

Managing Uncertainty in Crisis

*Exploring the Impact of Institutionalization
on Organizational Sensemaking*

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Exploring the Impact of Institutionalization on Organizational Sensemaking

Het Managen van Onzekerheid tijdens Crises: Een verkenning van de impact van institutionalisering
op “sense-making” in organisaties
(met een samenvatting in het Nederlands)

Proefschrift

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To my parents and my wife

Preface

Six years ago, I decided to continue pursuing my research interests in crisis management at Leiden University. I learned about the reputation of the Crisis Research Center (CRC) which had produced high quality publications in the field. Then CRC director Dr. Arjen Boin accepted me as a Ph.D. researcher. Starting from a student with a background in engineering and management, I am grateful to Dr. Boin for his guidance in the new world of social science research. During the six-year study, Dr. Boin provided constructive advice and encouragement with consistent patience and encouragement. When Dr. Boin stayed in the US for the first year of my Ph.D. study, Dr. Sanneke Kuipers and Prof. David Lowery helped me complete the research proposal and grasp the knowledge foundation of crisis management and public administration. I owe much to them.

My dissertation has been written at offices in four universities and a company; the assistance and advice by colleagues in these five organizations has been extremely helpful. At Leiden University's Institute of Public Administration, I owe so much to Toon, who helped me in adapting to life in the Netherlands. At Louisiana State University's Stephen Disaster Management Institute, Ping discussed with me about crisis research and introduced new friends to me in Baton Rouge. Special thanks to Warren, a former colleague at LSU (now at WVU), who commented on two chapters of the dissertation. At Crisisplan, I would like to express thanks to Werner, whose encouragement helped me out when I felt upset in the final stage of my dissertation. At Tsinghua University, I owe thanks to Dean Xue Lan, who offered me a visiting position in the final stage of my thesis writing, and Associate Dean Peng Zhongchao, who invited me to join in seminars at the Center for Crisis Management Research and the research and teaching program at the School of Public Policy and Management. Discussions with other colleagues in these organizations have been helpful in shaping my dissertation perspectives on crisis management, institutionalization, public organizations and general research methodology. I particularly mention Frank, Dimiter, Moosa, Sevgi, Brendan, Anne, Ling, Kaibin, Haibo, Peng, Bing, Xinchuan, Baoxia, Long and Xuran.

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Half of my Ph.D. life I operated the China Crisis Management Website as a founding coordinator (www.crisis119.org). Thanks to my colleagues of the website, Peigen, Yang, Lin, Yihong, Qian, Xi, Xin, Ni, and YinXuan, who share similar interests in crisis management and a willingness to contribute to the website.

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providing good dinners for me after discussions with Arjen. I owe thanks to my host family Mr. & Mrs. Joseph who helped me gain a better understanding of Baton Rouge and the southern culture.

Finally, many thanks go to my wife Dan for always standing right beside me for more than ten years. The dissertation is dedicated to my parents, who taught me about life and encouraged me always in the six-year long Ph.D. study.

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Table of Contents

List of figures	12
List of tables	13
Chapter 1 Managing uncertainty in crisis sensemaking: a core challenge for public leadership	15
1.1 Introduction: exploring the black box of dealing with uncertainty in crises.....	15
1.2 Uncertainty in crises as a challenge to crisis managers.....	16
1.3 Research puzzle: explaining the variation of strategies for coping with uncertainties in crises.....	19
1.4 Research strategy: towards an institutional sensemaking model.....	21
1.5 Research aims and outline.....	24
Chapter 2 Coping with uncertainty: towards an institutional sensemaking model ...	27
2.1 Introduction.....	27
2.2 Causes of diversity in strategy selection: different types of uncertainties	27
2.3 Causes of diversity in strategy selection: psychological factors.....	31
2.4 Causes of diversity in strategy selection: organizational factors	34
2.5 Causes of diversity in strategy selection: the macro environment.....	41
2.6 Towards an institutional sensemaking model.....	43
2.7 Conclusion	46
Chapter 3 Exploring the influence of institutionalization on sensemaking in crises: a research design	47
3.1 Introduction	47
3.2 Defining and Operationalizing key variables.....	47
3.3 Towards an empirical exploration of institutional sensemaking: integrating comparative-case study and within-case analysis	57
Chapter 4 The U.S. Federal Emergency Management Agency and the 2005 Great New Orleans Flood: A deinstitutionalized response organization facing unknown unknowns	63
4.1 Introduction.....	63
4.2 The Big Easy: a vulnerable city hit by a predictable top 10 catastrophic event	64
4.3 The deinstitutionalization of FEMA	66
4.4 FEMA and the Great New Orleans Flood: identifying uncertainties and coping actions	80
4.5 Analysis: a deductive sensemaking model in a deinstitutionalized response organization	90

