

罗云波：首先，转基因食品的安全性是有定论的，即凡是通过安全评价、获得安全证书的转基因食品都是安全的，可以放心食用。转基因食品入市前都要经过严格的毒性、致敏性、致畸等安全评价和审批程序。世界卫生组织以及联合国粮农组织认为：凡是通过安全评价上市的

Journalist: *someone mentioned that the safety of GM agricultural products have been proved, and most countries are extremely strict about GM agricultural products especially the Europe performing "0 tolerance". Is it true?*
Luo Yunbo: *Firstly, the safety of GM foods has certain effects. If it gets the safety certificate through the evaluation, the GM foods are safe to eat. GM foods should pass all processes of toxicity, sensitiveness, teratogenicity, etc. WHO and FAO think that once this product passed the supervision and evaluation, it should be safe...*

Figure 10: "Worries & Potential Risk/Safety" by *Southern Metropolis.*

The reasons why *People's Daily* preferred frame of "Advanced Technology", "International Perspective" and "Economic Consequences", whereas *Southern Metropolis* preferred "Worries & Potential Risk/Safety" could be because of three polarizing issues: media attributes, economic influence and media security.

First, the attributes of media determine the type of frame that media might use. According to the results (in Table 31), there is a significant difference in the sources used the highest number of sources used by *Southern Metropolis* came from the public (n=25, 31.3%), followed by Chinese government officials (n=20, 25.0%) and experts(n=18, 22.5%), while the dominant sources for *People's Daily* were the government officials (n=37, 46.3%), followed by the experts (n=17, 21.3%) which was statistically similar to the experts of

Southern Metropolis (n=18, 22.5%). Interestingly, the public was second least source of *People' Daily* (n=10, 12.5%), and celebrities in some specific fields showed up 0.0% of *People's Daily*. Therefore, it is possible that the difference in the source could have widely influenced the framing presentation.

The market positioning of *Southern Metropolis* targets younger and middle-aged readers who may prefer relative diversity in position, value, perspective. Also, *Southern Metropolis* used to rank first among the metropolitan newspapers in China determined by the general administration of press and publication (Southern Metropolis, 2017). Therefore, the *Southern Metropolis* had more active and inclusive attribution and the sources are selected mainly from the public it serves.

In contrast, *People's Daily* as the party paper, is focused on reflecting the will of the Chinese party and government, is aimed at actively promoting the party's beliefs, and spreading the major policy decisions to Chinese homes and overseas in a timely manner (People's Daily, 2017). In order to perform this duty, it is normal to mainly adopt government sources and a few experts with high authority. However, this position also limits the ability to use rhetorical devices and leads to much more distance between readers and editor, which may lead to a less-than-ideal and inefficient communication.

Second, the economic aspect of GM foods is a potential factor affecting the framing preference of *People's Daily.* The economic contribution of GM products currently accounts for more than half of the developing world's investments in plant-biotechnology. According to Zhang & Zhou (2006), Chinese officials announced that the budget for GMO research will be increased by as much as 400% before 2005, which showed a certain degree of attention paid to related research. Most Chinese biotechnologists received generous financial support from officials (Song Ying, 2008). The economic benefit from GMO implementation was substantial. It was recorded that, "China commercializes both Bt cotton and GM rice in the

most optimistic scenario, the welfare gains amount to an additional annual income of about US$ 5 billion in 2010" (Huang et al., 2003). Also Huang et al. (2003) indicated that the development of biotechnology has an important impact on trade, welfare,and production, and more importantly, the welfare gains far outweigh the cost of public biotechnology research. Therefore, in recent years, Chinese officials gradually presented a pro-GMO position which was found in the results from *People's Daily*.

Third, GM foods framed uncertain, potential risks which had not been evaluated by related research. According to Lippman (2006), media shapes the vague virtual world in people's mind by discourse construction caused by news, television, and other mass media. Lippman (2006) indicated that feelings of security or panic were likely to be influenced by the media's function and approach. Therefore, genetically modified foods as a controversial issue stimulating a lot of conflict and argument among public networks, were characterized negatively as "dangerous" or "unsafe" in China. It is questioned why *People's Daily* only posted this amount of news which could not equal the importance of GM foods itself in the real world. The result that was most highly adopted in relation to "economic consequences", "advance technology", and "international perspective" also reflected the issue salience that was placed in the issue by Chinese officials or some scientists. However, this kind of routine could not have an ideal communicating effect via the rigid and unequal communication system.

