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Smog Pollution in China: News Framing and Issue-Attention Cycle per the

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Smog Pollution in China:

News Framing and Issue-Attention Cycle per *the People's Daily*

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
The Zimmerman School of Advertising and Mass Communications
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Keywords: smog air pollution, framing theory, issue-attention cycle theory, content analysis

Dedication

Dedicated to the memory of my classmate and friend Chenxin Jing (1992-2017).

Thank you for your company and encouragement every time when I struggled for this research.

I will miss the time we spent together in USF, in Tampa and in the U.S.

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Abstract

China's smog air pollution has become an increasingly urgent environmental crisis in China. Using framing as theoretical framework, this research examined how much media attention is focused on smog air pollution and how print media frame smog air pollution. An empirical content analysis of 339 articles in the *People's Daily* newspaper was conducted from 2000 to 2016, and the results showed that "non-voluntary solutions" and "problem" frames were the two frames that had been most utilized to construct stories about air pollution. Smog air pollution crisis also discussed in terms of Downs issue-attention cycle, a five-stage model explaining the rise and down of social attention to a social issue. The smog air pollution crisis in China been found that exhibiting three cycles that relate to media attention. Also, the research found that the prominence of the frames varied at different cycles. It is worth noting that the prominence of the frames moved away from the "problem "and "effects on social economic" frames to the "government responsibility," "individual responsibility," and the "voluntary" frames. The finding suggests that media attention and media concerns and journalists' narrative considerations change across the different phases of development, that natural instincts, political influence, and media norms can all affect it.

Keywords: smog air pollution, China, the *People's Daily*, content analysis, framing theory, issue-attention cycle theory

Chapter One

Introduction

Environmental problems, including global warming, acid rain, overpopulation and water pollution, are not rare in modern societies due to the rapid speed of economic development. Today in China, smog air pollution has become one of the biggest and longest environmental crises in history and has drawn a lot of media and public attention. On Saturday, February 28, 2015, a documentary titled *Under the Dome*, produced by a Chinese author and former television Chai Jing, launched a debate about smog on the Internet. Chai narrated the show as a lecture that presents the results of her year-long research about air pollution. The documentary shows that in 2014, most cities in China, such as Beijing, Chengdu, Tianjin, and Shijiazhuang, suffered from smog. For approximately half the days of the year, the air quality in those cities was unhealthy or worse. According to the photos shown in the video, most of the time, the skies were gray, and people needed to wear masks to help them breathe. Suddenly, this documentary "took the Chinese Internet by storm" (Yang, 2016, p.1); it went viral on its first day of release and became the top trending topic on Sina Weibo, which is equivalent Twitter in China. *BBC News* claimed that the only place that air pollution documentaries can get more than 100 million views in less than 48 hours is China (Hatton, 2015). It is hard to pinpoint this video as the precise starting point for when the public in China began to notice the severity of their air quality, but it definitely sparked a debate throughout the country, "with millions stopping to pay attention to an issue that has been lingering in the air for years" (Hatton, 2015, p. 3).

Indeed, the problem of air pollution in China is not a transient climatic hazard that only happened and lasted for a few months; it can be traced back to the end of last century. The air

pollution problem was first observed in the 1970s with industrial emissions of sulfur dioxide (SO2) and total suspended particulates (TSP). In the following years, with the dramatic rise in the number of vehicles and the rapid development of industries in cities, car emissions and coal combustion have led to worsening air quality (Zhang, Liu & Li, 2014). Especially in 2008, when Beijing hosted the Olympic Games during the summer from August 8–24, air quality in Beijing became a major concern. Before the Olympic Games, measures had been taken to improve Beijing's air quality to ensure the health and enjoyment of all participants, but after the games, the air quality in Beijing turned even worse.

Smog pollution has now become a national crisis, too serious to be ignored by the public and the government, especially the government. The environmental crisis has brought not only health problems for the country, but it has also had significant impacts on the economy, politics, and even international affairs (Lu, 2016). Thus, how to deliver information to the public is important for the government from the perspective of crisis management. Using content analysis, this article examines the news about smog pollution to explore the frames and suggestions behind the news reports.

To examine how the media has constructed smog pollution for the public, this study introduces the framing theory to help explore the frames. According to the framing theory, frames are robust mechanisms that can help define problems and shape people's opinions about an issue (Knight, 1999; Gamson & Modigliani, 1989). It also posits that the mass media plays a significant role in shaping public opinion about one an issue, and people use media-generated images to construct meaning about political and social issues (Gamson et al., 1992). In this smog case, the media plays a significant role in informing and shaping public's understanding of the air pollution, including explaining the concept of particulates, exploring the reasons for pollution,

and providing solutions. In that regard, by examining the frames used in the news reports helps foster an understanding of the roles played by the media.

However, the process of news construction and news discourse is not stationary, but dynamic. Researchers have suggested that media frames tend to change as an issue evolves. For example, Shih, Wijaya, and Brossard (2008) found that media concerns and journalists' narrative considerations regarding health epidemics change across different phases of the development of diseases. This infers that media coverage emphasizes different narrative considerations at different stages of the issue-development cycle. Similarly, media coverage of global warming was found to highlight different narrative themes at different phases of the issue-attention cycle (McComas & Shanahan, 1999). Thus, another theory is applied in this article as well—the issue-attention cycle framework. By comparing the media narrative preferences used in the coverage of the smog issue from *People's Daily* at different phases, this article aims to answer the following question: Do media frames reflect differences at different stages of the development about smog air pollution?

Content analysis will be used to analyze the media coverage from the *People's Daily,* which is one of the most influential newspapers in China. The sample under study is based on the research results from China National Knowledge Infrastructure (CNKI) and is examined by a quantitative content analysis technique grounded in framing and the issue-attention cycle frameworks. Smog air pollution is the biggest environmental crisis that China is facing now, studying the frames in the most influential print newspaper providing an angle to understand how Chinese media delivery the environmental crisis to the public; Also, considering the People's Daily is the party newspaper, results of the framing might also reflect the State attempts to governance the smog pollution crisis. Furthermore, this article also looked at the differences of

the frames prominence at different stages of development (cycle 1, cycle 2 and cycle 3), which

suggest that the media have different narrative considerations as the issue evolve.

<center>**Chapter Two**</center>

<center>**Literature Review**</center>

This study uses the smog pollution crisis in China as the research subject and is grounded in the media framing and issue-attention cycle frameworks; therefore, the literature review provides the background research on smog pollution and presents overviews and previous studies of both the issue-attention cycle and frame theory frameworks.

Background of smog air pollution

Smog is a kind of air pollutant. The word *smog* was first coined in the early 20th century as a portmanteau of the words *smoke* and *fog* to refer to "smoky fog" (Allaby, 2009). After nearly a century since its first usage, smog has been used exclusively to characterize air pollution incidents in industrialized cities (Shi et al., 2016).

In the article entitled "Surface Weather Observing Practices" published by the China Meteorological Administration (CMA), the definition of smog is as follows: "many very fine dust particles dry evenly floating in the air so that the horizontal visibility is less than 10 km from common air turbidity." Later in 2010, the CMA promulgated the "People's Republic of China Meteorological Industry Standard," and it gave a more technical description of smog: "smog occurs when the visibility is less than 10 kilometers. After eliminating visual barriers caused by precipitation, dust storms, blowing sand, dust, and other weather phenomena, and when air relative humidity less than 80%, this kind of weather can be identified as smog" (Wang, et al.,2014).

The pollutants that comprise smog are complicated. However, the World Health Organization (WHO) claims that particulate matter (PM) affects more people than any other pollutant, and the major components of this pollutant include "sulfate, nitrates, ammonia, sodium chloride, black carbon, mineral dust and water" (WHO, 2016). According to the NASA Global Modeling and Assimilation Office (GMAO), PM is a kind of microscopic solid or liquid matter suspended in the Earth's atmosphere. Depending on nominal mean aerodynamic diameters, PM has been categorized as fine particles or coarse particles. PM 2.5 is particulate matter with an aerodynamic diameter smaller than 2.5 micrometers. Also, fine particles (PM 2.5) are more likely to penetrate and deposit deeper into the tracheobronchial and alveolar regions compared with coarse particles (PM 2.5–10). Thus, measuring the concentration of the PM 2.5 became a visible way to measure the impact of smog.

To better monitor the air quality, the CMA started using the Air Quality Index (AQI) in 2012. The index is based on five pollution sources: ground-level ozone, particle pollution, carbon monoxide, carbon dioxide, and nitrogen dioxide. Also, six grades of the AQI were established with stratifying levels represented by different colors. From grade 1 to grade 6, the air pollution goes from clean to hazardous (see figure 1).

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

Figure 1：Air Quality Grading Standards

Outbreak of smog pollution: Overview

Ever since the policy of "Reform and Open-door" was carried out in 1978, China has enjoyed extraordinary achievements in economic development, which increased the national income and promoted urbanization and industrialization. However, the biggest cost to China from its development is the pollution of the environment. According to Shao et al. (2006), "Air pollution is perhaps China's biggest environmental problem" (p. 357). Smoggy weather has been an issue in China since the onset of the twenty-first century, and lots of research on air pollution was conducted during that period, including studies about the relationship between disease and air pollution (e.g., Mumford, 1987; Xu, 1994; Xu, 1989) and about contaminants (e.g., Zhang& Smith, 2007). Recently, the smog pollution situation has gotten worse. Researchers at the Chinese Academy of Social Sciences reported that smog pollution in China had hit a record level: is the worst air pollution problem since 1961 (Wang, et al., 2014).

The worst year on record was 2013. In January 2013, a large range of foggy weather dominated the nation on four occasions, five hazardous air-pollution episodes were recorded, and more than 30 provinces and cities were affected by choking smog (Ji, et al,. 2014). The China National Commission for Disaster Reduction reported that smog was one of the natural disasters that occurred in that year. Smoggy weather has officially been defined as an environmental problem in China (Dong, 2014). After 2013, the poor air quality was still a concern. According to the CMA statistics, hazy days numbered more than half of the year in Beijing. In 2015, the CMA announced that there was a total of seven occurrences of large-scale persistent haze, mainly in January, November, and December; the middle eastern part of China suffered the longest duration of large-scale and heavily polluted hazy weather.