Chapter 5	NASA and the Space Shuttle Columbia disaster: an institution coping with “unknown unknowns”	95
5.1	Introduction.....	95
5.2	NASA: an American institution	96
5.3	NASA and the space shuttle Columbia disaster: identifying uncertainties and coping strategies.....	108
5.4	Analysis: the collapse of collective sensemaking in an institutionalized organization	116
Chapter 6	BP and the 2010 Gulf Coast Oil Spill Disaster: an arrogant organization coping with a “known unknown”	121
6.1	Introduction.....	121
6.2	The 2010 Gulf Coast Oil Spill Disaster.....	122
6.3	BP as an “arrogant organization”.....	123
6.4	BP and the 2010 Gulf oil spill disaster: Identifying uncertainties and coping actions ..	136
6.5	Analysis: an arrogant organization playing with discretion	146
Chapter 7	The Los Angeles Police Department and the 1992 LA Riots: a mythical organization coping with known unknowns	151
7.1	Introduction.....	151
7.2	An overview of the 1992 Los Angeles Riots	152
7.3	LAPD as a mythical organization	153
7.4	LAPD and the 1992 LA riots: identifying uncertainties and coping actions	168
7.5	Analysis: a deinstitutionalizing organization caught short.....	179
Chapter 8	Towards a theory of institutional sensemaking: building on a comparison of four cases.....	183
8.1	Introduction.....	183
8.2	Comparing the influence of institutionalization on sensemaking strategies: towards a dynamic model of institutional sensemaking	184
8.3	Implications for theory	192
8.4	Policy implications	196
8.5	Reflections on sensemaking and crisis management in China	198
8.6	Limitations of the study and recommendations for future research	201

References	203
Appendix 1 A list of web sources relevant to this research	233
Appendix 2 Figures and tables indicating the flooding areas in New Orleans	235
Summary	239
Samenvatting	243
CURRICULUM VITAE	247

List of figures

Figure 1-1 A decision tree model of typhoon evacuation.....	16
Figure 2-1 An inventory of different theories reviewed in this chapter.....	28
Figure 2-2 R.A.W.F.S. heuristic for coping with uncertainty	29
Figure 2-3 Organizational strategies for dealing with uncertainties: information processing.....	35
Figure 2-4 Weick’s view of the relationship among enactment, organizing and sensemaking.....	37
Figure 2-5 An institutional model of sensemaking	44
Figure 3-1 A typology of organizations based on institutionalization levels	56
Figure 3-2 Case selections under the typology of institutionalization.....	59
Figure 4-1 Tone of major newspapers editorials’ coverage of FEMA (1982-2003)	72
Figure 4-2 FEMA’s evolution in terms of its institutionalization status.....	79
Figure 5-1 NASA’s budget as a percentage of the Federal Budget (1958-2009)	97
Figure 5-2 the historical evolution of NASA’s centers	98
Figure 5-3 Downsizing of NASA’s overall workforce and technical workforce (1993-2003)	106
Figure 5-4 NASA’s evolution in terms of its institutionalization status	107
Figure 5-5 image request flow chart in STS-107	112
Figure 6-1 BP’s evolution in terms of its institutionalization	136
Figure 7-1 LAPD’s evolution in terms of its institutionalization status.....	167
Figure 7-2 Los Angeles City’s Emergency Management Framework (.....	169
Figure 8-1 An institutional sensemaking process model in crises.....	185
Figure 8-2 Weick’s sensemaking theory.....	193

List of tables

Table 1-1	A list of uncertainties and coping strategies generated from crises cases.....	20
Table 2-1	Thompson's (1967) categorization for the process of decision making.....	30
Table 2-2	A process demonstration of the sensemaking model.....	37
Table 3-1	Operationalization of uncertainty.....	48
Table 3-2	Operationalization of strategies to cope with uncertain situations.....	50
Table 3-3	Operationalization of the internal dimension of institutionalization.....	52
Table 3-4	Operationalization of the external dimension of institutionalization.....	55
Table 4-1	Comparison of Emergency Support Functions under the old Federal Response Plan and the new National Response Plan	75
Table 4-2	Reductions to FEMA budget base (FY 2003-2005).....	78
Table 4-3	A summary of uncertainties, coping actions and strategies in the 2005 New Orleans flooding	90
Table 5-1	A summary of uncertainties and actions taken by NASA in the 2003 Space Shuttle <i>Columbia</i> Disaster	115
Table 6-1	A summary of uncertainties, coping actions and strategies in the 2010 Gulf Coast oil spill disaster	145
Table 7-1	A summary of uncertainties, coping actions and strategies in the 1992 Los Angeles Riots	178

Chapter 1 Managing uncertainty in crisis sensemaking: a core challenge for public leadership

“The basic raw materials on which organizations operate are informational inputs that are ambiguous, uncertain, equivocal. Organizing serves to narrow the range of possibilities, to reduce the number of ‘might occur’. The activities of organizing are directed toward the establishment of a workable level of certainty”.

