

Unveiling stories in Korean smog

-A Critical Discourse Analysis of the air pollution policy of Seoul metropolitan government in Korea

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Abstract

Air pollution caused by highly concentrated particulate matter is recognized as the biggest problem in Korean society. Since the problem is directly related to human life and local people's livelihoods, the demand for fundamental policies rather than short-term measures is growing. In this context, the strong policies of Seoul metropolitan government including emergency reduction measures which require citizens' participation are getting attention and debate. Given the intense interest and urgency of this issue, the policy to address this issue has been actively discussed, formed, and framed by various social actors. These discursive constructions affect a broader range of social practices of the particulate matter problem and related policies.

Through firstly conducting a survey on public perception of air pollution policies in Seoul, the current status of policy awareness and their methods of acquiring information were investigated. Based on the obtained understanding from the results of the survey, a critical discourse analysis was carried out to identify the roles and characteristics of discourse in political and media sectors on the air pollution policy. For this purpose, the textual, discursive practice and social practice were analyzed based on a three-dimensional model following Fairclough's methodology. As a result of the analysis, several dominant discourses were extracted, such as public health discourse, Chinese attribution discourse, tax waste discourse, regulation discourse, and cooperation discourse. These different discourses were found to be often blended and competing with each other.

The findings of the analysis suggested that there are explicit and implicit interactions between social actors, which are articulated in texts as discursive practices. And they sometimes reproduce the existing social practices to stabilize the dominant social orders such as the minimization of social costs for environmental problems and the maintenance of automobile industries' economic power. These results do not necessarily provide a negative view of the current situation. Through the interconnection of text and social practice analysis, the improvement of the current situation was suggested. It is achieved by understanding the various interactions and power relations inherent in discourses. This research also suggests the necessity of the efficient and accessible delivery method of the research results and the active attitude of a researcher about it as a starting point for improving the current situation. It also proposes to conduct a critical discourse analysis of policy-making process for a future research that can contribute democratization.

Keywords: Particulate matter, air pollution, South Korea, environmental policy, Critical discourse analysis, Sustainability Science

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List of abbreviations & acronyms

CDA	Critical Discourse Analysis
IARC	International Agency for Research on Cancer
NASA	National Aeronautics and Space Administration
NIER	National Institute of Environmental Research in Korea
OECD	Organization for Economic Co-operation and Development
PM	Particulate matter
PM 10	particulate matter with a diameter between 2.5µm and 10µm (2.5/1000mm – 10/1000mm)
PM 2.5	particulate matter with a diameter of 2.5µm (2.5/1000mm) or less
SMG	Seoul metropolitan government
WHO	World Health Organization

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1 Introduction

In South Korea, the public interest in air pollution caused by particulate matter (PM) is higher than ever. Korean PM generation is characterized by a combination of the effects of long-distance transported materials from abroad and domestic factors (Kim et al., 2017a). There are a variety of debates on its impact on human health and the source of PM. Therefore, the Ministry of Environment and local governments, including the Seoul metropolitan government (SMG), are presenting their own solutions.

In history, the Great Smog of London, which occurred in 1952, is recorded as the worst air pollution event ever to have taken place (Bell, Davis & Fletcher, 2004). It has been mentioned as a representative event showing the dark side of economic and technological advancement. At that time, the smoke from coal power plants and homes was discharged into the atmosphere without filtration, and the smoke and mist merged to form smog. The smog was generated when the sulfur dioxide in the smoke turned into sulfuric acid mist (Polivka, 2018). Coal had been seen as a leading driving force for material affluence and economic development, but after the London smog became known to cause serious harm to human health, at the same time, global interest in air pollution was triggered.

The problem of air pollution becomes a major issue globally as the quality of life have been improved, and people become more interested in environmental problems and various diseases. As a result, PM, which is said to be one of the main cause of air pollution, has come to be a major social issue and all over the world.

In particular, Northeast Asian regions which have been experiencing rapid economic growth are suffering from the air quality deterioration due to industrial development and population growth (Jang & Yeo, 2015). In this thesis, the specific case of Seoul in Korea will be investigated. According to the report by the Organization for Economic Cooperation and Development (OECD) in 2016, the number of premature deaths per million people in Korea due to air pollution will increase to 1,109 in 2060. This estimate is a threefold increase compared to 2010 (OECD, 2016). The 'How's life?: measuring well-being' report of OECD (2015), which reported that fine particulate matter less than 2.5/1000mm (PM2.5) exposure of Korea was the highest among OECD countries, further stressed this issue.

Epecially, since Seoul is the capital of Korea and has the largest population in the country, many scholars have been conducted research on the distribution of PM (Ahn et al., 2007; Kim et al., 2017b). The concentration of PM 2.5 in Seoul was $23.1 \mu\text{g}/\text{m}^3$, and the maximum daily value was $70 \mu\text{g}/\text{m}^3$ in 2015, significantly exceeding the WHO's recommendation, $25 \mu\text{g}/\text{m}^3$ (Kim & Heo, 2016).

The SMG has come up with various policies since 2003. There are some different, unique and leading parts in its policies compared to other cities'. The 'Emergency reduction measures' that can be enforced when the PM2.5 concentration exceeds $50 \mu\text{g}/\text{m}^3$, was first announced in 2017 and issued in January 2018 and has become a big issue. This became the subject of debate among many people by raising questions about the direction and effect of Seoul's policy. A result of the survey (Kim & Lee, 2018) on the public perception of the free public transportation policy, which is one of the Emergency reduction measures, showed that the pros and cons of this policy are clearly confronting each other among the citizens. The negative perception of the citizens can be a big obstacle to the implementation of the Seoul City government's policies since most of the policies are citizen-led and citizen participatory (SMG, 2018b).

Currently, there is a limited amount of research on PM reduction policies. There are a number of studies on the scientific research such as the study on characteristics of the PM concentration distribution in Seoul (Ahn et al., 2007; Kim et al., 2017b), the effects on health (Huh, Choi, Kim & Lee, 2008; Son, Lee, Kim, Jung & Bell, 2012; Bae, 2016), and analysis of the source of PM (Kim & Jun, 2014; Kim & Kim, 2011). There are also research on the information source of PM and the risk perception path (Kim, Lee, Lee & Jang, 2016). However, the research on PM policy in Korea and Seoul is scarce. Also, there are very few studies that have approached this field from the standpoint of discourse analysis.

Here, I contribute to filling this knowledge gap and to positively influencing the lives of citizens by carrying out critical discourse analysis of air pollution policy. Since the Seoul metropolitan area, including Seoul and Gyeonggi province, is a mega city with a population of more than 25 million (Korean Statistical Information Service, 2017), research on air pollution and policies in this area is highly relevant to the lives of Koreans. I will analyze how the discourse on air pollution directly affects the human life, and the related policy are formed along with the local context and apply the results to improve the quality of life of citizens in the future.

1.1 Aims and Research questions

The aim of this thesis is to analyze how the PM policies in Seoul are discursively framed, if there is a foundation to realize the potential for environmental and social aspects of sustainability in it. To achieve this, I first examine existing perceptions of PM and related policies in the Korean context. This study aims to answer the following research questions:

Research Question 1. What are dominant discourses on air pollution policies of Seoul?

Research Question 2. How are dominant discourses formed and framed by different societal actors?

Research Question 3. Which are the most prominent entry-points for a critique of the dominant discourses?

Social agendas constitute discourses. Discourse is the practice of ideology (Fairclough, 1992; 1995). This study will investigate the discourses that surround PM reduction policies of Seoul as a social agenda from the perspective of critical discourse analysis (CDA). CDA is primarily aimed at analyzing the way in which the use of language is socially practiced and reveals power relations that exist in society (Philo, 2007). There are more robust discourses among a variety of discourses on each issue (Jørgensen & Phillips, 2002). Through the analysis of Fairclough's three dimensions, text, discursive practice, and social practice, it can be found out what is emphasized as dominant discourses by reproducing and competing with others (Jørgensen & Phillips, 2002). The question 2 can be answered by identifying the formation process of the dominant discourses and how the discourses are interpreted differently by other social actors. Finally, a critique point of existing dominant discourses and interactions between them can be presented based on the answers of research question 1 and 2.

1.2 Contribution to sustainability science

Sustainability science is defined as a field that tries to bridge the natural scientists (and natural science) and social scientists (and social science) to find a solution for complex sustainability challenges (Jerneck et al., 2011). Since there is a gap between nature and society, and science and society, it is essential to study how to fill the gap and provide new insights. It critically approaches the social issues and sustainability problems by questioning pre-conditions that cause the problems at its root (Jerneck et al., 2011). In this regard, this thesis can contribute to sustainability science through applying a social science methodology, CDA to air pollution issue which is one of complex sustainability problem. Since air pollution problem and the policymaking of it are all highly related to

natural science and social science at the same time, it is crucial to critically approach this problem to fill the gap. Although this thesis does not directly deal with the natural science field, it is still important because the problem actually raised from the scientific knowledge distribution and remains controversial because of the gap. What I attempt to achieve in this thesis is to bridge the existing knowledge gap in the issue by analyzing how environmental discourse is mixed with other diverse social discourses and how different objects are intertwined with each other.

2 The case of Seoul, South Korea (Air pollution in the Korean context)

2.1 South Korea: Basic facts

The study site is Seoul, capital of South Korea. South Korea is located on the eastern middle latitude (33°~ 43°N, 124°~ 132°E) of the Asian continent. It is a peninsula surrounded by the sea on three sides connected to the Yellow Sea and China continent to the west, the East Sea and the Japanese Islands to the east and the East China Sea and the Pacific Ocean to the south (see Figure 1).



Figure 1. Location of Korea and neighboring countries on the map (Google maps, 2018)

The Korean economy has grown rapidly since the 1960s (Lee, Clacher & Keasey, 2012). The export-led industrialization and development of intensive manufacturing industry had contributed to the economic growth of Korea from the 1960s to the 1990s (Cho & Jeong, 2011; Lee, Clacher & Keasey, 2012). In the energy sector, the share of energy consumption of coal and petroleum is gradually decreasing, and the share of consumption of LNG and renewable energy sources is increasing (SMG, 2014). But the share of coal-fired power generation is still high (39% in 2015) compared to the other OECD countries (Ministry of Environment, 2017).

The capital of Korea, Seoul, is located in the western middle of the Korean peninsula and surrounded by mountains in the east, north, and south, and is only open to the west side. Thus, it is considered to have a topographical structure where the contaminant inflow from Eastern areas is easy while the diffusion of the atmosphere is difficult (Kim, Choi, Kim & Jeon, 2011). Seoul, Incheon, and Gyeonggi

province surrounding Seoul are classified as 'Seoul metropolitan area'. In 2016, the Seoul metropolitan area has a population of 25 million, almost half of the total population in Korea. Seoul is one of mega cities in the world has a population of 9.8 million and 3.1 million vehicles (Korean Statistical Information Service, 2017; 2018). The energy consumption in Seoul from 2000 to 2012, has been somewhat fluctuated but showed a decrease of 0.46% per year for 12 years (SMG, 2014).

2.2. Air pollution: Particulate matter issue in Korea

The air pollution caused by PM became one of the significant social problems in Korea. In the OECD report in 2016, Korea ranked 38th among 38 countries in the subsection, air pollution, which is one of the environmental sections (OECD, 2016). PM is classified into PM₁₀, which is dust less than 10/1000mm, and PM_{2.5}, dust less than 2.5/1000mm (Harrison, Hester & Querol, 2016). PM_{2.5} is also called 'fine PM' (Park & Han, 2014). PM is a complex mixture of thousands of organic and inorganic ingredients from a wide range of natural and artificial sources. PM is released into a mixture of solid and liquid particles in the air, and the components are produced chemically or naturally (Zereini & Wiseman, 2010). It is discharged directly from specific sources, such as in-plant combustion, automotive fuel combustion, and biological combustion processes (Ministry of Environment, 2016).

The World Health Organization (WHO) has provided air quality guidelines for PM₁₀ and fine PM (PM_{2.5}) since 1987. In 2013, International Agency for Research on Cancer (IARC), part of WHO designated PM as a Group 1 carcinogen (IARC & WHO, 2013). In addition, PM 2.5 does not get caught in the lungs, but enters the respiratory organ, exacerbating respiratory diseases such as asthma (U.S. Environmental Protection Agency, 1996). Thus, the anxiety about the PM has gradually increased.

According to an investigation of risk perceptions on public health done by Research Institute for Healthcare Policy (Kim et al., 2016), it was found that the most fearful element in public health for Koreans was PM. In the past, the 'yellow dust', which was recognized as a natural phenomenon in spring, did not attract people's interest because it was not serious in autumn and winter. However, the problem of PM occurs regardless of the season. Thus it began to attract a huge attention from about five years ago (Lim & Oh, 2016). The pollution level of PM in Seoul has fluctuated between 51 and 61 $\mu\text{g}/\text{m}^3$ which is more than double the WHO recommendation level (25 $\mu\text{g}/\text{m}^3$) from 2001 to 2006. It has started to decrease since 2007 with the implementation of the 'Air Quality Management Plan in Seoul Metropolitan Area (2005-2014)' (Ministry of Environment, 2016). However, in recent years, the improvement in air quality has been somewhat stagnant. Also, the average concentration

level of Korea is two times higher than that of other major cities such as Tokyo and London (Kim & Heo, 2016).