Continued haze pollution is related to foggy winter weather to some extent, but the fundamental reason is a large amount of pollutant emissions due to human factors. Energy consumption, especially the consumption of fossil fuel, is a major source of man-made pollution in Chinese cities. Also, With the acceleration of urbanization and the development of transportation infrastructure, vehicle exhaust pollution in China is also increasing. In general, the cities in China were experienced the air pollution generated with coal-combustion pollution, vehicle exhaust pollution, and the pollution caused by multiple other pollutants (Wang&Hao, 2012).

PM 2.5 plays a significant role in this problem. Examining the definition and reviewing the role that PM 2.5 has played in smog pollution could provide a deeper understanding of the smog pollution issue in China.

The popularization of PM 2.5 as an issue in China is at the base of the controversy. In November 2010, the United States Embassy in Beijing posted a Twitter note stating that the PM2.5 concentration was higher than 500 and claimed that Beijing air quality was "crazy bad" in its account "Beijing Air." It was the first time that an official media account posted monitoring data about PM 2.5. On October 22, a famous Chinese micro blogger, *Shiyi Pan*, posted a screenshot showing that the Pm 2.5 concentration was 408 and the AQI was 439 in Beijing. According to the standard, both data had reached a "hazardous" level of air quality. This information immediately caught the public's attention and led to a discussion about PM 2.5 (Lu, 2016).

According to the official announcement at the time, it was illegal to post or monitor any result about PM 2.5 in public, and the Chinese government had no response about PM 2.5 until February 29, 2012, when the State Council urged all localities to publish monitoring results of

PM 2.5 to the public. On March 2, China's newly revised "Ambient Air Quality Standards" were released, adding new standard average PM 2.5 concentration limits. The city of Guangzhou began to release PM 2.5 data on March 8.

In 2013, China's central and eastern regions frequently fell victim to smog pollution, especially in December of that year. Smog and haze spread to 25 provinces and more than 100 cities. The national average haze days were up to 29.9 days in that month, reaching the highest level of the past 52 years.

In 2014, the governance of smog was first written about in local government work reports from the city of Beijing and the provinces of Shanxi and Hebei. Two years after PM 2.5 was first officially introduced to the public, more than 200 cities started releasing PM 2.5 data, which provided clues about the life cycle of smog pollution.

Frames and the Framing Process

Framing theory has been widely applied in research in the field of communication and media study. It provides "meaning to an unfolding strip of events" (Gamson & Modigliani 1987, p. 143; 1989) and promotes "particular definitions and interpretations of issues" (Shahetal, 2002, p. 343). The roots of the framing theory lie in different disciplinary traditions, and different scholars have defined framing as a concept at various levels of analysis (Scheufele, 1999). Like an artist placing a frame around a painting to affect the viewer's interpretation and reaction to the painting itself, the media may impact how audiences feel about an issue by framing an event in particular ways (Vreese, 2005).

In terms of messaging, the term *frame* was first introduced by the philosopher and anthropologist Gregory Bateson (1972) and was subsequently applied by Erving Goffman (1974) in the field of communication. Goffman (1974) suggested that people understand issues based on

their primary frameworks, which help people to "locate, perceive, identify, and label occurrences, thus rendering meaning, organizing experiences, and guiding actions" (p. 21). Similarly, more formulations of the frame include the work of Tuchman (1978), who claimed that the frame plays the role of an organizing device that allows the journalists to net, sort, and transmit information more efficiently. Gitlin (1980) wrote that media frames are "persistent patterns of cognition, interpretation, and presentation, of selection, emphasis and exclusion by which symbol-handlers routinely organize discourse' (p. 7). Gamson and Modigliani (1989) considered media discourse as a set of interpretative packages that give meaning to an issue; a frame is the central organizing idea of this interpretative package "for making sense of relevant events, suggesting what is at issue" (p. 3). Similarly, frames have been defined as "thought organizers" that help in packaging complex issues by focusing on certain aspects over others, suggesting what should be emphasized and what should be ignored (Ferree et al., 2002). According to the emphasis of some elements, a frame provides a way to understand an issue or event. In doing so, frames thus have four functions; they "define problems," "diagnose causes," "make moral judgments," and "suggest remedies" (Entman, 1993).

Studying the definition of frames contributes to understanding the power of the communicating text, but the communication is not static. The study of frame conception has gradually become the study of the framing process. Gitlin (1980) referred to frames as "persistent patterns of cognition, interpretation, and presentation of selection, emphasis and exclusion by which symbol-handlers routinely organize discourse" (p. 7). Furthermore, Entman (1993) explained that framing essentially includes "selection" and "salience" and said that "to frame" is "to select some aspects of a perceived reality and make them more salient in a communicating text" (p. 52). Entman (1993) further asserted that framing may take place at four

locations: the communicator, the text, the receiver, and the culture. Frames guide communicators'
(reporters and editors) belief systems, allowing them to decide, whether consciously or
unconsciously, what to say. Then in the text, frames are manifested in the presence or absence of
certain elements of an issue that provide clusters of facts. The text receiver's thinking and
conclusion may be influenced by the frames. Finally, *culture* is defined as "a set of common
frames exhibited in the discourse and thinking of most people in a social grouping" (pp. 52–53).
All in all, according to Entman (1993), the framing in all four locations has the same function as
discussed before: selection and highlighting. The virtue of using and analyzing framing is that it
not only can "offer a way to describe the power of a communicating text" (Entman, 1993, p. 51),
but it also can "illuminate the precise way in which influence over a human consciousness is
exerted by the transfer of information from one location to consciousness" (p. 51–52).

The approaches for studying frames can be broadly divided into two groups: frames as
dependent variables and frames as independent variables (Tewksbury & Scheufele, 2009). When
studies use frames as dependent variables, they usually deal with "frame building"; frames are
used as independent variables in studies that are mostly concerned with "frame setting"
(Scheufele, 1999).

Scheufele (1999) discerned four stages in the framing process: frame building, frame
setting, individual-level effects of framing, and journalists as audiences. Frame building focuses
on how to create a society discourse and how to select frames that will manifest in the news of
one issue (Vreese, 2005); it usually deals with three related areas: "practices of news
production," "political actors," and "cultural contexts" (Tewksbury & Scheufele, 2009).
Shoemaker and Reese (1996) established a hierarchical model of influences on media content
listed at various levels: macro-ideological, extramedia, media organizations, media routines, and

micro individual. In this way, the "practices of news production" is on the individual and media routine levels, which concern "how journalists frame a given issue" (Tewksbury & Scheufele, 2009, p. 19). Usually, the journalists' practices of news production that are related to those aspects include society norms and values, organizational pressures and constraints, external pressures from interests and other policy makers, professional routines, and ideological value in media (Shoemaker & Reese, 1996; Tuchman 1978). The second group, "political and corporate actors," is at the media organization and extramedia levels of the framing hierarchical model (Shoemaker and Reese, 1996), which influence frame building from elites, including "interest groups, government bureaucracies and other political or corporate actors" (Scheufele, 1999). And the third group, "cultural contexts," is at the ideological level, which refers to the commonly shared cultural roots in the presence of the frames. The interactive relationship between the frames and culture has been described by Tewksbury and Scheufele (2009) as follows: "A frame makes reference to something resident in the surrounding culture, and the presence of the frame essentially invites audiences to apply the information and meanings within which the culture has imbued the frame" (p. 22).

The second stage is frame setting. De Vreese (2005) refers to it as the "interaction between media frames and individuals' prior knowledge and predispositions" (p. 52). This part of the process has been explored in depth, and the research on the consequences of frame setting has usually been divided according to the micro or macro level (Tewksbury & Scheufele, 2009). In the same vein, De Vreese (2005) conceived framing on individual or societal level: "An individual level consequence may be altered attitudes about an issue 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" (p. 52).

The third stage is the individual-level effects of framing, which refers to the impact of frames on an individual's behavior, attitude, and cognition (Scheufele, 1999). Also, the fourth stage of the model of framing describes when journalists play the same roles as their audiences as "cognitive misers" and become susceptible to frames set by the news media (Fishman, 1977).

The Journalist's Role in the Framing Process

The mass media set the agenda through media framing to select and present information, which is considered an effective method of social manipulation (Mueller, 1970), and the agenda-setting influence of the news media is not only limited to putting public attention on a particular topic; it also influences people's understanding and perspective on the topics of news (McCombs, 2002). Three main factors influence these media frames: reporters, advertisers, and media owners (Dispensa & Brulle, 2003). Usually, journalists and editors are under the pressure of their owners' preferences about meanings and interpretations of news coverage (Gamson et al., 1992). In some cases, news media outlets are under the influence of a political party: "The political party's media will undertake the task of transmitting the spirit of the government and protecting the image of the ruling political party" (Rong, 2009). In the late 1960s, a new concept of the "development journalist" was introduced by Alan Chalkley as he discussed the media in developing countries. Basically, the idea is that the "development journalist" should take the responsibility of promotion, besides the tasks of informing audiences of the facts and offering context and interpretations (Campbell, 2004) Also, development journalism requires institutions to control the news media organization; thus, the capacity to challenge those authorities is significantly reduced (Hachten, 1992).

As a big developing country, China has one of the biggest newspaper industries in the world. Also, China's news media outlets are strongly influenced by the state. Most of the media

are called mouthpieces of the Chinese Communist Party and are said to be used as tools to transmit the party's will to the public. According to the Xinhua News Agency, 1,928 newspapers were in circulation in China at the end of 2011. Rong categorized Chinese newspapers into three general types: party newspapers, city newspapers, and newspapers for specific professions (Rong, 2009, p. 18). Party newspapers, such as the *People's Daily* and *Guangming Daily*, are representative newspapers of the Chinese Communist Party, with the main goal of providing political propaganda for the party.