—Weick (1969: 40)

1.1 Introduction: exploring the black box of dealing with uncertainty in crises

When a hurricane or tropical storm threatens coastal cities, the weather service usually issues a list of potential landfall areas on the coastline. The forecasts are based on a blend of specialists’ expertise and various scientific models. Meteorological experts usually phrase their forecast in terms of a “cone of uncertainty”.¹ The storm has only a 60 to 70 percent chance of staying within the cone during that period. Without accurate predictions, crisis managers² have to determine whether or not to evacuate threatened communities. In this situation, crisis managers face a critical dilemma in evacuation decision making as demonstrated in the decision tree model in Figure 1-1. Among the four outcomes of the decision tree, outcome A and D are the right choices, while one cannot exclude the errors of outcome B and C in an uncertain situation caused by a hurricane forecast. To be specific, deciding to evacuate will lead to a loss of governmental credibility and will incur unnecessary economic costs of evacuation if the hurricane doesn’t strike as predicted (outcome B)—a Type I error³. Deciding not to evacuate will cost lives and expose many other citizens to severe and acute danger if the hurricane does strike (outcome C)—a Type II error. The media, the public and political opponents will blame the government.

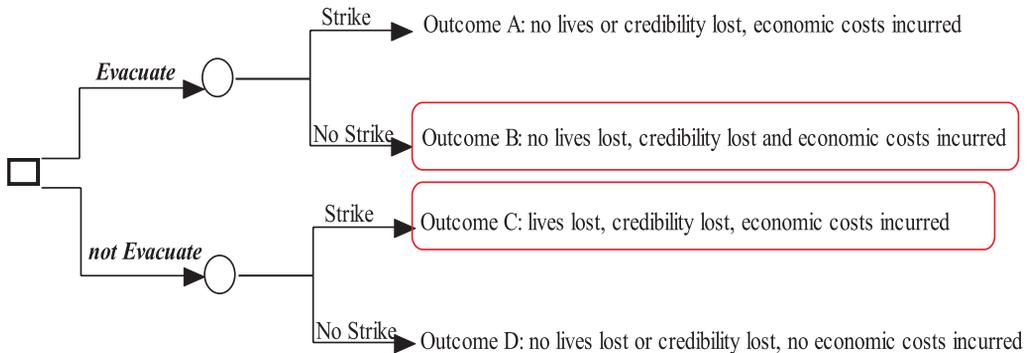
The above example illustrates a classic issue in crisis management: *coping with uncertainty*. Whether the crisis is the result of a natural disaster, technical system failure or human conflict, dealing with uncertainty is always an indispensable task for crisis managers. Uncertainty challenges crisis managers because they must make urgent decisions under difficult circumstances. Crises are characterized by incomplete information, the absence of a rational risk model which can provide an

1 See <http://www.iserp.columbia.edu/news/articles/cone.html> (accessed on June 10, 2009). The “cone of uncertainty” represents the forecasted track of the center of a tropical storm or hurricane and the likely error in the forecast track.

2 In this dissertation, crisis managers refer to leaders at the strategic level responsible for crisis management. Sometimes, when an analysis of leaders at the strategic level could not understand the whole picture of crisis management, leaders at the operational level are taken into consideration as well.

3 Type I error [also called “false positive” or “ α error”] and type II error [also called “false negative” or “ β error”] are originally used to describe errors made in a statistical decision making process by Jerzy Neyman and Egon Pearson in 1928. Type I error means error of rejecting the null hypothesis given that it is actually true; type II error means the error of failing to reject a null hypothesis given that the alternative hypothesis is actually true.

accurate assessment of the situation, and no way of weighing the pros and cons of alternatives and their consequences. Yet somehow crisis managers must make sense of the situation before making these decisions. The goal of this research is to open the black box regarding how crisis managers deal with uncertainty in such a difficult situation. This will be done by exploring the institutional context in which they make sense of a crisis.