For example, news reports shown in Figure 10 reflected a kind of uncertainty and panic about GM foods. The journalist in this article represented the perspective of the public who expect to get reliable answers about GM foods, and eventually got relevant answers via an unfolding interview. However, a number of rumors about GM foods still had not been clarified by the news media, such as sterilization and malformation caused to certain people after eating GM foods.

Perhaps, the result of themes distribution (Table 25) that reflected "Education & Introduction" was more likely to be adopted by *People's Daily* than *Southern Metropolis*, which should have been useful to spreading accurate knowledge and scientific information and reducing the public panic and hostility toward GM-related products. Connected to the total amount of reports using the theme of "Education & Introduction" (total n=16, 10%) or "Rumor Clarification" framing (total n=26, 16.3%), it was clear that the number of related reports were too little to have an effect on educating audience and eliminating the existing misunderstanding.

Significance 3: The potential position (positive, neutral or negative) in GM-related news coverage of *People's Daily* and *Southern Metropolis*.

The Chi-square test results of position (Table 34) indicated that there was a statistical difference between *People's Daily* and *Southern Metropolis* (df=2, p=.001). Specifically, there were more stories in *People's Daily* (n=31, 38.8%) with a "Pro-GMO" position than *Southern Metropolis* (n=18, 22.5%), whereas on "Anti-GMO" stance was more likely to be implied in *Southern Metropolis* than *People's Daily.* Also, the "Neutral" position was common in reporting by both *People's Daily* (53.8%) and *Southern Metropolis* (47.5%). Interestingly, the news coverage of *Southern Metropolis* held a statistically equal proportion of frames reflecting "Pro-GMO" as those that reflecting "Anti-GMO" positions. It reflected that, apart from the "Neutral" position, *Southern Metropolis* presented a significantly pluralistic standpoint. The equality in coverage by *Southern Metropolis,* showed useful information with less bias and a more balanced position. Apart from that, the bio-safety of GM foods still showed a vague prospect and the uncertainty of potential risk and negative impact, which reveals the potential reason why most of the reports reflect a neutral position

toward the issue of GMO. It was a difficult plight that should wait for further research to improve the accuracy and reliability of news producing process.

There are two aspects that need further focus: communication quality and function of media security. On the one hand, most media represent the desire of Chinese officials to replace the rigid tone and expression with a soft and readable tone which is easier for the public's accept. Also, the roles of scientists should not be shaped as being the opposite of public which exaggerates the social conflict and misunderstandings about GMO issue, because experts in this academic field are only one of the groups that eventually provide the public the accurate answers (Chen Gang, 2015).

On the other hand, the media should clarify the function of security. The negative escape neither solves problems of public panic and anxiety, nor reflects a good performance of the duty of media itself. Instead of evading conflict, recognizing what are the root problems obstruct the efficient communicating path between the public and officials.

Finally, the transparency of information, the flattening of media organizations and the efficient use of sources contribute to the important connotation of healthy and efficient communication, which is especially necessary in an uncertain public controversy.

CHAPTER SEVEN:

CONCLUSIONS

In this thesis, a content analysis was done on the news coverage of the *People's Daily* and *Southern Metropolis* over a 17 year period. The news coverage of genetically modified foods provided an opportunity to examine themes, sources, attribution patterns and frames used in the coverage of GM foods in two authoritative Chinese media outlets *People's Daily* and *Southern Metropolis*.

People's Daily represents the desire of Chinese officials to lead the discussion about GM foods beginning from 2000, while *South Metropolis* had increased reports about GM foods after 2010. Also, the summit of reports (2012-2016) is associated with a series of important public events that led to wide public panic.

Results of the analysis proved that different news frames were used in news reports from the *People's Daily* than these used in the *Southern Metropolis* indicating that theses two newspapers embodied different professional values, bias, and focus. The reported differences can be explained by variations in media systems, political interests, public opinion, cultural and historical ties outlined in the literature (Chen Gang, 2015).