In general, the sources of PM emissions include natural sources such as forest fires and yellow dust, and anthropogenic sources such as coal combustion and diesel vehicles (Zereini & Wiseman, 2010). PM pollution in Korea is largely influenced by three causes: Domestic emissions, secondary formation and external inflows (Ministry of Environment, 2016). Secondary formation means that gas components are converted to PM through photochemical reactions in the atmosphere (Derwent & Malcolm, 2000). The distinctive characteristic of the PM problem in Korea is that it is influenced by “long-range transport of anthropogenic emissions” (Kim et al., 2017a, p.1) from China, Mongolia and North Korea due to the effect of westerlies. However, experts say it is difficult to pinpoint the relative contribution of PM emissions, generation and migration processes (Kim, Lee, Lee & Jang, 2016). One of the research recently conducted to investigate the contribution rate of each source by Kim, Choi, Koo, Lee and Park (2016) concluded that PM10 concentration in Seoul can mostly be attributed to Chinese industrial regions (39.8– 53.2 %), emissions in South Korea (15.4–37.1 %), and emissions in North Korea (9.0–18.1 %) during the study period in 2014 February. On the contrary, the result of joint research carried out by the National Institute of Environmental Research (NIER) and the National Aeronautics and Space Administration (NASA) showed that the domestic contribution was higher than foreign influences as 52% (NIER, 2017a; NIER, 2017b). China’s contribution was found 34%, and North Korea at 9% (NIER, 2017).

The sources of pollution are also vary depending on the region (Han, Jung, Kum & Kim, 2017). As a result of analysis on PM emission of major cities in 2012, it was found that the key traffic pollution sources in Seoul, non-road pollution sources such as emissions from shipping in Busan, and manufacturing combustion in industrial city Ulsan were each region’s main sources of PM (Ministry of Environment, 2016). Especially, big cities such as Seoul, Incheon, Busan, where traffic volume is concentrated, the health risk due to the influence of PM pollution is relatively high (Ministry of Environment, 2016).

2.2.1 PM issue in Seoul

Seoul is surrounded by mountains and is open only to the west topographically (Kim, Choi, Kim & Jeon, 2011). Also, air congestion occurs frequently due to the basin terrain (SMG, 2014). These topographical characteristics make the atmosphere more difficult to be diffused. Although the

metropolitan area is only 12% of the nation's total area, air pollution is very severe due to the high population density and concentration of pollution sources such as automobiles, buildings, and factories (Woo, 2016). The concentration of PM in Seoul has shown a constant decrease from 69 $\mu\text{g}/\text{m}^3$ in 2001 to 41 $\mu\text{g}/\text{m}^3$ until 2012 (Kim, 2014) (see Figure 2). But the annual average concentration of PM of Seoul in 2016 was 26 $\mu\text{g}/\text{m}^3$, showing an increase compared to 23.1 $\mu\text{g}/\text{m}^3$ in 2015 (Kim & Heo, 2016; Mo, 2018).

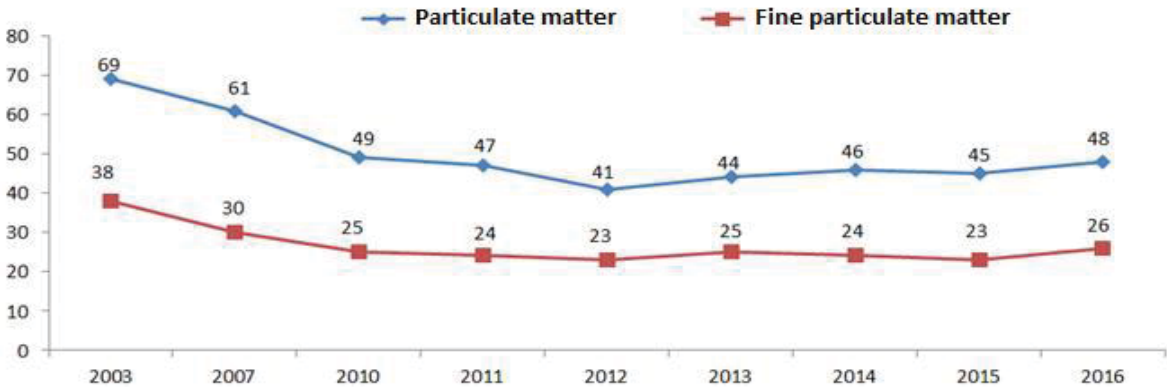


Figure 2. The trend of PM of Seoul from 2003 to 2016 (unit: $\mu\text{g}/\text{m}^3$) (Seoul Statistics, 2017)

The major pollution sources among the domestic sources in Seoul metropolitan area are the heavy traffic and domestic space heating (Lee & Schwartz, 1999). The biggest emission source is the emissions from vehicles, which account for 35%. The share of emissions from heating generation is 27%, and construction machinery is 17% (Mo, 2018). Thus, it can be said that 52% is emitted from the transportation sector (sum of emissions from vehicles and construction machinery) (Mo, 2018).

2.3 Seoul metropolitan government (SMG)'s policies against air pollution

The mayor of SMG announced that they defined air pollution caused by PM as a natural ‘disaster’ and revised the related law (SMG, 2017). They also have focused on reducing PM10 since they started to make efforts to improve air quality in 2002 (SMG, 2015).

Until the 1990s, the central government had monopolized all the rights of the Anti-Pollution Law, so Seoul city as a local government could not provide its own solutions (Kim, 2013). In 1995, local

governments were given a strengthened role to directly promote various measures to improve the atmospheric environment in their jurisdictions since the local self-governing system was introduced for the first time. Thus, in 1998, the SMG enacted 'the framework ordinance on Environment of Seoul city', which set out the basic principles of their policy direction and legislated and proclaimed Seoul's atmospheric environmental standards (Kim, 2013). In 2003, 'special act on Seoul metropolitan air quality improvement' was enacted with the aim of improving the atmospheric environment in the metropolitan area which had been experiencing the worst air quality in the OECD at that time (Kim, 2013). The special act required the establishment of a 'Basic Plan on the air quality management' every ten years to reduce contaminants including PM (Kim, 2013). The 1st air quality management plan in Seoul metropolitan area was implemented until 2014, and the main goal of this plan was reducing the emission from the mobile source in the area (Han et al., 2017). The 2nd plan of the 2015-2024 period has shifted policy direction from the target concentration management to a direction focusing on human risk (SMG, 2014).

As mentioned above, the concentration of PM in Seoul showed a good performance. However, since 2013, the generation of high concentration PM mainly in the metropolitan area has become remarkably elevated, raising public concern and awareness about PM (Ministry of Environment, 2016).

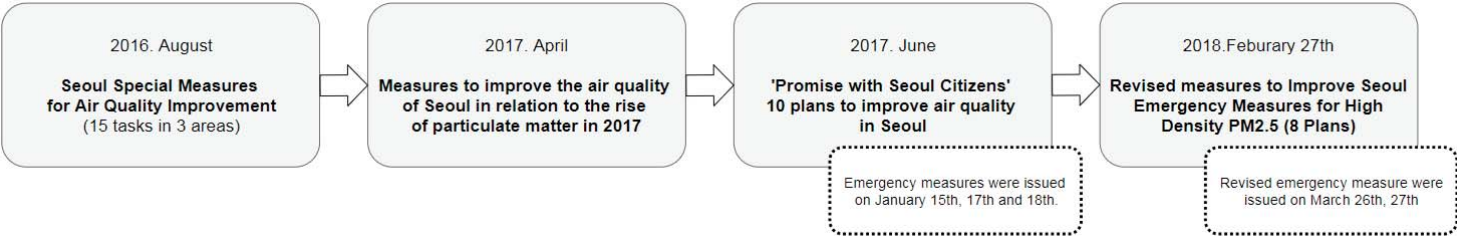


Figure 3. The process of policy transition of SMG since 2016. Own figure. (Source: SMG, 2016; 2017; 2018a; 2018b)

In 2016, SMG announced 'special measures for air quality improvement in Seoul' that focused on addressing 3 major sources of PM in Seoul: emissions from vehicles, construction machinery, and dust scattering (see Figure 3). It also pointed out that there is a need for strong traffic demand management plan (SMG, 2016). Since then, there have been three more official announcements of enhanced plans how to improve the air quality and control PM. The '10 plans to improve air quality

in Seoul' announced in June 2017, firstly included 'Emergency reduction measures' which can be issued when the forecast of PM concentration is high (PM 2.5 average concentration exceeding $50 \mu\text{g}/\text{m}^3$). The specific action plans in emergency reduction measures were (SMG, 2017): Closure of public parking lots, curtailed operation of construction sites, control of scattering dust, participatory alternative-day-no-driving system and free public transportation policy. It was January 15, 2018, that this emergency reduction measure was first issued and implemented. This emergency reduction measure was evaluated as a policy that directly infiltrated the lives of citizens, and the pros and cons of it were clearly divided (Kim & Lee, 2018). Based on this interest and criticism, the SMG revised the plan on February 2018 to '8 plans'. On the revised version, the free public transportation policy was eliminated, and citizen-led and citizen participatory policies such as town hall meetings with citizens and collaboration with non-governmental organizations are increased (SMG, 2018b).

2.4 Public perception and participation for policies of SMG

The SMG has citizen-led and participation policies as a feature of the policymaking process. The most recent measure, announced in February 2018, included the campaign for collecting signatures of one million citizens to draw participation on the alternative-day-no-driving system and the campaign for civic action. However, there has been not enough detailed investigation into citizen perceptions of Seoul policies. There was a public opinion poll on the abolished free public transportation policy conducted by a media company, but it was only about free public transportation. As a result of this survey, 49.3% evaluated the free public transportation policy as an appropriate policy, and 43.5% responded as an inappropriate policy (Kim & Lee, 2018). The answer to 'positively perceived', however, included the responses of 'better than no policy'. Even though the media domain have repeatedly reported Citizens' perception and opinion on the overall Seoul policies, there is no research that specifically examined it.

3 Theoretical Approach

3.1 Discourse theory

According to the linguistic approach, a discourse is defined as an ensemble composed of more than one sentence (Crossley, 2005). In common sense, discourse is defined as “the general idea that language is structured according to different patterns that people’s utterances follow when they take part in different domains of social life” (Jørgensen & Phillips, 2002, p.9). However, Jørgensen and Phillips (2002) mention that to understand how the discourses function and how to analyze the discourses, it should be defined as “a particular way of talking about and understanding the world (or an aspect of the world)” (p.9).

Therefore, discourse is not a neutral language system that reflects reality as it is in discourse theory. Discourse is the organization of specific values and ideologies in verbal form (Wodak, 2002). The linguistic actions of discourse are mainly presented through texts. It interprets social phenomenon based on a comprehensive understanding of the reality related to language by constructing a new meaning of the text, not by understanding the expressions of the text as they are (Fairclough, 1995). Thus, discourse analysis is primarily aimed at analyzing the way in which the use of language is socially practiced and capturing the interest between the powers that operate in society (Philo, 2007).

There are several different theories and methodologies around discourses to analyze them (Jørgensen & Phillips, 2002). Discourse research has several factions and is not stereotyped. Though, there are 4 common premises that many different discourse theories based on social constructionism share (Burr, 1995; Jørgensen & Phillips, 2002).

1. A critical stance towards taken-for-granted knowledge (Burr 1995, p.2): It recommends for being suspicious about the observation and assumptions on what appears in the world.
2. Historical and cultural specificity (Burr 1995, p.3): As Human beings are fundamentally historical and cultural, and therefore their worldview and identity can change.
3. knowledge is sustained by social processes (Burr 1995, p.3): Since human knowledge is constantly shared and reconstructed through social interactions, the knowledge that is considered 'truth' is not made up of objective observations, but of social processes.

4. Knowledge and social action go together (Burr 1995, p.3): In certain worldviews, some types of behavior become natural, while others cannot be imagined. Thus, the social composition of knowledge influences its social outcomes (Jørgensen & Phillips, 2002).

Based on these common premises, we can approach the broad concept of discourse analysis. In this research, I chose to use CDA as a main theory and method. CDA sees language use as a form of social practice and focuses on the overall social and historical context in which the discourses are situated (Fairclough, 2001). This distinction of CDA makes it appropriate for analyzing the discourses related to air pollution and air pollution policy that should be understood in consideration of various social and historical contexts in Korean society. So the following section will focus on CDA.