Previous studies

The framing theory has been widely used in media studies since its emergence. That includes the analysis of media coverage of political issues (e.g., Bystrom, Robertson, & Banwart, 2001; Iyengar & Simon, 1993; Brewer & Willnat, 2003), social public crises (e.g., Chyi & McCombs, 2004; Champion & Chapman, 2005), and scientific issues, such as stem cell research (e.g., Nisbet, Brossard & Kroepsch, 2003) and the gene patent controversy (e.g., Caulfield, Bubela, & Murdoch, 2007). Also, as for the environmental problems, some researchers have investigated the media coverage of climate change/global warming (e.g., Takahashi, 2011; Boykoff, 2007; Olausson，2009). As one of the most influenctial environmental crises in China, smog pollution has captured the attenion of many scholars. They have explored the relationship between smog and public health (e.g., Chen, Zhao, & Kan, 2013), the scientific charecteristics of smog (e.g., Kaiman, 2014; Ma, Xu & Yan, 2012), and a comparison of smog governance between China and London (Zhang, Liu, & Li, 2014).

In this study, exploring the frames in news articles is a target, but not the only one. The final goal of this article is to combine the cyclical patterns of environmental issues to examine the

issue developing process. Thus, in the following part, the issue-attention cycle theory is introduced.

Issue-attention cycle

To promote a better understanding of the nature of the smog issue news coverage, a social process model to examine the changes on frames during the evolution of an issue is introduced. The comings and goings of news coverage and public concerns are explained by Downs's issue-attention cycle (1972), which suggests that the media and the public rarely focus on certain issues for a long time, and attention from either the public or the mass media fluctuates (Shih, Wijaya & Brossard, 2008). Generally, the issue-cycle model always includes five stages (Downs, 1972):

1. The *pre-problem.* In this stage, it is acknowledged that an issue exists, but it has not yet captured a lot of public attention; only specific experts are interested in this issue. Generally, the issue's objective conditions are considered far more serious during this stage than when the public becomes interested in the issue.

2. A period of *alarmed discovery and euphoric enthusiasm.* During this period, the public becomes both aware of and alarmed about the seriousness of the issue. Also, the alarm is accompanied with confidence about the society's ability to solve the problem in a short time. However, Downs (1972) also pointed out that this confidence in American culture is generated from its tradition that views each obstacle in the process of social development with an optimistic attitude. Other cultures have different viewpoints and reactions. Some cultures have a pessimistic view, and some cultures even believe the problems cannot be resolved at all. In other words, the attitude that accompanies the alarm about the issue depends on the cultural background or other factors.

3. A period of *realizing the cost of significant progress*. During this period, people start to realize that the costs and sacrifices needed to solve the problem will be very high and far beyond their estimation. Also, people start to realize that the problems are caused by the arrangements that provide benefits to millions of people.

4. The *gradual decline of intense public interest* period. During this period, people are discouraged, and the intensity of the public interest in the problem gradually declines. After the previous three periods, some people gradually realize how costly and difficult it would be to solve the problems and thus feel discouraged. Also, some people become bored with the problem, and most people experience a combination of those feelings. As a result, the public's attention to the issue starts to wane.

5. The *post-problem stage*. This is the last stage of the issue-attention cycle, when an issue has been removed or replaced as the center of public attention and moved into prolonged limbo. However, compared to the prediscovery stage, this stage has a different relation with the public. Even the public attention has shifted elsewhere; those institutions, policies, and programs that had been created to solve the problems may always persist and influence the public to some extent.

However, Downs (1972) argued that not all kinds of social problems go through this cycle. Some social problems have characteristics in common. First, most people do not suffer directly from the problem, which means that most people in the society will not be continually reminded of the problem by suffering from it. Second, such problems are generated by a social arrangement that provides a significant benefit to the majority of the public; thus, solving the problem would threaten an important group's benefits. Third, if a problem has no intrinsically exciting qualities, the media's continued focus on the problem will soon bore the majority of

people. However, Downs (1972) considers environmental issues as intrinsically susceptible to the issue-attention cycle because those issues are either "experienced unequally, generated by social arrangements, or intrinsically unexciting." (McComas & Shanahan, 1999).

Even though the intrinsic characteristic of the issue's developing cyclical pattern has been challenged by various scholars (e.g. Hansen, 1991; Hilgartner & Bosk, 1988), the cyclical nature of media attention to a variety of issues has been demonstrated from a variety of theoretical perspectives (Shil, Wijaya, &Brossard, 2008).

For instance, McComas and Shanahan (1999) conducted a content analysis of media coverage about the issue of global warming and found that media narrative considerations about global warming influenced its cyclical pattern. Based on the amount of media coverage, they divided the issue-attention cycle of global climate into three stages: the waning phase, the maintenance phase, and the waxing phase. Their research found that differences occur in narrative preferences in different phases. For example, they found that when media attention increased (waxing phase), "consequence" and "implied danger" were the most prominent aspects of the media coverage. However, the maintenance phase and waning phase were marked by more narrative considerations about the "economics of dealing with global warming."

Also, on issues of a different nature, Shih, Wijaya and Brossard (2008) categorized the media attention and frames of three different epidemics: mad cow disease, West Nile virus, and avian flu. Based on the content analysis of the media coverage from *The New York Times*, they found that frames such as "action" and "consequence" were consistently employed in the media coverage of those three epidemics. For the West Nile virus and mad cow disease, the researcher found differences occurred in frame prominence at the different stages of the issue-attention cycle. In relation to the coverage of the West Nile virus, "uncertainty" and "action" were two

frames that were more prominent during the waxing stage than in the waning stage, while the "consequence" and "new evidence" frames were more prominent in the waning phase than in the waxing phase. The shift of frames in media coverage of mad cow disease revealed a different pattern. During the waning phase, journalists placed more emphasis on "action" and "new evidence" frames, and in the waxing phase, the frames "consequence," "uncertainty," and "conflict" were used more frequently. This research suggested that "different stages in the media attention cycle reflected different narrative considerations" (Shih, Wijaya & Brossard, 2008, p. 156).

Nisbet and colleagues (Nisbet et al., 2003; Nisbet & huge, 2007) have examined variations in the prominence of media attention about stem cell research and the issues of biotechnology across different phases of the issue-development process. They found that when an issue remained in the administrative context, new scientific research and the scientific background frames were important in this phase. With the issue attracting more attention, the media placed emphasis on morality and policy background, and when the issue reached the peak of media attention, the use of strategy/conflict frames increased as well. Their research indicated that "the prominence of these frames varied considerably across the stage of scientific and policy development" (Nisbet et al., 2003, p. 59); also, they suggested that the cyclical pattern of media coverage was because of the reporting strategies used rather than the intrinsic characteristics of the issue.

The influence of reporting strategies and narrative considerations in shaping the cyclical patterns of media attention has also been studied in different cultural backgrounds. Shanahan and McComas (2004) conducted research on global climate change in the United States and France. In their study, they tried to discover whether culture influenced the issue cycle that was

constructed. In comparing newspaper stories about global warming from American and French media coverage, this research found that the "issue attention cycle" was obvious in the American coverage, but not visible in French media coverage. Thus, they suggested that journalistic practices that were embedded within each cultural context were the major factors that determined the cyclical nature of the coverage.

In light of the overview of the previous research about the relationship between media coverage and the issue-attention cycle, this research will use the smog pollution issue in China to examine the cyclical pattern of media attention and frame prominence across the process.

Chapter Three

Research Questions

Using the framing as theoritical framwork, this study aims to examine how the mainstream Chinese media cover and frame smog air pollution. For this purpose, the mainland version of the *People's Daily* was selected for further analysis. The *People's Daily* was chosen because it is relatively the most influential newspaper in mainland China that provides high-quality news content. It is also an official newspaper of the Chinese Communist Party, which represents the mainstream media. The newspaper is the liaison between the party and the people, telling people what the party's expectations are, and to some extent, reporting the people's views and wishes to the leadership (Chang, 1989). In general, the newspaper has four versions: the mainland version, Hong Kong version, overseas edition, and Tibetan edition. Because the smog occurs primarily in mainland China, this article will analyze the news coverage from the *People's Daily* mainland version.

Previous research has shown that news media attention was linked to public concern about climate change (Trumbo, 1995). By examining the volume of the news attention would tell about the public concern about air pollution. Also, because of the media's influence discussed before, the prominence of each frame can tell the narrative consideration of the print newspaper about the air pollution. Moreover, another exploratory question will be asked about the difference in proportion of each frame been used in the coverage as the issue evolve. Thus, following three questions will be explored.

RQ1: How did media attention of the *People's Daily* shift over time to smog pollution under study?

RQ2: What is the prominence of each frame used in the *People's Daily* in the smog pollution coverage?

RQ3: Is there any difference in frame prominence at the different stages of the issue's life cycle?

Chapter Four

Methodology

This study uses quantitative content analysis to analyze how smog pollution was framed in print news coverage and how coverage evolved over time. Content analysis has been described by Harwood and Garry (2003) as "a technique that enable analysis of 'open-ended' data to be structured for purpose of diagnosis" (p. 479). Wimmer and Dominick (1994) claimed that content analysis can be used to identify what exists and to describe the trends over a long time. Considering the proposed research questions, content analysis will be an appropriate method of research for this study, as it can tell the distribution of the media attention and how different frames are used in different stages in the issue's developing process.

As for the media's attention distribution, it refers to the publishing time of each article, which can be found at the front of each article. The date of the article helps in forming the dynamic distribution of media attention from the *People's Daily* on smog pollution. By combing the media's attention distribution data with the Downs' issue-attention cycle, this article can discern the developing cyclical pattern of the smog pollution.

For identifying the frames used in the news, this article examines each frame as "present" or "absent" in single news stories.

Vreese (2005) explained, "Scholars have argued in favor of applying concise, a priori defined operationalizations of frames in content analyses." Cappella and Jamieson (1997) cautioned against too broad of a view when considering any production feature of a verbal exchange or text as a candidate for a news frame. Thus, they raised four criteria that a frame must have. First, the news frame must have identifiable characteristics. Second, it should be commonly used in journalistic practice. Third, it needs to be possible to distinguish it from other

frames, and last but not the least, it needs to be a valid representation; it cannot only be from the researcher's imagination (Cappella & Jamieson, 1997, pp. 47. 89).