Source: Raiffa (1968) and Clemen (1996).

Figure 1-1 A decision tree model of typhoon evacuation

The aim of this chapter is to introduce the research question that guides the study presented in this dissertation. The chapter starts with a discussion of the role of uncertainty in a crisis and the challenges it poses to crisis managers (Section 1.2). Section 1.3 enumerates various strategies adopted by crisis managers to cope with uncertainties in crises and introduces the central research question. Section 1.4 provides a preview of the theoretical perspectives that will help generate tentative answers to the research question and presents the theoretical framework and research method adopted in this dissertation. Finally, Section 1.5 addresses the theoretical and practical relevance and outlines the composition of this book.

1.2 Uncertainty in crises as a challenge to crisis managers

This section introduces the role uncertainty plays in a crisis. In a general sense, uncertainty, threat and urgency have been identified as the three fundamental characteristic of a crisis⁴:

A crisis is "...a serious threat to the basic structures or the fundamental values and norms of a social system, which-under time pressure and highly uncertain circumstances-necessitates making critical decisions". (Emphasis added by the author)

— Uriel Rosenthal, Paul 't Hart and Michael T. Charles (1989: 10)

4 Uncertainty is identified as an element not just in Rosenthal et al.'s (1989) definition of crisis, but also in the definition in the *Cambridge Advanced Learner's Dictionary* as "a time of great disagreement, uncertainty or suffering".

Read <http://dictionary.cambridge.org/define.asp?key=18339&dict=CALD> (accessed on June 10, 2010)

By definition, each crisis induces a sense of severe threat, originating from the potential tragedies caused by an emerging adverse development or incident.⁵ Disaster experiences, stories heard from others, or threats portrayed by scientists may all contribute to this sense of threat (Rosenthal and Kouzmin 1993; Bostrom 2002; Bostrom and Cirkovic 2008). In a crisis, threats are accompanied by time pressure. Within hours or minutes, crisis managers have to make critical decisions. Urgency is rarely objectively imposed by a crisis, but perceived as such by other involved actors or the public demanding visible and drastic response measures (Rosenthal and Kouzmin 1993).

Uncertainty comes in different guises in almost every crisis, such as unknown causes and nature of a crisis [what and why], unknown involvement of stakeholders [who], unknown scope [where] and duration [when] of crisis impacts. Crisis managers cannot acquire all intelligence about the causes or current states of a crisis. One can never predict who will be involved in a crisis, because every crisis requires a different response network formed by governmental organizations, non-governmental organizations and other interest groups. It is also hard to predict the boundary and scope of a crisis, given the fact that many crises cross geographical and functional boundaries (Boin, Ekengren et al. 2006; Lezaun and Groenleer 2006; Quarantelli, Lagadec et al. 2007; Beck 2008; Boin and Rhinard 2008; Bostrom and Cirkovic 2008; Ansell, Boin et al. 2010).⁶ The time frames of crises are also unpredictable, because they do not follow a linear process or simple causal relationships ('t Hart and Boin 2001).

A few words from the Mayor of Gretna, Louisiana State in the United States, Ronnie Harris, help us to better understand the dynamics of uncertainty in the crisis response to Hurricane Katrina in 2005: “We were going to protect the lives of our residents. It’s impossible to know what happened unless you were here. At the time, you don’t know what to believe, but you don’t want to be in a place to find out if what you heard is true” (Select Bipartisan Committee 2006: 171). In short, uncertainty is a fundamental characteristic of a crisis, which is worth studying because previous research has shed insufficient light on this issue.

Challenges for crisis managers

Uncertainties pose challenges for crisis managers (Nutt 1989) in every phase of a crisis (Rosenthal and Kouzmin 1993; Cioffi-Revilla 1998). Before a crisis, crisis managers find it hard to grasp the evolution dynamics of uncertainties, which makes it difficult for them to intervene before a crisis

5 In a general sense, crises can be understood as threats posed by a wide variety of new risks and age-old calamities, from extreme weather catastrophes to desertification, from epidemics to food security crises, from social unrest to cyber terrorism, from chemical explosions to coal mine collapses, from the collapse of a bridge to major blackouts of a city, from international conflicts to financial crises, from volcanic eruptions to global warming, or even nuclear wars.