3.2 Critical discourse analysis (CDA)

CDA includes various theories and methods that can be applied to empirical research aiming at investigating the relationship between "discourse and social and cultural developments in different social domains" (Jørgensen & Phillips, 2002, p. 55). In CDA, language is a source of power related to ideological and socio-cultural changes (Bryman, 2012). CDA also has various forms and approaches that do not agree on who belongs to where (Jørgensen & Phillips, 2002). In particular, CDA focuses on macroscopic socio-political discourse rather than the use of microscopic daily language. It is assumed that discourse reflects unequal power relations within society and forms hegemony through implicit ideology (Fairclough, 1992; 1995; 2003).

A variety of approaches to CDA have several common features. Fairclough and Wodak (1997, p. 271-280) provide these common tenets of overall CDA as follows:

1. CDA addresses social problems.
2. Power relations are discursive.
3. Discourse constitutes society and culture.
4. Discourse does ideological work.
5. Discourse is historical.
6. The link between text and society is mediated.
7. Discourse analysis is interpretative and explanatory.
8. Discourse is a form of social action.

Although there are common features in the various research methods of CDA as stated above, they are different according to "their theoretical understanding of discourse, ideology and the historical perspective" (Jørgensen & Phillips, 2002, p.58) and the analysis of "language use in social interaction and its ideological effects" (Jørgensen & Phillips, 2002, p.58).

In this research, Fairclough's approach to CDA, which focuses on the relationship between discourses and social changes (1992; 1993; 1995), will be applied to find out what discourses are existing around 'the PM policies of Seoul' and to understand and interpret the inherent social cognition within it from a critical point of view. Therefore, to help better understanding of the whole paper, I will describe Fairclough's approach in more detail than the overall CDA.

3.3 Fairclough's approach to CDA

The most important part of Fairclough's CDA, which differs from previous discourse analysis, is the perspective of considering "discourse is not only seen as constitutive but also as constituted" (Jørgensen & Phillips, 2002, p.58). Discourse itself is one of social practice and at the same time, plays a role in reproducing and changing social relations such as "knowledge, identities and social relations including power relations" (Jørgensen & Phillips, 2002, p.59). Thus, discourse also has a dialectical relationship with other nonlinguistic dimensions in society (Fairclough, 2001).

The theoretical background of Fairclough's approach to CDA is based in several social science theories: theory of ideology, Foucaultian theory and Habermas's theory of communicative action (Fairclough, 2001). The theory of ideology is used to reveal the underlying ideologies in discourses. Foucaultian theory is used to support the relationship between discourse and power, and the theory of communicative action is necessary to understand the discourse's relation with other discourses. Fairclough's approach focuses on studying how language works in the maintenance and change of power in modern society, and how people perceive, resist and change those languages based on Foucaultian theory. However, the approach of Fairclough differs from Foucault's in that Fairclough is more concerned with the actual expression aspect of the text and with the power relationship. Fairclough explores more deeply how individual language expressions carry power, operate it, and influence people in a social context. In addition, Fairclough's CDA is not completely against Marxist perspective which is also different from Foucaultian approach (Jørgensen & Phillips, 2002). He studies the linguistic indications in discourses such as the "elements of dominance, difference and resistance" (Wodak & Meyer, 2001, p.22) based on a Marxist approach. Additionally, Fairclough

mentioned that his approach is influenced by Halliday's functional grammar (Fairclough, 2001) to critically interpret the “linguistic expression in various discourses” (Sharififar & Rahimi, 2015, p.343).

Based on these theoretical backgrounds, Fairclough developed a framework to conduct researches applying CDA. The framework of Fairclough's approach includes a variety of concepts. The meanings of concepts are changing and evolving over time, and therefore the framework itself has kept developing (Jørgensen & Phillips, 2002). I will focus more on the approach and framework of Fairclough's three-dimensional model since it provides more diverse aspects of the texts. The three dimensions that appear in Fairclough's framework are text, discourse, and society (Fairclough, 1992).

3.3.1 Three-dimensional model

Before understanding the three-dimensional model which consist of text, discursive practice and social practice , the dimensions of communicative event and order of discourse should be explained (see Figure 4). Communicative event is “an instance of language use such as a newspaper article, a film, a video, an interview or a political speech” (Jørgensen & Phillips, 2002, p. 60) and the order of discourse is “the configuration of all the discourse types that are used within a social institution or a social field” (Jørgensen & Phillips, 2002, p. 60).

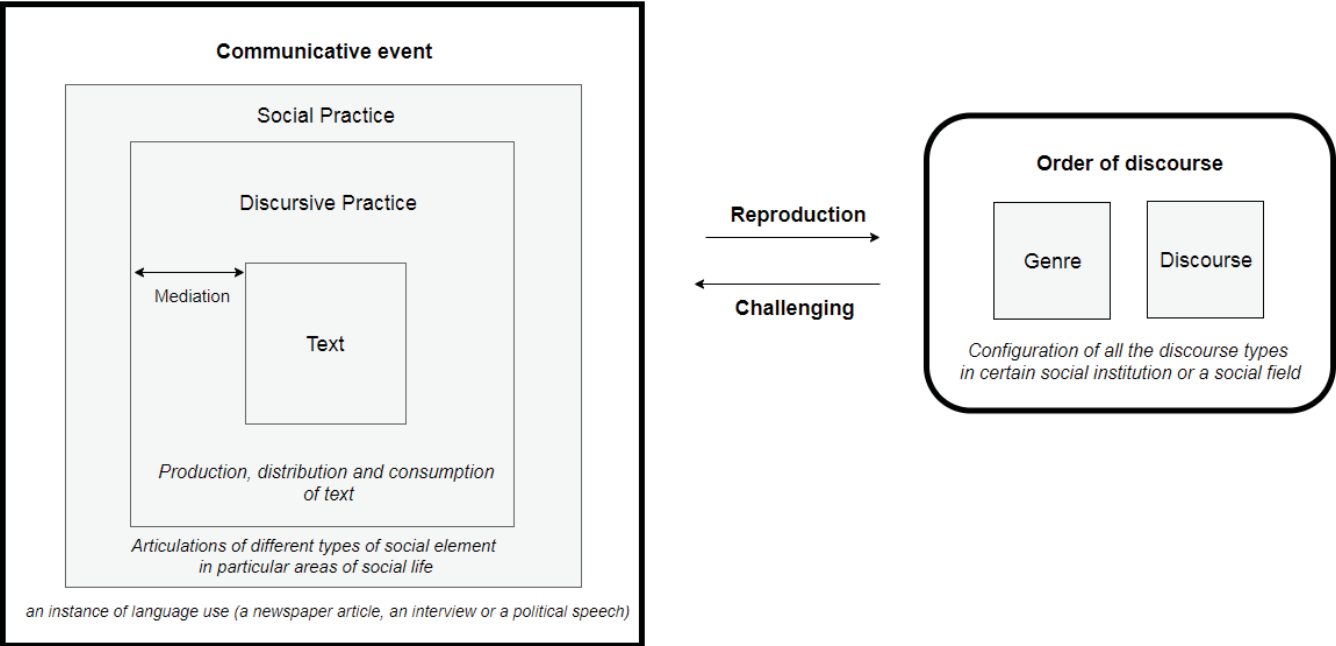


Figure 4. The relationship between the two dimensions of discourse and three-dimensional model (text-discursive practice-social practice). Own figure based on Fairclough (1992; 2001)

An article, interview and speech can be examples of a communicative event, while 'the order of discourse of university' and 'the order of discourse of health service' can be examples of an order of discourse (Jørgensen & Phillips, 2002). An order of discourse consists of discourses, genres and styles (Fairclough, 2013). The relationship between a communicative event and order of discourse is dialectical. The composition of a communicative event and the three dimensions in it can either reproduce or challenge the existing order of discourse.

In a communicative event, there are three dimensions that can be analyzed differently. The dimension of text is the text itself such as a form of speech, writing and visual image (Jørgensen & Phillips, 2002). The analysis of text dimension should focus on the linguistic features of the texts. Next, the dimension of discursive practice is the production, consumption and distribution of texts. Lastly, the social practice includes different types of political, cultural and hegemonic practices in a particular social structure (Wodak & Meyer, 2001). The discursive practice functions as a mediator between the dimension of text and social practice (Jørgensen & Phillips, 2002).

3.4 Discourse Analysis in Environmental policymaking

In analyzing environmental policy, it challenges the components that were taken for granted in conventional policy analysis such as "the linguistic, identity and knowledge base of policy making" (Feindt & Oels, 2005, p. 163).

According to a research done by Feindt and Oels (2005), discourse analysis of environmental policy can respond to three theoretical challenges in the field of public environmental policy. The three challenges are; "(i) environmental policy problems are obviously the effect of social constructions although they concern 'natural' objects; (ii) struggles about concepts, knowledge and meaning are an essential element of environmental policy; (iii) environmental discourse has material and power effects as well as being the effect of material practices and power relations" (Feindt & Oels, 2005, p.161).

In general, the environmental problem is considered as a natural phenomenon that independently exists or occurs. However, in discourse analysis, environmental discourse is regarded as socially constructed. Therefore, there are various contested interpretations of one environmental problem. Furthermore, the knowledge foundation in environmental policies is evaluated as unstable and arguable (Feindt & Oels, 2005). In this sense, different concepts in environmental discourses are not homogeneous and sometimes contested each other. By analyzing the environmental discourses by

examining the meaning of concepts and how it is interpreted, the political struggle behind the contested concepts can be found and discussed. The concepts and knowledge which are part of environmental discourse involve diverse elements of power formations such as practices, technologies and institutional foundations. And it also has specific cultural, historical and political factors in the discourse. So environmental discourse is also highly connected to 'cultural politics and to politics of citizenship' (Feindt & Oels, 2005, p. 167). These diverse power effects that are generated and internalized in environmental discourse can be studied to find out what kinds of policy options and actors stand out. Through this process, we can search for what was not articulated on the surface and what are the marginalized discourses that can provide alternative policies. Finally, it can be said that the discourse analysis of environmental policy provides insights to find out the forming process of subject and object, power relations between them, and other unrevealed power relations. This insight from the discourse analysis contributes to "processes of institutionalization" (Feindt & Oels, 2005, p.170) and reflection of "the preconditions and limitations of environmental justice and democracy" (Feindt & Oels, 2005, p.170).

4 Methodology and Research Design

4.1 Research Methodology

4.1.1 Epistemological consideration

Discourse analysis is based on social constructionism (Jørgensen & Phillips, 2002). It sees that human beings are fundamentally historical and cultural beings, and that knowledge is not a reflection of reality but a product of discourse that is categorized and interpreted by different actors (Burr, 1995). Thus, this research based on social constructionism also cannot be a value-free or entirely objective. So I will treat all the materials, arguments and evidence as non-objective products that have certain social values in this research. The social values, social actors and social relations in discourses will be considered as unfixed features. In this regard, the results of this research cannot be the universal truth, but rather a partial and situational output (Wetherell, Taylor & Yates, 2001).

4.2 Research Strategy

In this study, I will analyze the discourse of PM reduction policy of SMG based on the framework of CDA proposed by Fairclough.

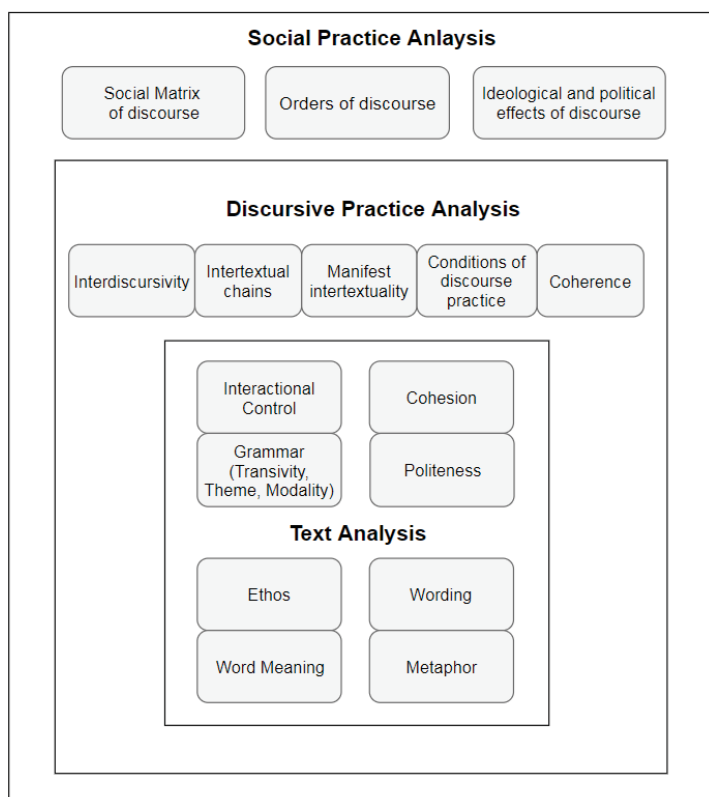


Figure 5. Different categories for each level of CDA. Own figure based on Fairclough (1992).