Vreese (2005) offered two approaches to identify the frames: "One approach is inductive in nature and refrains from analyzing news stories with a priori defined news frames in mind. A second approach is rather deductive in nature and investigates frames that are defined and operationalized prior to the investigation" (Vreese, 2005, p. 54).

The aim of this article is accordingly to examine frames in the smog evolution cycle, to determine whether differences occur at different stages of the process. Generally, Entman (1993), in his research article entitled "Framing: Toward Clarification of a Fractured Paradigm" established four functions of framing: define problems, diagnose causes, make moral judgments, and suggest remedies. Thus, this article follows this classification to build up four main framing types: (1) problems, (2) effects, (3) responsibilities, and (4) solutions.

Then, with a further preliminary analysis of the smog pollution reports, four categories have been refined into nine kinds of frames, including "problem," "effects on social economic," "effects on politics," "effects on health," "responsibility of government," "responsibility of the individual," "responsibility of nature," "non-voluntary solutions," and "voluntary solutions."

Frames definitions and examples

To clarify the coding scheme, frame definitions, and the framing content, analytical examples are provided as follows, which are translated from Chinese:

1. *"Problem" frame (PROB):* News articles that contain any status updates and science background definitions about the smog crisis were coded as problem-framed stories

(e.g., updating the values of air quality index, publishing the PM2.5 index and the degree of air visibility, days of pollution and non-pollution, and definitions of "smog," "PM 2.5," "AQI," and other nouns relating to smog air pollution).

Example: **"**Beijing October smoggy days are equal to the number of pollution days in 2010 for the entire year, and five yellow warnings fog were continuously released. From September to December of last year, Beijing appeared nine times, with 45 days of haze pollution, 29 days more than the same period".

2.   "Effects on Social economic" frame(EE): News articles that contain reporting on how the incident affected the social economics in polluted area and even the whole country were coded according to their effects (e.g., affects transportation, reduces gross domestic product (GDP), threatens agricultural production, and requires industrial restructuring).

Example: "In recent years, the pollution control and large-scale industrial restructuring that Hebei province has done does have effects on its economic development in the short term."

3.   "Effects on politics" frame(PE): These frame**s** contain reporting on how the incident and the actions of authorities affected the country image of China to the world, as well as the effects on residents' trust in government, including how they affected the national image, led to diplomatic issues, weakened the people's recognition of the country, and led to people's negative evaluations of reform.

Example: "Capital air quality is related to the public interest and the national image."

4.   "Effects on health" frame(HE): This frame contains reporting on how smog pollution affects the physical and psychological conditions of residents, including damage to the nervous system, cardiovascular system, respiratory system, and endocrine system.

Example: "Poor air quality increases the risk of people suffering from diseases of the upper respiratory system and increases the harm to patients with asthma, allergic rhinitis and other disease suffering,"

5. *"Government responsibility" frame(GR):* This frame contains reporting that assigns responsibility, blame, or culpability for smog pollution to the government, including inadequate government oversight, enforcement of environment oversight, and a national development policy framework that privileges industrial growth over environmental quality,

Example: "To cure this 'breathe with the pain,' the government needs to strengthen control and make the invisible responsibility tangible and concrete."

6. *"Individual responsibility" frame(IR):* This frame contains reporting that assigns responsibility, blame, or culpability to individuals, including car exhaust, household coal-fired heating exhaust, traffic jams, and home renovations.

Example: "Fireworks in the discharge process will produce a lot of sulfur dioxide, nitrogen oxides, soot, carbon particles, and other particulate matter; they are one of the important sources for PM 2.5."

7. *"Natural responsibility" frame(NR):* This frame contains reporting that assigns responsibility, blame, or culpability to the weather and geography, **i**ncluding stagnant air flow leading to weeks of low clouds and fog, tall mountains acting as a natural barrier for any smog to clear out, and strong high air pressure conditions in the winter also leading to enhanced smog levels.

Example: "Under the influence of the super El Niño event, the Eurasian region prevails in the east-west zonal circulation, and the Siberian high pressure is weak, causing the East Asian winter monsoon to be weak as a whole, and cold air activity is weak from the high latitudes to

the south. China is susceptible to static weather effects, making the air pollutants hard to diffuse and evaporate and causing the hazy days."

8. *"Non-voluntary solutions" frame(NVS):* This frame contains reporting on the government-specific actions and policies that have been proposed or implemented to tackle smog air pollution, including announcements of a "new environmental law," "new air quality standards," amendments to the PM2.5 warning signal, investments in environmental protection projects, and sanction polluting factories.

Example: "With the 'Air Pollution Control Action Plan' and other related measures continuing to be implemented and meteorological conditions with a favorable impact, air quality has improved in 74 cities overall".

9. *"Voluntary solutions" frame(VS):* this frame contains reporting on individual preventive measures the residents have made to reduce the harm caused by the smog, such as wearing anti-pollution masks, using air purifiers, staying informed about ozone levels in living areas, and limiting outdoor activities. Also, the frame contains reporting about individual voluntary solutions to tackling air pollution, including taking public transportation instead of driving cars, limiting the times of playing fireworks, and cooking outdoor BBQs.

Examples: "Reducing PM 2.5 needs everyone's efforts, and citizens need to restrain the times of setting off fireworks during the Spring Festival."

Data sources

Each news story was a unit of content analysis for this proposed study. A total of 339 news stories of smog pollution in China were collected from the research result from the China

National Knowledge Infrastructure (CNKI), which is the largest and most used academic online library in China.

Wumai, Huimai, Duwu, Mai, air pollution, particulate matter, PM 2.5, PM 10, AQI, weather, environment, blue sky Environmental Protection Law of the People's Republic of China and *monitoring air quality* were used as keywords to search headlines and whole paragraphs of news stories starting from the January 1, 2000 to August 1, 2016 in the *People's Daily*. According to the pilot research, a total of 980 articles contained one or more of the keywords. However, many of them were not related to the theme of smog air pollution. Thus, after the review and selection, 339 news stories were as the database for further research.

Coding scheme

News articles were analyzed in terms of the publishing date and the presence or absence of each frame identified by the preliminary analysis of smog pollution online coverage. Each news article was analyzed as a unit. The analysis was based on the percentage of stories that contain each individual frame. Each individual news article could contain several frames. The articles were coded according to the following criteria:

1. Date of publication. The publication date of the article will use the year as the unite, the data was collected from the year 2000 to 2016 august 1st, thus the date of the publication will be categorized into the year 2000,2001,2002,2003,2004,2005,2006,2007,2008,2009, 2010,2011,2012,2013,2014,2015 and 2016.

2. The types of frames occurring in the publication. "Problem" frame; "Effects on social economic" frame; "Effects on politics" frame; "Effects on health" frame; "Government responsibility" frame; "Individual responsibility" frame; "Natural responsibility" frame;

"Non-voluntary solutions" frame; and "Voluntary solutions" frame.

Chapter Five

Results and Discussion

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. The following procedure was used to assess intercoder reliability of the present study. First, the author (coder 1) coded the 339 news articles that appeared in People's Daily according to the coding scheme presented earlier. Using the same coding scheme, another graduate student (coder 2) in mass communications at USF was then invited to code 30 stories randomly selected from the pool of 339. The two coders are citizens of China and the U.S. respectively.

Table 1 presents two sets of intercoder reliability measures: Percentages of coding agreement between coders and Krippendorff's alphas. According to Neuendorf (2002, p. 145), 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." All but one percentages of agreement in this study were greater than .80, indicating acceptable agreement between the two coders.

Krippendorff's alpha (α) is generally considered the most reliable measure of intercoder reliability. The general form of the measure is: $\alpha = 1 - Do/De$, where Do is observed disagreement and De is expected disagreement based on an interpretation of chance. According to Krippendorff (2011, p. 1), "when observers agree perfectly, observed disagreement Do=0 and

α=1, which indicates perfect reliability. When observers agree as if chance had produced the results, Do=De and α=0, which indicates the absence of reliability." To interpret alpha, Krippendorff (2004, p. 241) suggests that "It is customary to require α ≥ .800. Where tentative conclusions are still acceptable, α≥ .667 is the lowest conceivable limit." Table X shows that all but one of the nine coding categories generated alphas greater than or equal to the acceptable .80.

Table 1.Intercoder Reliability

Coding Category	% Agreement between coders	Krippendorff's Alpha
PROB	77.0	.71
EE	93.3	.81
PE	100.0	1.00
HE	100.0	1.00
GR	100.0	1.00
IR	90.0	.80
NR	100.0	1.00
NVS	93.3	.84
VS	100.0	1.00

In this study, the smog pollution crisis is used as a case study to examine the newspaper's narrative differences at different phases of the developing process. The analysis of People's Daily allows defining the developing stages and comparing the frames used in each stage of the smog pollution crisis. The research explored the media attention changes and framing consideration changing along with the issue developing in the related articles of People's Daily. Three research questions guided the data collection and analysis using SPSS.