Specifically, *People's Daily* preferred the frames of "Advanced Technology", "International Perspective" and "Economic Consequences", whereas *Southern Metropolis* preferred the frames of "Worries & Potential Risk/Safety", reflecting their different media emphases and basic positions.

In view of the incredible economic benefits created by GMO products, *People's Daily* attempted to shape the public ideology toward the issue of GMO by frequently adopting the

frames of “Advanced Technology”, “International Perspective”, and “Economic Consequences”, all of which may have conformed with the instruction of Chinese officials.

Even though the debates are continuing in the public, GM-related issues have been rarely emphasized by authoritative media which was reflected from the low coverage over the past few years. This reveals that the amount of GM-related coverage in *People’s Daily* is proportional to public attention toward the issue of GM foods.

Summing up the results, it contributes to a finding that potential problems existing among GM-related communication caused by the media producing process by comparing the news framing in *People’s Daily* and *Southern Metropolis.* It also emphasized that the media security function study should be done, especially dealing with vague and unreadable scientific issues that incur heated debates.

Limitations and Future Studies

The issue of genetically modified foods attracted a lot of attention around the world and led to the formation of different positions incurring large-scale discussion and arguments about GMO. This content analysis is only based on news coverage from two newspapers in mainland China. A longer-term observation and data collection from various outlets can provide a more accurate conclusion on how framing applies to the communication of genetically modified foods in China. Another limitation could lie in the coding process that further distinction of story themes, news routines could be refined into other meaningful categories and types. In doing so, it would lead to more accurate definitions and inductions on setting frames.

In order to get a better understanding of how various media systems, political environments, public opinion, cultural and historical ties influence media framing, further studies of the topic need to address more logical relations in the discussion of specific frames.

In addition to text, further research can explore visual framing in the news coverage between two countries. During the analysis, the researcher noticed a photo or a video report accompanies almost every online publication which was not considered as the study object in present study. According to Gamson & Stuart (1992), Visuals offer various numbers of condensing symbols that support the core frame and can also influence the evaluation of news coverage.

Future research should also build on the current study by examining the relationship between social media and changes in media frames. Also, the study focused on a different category of framing effects in specific theme of GM-related news. Other quantitative research methods (e.g., surveys) should be employed to provide additional insight that contributes to future investigations of the trend of public opinion with the framing effect.

REFERENCE

Berelson, B. (1952). Content Analysis in Communication Research, *Free Press*, New York.

Chen Gang. (2015). Genetic Modification Debate and Anxiety of Knowledge Production in Mass Media: A Perspective of the Relations between Scientists and Journalists. *Journal of International Communication*, *1*(008), 101-113.

Chong, D., & Druckman, J. N. (2007). Framing theory. *Annu. Rev. Polit. Sci.*, 10, 103-126.

Chyi, H. I., & Yang, M. J. (2009). Is online news an inferior good? Examining the economic nature of online news among users. *Journalism & Mass Communication Quarterly, 86*(3), 594-612.

Connor, M., & Siegrist, M. (2010). Factors influencing people's acceptance of gene technology: The role of knowledge, health expectations, naturalness, and social trust. *Science communication*, *32*(4), 514-538.

Cormick C.(2007). Public attitudes towards GM crops and food. *Agricultural Science, 21*(2), 24–30.

De Vreese, C. H. (2004). The effects of frames in political television news on audience perceptions of routine political news. *Journalism and Mass Communication Quarterly*, *81*, 36–52.

De Vreese, C. H. (2005). News framing: Theory and typology. *Information Design Journal & Document Design*, 13(1), 51-62.

Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of communication*, *43*(4), 51-58.

Entman, R. M. (1991). Framing United-States coverage of international news—Contrasts in narratives of the KAL and Iran Air incidents. *Journal of Communication, 41*(4), 6–27.

Fairhurst, G. & Sarr, R. (1996). The art of Framing. San Francisco: Jossey-Bass.

Gang Chen. (2014). Communication of "uncertainty": Issue competition in the transmission of "transgenic arguments", discourse order and media reproduction. *Journalism & Communication,7*, 17-34.