Different levels of discourse analysis on textual analysis, discourse practice analysis, and social practice analysis of discourse related to the PM reduction policy will be conducted based on the three-dimensional model of Fairclough (Jørgensen & Phillips, 2002). The overall factors that can be applied to each dimension can be differently used or omitted depending on the individual research topic (see Figure 5) (Fairclough, 1992).

4.2.1 Text analysis

Text analysis describes the linguistic characteristics of a certain text. In CDA, text analysis can be done by applying different categories such as interactional control, words, grammar, cohesion, and metaphor (Fairclough, 1992), but it is aimed at identifying potential meanings rather than linguistic forms. For example, the questions such as what is selected and what is excluded, what vocabulary is chosen to represent events, what grammatical structure is used, how it is framed and managed to interpret the text, what participants have chosen and stood out, and how the relationship between participants is set' can be useful to analyze texts (Fairclough, 1995; 2003). Text analysis not only analyzes what is in the text but also analyzes what is assumed, that is, the premise (Fairclough, 1995).

4.2.2 Discursive practice analysis

The discourse practice dimension focuses on analyzing the interactive aspects of texts, for instance, what is intended in the process of production, distribution, and consumption of individual texts or discourses (Fairclough, 1992). The interdiscursivity appears when "different discourses and genres are expressed together in a communication event" (Jørgensen & Phillips, 2002, p.65). It reveals that the discourses are constructed in a customary or creative way. The discourse constructed in an existing way stabilizes the dominant social orders and contributes to the normalization of the ideological and power relations (Fairclough, 1995). To analyze discursive practice, it is also important to understand intertextuality which means "the condition whereby all communicative events draw on earlier events" (Jørgensen & Phillips, 2002, p.65). It can be analyzed by manifest intertextuality and intertextual chain. The objective of manifest intertextuality is to find out what and how the specific texts explicitly draw on other texts, for example, by quoting (Fairclough, 1992). The objective of intertextual chain is detecting how the elements of a certain text are blended into another text (Jørgensen & Phillips, 2002).

4.2.3 Social practice analysis

The social practice of discourse has a variety of directions (Fairclough, 1992; 1995). Therefore, Social practice analysis is more complex than text and discourse practice, which can be analyzed using specific categories as mentioned above. In social practice analysis, finding out the political, social and ideological effects of discourse and the social structure that constitutes the discursive practices is needed (Fairclough, 1992). The analysis of social practice reveals the political and social context of discourse generation. The process of production and interpretation of discourse is fundamentally not in the language system itself but in other nonlinguistic conditions of society such as social and cultural backgrounds (Jørgensen & Phillips, 2002).

4.3 Data Collection

As illustrated in Figure 6, I have selected to critically analyze textual documents from the political and media domains. The reason why I choose the political domain and media domain is elaborated below.

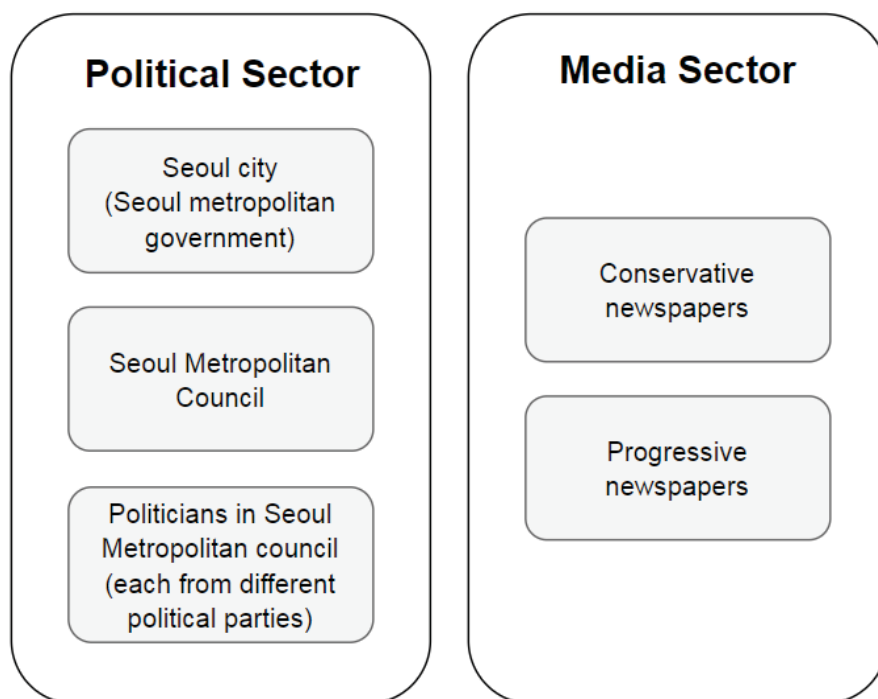


Figure 6. Research domains chosen and overall research materials to study discourses around 'PM reduction policies of SMG', Own figure.

4.3.1 Survey as material to investigate public perception

Before collecting materials in the individual research domains, a survey was conducted to obtain better understanding of the public perceptions on air pollution policies in Seoul and emergency reduction measures implemented recently and decide what domains to be investigated. There was a survey conducted by a polling organization requested by a media company (Kim & Lee, 2018), which only asked for an opinion on the 'free public transport policy', one of the emergency reduction measures. Thus, to obtain a better understanding of the public perception of the policies and collect the citizen's suggestions for policy improvement, I prepared my own questionnaire and conducted the survey online (see Appendix A). The online survey was formed by Google document and posted on the online community called 'Call for measures against PM', one of the biggest online communities related to the PM issue. Since it was targeted to citizens in Seoul metropolitan area including Seoul, Incheon and Gyeonggi-do, the responses from the respondents living in other cities are excluded. Total 117 respondents were selected for final analysis. The result of the survey shows that 64.3% of the respondents are negatively perceived about the policies, and 11.1% of people are positively perceived (24.8% of respondents take a neutral response). It is also found that people are affected by the media when they obtain information about the PM policies. They also consider that the air pollution problem is highly related to the policies, politics, and diplomacy. Based on these background results, analysis of the three dimensions in political and media domains are conducted. The other detailed responses about how people perceive the PM reduction policies of SMG will be used in Analysis and Discussion sections of the thesis.

4.3.2 Political domain

Since the policies are suggested, implemented and evaluated by the political domain, such as SMG, Seoul metropolitan council and the members of the council, the political domain has been selected as the subject of discourse analysis (see Appendix C). Also, the choice of political discourse as one of the analysis topics is due to the fact that governments and politics are closely related to the decision-making process and legislation that affect society. Seoul Mayor's Statement and Interviews with policymaker in the city government specifically include discourses that directly affect policy decisions. Through interviews together with press releases from city council and councilors, it is possible to analyze the discourses created by political elites who are responsible for monitoring and evaluating the departments and policies of SMG. By analyzing the discourse created by these political elites, it

can be found out how discourses in various fields are produced, influenced, and connected (Dijk, 1993).

The search period is from January 14th, 2018 when the first emergency measure against PM was issued to March 31st, which was the end of the week after March 26th and 27th when the emergency measures were put into effect firstly since the SMG announced its revised 'Eight Measures'.

Lastly, the two interviews to collect more from the perspective of the policymakers in SMG and the parliament investigator were conducted in accordance with ethical considerations (Bryman, 2012). An interview guide (see Appendix B) was introduced to ensure the anonymity of the interviewee and the protection of personal information.

4.3.3 Media domain

Media can be seen as a causal process that not only reflects social reality but also presents a selection of the dominant discourse in the reproduction process (Hall, 1980). It means that media is not only reproducing certain discourses from the social and political domain but also selecting, focusing and emphasizing the discourses, therefore, the processes are observable. In the context of PM reduction policy of Seoul, several previous studies found that the media reports played a very important role in recognizing and evaluating the presence of PM and related policies (Kim, Lee, Lee & Jang, 2016). Media can reflect the professional's opinion and public perception of the PM problem since it collects all the opinions from different sources. The survey that I carried also shows that most of the citizens in Seoul and Gyeonggi-do (a metropolitan area around Seoul) obtain information about PM issue and the emission source from media such as online newspaper articles, newspapers, and TV news (see Appendix D).

In this study, 5 major daily newspapers (ChosunIlbo, Joongang Daily, Dong-A Ilbo, Hankyoreh, Kyunghyang Shinmun) were analyzed for investigating media domain including public domain. Of these, three newspapers (ChosunIlbo, Joongang Daily, Dong-A Ilbo) are conservative, and two newspapers (Hankyoreh, Kyunghyang Shinmun) are progressive. These five newspapers were selected for the balanced analysis. To do this, I searched articles related to 'Measures against PM of SMG' using the most popular portal, 'Naver' (www.naver.com) in Korea. The search period is from January 14th to March 31st, which is same as the political domain above. Through this search, total 90 newspaper articles were found. Since Naver has the function of showing the main articles that the

newspaper company picked themselves, 11 articles were identified through this function. Then, 4 articles with little relevance to the topic were excluded. And there was no article selected as the main articles of Dong-A Ilbo and Kyunghyang Shinmun through the function, hence I selected three relevant articles each, total 6 articles to add. Through this process, 13 articles were finally selected and analyzed (see Appendix D).

The materials for political and media analysis were coded with a coding program called NVivo 12. The inductive method of conceptualization is used when coding and writing notes, and the deductive process is used to verify that the concepts set through this process are applied correctly to the text (Bryman, 2012). And I double-checked the result by using the coding process of NVivo 12 and the color coding of each document.

5 Analysis

The analysis of political and media discourse in this part analyzes the characteristics of text and discourses in Seoul's particulate reduction policy and reveal ideology and hegemony in economic, political, and cultural context through analysis of social practice embedded in discourses. Also, by observing certain discourses that repeatedly appears in both domains, it can be found what kinds of discourses are dominant and how it is interpreted when it's reproduced.

The results of political and media analysis were classified by each subject: Understanding of the phenomenon of air pollution caused by PM, the discourse related to the cause and source of the phenomenon, the perception on Seoul city policy, the process of making policy and the governance. The findings of text, discourse practice and social practice analysis for each topic are shown below.

5.1 What 'PM' is

The given newspaper articles do not define the concept of PM. It can be interpreted that there is an assumption that the readers of the article, the public, already understand the concept. The words 'PM', 'fine PM', 'nitrogen oxide', 'PM10' and 'PM2.5' are used in combination, but the word 'PM' is mainly used. The ' μg ', which is presented as a unit of density, is explained as 'a microgram' (article 13) for the reader's understanding, but there is no specific explanation for 'PM' and 'fine PM'. Also, the data in the political domain does not mention the exact definition of PM. Instead, the assumption behind the PM is directly connected to the words such as 'threat' and 'risk' which related to public health. The 'Public health discourse' are articulated in phrases such as 'lives of citizens depend on the problem', 'If we assume that people are dying of PM' and 'health of the people' and in words such as 'carcinogens' and 'public health' in both of political and media domain. There is also an interdiscursive blending of 'public health discourse' with 'human right discourse' apparent in the phrases, 'right to breath' and 'we cannot survive because the air is contaminated'. The 'death discourse' related to public health also appeared as a minor discourse in media. The metaphor, 'silent assassin' (Article 13 and press release 3) that are found in both domains, implies the traits of PM which is 'not visible or easily noticeable but very hazardous to human life'. At the same time, the strong expression 'assassin' which directly relate to 'death' draws people's attention to the seriousness of air pollution. The choices of metaphors show how the topic is described in a certain society or culture (Fairclough, 1992) and how the author intends to reproduce the issue. But there are not many metaphors in media domain since the newspaper articles are news genre which is

more focus on conveying facts and opinion of stakeholders. In the political domain, especially in press releases produced by politicians, uses more metaphors to give a strong impression to the readers, the reporters, and the public. These will be covered in the other categories below.

5.2 The source of PM

The discourses related to the source of PM were categorized as 'Chinese attribution', 'weather attribution' or 'Domestic attribution' in all material. The dominant discourse is 'Chinese attribution discourse' in both political and media discourse. However, the materials produced and distributed by government more emphasize the 'domestic attribution' which is the focus of Seoul policies is more emphasized. Even though they acknowledge that some of the PM in Korea is moving from China (articulated in interviews and document of Seoul City's stance), they still focus on the 'domestic attribution discourse'. On the contrary, the press releases produced by politicians in Seoul metropolitan parliament explicitly or implicitly mention about Chinese attribution. One of the press release (no. 4) defines 'fine PM' as 'contaminants from China'. It uses passive form, 'fine PM is known for', which does not reveal the agency. It also refers to the cause of PM based on the individual opinion of a politician such as 'it is not a good idea to blame the cause of the PM on citizens' rather than on scientific grounds.