RQ1: How did media attention of the **People's Daily** *shift over time to the smog pollution under study?*

After excluding articles not related to smog air pollution and duplicate articles, a total of 339 articles from January 2000 to August 2016 remained for the content analysis. The first question asked was how media attention of the *People's Daily* shift over time on smog pollution. Figure 2 presents the distribution of the sample through time; it shows a general increasing trend of media attention of smog air pollution from the beginning to the end (2000 to August 2016). Three major surges appeared in 2002, 2007, and 2014. As of 2000, the number of articles began to increase and reached a peak in 2002 and then started to decrease until 2004, which naturally presented an inner attention cycle from 2000 to 2004, and the situation was the same from 2005 to 2009 and 2010 to August 2016.   Downs offered his issue-attention cycle as an explanation for the comings and goings of news coverage and public concerns. According to Downs (1972),
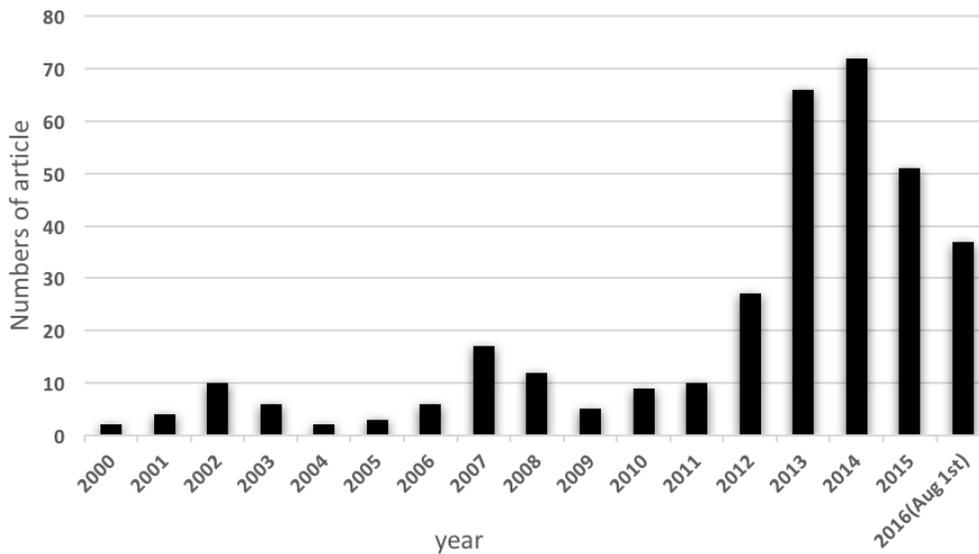

Figure 2. Distribution of the Media Attention from 2000 to 2016 august 1st

an issue rests in the pre-problem stage until a trigger event makes it the focus of public attention. This triggering process is often accompanied by a public interest and collective enthusiasm to solve the problem. However, with the policy makers and media inevitably exhausted by the dramatic elements of the issue, another new issue typically appears in the attention pipeline. The rise of concern leads to the emergence of institutional arrangements to solve problems, and these institutional arrangements continue for a long time after the initial focus subsides. Moreover, according to Downs, some important aspects of the previous issue may be linked to following issues that latter catch the public focus. In this model, he articulated five life stages of for a given issue that has been discussed in a previous review, including the pre-problem stage, alarmed discovery with euphoric enthusiasm, realization of the cost, gradual decline of interest, and the post problem. The coverage of environmental issues has often mirrored Downs' suggestions, and this article examines the realities of smog pollution coverage in China.

According to Figure 3, which shows the media attention from 2000 to 2004, a total of 24 articles covered smog pollution. The attention reached the peak in 2002, when Beijing had just won the bid to host the 2008 Olympics. Beijing had put in a bid to host the 2000 Summer Olympics eight years earlier but lost to Sydney, Australia. To successfully bid the 2008 Summer Olympics, Beijing launched the "Beijing sustainable development plan" in 1998 to ensure good air quality. The anti-pollution measures included removing or altering factories, converting fuel from coal to gas, and planting trees. The Olympics games are regarded far more than any other sporting event and also have political and economic significance to the country (Dayan and Katz, 1992; Tomlinson & Young, 2006). Cities hosting the Olympics games may face political and social problems that easily turn into controversies, criticisms, or protests. Some scholars believe that there is always a "political" ideological agenda behind the Olympic games and other urban

large-scale projects, trying to persuade citizens that those projects would transform their home into a "world class" city and at the same time enhancing civic identity and community spirit (Lenskyj, 2000, p. 98). Holding the Olympics Games is a challenge for the host city, as it needs to transform the negative aspects of the city's image into an attractive tourist product. Also, according to the United Nations Environment Programme (UNEP), since 1994, organizing committees of the Olympic Games have actively increased their focus on the environment and sustainable development issues when preparing and hosting the games. All cities bidding for the Olympic Games need to have a comprehensive environmental program that can be carried out in the run-up to the Olympic Games. Each Olympic Games is expected to leave a legacy and use the Olympics to promote environmental awareness, policies, and practices. Thus, because the international media showed doubts about Beijing's ability to host the Olympics Games in 2008, particularly because of its air pollution levels, the news reports on the quality of the air became a matter of importance (Xu, 2012).
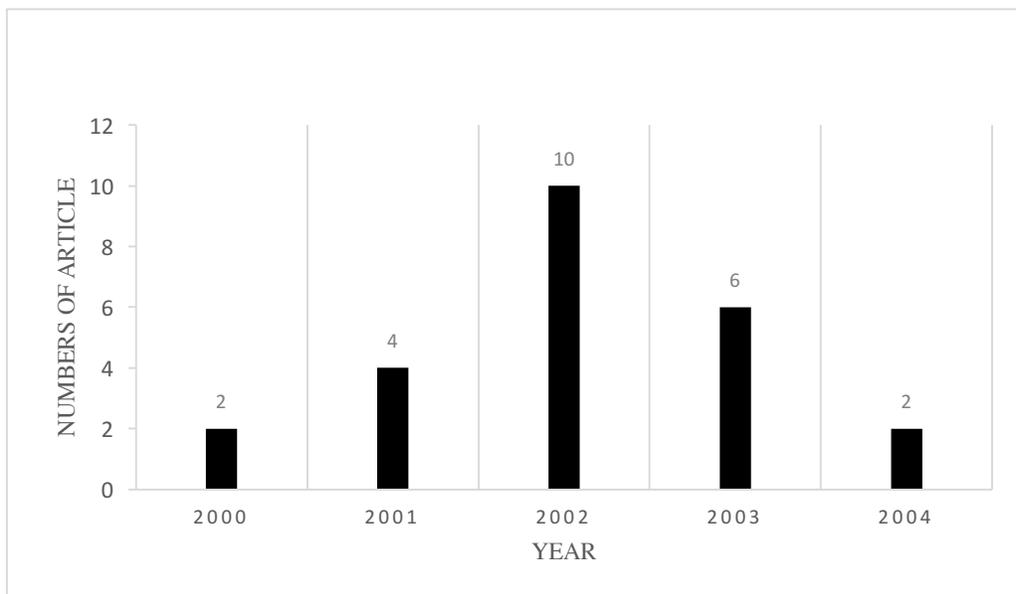

Figure 3. Media attention distribution from the year 2000 to 2004.

However, the media and public attention was relatively low compared with the ensuing years. Only 24 articles were found from 2000 to 2004, and the coverage mostly concerned the capital city. Also, few studies has been done on PM 2.5 at that time; the data related to it was also very poor, and the limited observations could not fully reflect the overall situation with fine particulate pollution in China (Wang, et. 2000). Trumbo (1996) claimed that "an important aspect of the pre-problem stage involves the preparation of the issue for its alarmed discovery" (p 274). For smog air pollution in China, this preparation was mostly in the form of articles about the generally rising level of concerns about health. In general, the period from 2000 to 2004 was when it was acknowledged that "some highly undesirable social conditions exist but have not yet captured much public attention, even though some experts or interest groups may already be alarmed by it," which was a description that perfectly fit the pre-problem stage of the issue-attention cycle. Thus, 2000 to 2004 will be categorized as cycle 1—the "pre-problem" stage for future discussion.

The second media attention surge occurred in 2007, between 2005 and 2009 (See Figure 4). Compared with the 2000 to 2004 period, the smog events from 2005 to 2009 had more media attention, as the number of the media accounts increased to 44. One of the reasons that smog had more attention during this period could be attributed to poor air quality. In 2005, the emissions of SO_2 from coal combustion were 2.55×10^7 tons, a concentration level that exceeded the Chinese Grade-II standards in 22% of the cities in China and caused acid rain problems in 38% of the cities (Report of the State of the Environment in China, 2005). Also, besides the acid rain, the particulate pollution was still severe, and it was the major air pollution problem in the mega cities at the time. As more air pollution episodes and low visibility days were reported, more attention was paid to reducing air pollutant emissions and to improve air quality in the
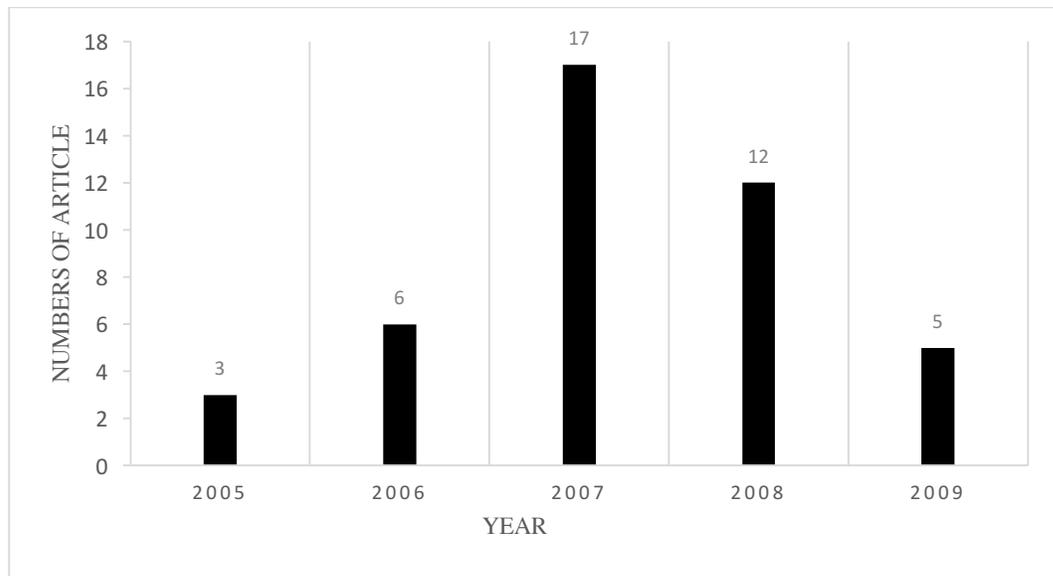
Figure 4. Media attention distribution from the year 2005 to 2009.

cities of the country (Chan & Yao, 2008). Political propaganda may be another reason that

reports about this issue brought more attention. With the time approaching for Beijing to host the

Summer Olympic Games in 2008, the government needed to present evidence that it had done

something about the commitment to ensure air quality for the athletes and guests. The

preliminary assessment suggests that these emission-reduction measures reduced the emissions

of SO_2, NOx, CO, VOCs, and PM10 by 14%, 38%, 47%, 30%, and 20%, respectively, in the

Beijing area (UNEP, 2009).