6 What Quarantelli, Lagadec, and Boin refer to Trans-system Social Ruptures (TSSRs), means crises “jump across different societal boundaries, disrupting the fabric of different systems”. Beck defines this new feature as “cosmopolitanism” which means the erosion of clear borders for separating markets, states, civilizations, cultures, life-worlds of common people and its consequences. Syracuse University’s Moynihan Institute set up a research project on transboundary crisis management with a focus on how problems of governance are exacerbated when they cross jurisdictional borders. The transboundary crisis increases the possibility that some types of crises, such as pandemics disease, spread to different regions of the world.

unfolds (Turner 1978). The 1972 Rapid City flood in South Dakota in the US is a case in point. Crisis managers detected the threats to local communities caused by the rising water, but failed to prevent the dam from breaking (Mileti and Beck 1975).

The quality of critical decision making in crisis response is often impaired by insufficient intelligence regarding the causality, the severity, and the impact and scale of the crisis (Dutton 1986; Quarantelli 1988). For instance, during the response to the 9/11 terrorist attacks, fire commanders in the lobbies of the two towers of the World Trade Center lacked intelligence on what was happening outside the towers, and what the consequences of the plane crashes would be for the stability of the towers (Kettl 2003). The decision to send fire fighters to the towers led to more deaths.

Coordination between organizations is an indispensable part of a crisis response and is often accompanied by unexpected involvement of other organizations. Organizations that rarely work together in normal times may have to break with their professional rules of operation and standard routines in order to work together effectively, which creates new uncertainties (Wilson 1989). Organizations responding to a crisis for the first time may not perform as expected, suffering from the “new organization syndrome”⁷ (Stern 1997). For instance, during the response to the 2005 Hurricane Katrina, the Federal Emergency Management Agency (FEMA) was instructed by the White House to coordinate the response under the guidance of the Department of Homeland Security (DHS). DHS initiated a new response framework, forcing FEMA to drop its long existing professional rules for emergency management. The incompatibility between FEMA and DHS created uncertainty which led to chaos.

A lack of knowledge about future outcomes and possible consequences of an intervention also challenges crisis managers in their efforts to set a response strategy (Dutton 1986; Quarantelli 1988). In 2002, when the first SARS patient was sent to the hospital in Guangdong, China, doctors could not diagnose the strange disease (which was later named the Severe Acute Respiratory Syndrome). This made it hard to determine the response strategy. If the disease would not be a deadly flu, taking precautions to isolate all who had been in contact with the patient might cause social panic and unnecessary costs (Zeng 2003). However, if it would prove to be a deadly flu, taking the risk to do nothing might allow the flu to spread to different corners of the world (as shown in the SARS crisis).

During the crisis response, stakeholders compete to give meaning to the ongoing crisis and the response (framing); this framing process increases uncertainty about the social construction of a crisis. It is not always clear from the start which frame will eventually define the situation in media reports, political debates, and public opinion. This impedes a crisis manager’s ability to predict the public’s response to his or her efforts. Political opponents may seize this opportunity to disclose the inadequacy or failure of preparation and response efforts. Journalists may point at human errors and institutional flaws. Internet users may use different peer to peer web 2.0 tools (e.g. instant messengers, BBS, Twitter, Facebook, individual blogs) to discuss the response to the

7 “New organization syndrome” means that members fail to act due to a lack of understanding on the organizational role, status and accountability in a new organization (Stern 1997).

crisis. Malpractices in government may lead to intense public attention and criticism in the social construction process, which quickly erodes the legitimacy and credibility of organizations involved in the response and which may finally result in an institutional crisis or political crisis.

1.3 Research puzzle: explaining the variation of strategies for coping with uncertainties in crises

Given that uncertainty is an inherent part of a crisis, dealing with uncertainty is an indispensable task for crisis managers. Although the example at the beginning of this chapter describes a critical situation forcing crisis managers to make sense of uncertainty, the way crisis managers cope with uncertainties is not limited to this example. This section will demonstrate various strategies developed by crisis managers to cope with uncertainties in crises, which have been extracted from different cases (a list of these uncertainties, coping strategies and crisis cases has been summarized in [Table 1-1](#)). These strategies represent various ways of dealing with uncertainties during a crisis (the strategies are not limited these types).⁸ Each type of coping strategy listed in [Table 1-1](#) will be described in the following sections.

In the unfolding phase of a crisis, routine accidents or risks that may lead to a crisis or disaster emerge from the normal rhythm of the organizational operations. Crisis managers may simply deny the possibility of a catastrophic consequence. Crisis managers might mask these deficiencies of operations or block the information from being released to the public or their superiors, hoping that they can control the situation (Peng 2008). When many patients with unknown fever symptoms were found in different regions in China in 2003, nobody knew what the disease named SARS actually was and how such an unknown disease could be controlled. Yet, the Chinese Minister of Health Zhang Wenkang simply played down the uncertainty with a declaration to the media that SARS was under control in China (Xinhua Reporter 2003). In response to the unknown impact of the coming Hurricane Alicia, Galveston's Mayor E. Gus Manuel simply dismissed the warning by Texas Governor Mark White in 1983. Alicia caused 21 deaths in Galveston (Isaacson, Griggs et al. 1983; Committee on Natural Disaster 1984).