Gitlin, T. (1980). The whole world is watching: Mass media in the making & unmaking of the new left. California: Univ of California Press.

Goffman, E. (1981). Forms of talk. University of Pennsylvania Press.

Goffman, E. (1974). Frame analysis: An essay on the organization of experience. New York: Harper & Row.

Greenwich, CT: Ablex. Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication, 49*(1), 103–122.

Hallahan, K. (1999). Seven models of framing: Implications for public relations. *Journal of public relations research*, *11*(3), 205-242.

Ho, P., & Vermeer, E. B. (2005). Food safety concerns and biotechnology: Consumers' attitudes to genetically modified products in urban China.

Huang, J., Hu, R., van Meijl, H., & van Tongeren, F. (2003, August). Economic impacts of genetically modified crops in China. In 25th International Conference of Agricultural Economists Durban, South Africa (pp. 16-22).

Huang, J., & Wang, Q. (2002). Agricultural biotechnology development and policy in China. AgBioForum, 5(4), 122-135.

Jiayun Feng. (2017). Anti-GMO activist says he's receiving death threats - China's latest society and culture news. *Supchina*. Derived from:

http://supchina.com/2017/08/01/anti-gmo-activist-says-hes-receiving-death-threats-chinas-latest-society-culture-news/

Jane Qiu. (2012). China sacks officials over Golden Rice controversy: Chinese families did not give consent for children to consume genetically modifed rice in the part US-funded study. Derived from: https://www.nature.com/news/china-sacks-officials-over-golden-rice-controversy-1.11998

Krippendorff, K. (2004). *Content Analysis: An Introduction to Its Methodology.* Thousand Oaks, CA: Sage.

Lippmann, W. (1921). *Public opinion*. Long Island.

Lippmann, W. (1946). *Public opinion* (Vol. 1). Transaction Publishers.

Liu, B. (2009). An analysis of US government and media disaster frames. *Journal of Communication Management, 13*(3), 268-283.

Matthes, J., & Kohring, M. (2008). The content analysis of media frames: Toward improving reliability and validity. *Journal of Communication*, *58*(2), 258-279.

McCombs, M. E., & Shaw, D. L. (1993), The Evolution of Agenda-Setting Research: Twenty-Five Years in the Marketplace of Ideas. *Journal of Communication, 43*: 58–67. doi: 10.1111/j.1460-2466.1993.tb01262.x

McQuail, D. (2000). *McQuail's mass communication theory*. London: Sage Publications.

McQuail, D. (2003). *Media accountability and freedom of publication*. Oxford University Press, USA.

Matthes, J., & Kohring, M. (2008). The content analysis of media frames: Toward improving reliability and validity. Journal of communication, 58(2), 258-279.

Neundorf, K. (2002). The Content Analysis Guidebook.

Price, V., & Tewksbury, D. (1997). News values and public opinion: A theoretical account of media priming and framing. *Progress in communication sciences,* 173-212.

Pan, Z., & Kosicki, G. M. (1993). Framing analysis: An approach to news discourse. *Political communication*, *10*(1), 55-75.

P. Valkenburg, H. Semetko. (2000). Framing European politics: a content analysis of press and television news. *Journal of Communication, 50*(2), 93–109.

Reese, S. D. (2007). The framing project: A bridging model for media research revisited. *Journal of communication, 57*(1), 148-154.

Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of communication*, *49*(1), 103-122.

Scheufele, D. A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: The evolution of three media effects models. *Journal of communication*, *57*(1), 9-20.

Scheufele, D. A. (2000). Agenda-setting, priming, and framing revisited: Another look at cognitive effects of political communication. *Mass Communication & Society, 3*(2-3), 297-316.

Scheufele, Dietram A. 1999. Framing as a Theory of Media Effects. *Journal of Communication, 49* (4), 103-22.

Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of communication*, *49*(1), 103-122.

Scheufele, D. A. (2000). Agenda-setting, priming, and framing revisited: Another look at cognitive effects of political communication. *Mass Communication & Society*, *3*(2-3), 297-316.

Shoemaker, P. J., & Reese, S. D. (1996). Mediating the message: Theories of influences on mass media content (2nd ed.). White Plains, NY: Longman.