The 'Chinese attribution discourse' appears in almost all news articles articulated in phrases such as 'cannot control the PM from China', 'we cannot just blame China' and 'have to make a strong protest against China'. There is manifest intertextuality found as a form of the direct quote of a governmental officer such as 'we cannot blame only China when the concentration is high. We must do what we can' (article 3). There is also intertextual chain, which brings the language of scientific reports to the newspaper article, i.e. 'the National Institute of Environmental Research reported that the contribution of overseas countries to a high concentration of PM was 60-80% and maximum 86% in springs last year' (article 5).

The social context of 'Chinese attribution discourse' is influenced by scientific research that refers to the effects of westerlies and by the public perception of China's economic growth (Kim, Lee, Jang & Lee, 2015). Some researchers pointed out that Chinese attribution is emphasized repeatedly through the media, and that it has become more popular among the public than other causes (Kim, Lee, Jang, & Lee, 2015). There is also a view that this issue is a matter of the diplomatic problem with China and differences in national power (Hong, 2017). In this sense, it can be said that 'the order of discourse of

science' is merged with 'the order of discourse of international politics'. In addition, as a result of the survey targeting Seoul citizens in this research, the highest percentage of people (86.3%) chose foreign influx as the largest cause of air pollution of Korea. In the question that asked about policy improvement, the percentage of respondents who referred to Chinese factors such as 'discussion with China' and 'protest to China' as means of solving the air pollution problem exceeded 50%.

Even the 'Chinese attribution discourse' is very dominant and well-known here, it is being challenged by the various competing discourses such as 'Domestic attribution discourse' which consists of 'Diesel car attribution', 'traffic attribution', 'industry attribution' and 'weather attribution' in some articles. These specific attributions that are included in 'domestic attribution discourse' are emerging. In the political domain, 'traffic attribution' is articulated in phrases such as 'to manage the transportation sector, which is a big part of the factors in Seoul city' (statement 1) and 'There are a lot of vehicles in Seoul. Basically we have 4 million?' (Interview 2). The 'Diesel car attribution' also appears in several articles. This is especially referred to as the largest pollutant source in the metropolitan area rather than other regions in Korea. It is also highly blended with 'regulation discourse' articulated in phrases such as 'old diesel car scrapping' and 'reduction device'.

5.3 How policies are perceived

5.3.1 Free public transportation policy

The most frequently mentioned topic during the first three days of the emergency reduction measures (15th, 17th, and 18th of January) is the 'free public transportation policy' in both political and media domain. This policy is considered as a measure that directly penetrates the lives of citizens (articulated in words, 'commuting', 'transportation', 'transportation cards', and 'office workers'). The SMG has mentioned it as a 'priming policy' and 'promotion policy', which means the policy that is used to inform the seriousness of the PM issue and promote the emergency reduction measure to the public. The policy is also mentioned as the most important topic through the voices of two subjects, SMG, and citizens in a positive way. At the same time, this policy is also presented in a negative way from the opposition party, political rivals, Gyeonggi-do province and some citizens who oppose it in the post-implementation period. They question the outcome and effectiveness of the policy (articulated in words, 'effectiveness', 'an effect' and 'tax waste'). Related to this policy, there are two different modes, expository and argumentative modes. It is usually explained how and when the policy works and then argued that each agency is against it or not. And the agencies of text

explicitly appears by using active voice. Particularly, in almost all of the press releases written by politicians in parliament, the agencies of texts are revealed by mentioning his or her name to show their own opinions and evaluate the policy. In the statement of Seoul mayor (statement 3), it also uses 'I' instead of 'Seoul city' or 'SMG', i.e. a sentence, 'In the past few days, I was standing in the middle of a controversy about free public transportation policy'. This can be understood as a feature of the political speech genre or interpreted as a way of expressing the responsibility of the mayor himself.

The 'tax waste discourse' and 'populism discourse' are blended in some articles. They are all related to free public transportation policy. The 'tax waste discourse' is dominant in many articles, especially in conservative newspapers as articulated in phrases such as 'Budget efficiency is poor' and 'controversy over the budget waste'. The specific amount of money spent on the policy such as '15 billion' and '5 billion won' is mentioned repetitively to emphasize and imprint tax waste issue on readers' mind in both political and media domain. Some of the press releases and articles only focus on the budget and cost. They use not only the particular numbers but also the terms such as 'cost-effectiveness', 'investment' and 'calculation of the lives' to compare the cost. In this point, it can be found that the elements in 'the order of discourse of politics' are blending with the elements such as 'cost-effectiveness' and 'calculation of non-material things' in 'the order of discourse of market'. Besides, metaphors such as 'a huge dinosaur called "free public transportation policy"' (press release 2), 'the cost increased like a snowball' (press release 4) and 'It's like pouring tax in a sieve' (article 10) also indicate that the policy cannot be a fundamental solution but just a tax waste. 'Populism discourse' is apparent in phrases such as 'window dressing to gain popularity', 'pork-barreling policy', 'vote-catching policy' and 'criticize populism' in many different articles. The opposition parties and citizens who are against the free public transportation policy are the agencies who constitute the discourses. In one press release (no.2), the 'tax waster discourse' even challenges the premise, 'the seriousness of the PM issue'. This press release is made based on the question whether the PM problem is that severe a problem so many resources should be allocated and how serious it is when compared to other 'natural disasters' such as floods and earthquakes.

There are also doubts in the media as to whether people can faithfully believe in scientific observations of the fact that 'the concentration of PM is high' and the standard itself. In terms of PM concentration forecasts, modifiers such as 'wrong', 'inaccurate', and 'mistaken' are used, and this doubt on the accuracy of forecasts is linked to 'waste of money'. These try to gain trust by citing 'expert's evaluation' ('a weather expert' and 'professor'). In this sense, there are diverse elements

from three different orders of discourse are blended regarding the issue. The policy which is included in 'the order of discourse of politics' is mixed with 'scientific forecast', 'forecast model' and 'research report' in 'the order of discourse of science or scientific academia'.

On the other hand, 'promotion discourse', which implies the free public transportation policy functions as a promotion policy that draws people's attention, raises awareness and creates a forum for discussion, is competing with 'tax waste discourse' and 'populism discourse' that are denying the effect of free public transportation policy. It clearly appears in the statement of government and interviews with officers of government and parliament. The word, 'priming water' is used several times in political domain and also used in newspaper articles by quoting Seoul mayor's statement. The policy itself is defined as 'an opportunity to improve and spread social awareness of PM issue' (statement 3) on the governmental side.

In the situational context, the fact that local elections nationwide including a mayoral election are coming soon can be assumed as a backdrop to the 'populism discourse'. Since the 'populism discourse' is mostly brought up by opposition parties, the social and situational context of the local election cannot be ignored. This discourse can be presumed to have been formed by the historical experiences of political scandals and tax scandals related to environmental policy, for example, the four major river restoration project in Korea (Lee, 2009; Yun, 2009).

5.3.2 Mitigation policies

There are several mitigation policies among the emergency reduction measures mentioned in political and media domain, for example, alternative-day-no-driving system and diesel car (crackdown and attachment of reduction device) policy. In particular, the topic that was emerged most followed by free public transportation policy is 'alternative-day-no-driving system' which is also included in emergency reduction measures. There are two different development paths of the topic. One direction is to have doubts about the effectiveness of the alternative-day-no-driving system (articulated in words, 'limited effect' and 'not efficient'), and the second is a suggestion for the compulsory and extension of it ('strong regulation', 'compulsion', and 'including citizens'). The topic was introduced by the SMG, but developed by several different agencies such as Gyeonggi-do local government, Ministry of Environment, governmental officers and citizens. In the media domain, it is frequently found the expressions of doubt on the effectiveness of the alternative-day-no-driving system in public institutions and voluntary alternative-day-no-driving system in private sector. Some

of the articles draw on a narrative genre when describing the situation on the day on which the Emergency reduction measures (January 15, 17 and 18) were issued. For instance, article 1 explains the situation as 'In front of the main gate of the Seoul Government Complex in Jongro-gu, Seoul, there was a sign for the 'Implementation of alternative-day-no-driving system' [...] even when an even-numbered vehicle was banned, no one stopped it. The security guards said, "Please pay attention next time"'. The other article, article 13 also brings personal experience as a narrative style, 'Mr. Kim was very surprised that there were more vehicles than expected. He thought that the amount of traffic should be small due to the influence of the emergency reduction measures such as the alternative-day-no-driving system and the closure of public parking lot'. This mixed use of newspaper genre and narrative genre makes it possible for readers to feel more immersed into the content. Next, the second direction of developing the topic, the 'alternative-day-no-driving system' is suggestion of a compulsory system, which is elaborated in the statement of Seoul mayor and interviews with the governmental officers. Another dominating discourse, 'Regulation discourse', which is competing with 'participation discourse', is highly related to this issue. SMG asserts that the obligation of the alternative-day-no-driving system is necessary. It is articulated in phrases such as 'urgent than anything else' (statement 3), 'Since it is most effective to reduce the traffic in Seoul, the content about the alternative-day-no-driving system can be...' (interview 1). But in this issue, it is highly related to 'legal authority' and 'national government's authority'. As mentioned in the statement of Seoul mayor, 'the implementation of a compulsory alternative-day-no-driving system is out of Seoul mayor's authority'. However, there is still an active voice of Seoul mayor related to the compulsory system by using transitive verb such as 'push' and modal verb 'will' in his statement.

On the contrary, the opposition parties, especially the Liberty Korea party, are against the enforcement of the system since it has a possibility to limit people's right. It is articulated in phrases such as 'people will suffer from' (press release 5), 'a unilateral decision on revision of enforcement decree that did not listen to citizen's opinion' (press release 5). It is directly related to the incentive or subsidy to compensate for the 'suffer' (press release 5) and 'inconvenience' (interview 2) of citizens. They sometimes suggest detailed incentive options that are articulated in phrases such as 'subsidies for days that they could not use car and substantial support measures such as providing premiums' (press release 5) and 'providing a tax reduction benefit of around 3,000 won per day' (article 2). This is often blended with the 'Chinese attribution discourse'. Since the mitigation policies including the alternative-day-no-driving system and free public transportation policy are strongly associated with 'domestic attribution discourse' and emphasize the control of domestic factors, It has

the characteristic of running counter to 'Chinese attributive discourse'. It becomes apparent from the phrase such as 'It will be degraded like pouring water in a sieve when the circumstances of sources such as China and North Korea are taken into'(press release 2). Even though it is not explicitly articulated in the text, the press releases and articles talking about a more 'fundamental solution' oppose to mitigation policies and refer to the 'Chinese factor' implicitly. For example, article 11 does not strongly argue that Chinese factor is important, but brings the citizen's opinion such as 'as the anxiety of citizens grew, more than 150,000 people agreed to the petition 'To protest against China' on the on-line billboard of the Blue House (Korean presidential house) National Petition'.

The diesel car policy is also considered one of traffic control policy. It is highly related to 'regulation discourse' since it is more focused on 'scrapping old diesel car', 'crackdown on driving old diesel cars' and 'emission control infrastructure'. Discussion about regulations on diesel cars that are already being produced and operated is the main topic of the most texts, but there are also materials that talk about strengthening regulations on vehicles before production, that is, changing vehicle production standards. The topics of vehicle production standards, automobile manufacturers and the overall automobile industry are dealt with through the phrases such as 'strengthening guidelines on new cars' (interview 2), 'international competitiveness of domestic automobile industry' (article 13), 'strengthening environmental standards' (article 13) and 'because automobile companies are lobbying' (article 10). It can be said that there is combination of regulation discourse from 'the order of discourse of government' and business discourse from 'the order of discourse of industry'. This new discourse blending can contribute to social change in a long term. However, these new discourse blending is driven only by media, not by political domain. Although there is a mention of 'the green vehicle rating system' that classifies vehicles into 7 grades according to emission standards in the Seoul mayor's statement, it is more linked to 'crackdown' or 'incentive expansion' rather than regulation of vehicle production guidelines. Rather, it is more directly mentioned in articles and the interview with investigator in parliament. And the newspaper articles are trying to justify and reinforce this discourse by referring to experts' words ('professor', 'representative of association') and overseas cases such as Japan and China.

However, similar to the alternative-day-no-driving system, the liberal party frames this policy as a policy that limits citizen's right and damages their livelihood. In press release 1, it is articulated in the sentence, 'It attributes all the responsibility to the citizens who are using diesel cars by eliminating all other causes'. In the press releases and articles that argue for this, incentives and subsidies are suggested as alternatives to regulations. These ideas of incentive policies are related to 'participation

discourse' which highlights citizen's voluntary participation should be the driver for all the mitigation policies. The 'participation discourse' is competing with the 'Regulation discourse' mentioned above. The 'Participation discourse' is challenged several times by SMG, opposition parties and citizens. It is articulated in sentences such as 'Citizens' awareness of participation was also low' and 'It is because the private sector has left it to autonomy'.