Even though these results were based on the comparison of data obtained during the

Olympics with those from non-Olympic periods, the improvement in air quality brought

enthusiasm and confidence about the possibility of tackling the air pollution problem. Thus, this

period was when people became alarmed by air pollution but had great confidence in dealing

with it. Thus, this time frame is categorized as cycle 2, the "alarm discovery and euphoric

enthusiasm" stage.

The third period was from 2010 to August 1, 2016 (Figure 5). The air quality problem in China became the center of the public attention during this time, with the help of the breakout of extreme haze pollution in northern China in 2013. At that time, a persistently large scale of heavy haze pollution covered much of northern and central China. In big cities such as Beijing, more than 20 hazy days occurred during January, with the highest concentration of PM 2.5 exceeding 600 mg/m3 (Wang et al., 2014). The hazy pollution over northern China during January 2013 caused broad concern in the whole society due to its long-lasting time, the extensive range of influence, and the record-breaking particle concentration (Tao et al., 2014).

In 2013, China's smog issue earned global news headline because of the historically high levels of PM 2.5. Through exposing the PM 2.5 index to the public, "the smog pollution issue became a battle among Chinese government, the Chinese public and the United States" (Lu, 2016, p.2). The public found out that the air quality data posted by the Chinese government was too rosy compared with the U.S. Embassy's AQI figure. The conflict resulted in the people's attention to the smog air pollution reaching a new level. However, as the issue matured, people attained a more comprehensive understanding of smog pollution and started to realize that the difficulty of tackling such a tough problem. Yang et al. (2014) claimed that the cost of smog mitigation must ultimately be accepted by the residents who would bear the cost. Wang and Hao (2012) asserted that the most efficient way to reduce the emissions of polluted air was to change the economic structure and to optimize the processes of technology so that less polluted air would be produced. However, the reformation of the economic structure was related to politics and required great money and effort. Also, vehicle emissions were another main pollutant, which required major sacrifices by large groups in society. Besides, some researchers held a negative attitude about air pollution control, and they predicted that with the continuous development of

the economy, China would face a more severe situation in terms of energy consumption, electricity generation, and vehicle population leading to increases in pollutant emissions (Wang & Hao, 2012, p. 4). This stage involved citizens gradually realizing the cost of tackling smog pollution; thus, this time frame is assigned to the "realizing the cost of significant progress" stage (Figure 5).
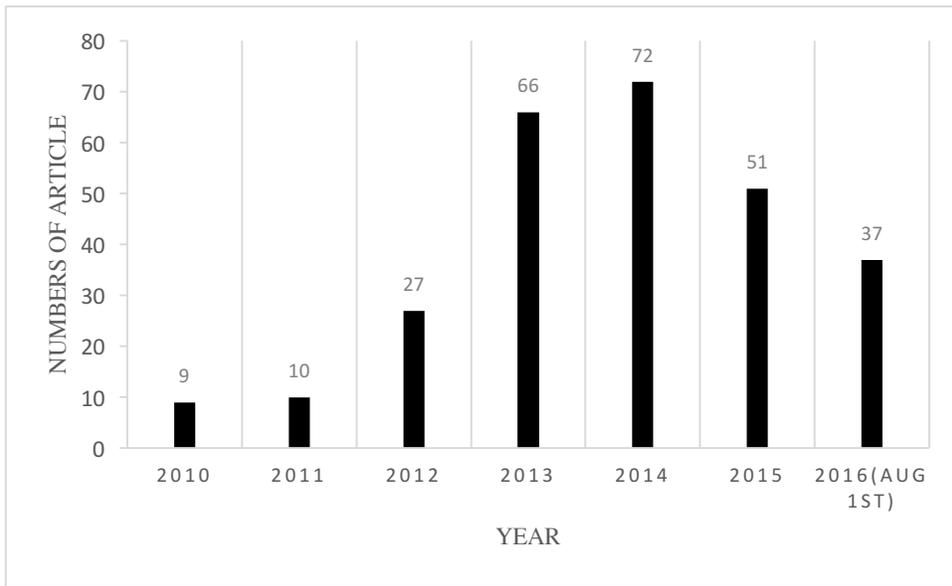
Figure 5.Media attention distribution from 2010 to August 1, 2016.

Thus, back to the question, how did media attention of the *People's Daily* shift over time to smog pollution? The result suggests that the volume of the media attention on smog pollution presented an intermittent growth trend as the issue evolved. Surges occurred within the attention distribution cycle, and the attention trend was naturally divided into three cycles. With the introduction of the issue-attention cycle theory, this article finds that the progress of the smog pollution coverage reasonably fits the first three cycles of Downs' theory. Thus, in this article, the time frame from 2000 to 2004 is categorized as cycle 1; in this period, smog pollution already exists, but has not captured much public attention yet—

the pre-problem stage. Cycle 2, from 2005 to 2009, is categorized as the alarmed discovery

and euphoric enthusiasm stage (cycle 2), and the 2010 to 2016 period is considered the

realizing the cost stage (cycle 3).

RQ2: What is the prominence of each frame used in the People's Daily's smog pollution

coverage?

Nine kinds of frames have been summed up earlier in this study; according to the codes

"presence" or "absence" of each frame, the results show that all nine kinds of frames (PROB,

EE, PE, HE, GR, IR, NR, NVS, and NV) were found more than once among the 339 news

stories from 2000 to August 2016 (see figure 6).

The most utilized frame was the non-voluntary solutions frame, which appears in 61.0% of

the publications, with an article number of 210. This frame includes the reporting on government
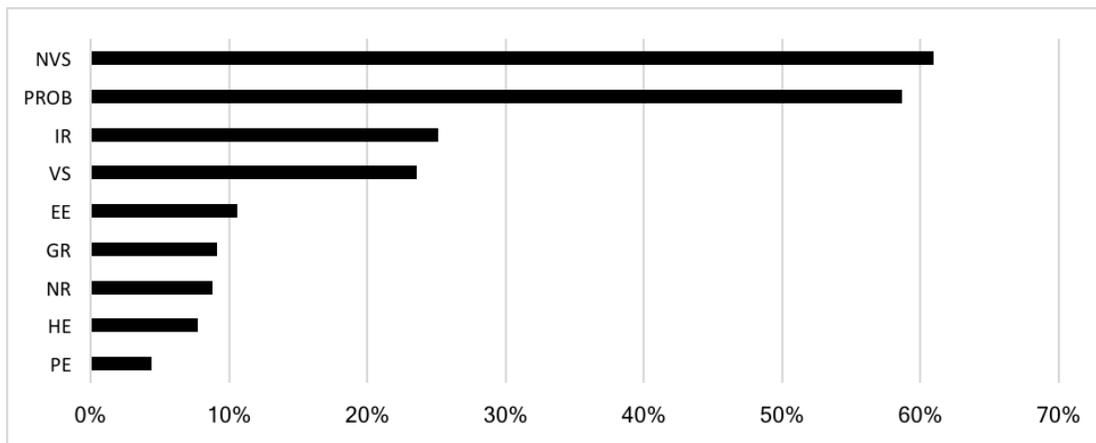
Figure 6. Distribution of all frames (based on a sample of *n = 339*)

solutions for tackling the air pollution problem. The prevalence of non-voluntary solutions frame

can be attributed to the characteristics of the *People's Daily*. Being an official newspaper of the

Chinese Communist Party, it under the control of the Party, and "Party principle" (*dangxing*

yuanze) is the central idea that underlies the Party's domination over the media. Which included

three aspects: '1). *The news media must accept the Party's guiding ideology as its own 2). Media must propagate the Party's programs, policies and directives 3). they must accept the Party's leadership and stick to the Party's organizational principles and press policies'(*Zhao,1998. p.19). For this reason, *the People's Daily* need to provides direct information on the policies and viewpoints of the government.

From the 1970s, with air pollution growing worse, the Chinese government published and updated a series of laws, standards, regulations, and action plans to prevent and control the problem, such as the Prevention and Control of Atmospheric Pollution Law (1987, 1995, and 2000), the National Ambient Air Quality Standards (GB3095-1996), and the Environmental Protection Law (2015). "China's air pollution management policies were adopted in the decade of the 1970s and have since been continuously updated" (Hernandez, 2015).

The problem frame is the second most presented frame in the articles (n = 199, 58.7%). Those stories dealt with updated information on smog pollution and the severity of air pollution. Considering that smog pollution is a constantly changing crisis, any information about the most recent air pollution conditions would be important for the public. Also, Hannigan (1995) claimed that mass media should take the role of "environmental education" for constructing environmental problems, which means making the public aware of environmental issues and publicizing possible risks and possible remedies. Thus, it is reasonable to say that the *People Daily* provided the latest information about smog in more than half of the stories.

The problem frame is followed by the individual responsibility frame (n = 85, 25.1%) and the voluntary solutions frame (n = 80, 23.6%). The individual responsibility frame attributes the responsibility of environmental pollution to individuals, and the voluntary solutions frame

concerns the reporting of non-government, non-mandatory solutions to help tackle haze

pollution. Both frames emphasize the impact of an individual's power on the environment.

Among the three responsibilities for hazy weather, the number of articles included the individual

responsibility frame (n = 85, 25.1%), which had more than twice the articles as those mentioning

government responsibility (n = 31, 9.1%), and natural responsibility (n = 30, 8.8%). For

example, the headlines of *the People's Daily* included "Protecting the Environment is Everyone's

Responsibility," "What Can I Do to Cut Emissions," and "Tackling air Pollution Requires Input

From Individuals." Bolsen et al. (2014) claimed that communication that emphasizes individual

responsibility and collective environmental benefits can promote collective action. Thus, the

prominence of the "individual responsibility" and "voluntary solutions" frames shows that the

People's Daily prioritizes individual behaviors as having more responsibility than government

mismanagement and natural causes for smog pollution. This can be explained by the

government's intentions to encourage members of the public to change their behaviors and to

protect the environment. Also, commenting on the government is a very sensitive topic for

Chinese media outlets, not to mention the *People's Daily*. The government responsibility frame

emerges in 9.1% of the *People's Daily* news stories.