Crisis managers may have become accustomed to existing uncertainties in the system that never caused any damage or problems before and they may refuse to take further measures to deal with them because of other pressing problems at hand (Weick 1995; Vaughan 1997). For example, NASA had found flaws in "foam shedding"⁹ in many space shuttle flights since 1983. However, these flaws had never caused serious damage to the shuttle until the fatal last mission of space shuttle *Columbia*. NASA managers got used to these recurrent uncertainty and classified them as an accepted risk, which later caused the catastrophe of space shuttle *Columbia* in 2003 (CAIB 2003).

⁸ Please be aware that these strategies are not mutually exclusive in a single crisis. Crisis managers can select multiple strategies in coping with an uncertainty in a crisis.

⁹ The foam was attached to the External Tank (containing low temperature fuel for the space shuttle) to prevent the formation of ice on the surface of the tank. The forming ice might damage the space shuttle during the launch process.

Table 1-1 A list of uncertainties and coping strategies generated from crises cases

<i>Cases</i>	<i>Uncertainties</i>	<i>Coping strategies</i>
The Chinese Health minister Zhang Wenkang in the SARS crisis in 2003	Impacts of an unknown disease	Denial/playing down
Galveston (US) Mayor E. Gus Manuel in responding to Hurricane Alicia in 1983	Impacts of a potential Hurricane	
NASA in the Space Shuttle <i>Columbia</i> disaster in 2003	Consequences of the “foam strike”	Normalization
Local officials in Wenzhou, China in coping with a coming typhoon	Uncertainties about the typhoon track in the weather forecast	Reliance on rules and procedures
BP in the 2010 Gulf of Mexico oil spill disaster	Unknown effectiveness of the oil containment method	Analogy
UK government and EU in the BSE crisis in 1996	Uncertainty whether BSE caused human deaths	Reliance on experts
The Texas state government in the 1964 Hurricane Carla	Unknown hurricane track	Delegation

Although crises usually pose threats to fundamental social values and break down normal organizational routines, crisis managers might still rely on routines or existing procedures to cope with uncertainties in a crisis. In the typhoon evacuation response, the authorities had to deal with the fact that weather forecast cannot accurately predict what cities will be affected by a coming typhoon. Local officials in Wenzhou, China, reported that they coped with this uncertainty by acting according to routines and procedures prescribed in the emergency plans, which specified the evacuation procedures in accordance with the distance of the typhoon to the coast and its speed.¹⁰

Searching for analogies with historical cases is another strategy of coping with uncertainties. Using this strategy, crisis managers rely on lessons learned from experience with similar uncertainties (May 1973; Khong 1992). They may predict the outcome of a situation based on comparisons with similar historical cases (Khong 1992; Houghton 2001; Tetlock and Lebow 2001; Brandstrom, Bynander et al. 2004). After a crisis, crisis managers may learn lessons from their way of coping with uncertainties and store the experience as a reference for future use (Brandstrom, Bynander et al. 2004). For instance, when BP tried to contain the *Deepwater Horizon* oil spill in the Gulf of Mexico in 2010, BP and the whole oil industry lacked knowledge regarding the effectiveness of the oil containment method that was chosen. BP tried the method used effectively in inland oil spills, and adapted the method to the deepwater situation (National Commission on the BP Deepwater Horizon Oil Spill Offshore Drill 2011). But this method did not work in the deep sea environment.

10 This is based on interviewees #2, #3, #5, and #7 in the field research in China in 2008.

The complexities and uncertainties of modern crises, especially in cases of technical disasters, can rapidly exceed the professional capacities of crisis managers. Therefore, crisis managers often resort to professionals and experts, who offer their expertise and experience to help to make sense of unclear situations and improvise solutions (Rosenthal and 't Hart 1991). In the Bovine Spongiform Encephalopathy (BSE) crisis in 1996, a new human disease [a variant of Creutzfeldt–Jakob Disease] was suspected to result from exposure to BSE, a well-known disease in cattle. In order to deal with this uncertainty and clarify whether beef consumption posed a threat to human health, the UK government and the European Union relied heavily on the advice from experts (Grönvall 2001; Millstone and van Zwanenberg 2001), but these experts offered very conflicting advice.