5.3.3 Adaptation policies

The adaptation policies are not the main topic among all the different policies against air pollution. But still, it often appears in opposition party's press release and articles that are more attached to 'Chinese attribution discourse'. When the Chinese factor is considered the strongest source, adaptation policies appear rather than mitigation policies since it is considered that Korea cannot solve the problem alone but should wait for China to take action. In addition to that, when the material focus on the venerable group, the adaptation policies such as 'supply of mask for free' and 'supply of air cleaner'. The venerable group is defined as 'the elderly, pregnant women, people with cardiovascular disease, children and infants' in texts. The keywords shown here are all related to 'public health discourse'. And there is no argumentation on the adaptation policy related to a venerable group.

Another adaptation policy that is not included in any current policies or emergency reduction measures, but mentioned and suggested by an article and a press release, is the technical adaptation solution such as large-scale air purifier and artificial rainfall. There are differences in the attitudes that present these two alternatives, but they share common ground in treating this alternative as a 'fundamental solution'. They do not directly say, but implicitly express it by connecting two different sentences in one line, for instance, 'He says that it is necessary to carefully examine the introduction of a large-scale air purifier currently piloted in China, and pointed out that it is urgent to establish long-term PM reduction measures instead of temporary measures' (press release 7). For the readers of this text, 'the introduction of a large-scale air purifier' can be read in line with 'establishment of long-term PM reduction measure'.

There are not only texts but also images included in articles. As Fairclough has mentioned, discourse "encompasses not only written and spoken language but also visual images" (Jørgensen & Phillips, 2002, p.56).



Figure 7. The photo included in the newspaper article, ‘Unwelcome guest in the spring? The concentration is different but occurs regardless of season’ (Kim, 2018).

The photo reprinted from article 13 (see Figure 7) is edited in black and white and is in the background of central Seoul. The people taken in the photo are wearing masks without any special actions. The text arranged on the left side of the photo is about 7 rules of life announced by Ministry of Environment, mainly focusing on individual adaptation strategies such as ‘If the concentration of PM is high, avoid going out’ and ‘When going out, wear a mask’. Except one rule, ‘Use public transportation to control air pollution inducing’, all the rules are about how to adapt to air pollution and health issue. The combination of the gray color of the photo and the adaptation rules symbolizes the severity of air pollution and the seriousness of its impact on the citizens. Therefore, the overall function of this image is to raise awareness and induce citizens’ participation and actions by suggesting the dark image of the air pollution.

5.4 The process of making and implementing policy

The ‘cooperation discourse’ which is apparent in phrases, ‘in cooperation with the national government, Gyeonggi-do Province, Incheon and non-governmental organizations’, ‘share air quality information of the two major cities frequently and conduct cooperative research’ and ‘by strengthen cooperation with China’. The direction of ‘cooperation discourse’ is divided into two different ways. When ‘negotiation’ and ‘management’ are emphasized in cooperation discourse which is articulated in phrases such as ‘national government is also working with China to improve air quality’ and ‘to manage foreign factors such as China’, the ‘cooperation’ here has an intention to improve Korean air pollution problem by reducing China's emissions.

On the other hand, 'cooperation' with China is often shown as 'learning process' to make up better measures to 'reduce our own emission in Korea'. It is articulated by the phrases such as 'learn Chinese high-intensity environmental policy' and 'when Seoul suffers from PM, the citizens' masks disappeared in Beijing'. It is also reinforced through environmental improvement and successful leadership practices in Beijing, which is described as a narrative genre, i.e. 'Of course, efforts to reduce PM in Beijing began before he became a mayor. Coal heating was rapidly replaced by natural gas heating [...] the sky in Beijing last winter was exceptionally clean' (article 9). These two directions of 'cooperation discourse' are different depending on who is the subject. The voice of China is hidden in all of the material, but still, the attitude of China is considered to be very important in this issue. Similar to the issue of cooperation with China, cooperation with other local governments such as Gyeonggi-do and Incheon, is shown two different ways. In the political domain, Gyeonggi-do Province is only represented as an object that should be led to cooperate or participate in Seoul's plan because the authors (or interviewees) of all documents are related to or belong to the SMG. But in media domain, active voice is used, creating a sense of agency and responsibility, to express the stance of Gyeonggi-do. For instance, the voice of Gyeonggi-do's provincial governor can be found in article 3. In this article, the governor mentions that 'Seoul City should make measures together with Gyeonggi and Incheon'. This sentence shows a completely different view of Seoul and Gyeonggi-do on the same topic. The Seoul Mayor's quotation, which follows the sentence, is 'Seoul has announced this policy first, but Gyeonggi and Incheon are not participating [...] thinks that we should solve this problem with Gyeonggi-do and Incheon'. Here, their different perspectives of each region are revealed by two representative words, 'together' and 'participating' in each sentence. By starting from this implicit different perspective in 'cooperation discourse', the 'political conflict discourse' is explicitly revealed on the surface in several articles, statements, and interviews. Article 3 reveals the conflict between the mayor of Seoul and the governor of Gyeonggi province with manifest intertextuality and a unique text configuration. It quotes their claims and puts them in a line by line, revealing how different opinions they have on the same topic. The voice of ruling party (statement 2) looks stronger than that of Seoul mayor regarding this issue. By using transitive verbs and phrases such as 'urge Gyeonggi-do to join' and 'stop the political strife' which reveals the subject and object very clearly, it makes their argument stronger.

Lastly, the elements from a 'pioneer discourse' is evident in phrases such as 'Seoul policy was adopted as central government's policy', 'with the preemptive response while taking all the blame' and 'new attempts of Seoul'. In the media domain, the direct intertextual quoting of Seoul mayor,

'Excessive response is better than sluggish response' reinforces the discourse. A metaphor is also used to make the discourse stronger. In the statement of Seoul mayor, he expresses himself as 'a commander standing in front line'. This metaphor, representing the PM problem as a war, strengthens the 'pioneer discourse' and simultaneously reveals the seriousness of the issue. From the historical background, the SMG has a successful experience through the citizen-led energy policy 'One Less Nuclear Power Plant Policy' (Yun, 2015). It can be assumed that the experience has given the SMG insight into new governance and has influenced Seoul's policy decisions. Some of the articles consider that the local government including Seoul has the strongest authority to implement and lead the policies (articulated in verbs, 'manage', 'encourage', 'regulate' and 'take action'). It is mixed used with Seoul mayor, by mentioning his will (articulated in words, 'preemptive move', 'make an effort'). Also, citizens are considered to be another main agent in this issue. It is emphasized with the words such as 'participation', 'voluntary action' and 'willingness'. But it is limited as compared with the governmental actors since their role is more focused on participating and evaluating rather than planning or organizing (articulated in the verbs, 'participate', 'join', 'use', 'sympathize' and 'criticize').

6 Discussion

The main aim of CDA is contributing to critical language awareness by providing insight for people to find out “the constraints on their practice and of the possibilities for resistance and change” (Jørgensen & Phillips, 2002, p. 77). It can also contribute to further democratization by fostering more egalitarian and liberal discourses (Jørgensen & Phillips, 2002). Since the air pollution caused by PM has a direct impact on livelihoods of local people and the decision making of reduction measures are being actively discussed, it is very important to look at what are the dominant discourses around air pollution itself and the PM reduction policies in Seoul currently. As it is mentioned in the study of Feindt and Oels (2005), discourse analysis can contribute to the democratization of policymaking by considering the environmental problem as a socially constructed issue and studying the power relationship built in environmental discourses. As seen in Figure 8, there are some dominant discourses that are repeatedly emphasized or have an impact on other elements.

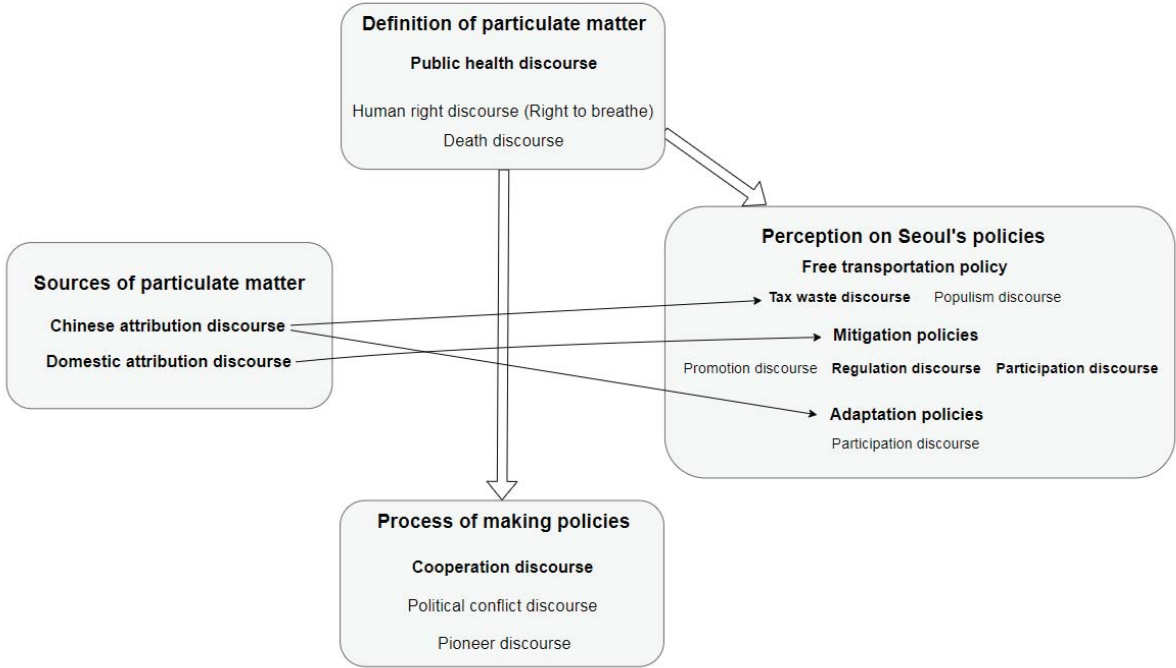


Figure 8. Dominant discourses appeared in the PM issue in Seoul, Korea. Own figure.

From the observation of how diverse discourses around air pollution policies of SMG formed in the analysis, it can be found the relationship between different discourses and how their texts and discursive practices actively engaged with social practices. In the following section, I will inquire

these findings within the broader context of Korean society and explore opportunities for improving the current situation to answer the research question 2 and 3.

First of all, it can be found that the 'tax waste discourse' is the most dominant discourse in the political domain, especially in the press releases of politicians in parliament. This discourse is strengthened by presenting specific numbers such as '15 billion', '5 billion won', and by blending with 'Populism discourse'. Through examining the texts and unrevealed discourses in texts, as well as the political and social contexts of tax discourse, the power relations behind them can be unveiled (Fairclough, 2001). Above all, the numerical texts presented can be interpreted in a broader social context. Among the overall national budget of the Korean government, 1.46% is allocated to the environmental sector in 2018. This is extremely small compared to the areas of health, welfare and labor (34%), education (14.9%) and defense (10%), and is the third smallest allocation of the sectoral budget (Ministry of Strategy and Finance, 2017). Examining the budget of SMG, the climate and environment headquarter's budget for air quality improvement is about 400 billion won, accounting for 1.3% of the total budget of 31 trillion won (SMG, 2018a). The 'wasted' budget for free public transportation policy, which is repeatedly articulated in the texts, was about 5 billion won a day and total 15 billion won for three days. This is only 0.04% of the total budget of Seoul. The texts covered in this thesis focus on the sum of free public transportation policy, but do not mention the overall budget allocation. There are three points found in texts and social practices that can be discussed: (1) the fact that the Ministry of the Environment's budget is very small in the overall budget in Korea, (2) the quote, 'the political power of Ministry of Environment is weak' in interview 2, and (3) the most dominant discourse, 'tax waste discourse' which focuses on economic value rather than environmental pollution. Based on these social contexts and the results of discourse analysis, the questions about how the power of the Ministry of the Environment is allocated and whether the environmental problems cannot be addressed strongly since the government is more focused on 'restriction of citizens', 'citizens' freedom' or 'inconvenience' emerge.

The other dominant discourses, 'regulatory discourse' and 'participation discourse' are focused on the citizens. Although the subjects of this discourse are diverse, objects commonly appear as 'citizen', 'driver', and 'diesel car driver', all of which are defined as a collective term, 'citizen'. In contrast with these two dominant discourses, the perspective that considers the object of regulation as an 'automobile company' or 'automobile industry' is observed in two articles and one interview. In these data, automobile companies rather than drivers are seen as objects of regulation. Taking into account social customs other than text, it is possible to estimate the existence of the lobbying

activities by the automobile industry and the social and economic power of automobile companies. In particular, the fact that there is no mentioning of existing automobile companies or automobile production guidelines in political discourse can be interpreted as 'exclusion' of CDA (Fairclough, 1995). The press releases in political domain commonly urge 'fundamental solutions' but do not offer concrete alternatives. This may be due to an actual failure to find a solution, but can be interpreted as an intention not to refer to a particular object as a cause or solution. In this regard, Seoul's 'Green car grading system' that classifies vehicles into 7 grades according to emission standards is not the dominant theme in both of the political and media domains. Although this policy was the first follow-up measure in the statement of Seoul mayor (2018c), there were few articles or press releases to reproduce it. Even when the 'green car grading system' was announced in the Seoul mayor's statement, the words targeting citizens such as 'options', 'incentives' and 'crackdowns' were used.