The fifth is the effect on the social economic frame (n = 36, 10.6%), followed by the

government responsibility frame (n = 31, 9.1%), the natural responsibility frame (n = 30, 8.8%),

the effect on health frame (n = 26, 7.7%), and the effect on politics frame (n = 15, 4.4%).

The three kinds of negative effects frames of smog pollution were relatively rare in the

report. And within the three effects frames, the use of the effects on social economic frame was

greater than that of the effects on health, and the effect on the politics frame was the least utilized

frame. According to the results, it is clear that the government attempted to minimize the impacts

of air pollution. For the effect on economics, most stories reflected the impact on the GDP. In the past 35 years, China's rapid economic growth has been fired by coal, as it constitutes three-quarters of the overall energy mix (Qi et al., 2016). Tackling the smog issue requires controlling the emissions from coal and other pollutants, which requires a lot of money and efforts to transform the economy—from an extensive economy to an eco-sustainable intensive work economy. This of course would have a detrimental effect on the industrial contributions to the GDP. Thus, the impact of smog pollution on the economy is still a controversial topic constructed by the people in power. As for the health damage caused by the smog, they are serious. According to WHO (2013), high air pollution levels can cause immediate health problems, such as aggravating cardiovascular and respiratory illnesses, adding stress to the heart and lungs, and damaging cells in the respiratory system. Long-term exposure to polluted air can have permanent health effects, such as accelerated aging of the lungs, the loss of lung capacity and decreased lung function, the development of disease, and even shortened life spans.

RQ3: Is there any difference in frame prominence at the different stages of an issue's life cycle?

To answer RQ3, the researcher followed a three-step procedure. First, the researcher calculated the frequency and percentage of the nine frames presented in each cycle. Then, for each frame, the researcher conducted a Pearson's chi-square (X^2) to test against the null hypothesis that the frequency of the frame was the same across all three cycles. When the chi-square test resulted in a p-value smaller than .05, then there was strong evidence of a difference between at least two of the cycles. Third, a pairwise z-test of the difference in proportions was conducted to determine which two cycles were different in a specific frame category. All

pairwise z-tests were performed with Bonferroni corrections to hold the overall type I error level

to 5% or less.

Table 2.Frequency and Percentage of Frames Presented in Each Cycle*.

	Cycle 1		Cycle 2		Cycle 3		
Frame	N	%	N	%	N	%	p
PROB	19	79.2	37	86.0	143	52.6	.000
EE	6	25.0	0	0.0	30	11.0	.006
PE	0	0.0	1	2.3	14	5.1	.388
HE	0	0.0	2	4.7	24	8.8	.217
GR	0	0.0	0	0.0	31	11.4	.015
IR	2	8.3	6	14.0	77	28.3	.019
NR	1	4.2	4	9.3	25	9.2	.704
NVS	18	75.0	29	67.4	163	59.9	.252
VS	2	8.3	3	7.0	75	27.6	.002
Total	24	100.0	43	100.0	272	100.0	

* p<.05 Chi-square analysis, indicating the proportion of frame used is significantly different among the three

cycles.

The results of the chi-square analysis are summarized in Table 2. It shows that reporting

intensity was statistically different among the three cycles on five frames: the problem, effects on

social economic, government responsibility, individual responsibility, and voluntary solutions.

And the rest of the four frames—effects on health, effects on politics, natural responsibility, and

non-voluntary solutions—showed no significant differences among the three cycles.

Problem Frame

As Table 3 shows, the chi-square test showed a significant difference among the three

cycles in the proportion of the problem frame ($X^2 = 21.62$, df = 2, p < .05). Pairwise z-tests

provided additional results, and Table 4 shows a significant difference between cycle 1 (n = 19,

79.2%) and cycle 3 (n = 143, 52.6%) and also between cycle 2 (n = 37, 86.0%) and cycle 3 (n =

143, 52.6%), and no significant difference is seen between cycle 1 (n = 19, 79.2%) and cycle 2 (n = 37, 86%). The percentages of the problem frame in cycle 1 and cycle 2 are significantly higher than in cycle 3. According to Downs, the media coverage of can reinforce the cyclical pattern of the issue, at the beginning, media always prefer to use the dramatic content to draw attention from the publics. From this consideration, the People's Daily emphasized on the PP frame, by describing the severity of the smog, reporting the haze days to attract readers. Also, the decrease of the percentage in cycle 3 can be consistent with the Trumbo's (1996) finding that "a set of perspective must compete for finite space in a limited number of stories". It can tell from the Table 2 that the numbers of the article in cycle of PP is not low; thus, we can assume that the lower percentage in cycle 3 may be the explained by the more attention to the other frames: GR, IR, VS.

Table 3. Chi-Square Test: PROB* CYCLE*.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	21.623[a]	2	.000
Likelihood Ratio	23.964	2	.000
Linear-by-Linear Association	16.719	1	.000
N of Valid Cases	339		

* 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.91.

Table 4. Crosstab: PROB * CYCLE*

				CYCLE			Total
				2000-2004	2005-2009	2010-2016	
PROB	Abse nt	Count		5_a	6_a	129_b	140
		% within CYCLE		20.8%	14.0%	47.4%	41.3%
		% of Total		1.5%	1.8%	38.1%	41.3%
	Prese nt	Count		19_a	37_a	143_b	199
		% within CYCLE		79.2%	86.0%	52.6%	58.7%
		% of Total		5.6%	10.9%	42.2%	58.7%
Total		Count		24	43	272	339
		% within CYCLE		100.0%	100.0%	100.0%	100.0%
		% of Total		7.1%	12.7%	80.2%	100.0%

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

"Effects on Social economic" frame(EE)

As Table 5 shows, the chi-square test results indicated that the proportional differences of the EE frame did exist among the three cycles ($X^2 = 10.39$, df = 2, p < .05). According to Table 6, the *People's Daily* touched the EE frame in 25.0% of the coverage in cycle 1 (n = 6), 11.0% in cycle 3 (n = 30), and 0.00% in cycle 2 (n = 0). This means that there is significant difference between cycle 1 and cycle 2, and there is no significant difference between cycle 1 and cycle 3 or between cycle 2 and cycle 3. The finding that the EE frame is significantly higher in cycle 1 can also be explained by the media coverage consideration that put emphasis on dramatic content may have attracted media attention about smog pollution. Also, according to Table 6, the EE frame of smog pollution was discussed in six articles, but in cycle 2, the number of the EE frame been found in the coverage is zero. This may be explained by the possibility that with the Olympic games in hold in 2008, the economic effect of the smog is not to be expected during that period.

Table 5. Chi-Square Test: EE*CYCLE*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.386ᵃ	2	.006
Likelihood Ratio	13.662	2	.001
Linear-by-Linear Association	.500	1	.479
N of Valid Cases	339		

*2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.55

Table 6. Crosstab: EE * CYCLE*

			CYCLE			Total
			2000-2004	2005-2009	2010-2016	
EE	Absent	Count	18_a	43_b	$242_{a, b}$	303
		% within CYCLE	75.0%	100.0%	89.0%	89.4%
		% of Total	5.3%	12.7%	71.4%	89.4%
	Present	Count	6_a	0_b	$30_{a, b}$	36
		% within CYCLE	25.0%	0.0%	11.0%	10.6%
		% of Total	1.8%	0.0%	8.8%	10.6%
Total		Count	24	43	272	339
		% within CYCLE	100.0%	100.0%	100.0%	100.0%
		% of Total	7.1%	12.7%	80.2%	100.0%

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

"Government responsibility" frame(GR)

As for the GR frame (Table7), the chi-square test results indicated that the differences among the three cycles reached statistical significance ($X^2 = 8.41$, df = 2, p < .05). The pairwise z-tests results presented in Table 8 show a significant difference between cycle 1 (n = 0,0%) and cycle 3 (n = 31, 11.4%) and between cycle 2 (n = 0, 0%) and cycle 3 (n = 31, 11.4%), and no significant difference can be seen between cycle 1 (n = 0, 0%) and cycle 2 (n = 0, 0%). As the issue matures, people begin realizing the cost of significance progress in tackling the smog pollution in cycle 3. However, realizing the cost does not mean giving up on tackling pollution, especially for the government. The GR frame is found in the article of January 19, which said (translated from Chinese),"The goal of improving air pollution is not a matter of a few days; the government should be firm to it—holding the courage to "gnaw the hard bones" and "preparing

for the long fight." As air pollution became more severe, both people and the government

realized the difficulty of cleaning up air pollution; The increase of the GR frame in this cycle

suggested the propaganda role of the *People's Daily.* Showing positive attitudes toward pollution

governance can encourage the public and reveal the ability of the government. Also, noticing that

there was no article mentioned in the GR frame in cycle 1 and cycle 2 reinforced the attributes of

the Party's newspaper, ensuring that the government is always be the last to be blamed, unless it

needs to be.

Table 7. Chi-Square Tests: GR*CYCLE*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.405[a]	2	.015
Likelihood Ratio	14.402	2	.001
Linear-by-Linear Association	7.253	1	.007
N of Valid Cases	339		

*2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.19.