When crisis managers find it difficult to make sense of a situation owing to a lack of information, they might delegate decisions to their subordinates. In the response to the 1964 Hurricane Carla in the US, state governments along the Gulf coast encountered uncertainty regarding whether to issue hurricane evacuation orders. The Texas State officials lacked sufficient information regarding the local situations. Therefore, Texas state officials did not order a state level evacuation but delegated the powers to order evacuation to local authorities (Treadwell 1962; Moore, Bates et al. 1963).

As demonstrated in cases of crisis, crisis managers adopt various strategies to cope with uncertainties. The fact that crisis managers employ different strategies in the face of uncertainties during a crisis still remains unexplored in crisis research. Therefore, this study asks:

Why do crisis managers adopt different strategies to cope with uncertainties in crises?

1.4 Research strategy: towards an institutional sensemaking model

A lot of research has been done on coping with uncertainties, but very few studies have focused on how crisis managers deal with uncertainty in a crisis (Czinkota, Knight et al. 2005; Briggs and Edwards 2006; Croft 2006; Sullivan-Taylor and Branicki 2008). There is no general theoretical framework that identifies factors affecting crisis managers' strategy selection for dealing with uncertainty in a crisis. Zooming out from the crisis context to the general context, a large set of factors in the literature at the individual, organizational and environmental level has been identified (Thompson 1967; Aldrich 1979). The individual level of analysis is used in psychology and involves the study of "micro-level" individual behaviors – referring to individual and group dynamics in an organizational setting. Psychologists highlight the individual experience, differences in framing regarding loss and gain, and the selection of reference points to judge uncertain situations (Janis 1972; Kahneman and Tversky 1979; Klein 2008). The meso-level or organizational level analysis includes the organizational information-processing perspective and classical institutional perspective. The former examines strategy change as the information load increases, while the latter highlights the impacts of routinized ways of working embedded in organizational history to organizational actions. When it comes to neo-institutionalism, the third level of analysis, the theory mainly concentrates on how the external environment influences organizational strategy selection. A detailed discussion of these three analytical levels will be presented in **Chapter 2**.

After reviewing the three analytical levels, we will turn to sensemaking theory, which was developed by Karl E. Weick to model the organizational process of coping with uncertainty through a synthesis of micro- and meso-level factors (Weick 1979; Weick 1995). The theory provides a general framework to depict how organizations interpret uncertainty. The theory predicts that the occurrence of a crisis marks an ecological change, which requires organizations to make sense of the equivocal/uncertain information (Weick 1988; Boin, 't Hart et al. 2005; Maitlis and Sonenshein 2010). Organizational sensemaking begins when equivocal changes are noticed by organizations and considered worthy of further analysis. If an ecological change is subjectively constructed as being inconsistent with organizational experience, it will be listed as a cue for further attention (the cue is also referred to as 'equivocal data'). Here, cognitive biases at the individual level filter the information received, which may determine whether the ecological changes might attract further organizational attention. The equivocal data might be given an interpretation based on existing frames which have proved successful in interpreting equivocal data in previously-occurring situations. If the existing frames are not appropriate for interpreting the equivocal data, the organization will have to give a new interpretation to the equivocal data. Existing frames saved in the organizational memory and the organizational identity formed in organizational history [factors on the organizational level take effect] serve as a schema to determine whether to use existing frames to interpret enactment data or not. Organizations save successful interpretations in the organizational memory for future use.

Sensemaking theory helps to model the organizational processes of coping with uncertainties and provides two basic ways of coping with uncertainties: interpreting based on existing frames versus giving a new interpretation. However, the theory fails to consider the influence of the organizational context to sensemaking actions, and does not integrate environmental factors into the analysis. Institutional theory can fill in this gap by connecting the organizational-level and environmental-level factors.¹¹ Moreover, institutional theory suggests that organizations vary in terms of the degree of institutionalization, which might influence organizational sensemaking actions.