Next, the "Chinese attribution discourse" frequently mentioned in the responses of questionnaire targeting Seoul citizens is also found as a dominant discourse in the discourse analysis. Thus, it can be said that the 'Chinese attribution discourse' is one of the reasons behind the negative view on the Seoul city policy, since this is repeated in both of political and media domain. According to a study (Kim, Lee, Jang & Lee, 2015) analyzing the risk reporting frames and information sources for the media articles about PM found in major media from 2011 to 2014, 62.5% of the reports had the 'China attribution frame' which argued that China's desertification, yellow dust, and smog due to industrial development are the main attributions of PM in Korea among the diverse reporting frames. The repetitive 'Chinese attribution discourse' which appears in the texts and the previous researches was formed for the first time because of the scientific research results, but it became more powerful as it was reproduced and cited over time (Kim, Lee, Lee & Kim, 2017). It is also noted that the materials which are dominated by 'Chinese attribution discourse' tend to have more negative perception on 'mitigation policy', or mention directly and indirectly looking for 'alternatives' instead of current mitigation policies. However, as mentioned above, they do not suggest a detailed 'alternative'. This 'silence' can be interpreted as a re-reference to China's influence, which suggests a passive stance that expresses 'we have to wait for China to find something' rather than 'we have to find our own solution'.

In the social practice of 'Chinese attribution discourse', Chinese attribution is reinforced by the inconsistent results of scientific analysis on the PM contribution rate and the continuous experiences of observing yellow dust from China in the spring for a long time. Due to the nature of the atmosphere, season and meteorological conditions are very influential, resulting in a complex

mechanism of PM formation, i.e. the combination of the first generation from direct emissions and second generation from photochemical reactions (Ministry of Environment, 2016; Kim et al., 2017a). Therefore, the analysis of contribution rate is subject to seasonal and meteorological conditions and cannot always show same analysis results (Kim, Lee, Lee & Jang, 2016). However, these characteristics are perceived by the public as 'uncertainty', and these uncertainties are repeatedly reproduced and distorted through media (Kim, Lee, Jang & Lee, 2015). According to the study of risk perception, if a risk issue contains uncertainty, the public tends to rely on the media to make decisions about the risk (Kim, 2014). This suspicion and distrust in the certainty of the forecast and scientific research result in the distrust of the governmental institutions and even result in the distrust of 'science' in a larger perspective by combining with 'Chinese attribution discourse'. In 2016, the Korean government was criticized for blaming the cooking process of grilled mackerel as a major source of PM among various causes. It was considered as an attempt to weaken the 'Chinese attribution discourse' and to shift the responsibility to individuals. This experience has led to citizens' distrust of the government and scientific research, and it can be said that such distrust has further strengthened the trust of 'Chinese attribution discourse'.

Since there are some potential critique points of dominant discourses and the underlying forms of the power structures have been identified above, resistance to them or the more egalitarian discourses should be formed or promoted. This is a goal of CDA itself and, ultimately, its final goal is to promote democratization (Jørgensen & Phillips, 2002). When these goals of CDA are applied to this case of critical discourse analysis of the PM policy in Seoul, this thesis itself can be one of the improvement points that can be presented. However, research alone cannot improve the current situation. The most critical thing is how to communicate with the public efficiently to deliver the research result and researcher's sense of purpose. For critical discourse analysis to contribute to democracy, it is necessary to raise awareness and sensitivity of important socio-political issues (Farrelly, 2014). Farrelly (2014) said that the potential for democracy can be grown from the already existed conditions of social relationships. Therefore, systematically analyzing the pre-existing conditions of social relationships and sharing this analysis can be a good way to promote democracy. For instance, in this thesis, it is most important to convey the existence of dominant discourses and the power relations inherent in the discourses investigated by the researcher to the public in an accessible way.

Moreover, the results of the 'the process of policymaking' presented and analyzed in this thesis focused on 'cooperation' and 'participation'. However, if further research can be carried out with

more data, it is possible to confirm whether negotiation has been carried out by a democratic process. Research of discourse analysis on policymaking processes can reveal which actors are struggling to form, group, and institutionalize dominant discourses (Hajer, 1993). Therefore, in addition to the study of policy implementation and outcome itself, it is necessary to study the process through which the policy is determined and who has actually created the dominant discourses embedded in the policy.

Apart from the CDA methodology, other improvement points such as changes in the attitude of political elites and the withdrawal of media dependence on the public can be suggested. However, I excluded these which are not directly related to CDA.

6.1 Research Limitations

I acknowledge that my research method has some limitations. This study attempts to overcome the limitation of single text analysis by collecting and analyzing a variety of empirical data such as government documents, politicians' press releases, interviews, and newspaper articles within the political and media domains. In spite of trying to prove that dynamic discourses constitute and change the social world by analyzing various types of data (Jørgensen & Phillips, 2002), it is hard to say that this research deals with all relative discourse and ideologies in the composition of Seoul PM policies in that it analyzes a limited amount of data. For instance, I could have extended to a broader range of discourses such as discourse in the corporate domain and academia domain. I could also have analyzed more practical public perception by adding social media domain in the data of media areas limited to newspaper articles. This also leads to the problem of representation, because a small amount of data analysis limited to the political and media domains cannot represent all discourse related to the topic. Therefore, I cannot say that this study reveals the systematic pattern of the discourses constituting Seoul PM policy.

In addition, since the CDA depends somewhat on the subjectivity of the researchers, there has been a need to narrow the gap between empirical analysis and theory through methodological strictness. This is also linked to doubt of the CDA's 'critical' sense of purpose itself. Schegloff (1998) and Widdowson (1995) criticized CDA researchers for concentrating on ideological interpretation rather than linguistic analysis. I, as a researcher, am also not completely free from this criticism. According to my personal judgment, the extent of dealing with text analysis, analysis of discursive practice, and social practice analysis with non-discursive practice was determined. Finally, it should be taken into

account that there may be some gaps in the fact that the CDA, which is considered to be a Western paradigm, is applied to the specific social, political and cultural contexts of the Asian country, South Korea.

7 Conclusion

Starting from investigating what kinds of discourses are formed around air pollution and air pollution policies in Seoul, this thesis has navigated who are the main subjects and objects and how the power relations are internalized in each dominant discourse. Since the air pollution issue is one of the most emerging environmental and social problems both in Korea and worldwide, there are a variety of argumentations, discourses and social actors engaged in it. Among the diversity, political and media domains are chosen in this research due to their high relativity to public perception. By using CDA as a theoretical base and methodological framework, the research aims at not only exploring the dominant discourses around the issue but also uncovering the social practices, power structure and what can be criticized in the results. A total of 7 dominant discourses such as public health discourse, Chinese attribution discourse, tax waste discourse and cooperation discourse were found in each stage of defining PM, detecting sources, accepting the policies and policymaking process. The dominant discourses often blended with each other and with other minor discourses to be emphasized or competing. After detecting the dominant discourses and understanding the complicated relations between them, I could isolate some social structures, social relations, and power relations through the analysis of social practice dimension. The social, cultural and historical contexts of Korea and air pollution issue were used to find out them. Even though the thesis reached some concrete discussion points, it is not exhaustive. There are many other areas related to environmental discourse, environmental policy-making and air pollution policies that could be interesting to look into. For instance, it can be interesting to focus on policy-making processes and how it affects public perception rather than the overall discourse formation in this issue. Additionally, further research is needed to investigate how the social practices of dominant discourses have direct and indirect impacts on public perception to find out the linkage between them.

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9 Appendices

Appendix A - Survey Template

- Introduction

Hello.

Thank you very much for your time and dedication to this survey.

I am a graduate student in Environmental studies and Sustainability Science at Lund University, Sweden. I am currently investigating the public perception of the particulate matter reduction policy in Seoul.

Please note that your response will only be used as statistical data for academic research purposes and will be kept confidential under Section 8 of the statistical law in Korea. It is also treated as an anonymity in statistical analysis pursuant to Article 13. In particular, all material related to personal data will not be disclosed.

There are no correct answers to the questions on the questionnaire, and I ask for your earnest and candid answers. The questionnaire is expected to take approximately 5 to 10 minutes to be completed. Thank you again for participating in this study.

March 2018

Lund University, Sweden

Researcher: Su Yeong Jo

Email: whynotilene@gmail.com

- Survey Questions

1. Questions about personal information

1) Where do you live?

- ① Seoul
- ② Gyeonggi-do (Suburbs of Seoul/ metropolitan area outside Seoul)
- ③ Others _____

2. Personal opinion about particulate matter

(The followings are questions to ask your thoughts and opinions about your Korean particulate matter problem. Please read the items carefully and mark them where you think most appropriate.)

1) I think Korean particulate matter is a serious problem.

Strongly Agree – Agree – Undecided / Neutral - Disagree - Strongly Disagree Very much

2) I think that the main cause of particulate matter in Korea is foreign factors.

Strongly Agree – Agree – Undecided / Neutral - Disagree - Strongly Disagree Very much

3) What do you think is the biggest cause of the particulate matter problem in Korea?

- ① Coal-fired power plants and other energy related plants
- ② Transport of pollutants such as diesel vehicles
- ③ Excessive vehicle traffic in the city center
- ④ Industrial sector such as large-scale / small-scale workplace emission
- ⑤ Particulate matter generated at a construction site
- ⑥ Heating, illegal incineration, and other life cycle emission
- ⑦ Long distance movable pollutants from China and other countries
- ⑧ Other: _____

4) What do you think is the biggest cause of the particulate matter problem in Seoul?

- ① Coal-fired power plants and other energy related plants
- ② Transport of pollutants such as diesel vehicles
- ③ Excessive vehicle traffic in the city center
- ④ Industrial sector such as large-scale / small-scale workplace emission
- ⑤ Particulate matter generated at a construction site
- ⑥ Heating, illegal incineration, and other life cycle emission
- ⑦ Long distance movable pollutants from China and other countries
- ⑧ Other: _____

5) I think that Seoul's particulate matter is more serious than other cities.

Strongly Agree – Agree – Undecided / Neutral - Disagree - Strongly Disagree Very much

3. A survey of Seoul's particulate matter reduction policy

1) Do you think Seoul's policies are strong enough for solving particulate matter problem?

Very weak – Weak – Undecided / Neutral - Strong – Very strong

2) Do you think positively or negatively about overall Seoul particulate matter policy?

Very positive – Positive – Undecided / Neutral – Negative – Very negative

2-1) Why do you think that Seoul's particulate matter policy is positive or negative?

: _____

3) Which have you heard of the Seoul Metropolitan air pollution related measures? (Multiple items can be selected)

- ① Picture campaign for voluntary alternative-day-no-driving system ('alternative-day-no-driving system' participating sticker distribution)
- ② Supplying a mask for health when issued a 'Ultrafine particulate matter-sensitive watch' to micro-dust vulnerable classes (infants, pregnant women, elderly people, etc.)
- ③ Designated 'High emission Vehicle' and limit the volume of traffic when issued emergency measures in all areas of Seoul
- ④ Establishment of environmentally friendly grading system for automobile emissions and provision of incentives to top graded vehicle (scheduled to be announced in April 2018)
- ⑤ Providing incentives to individuals and companies that do not use their vehicles when emergency measures are issued
- ⑥ Establishment of Seoul-style indoor air quality standards (scheduled for the second half of 2018)
- ⑦ non-governmental organizations and local governments will intensify the control of traffic and living areas
- ⑧ Strengthening of cooperation through ' Policy Council of capital area' in Korea and international cooperation in Northeast Asia for reducing external factors
- ⑨ Establishment of Northeast Asian Water Partnership Organization (Seoul, Beijing, Tokyo, Ulaanbaatar) to be installed (October 2018)
- ⑩ obligation of Low-pollution construction and using eco-friendly construction machinery

- ⑪ Free Public transportation policy (currently abolished)
- ⑫ Mandatory supply of Eco-friendly boiler in Seoul city and low-Nox burner
- ⑬ R & D support for particulate matter and expansion of research (introduction of particulate matter R & D)
- ⑭ Establishment of car eco mileage to reduce kilometers
- ⑮ I've never heard anything.
- ⑯ Other: _____

3-1) How did you learn about these policies? (if you have heard about any of them)

- ① Through the homepage of Seoul city policy
- ② Through TV news
- ③ Through newspaper articles
- ④ Through online articles
- ⑤ Through people around you
- ⑥ Other: _____

4) What policies are expected to be effective in the Seoul Metropolitan Pollution Measures? (Multiple items can be selected)

- ① Picture campaign for voluntary alternative-day-no-driving system ('alternative-day-no-driving system' participating sticker distribution)
- ② Supplying a mask for health when issued a 'Ultrafine particulate matter-sensitive watch' to micro-dust vulnerable classes (infants, pregnant women, elderly people, etc.)
- ③ Designated 'High emission Vehicle' and limit the volume of traffic when issued emergency measures in all areas of Seoul
- ④ Establishment of environmentally friendly grading system for automobile emissions and provision of incentives to top graded vehicle (scheduled to be announced in April 2018)
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- ⑫ Mandatory supply of Eco-friendly boiler in Seoul city and low-Nox burner
- ⑬ R & D support for particulate matter and expansion of research (introduction of particulate matter R & D)
- ⑭ Establishment of car eco mileage to reduce kilometers
- ⑮ I've never heard anything.
- ⑯ Other: _____

4-1) What policies are expected to be most effective in the Seoul Metropolitan Pollution Measures?