Table 8. Crosstab: GR * CYCLE*

			CYCLE			
			2000-2004	2005-2009	2010-2016	Total
GR	Absent	Count	24_a	43_a	241_b	308
		% within CYCLE	100.0%	100.0%	88.6%	90.9%
		% of Total	7.1%	12.7%	71.1%	90.9%
	Present	Count	0_a	0_a	31_b	31
		% within CYCLE	0.0%	0.0%	11.4%	9.1%
		% of Total	0.0%	0.0%	9.1%	9.1%
Total		Count	24	43	272	339
		% within CYCLE	100.0%	100.0%	100.0%	100.0%
		% of Total	7.1%	12.7%	80.2%	100.0%

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

"Individual Responsibility" frame(IR)

Table 9 shows that the differences in the IR frame prominence among the three cycles reaches the statistical significance indicated by the chi-square test results ($X^2 = 7,93$, df = 2, p < .05). From the pairwise z-tests result shown in Table 10, a significant difference between cycle 1 (n = 2, 8.3%) and cycle 3 (n = 77, 28.3%) is observed, as well as between cycle 2 (n = 6, 14.0%) and cycle 3 (n = 77, 28.3%), and no significant difference is seen between cycle 1 (n = 2, 8.3%) and cycle 2 (n = 6, 14.0%). As the smog pollution days increased during cycle 3, it became urgent to call on individuals to take responsibility to help reduce the polluted air emissions, which explains the significant increases in cycle 3 of IR. However, unlike the GR frame, which is only found in cycle 3, the IR had more media coverage in each cycle. The reason that the IR frame had more coverage than the GR frame was discussed in the response to the last research

question, and the appearance of the IR in each cycle reinforces the government's attempts to

share the responsibility of talking about pollution to every individual.

Table 9. Chi-Square Tests: IR*CYCLE*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.926[a]	2	.019
Likelihood Ratio	9.149	2	.010
Linear-by-Linear Association	7.610	1	.006
N of Valid Cases	339		

*0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.02.

Table 10. Crosstab: IR * CYCLE*

			CYCLE			
			2000-2004	2005-2009	2010-2016	Total
IR	Absent	Count	22_a	37_a	195_b	254
		% within CYCLE	91.7%	86.0%	71.7%	74.9%
		% of Total	6.5%	10.9%	57.5%	74.9%
	Present	Count	2_a	6_a	$\mathbf{77_b}$	85
		% within CYCLE	8.3%	14.0%	28.3%	25.1%
		% of Total	0.6%	1.8%	22.7%	25.1%
Total		Count	24	43	272	339
		% within CYCLE	100.0%	100.0%	100.0%	100.0%
		% of Total	7.1%	12.7%	80.2%	100.0%

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

"Voluntary solutions" frame(VS)

Last but not least, according to Table 11, the chi-square test results indicated that the differences in prominence regarding the VS frame among the three cycles reached statistical significance ($X^2 = 12.08$, df $= 2$, p $< .05$). In Table 12, the pairwise z-tests result shows a significant difference between cycle 1 (n=2, 8.3%) and cycle 3. The result was not surprising because of the increase of the IR in cycle 3. The higher number of VS frames in cycle 3 can be explained by the increase in IR at cycle 3.

Table 11. Chi-Square Test: VS*CYCLE*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.075[a]	2	.002
Likelihood Ratio	14.587	2	.001
Linear-by-Linear Association	10.113	1	.001
N of Valid Cases	339		

* 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.66.

Table 12. Crosstab: VS * CYCLE*

				CYCLE			
				2000-2004	2005-2009	2010-2016	Total
S	V	Abse nt	Count	22_a	40_a	197_b	259
			% within CYCLE	91.7%	93.0%	72.4%	76.4%
			% of Total	6.5%	11.8%	58.1%	76.4%
		Pres ent	Count	2_a	3_a	75_b	80
			% within CYCLE	8.3%	7.0%	27.6%	23.6%
			% of Total	0.6%	0.9%	22.1%	23.6%
	Total		Count	24	43	272	339
			% within CYCLE	100.0%	100.0%	100.0%	100.0%
			% of Total	7.1%	12.7%	80.2%	100.0%

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

All five frames above show significant differences across the three cycles, and the PP frame, HE frame, NR frame, and NVS frame all showed no significant variation among the three cycles. One interesting finding is that, according to Table 2, the frequency and percentage of the NVS frame were high in every cycle, and the PE and HE are low in every cycle. This no difference and high intensity in the NVS frame, no difference and low intensity in the PE and HE frame could be reflecting the Party newspaper's tendency to stress the achievement measures of the government and to neglect the effects of smog on the public health, as well as the bad influence on the country's image and the people's trust in the government.

Chapter Six

Conclusion

Through the analysis of 339 news stories from the *People's Daily* over a 17-year period (2000–2016), this study examined how the main stream media in China portrayed the smog pollution crisis.

By calculating the media attention changes about smog pollution for 17 years, this study discerned part of the cyclical pattern of smog air pollution news coverage. Downs' issue-attention cycle suggests a natural cyclical pattern in public attention of social problems, especially for the environmental issue. By examining the elements of this cycle, this research found that they do seem to fit the evolutionary pattern of the smog air pollution story. Also, the changes in media attention do fit the expectations of Downs' model, thus suggesting that it might be reasonable to categorize the three phases of the life cycle of the smog air pollution story in further research. This article also noticed that the partial cyclical pattern of the smog air pollution story, which has been observed for 17 years, just fits the first three stages of the issue-attention cycle. This would indicate that the following years after 2016 would see a continuous decrease in media attention. As Downs suggested, the public will get bored or discouraged and gradually lose interest in the issue.

The result from question 2 showed that the NVS, PRO, IR, and VS are the four most prominent frames found in the coverage of smog air pollution, and the EE, HE, PE, GR, NR all have media coverage less than 10%. Emphasizing the measures that the government had implemented, the *People's Daily* played a role as the "mouthpiece" for the Party. The prominence

of the PROB revealed the media's efforts in "entertainment education" in terms of reporting about smog pollution. It seems fair that both IR and VS had high prominence in media coverage because it explained the government's attempts to call for collective efforts from the public and because the voluntary solutions are results of the propaganda about individual responsibility. The high prominence in the reports shows the positive influence of this media propaganda to some extent. As for EE, HE, PE, and GR, their low proportion in the news reports represent the censorship of the Party. Negative effects and sensitive words are forbidden in the media in China, not to mention in the Party newspaper. In general, this study's results in terms of the framing prominence of the news coverage of the environmental crisis reinforce the claims that the Chinese mainstream media is deeply influenced by the "Party principle" (*dangxing yuanze*).

The third research finding is that the emphasis of the news coverage concurrently transited away from presenting smog air pollution in terms of the number of hazy days and the concentration of pollutants toward a call for action to the public and an effort to assign responsibilities. This transition seems to fit most closely to the first three stages in the issue-attention cycle, from the pre-problem stage, to the "alarmed discovery" phase, and to the gradual realization of the cost of solving the problems. Also, a further examination of the prominence of the frame changes in different cycles revealed the political domination of the *People's Daily*.

This study's results indicate that the media considerations did change as the issue evolved and that natural instincts, political influence, and media norms can all affect the considerations about the change. The content analysis of China's largest newspaper's coverage of the smog crisis in China, utilizing the issue-attention cycle, sheds light on how the issue has been framed. Studying the biggest environmental crisis in China will hopefully contribute to a better understanding of it.

Also, this research has some limitations. Just like the McComas and Shanahan said that,'any cyclical analysis of media coverage will be out of date as soon as a new cycle begins'(1999, p.52) If the smog pollution evolve as before followed by the issue cycle attention as Downs(1972) suggested, there would be a decline of the interest about the smog pollution considering some people might be threaten by the problem and thus they suppress their thoughts and also some people might get bored with the issue.

Besides, as for the content analysis about the media coverage of the smog pollution from the People's Daily, the "tone" and the "recourses" should also be examined to provide a more comprehensive insight about how the China's media report about the environmental issue.

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Appendix

Content Coding Scheme

I. General

Coded By: _____

Story Number: _____

II. Publication year of the Article:

☐2000 ☐2001 ☐2002 ☐2003 ☐2004 ☐2005 ☐2006 ☐2007 ☐2008 ☐2009
☐2010 ☐2011 ☐2012 ☐2013 ☐2014 ☐2015 ☐2016

III. Please code each story into the frames presented in the article.

☐ **"Problem" frame:** News articles that contain any status updates and science background definitions about the smog crisis were coded as problem-framed stories (e.g., updating the values of air quality index, publishing the PM2.5 index and the degree of air visibility, days of pollution and non-pollution, and definitions of "smog," "PM 2.5," "AQI," and other nouns relating to smog air pollution).

☐ **"Effects on Social economic" frame:** News articles that contain reporting on how the incident affected the social economics in polluted area and even the whole country were coded according to their effects (e.g., affects transportation, reduces gross domestic product (GDP), threatens agricultural production, and requires industrial restructuring).

☐ **"Effects on politics" frame:** These frames contain reporting on how the incident and the actions of authorities affected the country image of China to the world, as well as the effects on residents' trust in government, including how they affected the national image, led to diplomatic

issues, weakened the people's recognition of the country, and led to people's negative evaluations of reform.

☐ **"Effects on health" frame:** This frame contains reporting on how smog pollution affects the physical and psychological conditions of residents, including damage to the nervous system, cardiovascular system, respiratory system, and endocrine system.

☐ **"Government responsibility" frame:** This frame contains reporting that assigns responsibility, blame, or culpability for smog pollution to the government, including inadequate government oversight, enforcement of environment oversight, and a national development policy framework that privileges industrial growth over environmental quality.

☐ **"Individual responsibility" frame:** This frame contains reporting that assigns responsibility, blame, or culpability to individuals, including car exhaust, household coal-fired heating exhaust, traffic jams, and home renovations.

☐ **"Natural responsibility" frame:** This frame contains reporting that assigns responsibility, blame, or culpability to individuals, including car exhaust, household coal-fired heating exhaust, traffic jams, and home renovations.

☐ **"Non-voluntary solutions" frame:** This frame contains reporting on the government-specific actions and policies that have been proposed or implemented to tackle smog air pollution, including announcements of a "new environmental law," "new air quality standards," amendments to the PM2.5 warning signal, investments in environmental protection projects, and sanction polluting factories.

☐ **"Voluntary solutions" frame:** this frame contains reporting on individual preventive measures the residents have made to reduce the harm caused by the smog, such as wearing anti-pollution masks, using air purifiers, staying informed about ozone levels in living areas, and limiting outdoor activities. Also, the frame contains reporting about individual voluntary

solutions to tackling air pollution, including taking public transportation instead of driving cars,

limiting the times of playing fireworks, and cooking outdoor BBQs.