Siebert, F. S., & Schramm, W. (1956). *Four theories of the press: The authoritarian, libertarian, social responsibility, and Soviet communist concepts of what the press should be and do*. University of Illinois Press.

Tankard, J. W. (2001). The empirical approach to the study of media framing. *Framing public life: Perspectives on media and our understanding of the social world*, 95-106.

Thousand Oaks, C: Sage.Pan, Z., & Kosicki, G. M. (1993). Framing analysis: An approach to news discourse. *Political Communication*, 10(1), 55–75.

Tuteja, N., Verma, S., Sahoo, R.K. et al. J Biosci (2012). Recent advances in development of marker-free transgenic plants: Regulation and biosafety concern. *Journal of Biosciences, 37*: 167-197. https://doi.org/10.1007/s12038-012-9187-5

Zhang Tao & Zhou Shudong. (2006). The Economic and Social Impact of GMOs in China, China Perspectives. Derived from: http://chinaperspectives.revues.org/359

Zhong, F., Marchant, M. A., Ding, Y., & Lu, K. (2003). GM foods: A Nanjing case study of Chinese consumers' awareness and potential attitudes.

APPENDIX 1:

CONTENT CODING SCHEME

Coded By_____

News Number_____

Publication date of the article_____

1. Online newspapers

(R_) *People Daily* (N_) *Southern Metropolis*

3. Story themes

Code each publication into one of the five theme categories. Take into account only the dominant theme (no more than two themes on one article).

(1) new achievement & improvement;

(2) economic, financial benefit;

(3) ethic and risk;

(4) the impact of GM product on individuals or specific groups;

(5) education and introduction;

(6) supervision;

(7) label;

(8) others.

4. Sources of attribution

Source
(1) Chinese government officials (including presidents, prime ministers and other politicians)
(2) Experts (such as health or biology commentators, professors, etc.)

(3) Celebrity in some specific fields
(4) Public (customer, farmer, housewife, individual)
(5) Representatives of international organizations, NGO or welfare enterprises
(6) Other foreign media outlets (newspapers or news agencies such as BBC, Associated Press, The Washington Post, The Guardian, etc.)
(7) Unknown

5. Coverage stance

Identify the overall stance of an article according to the following instructions

The lead is constructed like an argument that supports the issue	The lead is constructed like an argument that condemns the issue	The lead is constructed like a statement that does not have any stance on the issue
Pro-GMO (1)	Anti-GMO(2)	Neutral (3)

6. News Routine

The professional producing format of News.

(1) Domestic vs Foreign	Talking about domestic and foreign at the same time.
(2) Benefit vs Risk	Talking about benefit and risk at the same time
(3) Interview	Interrogation reply system (presenting via questions and answers)
(4) Others	

7. Knowledge attributes

(1) Declarative knowledge

(2) Procedural knowledge

8. Story frames

Please code each article according to presence or absence of the frames identified below. Pay attention to certain phrases and keywords. A single story may contain multiple frames.

Frame	Yes/Present	No/Absent
*1) **Advanced Technology.*** This frame focuses on positive character of GM technology and product as a fashionable trend, normal approach of agriculture and biology. The frame includes such keywords and phrases as **"fashion", "advantages", "popular technology", "abroad finding", "worthy discovery", "huge success", etc.**		
*2) **The right to know.*** This frame includes such phrases as **"the right to know the GM product",, "label", "option", etc.**		
*3) **Worries & Potential Risk/ Safety**.* This frame includes such keywords and phrases as **"an alarming/ a worring Technology", "challenge to public agreements", "a threat to the health of Chinese citizens", "potential dangerous influence", "illegal/illegitimate", "safety problem", etc.**		
*4) **Environmental Concerns.*** This frame includes such keywords and adjectives describing the GM product connected with **"environment", "bio-pollution", "environmental friendly", "environment pollution", etc.**		
*5) **Rumor Clarification.*** This frame emphasizes the examination or evidence to clarify some rumors of GM product. The frame includes such keywords and phrases as **"It's not an American's ruse/trick", "misleading", "misunderstanding", "the evidence of..."etc.**		
*6) **Supervision to GM Product**.* This frame outlines legal definition, regulations concerning the GM product. The frame includes such keywords and phrases as **"Policy making", "government responsibility", " approval process", "Law/ Regulation", etc.**		