- ① Picture campaign for voluntary alternative-day-no-driving system('alternative-day-no-driving system' participating sticker distribution)
- ② Supplying a mask for health when issued a 'Ultrafine particulate matter-sensitive watch' to micro-dust vulnerable classes (infants, pregnant women, elderly people, etc.)
- ③ Designated 'High emission Vehicle' and limit the volume of traffic when issued emergency measures in all areas of Seoul
- ④ Establishment of environmentally friendly grading system for automobile emissions and provision of incentives to top graded vehicle (scheduled to be announced in April 2018)
- ⑤ Providing incentives to individuals and companies that do not use their vehicles when emergency measures are issued
- ⑥ Establishment of Seoul-style indoor air quality standards (scheduled for the second half of 2018)
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- ⑫ Mandatory supply of Eco-friendly boiler in Seoul city and low-Nox burner
- ⑬ R & D support for particulate matter and expansion of research (introduction of particulate matter R & D)
- ⑭ Establishment of car eco mileage to reduce kilometers
- ⑮ I've never heard anything.
- ⑯ Other: _____

5) What policies are expected to be ineffective against Seoul's particulate matter? (Multiple items can be selected)

- ① Picture campaign for voluntary alternative-day-no-driving system ('alternative-day-no-driving system' participating sticker distribution)
- ② Supplying a mask for health when issued a 'Ultrafine particulate matter-sensitive watch' to micro-dust vulnerable classes (infants, pregnant women, elderly people, etc.)
- ③ Designated 'High emission Vehicle' and limit the volume of traffic when issued emergency measures in all areas of Seoul
- ④ Establishment of environmentally friendly grading system for automobile emissions and provision of incentives to top graded vehicle (scheduled to be announced in April 2018)
- ⑤ Providing incentives to individuals and companies that do not use their vehicles when emergency measures are issued
- ⑥ Establishment of Seoul-style indoor air quality standards (scheduled for the second half of 2018)
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- ⑨ Establishment of Northeast Asian Water Partnership Organization (Seoul, Beijing, Tokyo, Ulaanbaatar) to be installed (October 2018)
- ⑩ obligation of Low-pollution construction and using eco-friendly construction machinery
- ⑪ Free Public transportation policy (currently abolished)
- ⑫ Mandatory supply of Eco-friendly boiler in Seoul city and low-Nox burner
- ⑬ R & D support for particulate matter and expansion of research (introduction of particulate matter R & D)
- ⑭ Establishment of car eco mileage to reduce kilometers
- ⑮ I've never heard anything.
- ⑯ Other: _____

5-1) What policies are expected to be most ineffective against Seoul's particulate matter?

- ① Picture campaign for voluntary alternative-day-no-driving system('alternative-day-no-driving system' participating sticker distribution)
- ② Supplying a mask for health when issued a 'Ultrafine particulate matter-sensitive watch' to micro-dust vulnerable classes (infants, pregnant women, elderly people, etc.)
- ③ Designated 'High emission Vehicle' and limit the volume of traffic when issued emergency measures in all areas of Seoul
- ④ Establishment of environmentally friendly grading system for automobile emissions and provision of incentives to top graded vehicle (scheduled to be announced in April 2018)
- ⑤ Providing incentives to individuals and companies that do not use their vehicles when emergency measures are issued
- ⑥ Establishment of Seoul-style indoor air quality standards (scheduled for the second half of 2018)
- ⑦ non-governmental organizations and local governments will intensify the control of traffic and living areas
- ⑧ Strengthening of cooperation through ' Policy Council of capital area' in Korea and international cooperation in Northeast Asia for reducing external factors

- ⑨ Establishment of Northeast Asian Water Partnership Organization (Seoul, Beijing, Tokyo, Ulaanbaatar) to be installed (October 2018)
- ⑩ obligation of Low-pollution construction and using eco-friendly construction machinery
- ⑪ Free Public transportation policy (currently abolished)
- ⑫ Mandatory supply of Eco-friendly boiler in Seoul city and low-Nox burner
- ⑬ R & D support for particulate matter and expansion of research (introduction of particulate matter R & D)
- ⑭ Establishment of car eco mileage to reduce kilometers
- ⑮ I've never heard anything.
- ⑯ Other: _____

4. Questions about alternative-day-no-driving system policy in Seoul

1) Do you have your own car?

- ① I have my own car and use it frequently.
- ② I have my own car but rarely use it.
- ③ I do not have my own car.
- ④ Others _____

2) What transportation do you use to get to work? (What kind of transportation do you usually use?)

- ① By my own car
- ② By public transportation (train, subway, bus)
- ③ By walking
- ④ Others _____

3) Are you willing to participate in voluntary alternative-day-no-driving system? (Only asking for car owners)

I will join actively – I will join often – I will join sometimes – I will rarely join – I will not join

4) What do you think is necessary to improve the particulate matter in Seoul in the future? (Your suggestion)

: _____

*** Please leave an e-mail address if you want to receive information about the thesis.**

: _____

Appendix B - Interview Guide

- Pre-questioning guide

1. Introduce myself and the topic of my thesis
2. Ask for consent to record the interview
3. State that interviewees can be anonymous if they wish so
4. Write down name, time, location, context
5. Emphasize that there are no right or wrong answers and that they can interrupt me or ask questions about the interview any time
6. Inform interviewees that it's possible to send the complete thesis

- Interview Questions

A. Personal Information

1. Age / Work / Title / Career
2. How long have you been working on the area?
3. Can you describe your role in your work?

B. Perspective on particulate matter

1. How do you define particulate matter?
2. What are the characteristics of Korean-typed particulate matter?
3. When did the Korean particulate matter start to be perceived as a severe problem?
4. What are the causes of particulate matter in Korea & why do you think so?
5. How do you get information on the particulate matter condition and the causes?

6. When & why do you think Korean particulate matter has become a national issue?

C. Visibility and understanding of particulate matter policy in Seoul

1. What is the biggest cause of particulate matter in Seoul?

2. Do you think it is serious compared to other cities (or other countries)?

3. What is the position of Seoul City on the particulate matter problem?

4. What are the special features of Seoul City policies compared to other cities and provinces?

5. What is the most important (prioritized) policy of the particulate matter policy in Seoul?

6. Which policy do you think can be the most effective?

7. What do you think is the reason why Seoul's particulate matter policy is getting more attention than other cities and provinces?

9. What is the hardest part of making a policy? (What is the barriers?)

10. Are there any difficulties due to legal or organizational discipline?

11. Do you think the current Seoul city policies are supported by the central government?

12. Who do you think is opposed to Seoul's policy & why?

D. About the policy making process

1. What is the process of policy making?

2. Who participates in the decision-making process?

3. Does the decision process reflect the views of NGOs and citizens? How do you get feedbacks?

4. How do you plan to reflect the opinions of NGOs and citizens in making policies in the future?

E. About policy results

1. What are the effects of the Emergency measures against particulate matter?
2. The free public transport policy has been discontinued, what do you think is the biggest reason?

F. Future measures to improve particulate matter policy

1. When do you think the problem of air pollution caused by particulate matter can be solved?
2. Apart from the current position, what do you think is the most important measure?
3. What policy measures can be improved?
4. What do you think is the barriers to these solutions?

G. How do you see citizens' positive / negative reactions to policies?

1. Do you think citizens are positively (or negatively) aware of the current policy?
2. Why do you think so?
3. What do you think is the way citizens get information about the policy?
4. Do you think the way citizens get information affects the response to the policy?

H. A plan to improve citizen's perception of the future

1. What are some ways to make citizens more aware of the importance and importance of particulate matter issues?
2. What can Seoul do to encourage citizens to take a positive view of Seoul's air pollution policy?

Appendix C - List of materials for discourse analysis in political domain

Table 1. Chosen political documents for analysis, own figure.

Genre	No.	Author (interviewee)	Title	Date
Political Statement	Statement 1	Seoul metropolitan government	Seoul City's stance on Seoul's particulate matter emergency measures	January 16, 2018
	Statement 2	Members of a political party who belong to Seoul metropolitan council	Democratic Party's Statement in Seoul metropolitan council - We urge the Gyeonggi Province and Incheon City to participate actively in the implementation of the particulate matter emergency reduction measures in Seoul!	January 17, 2018
	Statement 3	Seoul metropolitan government	Seoul Mayor's Statement on Measures against particulate matter	January 21, 2018
Press Releases written by members of Seoul metropolitan council	Press release 1	Park, Jung Hwa (Liberty Korea party)	Wrong policy of emergency reduction measure! Is it an election campaign of Seoul mayor, Park Won soon?	January 18, 2018
	Press release 2	Joo, Chan Sik (Liberty Korea party)	Stop using "Disaster management fund" for free public transportation	January 18, 2018
	Press release 3	Lee, Jeong Hoon (Democratic party)	'Silent assassin', the reduction of fine particulate matter, should be a top priority policy	January 19, 2018
	Press release 4	Hwang, Joon Hwan (Liberty Korea party)	The measures against particulate matter receive failing grade	January 19, 2018
	Press release 5	Park, Jung Hwa (Liberty Korea party)	For whom is the particulate matter reduction measure, alternative-day-no-driving system?	January 23, 2018
	Press release 6	Moon, Hyeong Ju (Bareunmirae Party)	For whom is the policy of emergency reduction measure against particulate matter of Seoul mayor, Park Won Soon?	January 25, 2018
	Press release 7	Kim, Gwang Soo (Bareunmirae Party)	Preparation of medium-and long-term measures of Seoul city is urgently needed!	March 29, 2018

Interviews	Interview 1	Lee, Jun-Bok (Seoul metropolitan government)	Interview with officer of climate and Air Quality Management Division in Seoul metropolitan government	March 16, 2018
	Interview 2	Lee, Jae Hyo (Seoul metropolitan council)	Interview with a investigator of environment and water policy division in Seoul parliament	March 26, 2018

Appendix D - List of materials for discourse analysis in media domain

Table 2. List of Research Materials for media discourse analysis

Article no.	Newspaper	Title	Date	Attitude
Article 1	Chosun	1.8% traffic reduction... Waste 5 billion won on 'free transportation service against particulate matter'	January 16, 2018	Negative
Article 2	Chosun	If the day before is clean... The emergency measure cannot be issued even the worst particulate matter comes	January 17, 2018	Negative
Article 3	Hankyoreh	Clash between Seoul and Gyeonggi-do... "Enforce today also", " alternative-day-no-driving system is not efficient"	January 17, 2018	Neutral
Article 4	Kyunghyang Shinmun	"Free public transportation, I sympathize with the effect, but is it effective?"	January 17, 2018	Neutral
Article 5	Donga	particulate matter, will It be effective only with 4.8 billion 'short-term measure' a day?	January 18, 2018	Negative
Article 6	Hankyoreh	Seoul city, "particulate matter, similar to London smog killed 4 thousand people"	January 19, 2018	Positive and neutral
Article 7	Kyunghyang Shinmun	[Column] Particulate matter and life's worth of citizens	January 21, 2018	Positive
Article 8	Chosun	Waste 15 billion won ... Give up 'free public transportation policy'	January 28, 2018	Negative
Article 9	Jungang	[Seousomun forum] 3 reasons why congressman, Sim Sang Jeong was surprised	February 15, 2018	Negative
Article 10	Kyunghyang Shinmun	[World of Gu Jeong Eun] Seoul Mayor, Beijing Mayor, particulate matter	March 20, 2018	Negative
Article 11	Donga	'Bad' days are increasing... Stuck measures against particulate matter	March 28, 2018	Negative
Article 12	Jungang	Can we cut the bad relationship with particulate matter, total modification of old diesel cars	March 28, 2018	Positive
Article 13	Donga	Unwelcome guest in the spring? The concentration is different but occurs regardless of season.	March 30, 2018	Suggestion, partly positive