7) ***Economic consequences***. This frame emphasizes the economic consequences of the genetic modified products. The frame includes such keywords and phrases as **"Profits", "economic benefits", "suspension of exports or imports", "impact on the country's economy", etc.**		
8) ***Education and Introduction.*** This frame focuses on the introducing the GM knowledge to Chinese civilians or educate audience about some instruction and regulation of GM technology. Such as **journalists' experience, experts' recommendation, or some statement in governmental conference, etc**.		
9) **"Global/ international issue"**. This frame recognizes the GM technology and application as a global trend which should evoke international relative cognition and actions. It exists a comparison between two or more than two countries or a reference of other country.		
10) **Others**		

APPENDIX 2:

NEWS ARTICLE

人民日报/2006 年/7 月/11 日/第 005 版
视点新闻

转基因食品能否放心食用？如何保障农业转基因生物的安全性？请看本报记者独家专访——

把好转基因生物安全关

本报记者　　冯华

受访人：

危朝安 农业部副部长

旭日干 内蒙古大学校长，中国工程院副院长、院士

转基因技术造福人类的同时，也可能对人类、动植物、微生物及生态环境构成危险或潜在风险

记者：现在，许多转基因产品进入普通人的生活。请问我们该如何认识转基因技术呢？

旭日干：转基因技术是生物技术的核心，它打破了不同物种之间天然杂交的屏障，实现了物种间的基因转移，获得了新的性状，丰富了遗传资源，加快了育种进程，但同时也可能对人类、动植物、微生物及其生态环境构成危险或潜在风险，产生生物安全问题。

记者：看来转基因技术的发展离不开政府的引导。请问，我国政府对转基因技术的基本态度是什么？

危朝安：生物技术是 21 世纪世界经济发展的新引擎，中国政府高度重视农业生物技术发展。《国家中长期科学和技术发展规划纲要》中明确提出生物技术是支撑发展、引领未来的前沿技术之一，并把转基因生物新品种培育作为重大专项。

农业部始终坚持“科学规划、积极研究、稳步推进、加强管理”的农业转基因生物产业发展指导方针，根据国家科技发展规划和转基因作物研发进展以及安全评价结果、生产应用前景、市场需求等情况，明确重点，分步推进我国转基因作物研究及其产业化。

记者：现在，各个国家对转基因技术都非常重视。那么，我国转基因技术研究在国际上处于什么地位？

旭日干：近年来，我国转基因生物技术取得了长足进步：一是获得了一批转基因农作物新品种和新材料，主要有抗虫棉花、高油油菜及抗虫玉米、抗穗发芽小麦等。二是疫苗和饲料生物制剂已经形成了产业，包括基因工程疫苗、诊断试剂盒、新型饲料蛋白、生物药物饲料添加剂等。三是技术研发不断突破，获得了水稻生长发育基因、雄性不育育性恢复基因、新型抗除草剂基因等新基因，为创造转基因植物新品种提供了基因资源。可以说，目前我国农业转基因生物研究与产业化在发展中国家处于先进水平，基因工程疫苗、转基因抗虫棉等研究达到国际先进水平。

危朝安：旭院士所说的基因工程疫苗和转基因抗虫棉是我国转基因生物技术研究与安全管理两个成功的范例。截至 2005 年，国产抗虫棉已累计推广 1 亿多亩，占全国抗虫棉种植面积的 73%，创造社会经济效益 150 多亿元。

转基因技术本身是中性的，经过转基因生物安全评价、获得主管部门批准的转基因生物可以放心使用或食用

记者：目前，一些转基因食品已经上了百姓饭桌，老百姓普遍关心的一个问题是，转基因食品安全吗？

旭日干：这是一个经常被问到的问题。从某种程度上说，公众对转基因技术和食品存在“误读”，这主要是因为不了解转基因技术。转基因技术本身是中性的。我建议今后加强转基因知识

的科普和法规宣传，让公众正确认识转基因。

现在通常有两种极端的认识，一种认为转基因生物很可怕，谈“基因”色变；另一种认为转基因生物不存在安全性问题，可以放任自流。这都不是科学、理性的态度。

记者：那科学、正确的态度应该是什么呢？

旭日干：一方面，转基因生物安全是一个相对概念，它以非转基因生物为参照系来比较两者在安全性方面的差异。从目前的科学资料看，没有发现转基因食品与传统食品在人类食用安全性上存在差别。另一方面，转基因生物安全又是具体的，种类众多，千差万别，不同的受体生物、不同的外源基因、不同的基因操作方法、不同的接收环境，其安全性都会有很大的差异。

因此，要对转基因生物进行个案分析，要搞清楚是否存在危险或潜在风险、危害程度和几率有多大、其后果如何等问题，在具有足够技术资料和试验数据支持基础上做出科学判断。目前，经过转基因生物安全评价，获得主管部门批准的转基因生物可以放心使用或食用。

记者：目前转基因生物技术在国际上的应用情况如何？您认为转基因技术的发展前景怎么样？

旭日干：近年来，全球转基因作物种植面积和转基因农产品国际贸易迅速发展。据统计，自1996 年全球转基因农作物大规模产业化以来，10 年间全球种植面积增加了 52 倍，累计种植面积4.75 亿公顷。种植转基因农作物的国家从最初的 6 个增加到 21 个。按种植面积大小排序，前三名分别是美国、阿根廷、巴西，中国种植面积为 340 万公顷，排在第五位。2005 年全球转基因作物市场价值达到 52.5 亿美元，占全球种子市场的 18%，预计 2006 年市场价值为 55 亿美元。

随着生物科技领域新技术的不断涌现，预计转基因作物、疫苗、饲料的强劲增长势头在未来10 年将会进一步提高。除食品、饲料和纤维等传统农产品以外，药品、口服疫苗、特种转基因农产品将不断涌现。同时，生物技术在可再生的农作物资源方面有较好的应用前景。

我国形成了符合中国国情并与国际接轨的转基因生物安全法规体系。但随着生物技术研发日新月异，转基因生物安全管理面临一些新问题

记者：作为主管部门，农业部如何把好农业转基因生物安全这道关？

危朝安：对农业转基因生物进行安全管理是世界各国普遍的做法。2001 年 5 月 23 日我国颁布了《农业转基因生物安全管理条例》。5 年来，形成了符合中国国情并与国际接轨的法规体系。归纳起来主要有三点：

一是实施安全评价制度。农业部每年组织两次农业转基因生物安全评审，重点考察遗传稳定性、环境安全和食用安全。经安全评价合格的，由农业部批准进入下一阶段试验或颁发农业转基因生物安全证书。截至目前，农业部共受理安全评价申请 1525 项，已发放安全证书 424 项。转基因抗虫棉、耐贮藏番茄、抗病毒甜椒及基因工程疫苗等已获得生产应用安全证书。

二是实施进口安全管理，规范转基因农产品进出口秩序。对境外公司进口用作加工原料的转基因生物，在中国境内进行两年多的环境安全和食用安全检测验证，并经国家农业转基因生物安全委员会安全评价合格后，我部共发放转基因大豆、油菜、棉花等 18 个品种的进口加工原料用安全证书。

三是实施标识管理，维护消费者的合法权益。2002 年以来，各省（区、市）农业行政主管部门联合工商部门与消费者协会，连续四年对转基因农产品标识情况进行执法检查，查处了多起违规案件。目前列入标识目录的转基因农产品基本实现了标识，有效保护了消费者的知情权和选择权。

记者：我国农业转基因生物安全管理还存在哪些难点？

危朝安：转基因生物安全管理工作面临许多新问题：一是生物技术研发日新月异，安全性研究相对滞后，安全评价难度增加；二是生产应用要求迫切，科学决策综合性因素诸多，安全管理责任重大；三是市场接受环境复杂，公众关注度高，信息交流与科普宣传任重道远。

今后要进一步完善法律法规，加快技术支撑体系建设，还要加强宣传，提高公众的认知水平，

为生物产业发展营造良好氛围。