According to classic institutional theory, organizations can be placed on a continuum in terms of institutionalization levels, ranging from highly institutionalized to an institutional void (Jepperson 1991). An institutional void refers to a state where "there are no clear rules and norms according to which politics is to be conducted and policy measures are to be agreed on" (Hajer 2003: 175). In this research, Institutional void is defined as *a situation in which there are no clear, accepted rules and norms according to which a strategy is selected to deal with uncertainty*. To be specific, in an institutional void, organizations lack an existing frame to interpret enactment data. By contrast,

11 In order to better understand the origin of the concept: institution, I hereby give an analogical example from physics, i.e. Newton's gravitation theory. After observing an apple falling from a tree, Isaac Newton was inspired to formulate the concept "gravity" and related gravitation theory to explain the forces that draw objects to the Earth instead of up to the sky. In a similar way, the basic logic in organizational science is that organizations never perform according to their designs, and there are always some "unanticipated consequences of purposive action" as proposed by Robert K. Merton. There might be something hidden that causes these unanticipated consequences. Deeply inspired by his mentor Merton, Philip Selznick adopted the concept institution to explain the unanticipated consequences constrained by contexts, environments, and history.

highly institutionalized organizations *have appropriate rules and procedures that have been accepted and supported by organizational members and constituencies.*

Different degrees of institutionalization may influence organizational ways of coping with uncertainties in the sensemaking process: selecting whether to interpret uncertainties based on existing frames or to develop a new interpretation to a specific situation. A highly institutionalized organization has a frame to help interpret enactment data, whereas organizations with a low degree of institutionalization lack such a frame which makes shared interpretation of uncertainties more difficult. This research will empirically explore how organizations with different levels of institutionalization deal with uncertainty, based on the hypothesis that: *organizations with a high degree of institutionalization tend to rely on existing frames to interpret uncertain information, whereas organizations with institutional voids are more likely to trigger new interpretations to uncertainty.*

Comparative case study

The empirical section of this book consists of a comparative study of four large organizations in the United States that had to cope with uncertainties encountered in four separate major crises. These four organizations have been selected on the basis of their degrees of institutionalization and experience of coping with a documented major crisis. These selected organizations and crises include the Los Angeles Police Department and the 1992 Los Angeles riots, the National Aeronautic Space Administration and the 2003 Space Shuttle *Columbia* Disaster, the Federal Emergency Management Agency and the 2005 New Orleans Floods, and BP and the Deepwater Horizon Oil Spill in 2010.

As this study seeks to identify the influence of institutionalization on organizational sensemaking, data on the development of organizational institutionalization and how organizations cope with uncertainties in crises have been collected using qualitative methods. Each case study describes the organization's institutional development and identifies its level of institutionalization at the time the crisis unfolds. The process-tracing method has been adopted to identify uncertainties encountered in each crisis and organizational sensemaking actions (George 1979; George and Bennett 2005). Process tracing can also help to explore the dynamics of institutionalization and its influences on the strategy change of organizational sensemaking. The data regarding the organizational life history and storyline of each crisis mainly come from secondary sources, such as in-depth incident reports, monographs, and newspaper articles.

1.5 Research aims and outline

The primary research aim of this book is to explain the variety of strategies selected to cope with uncertainties during a crisis. Clearly, the strategy selection of coping with uncertainties is the result of many factors, such as individual preference, organizational characteristics, and political, cultural and societal factors, but the study aims to explore whether different degrees of institutionalization influence organizational strategy selection when coping with uncertainties in crises. Based on the empirical research, we will not only assess if and to what extent institutionalization matters, but also studies if and how institutionalization influence to the selection of strategies to cope with uncertainties during a crisis.

A related goal is to extend Weick's sensemaking theory to different organizational contexts. Weick provides a general theory on the organizational process of coping with uncertainties. This research will apply this theory to organizations with different levels of institutionalization and examine whether the general theory is applicable to organizations with different levels of institutionalization.

Another goal is the empirical application of institutional theory to crisis management. With only a few exceptions, the influence of institutionalization on organizational actions has not been studied much in the crisis context. That is not surprising, because conventional crisis management theory assumes that crises mark a breakdown of basic social systems and social values (Hart 1993), which leads to a focus on organizational actions during crisis response rather than on the influence of institutionalization.

A final goal is to help crisis managers open one of the key "black boxes" in crisis management: sensemaking. The research will help crisis managers catch the dynamics of institutionalization influencing sensemaking. To be specific, the research will help crisis managers learn [1] the role of institutionalization that "blinds" or enables sensemaking according to existing rules, and [2] lessons to switch from dealing with uncertainties based on routines to ad hoc analysis to cope with the novel situations in crisis response.

Outline

This book is divided into eight chapters. Chapter 2 presents a literature review from the field of social psychology, organizational science, crisis management, decision science, public administration, political science and institutional theory to see how the theories outlined their answers to the research questions. This review consists of three layers: firstly, it focuses on individual factors which influence strategy selection by decision makers. Secondly, factors at the meso-level, predominately the organizational level, will be examined. The macro environmental influence is the third layer. At the end of this chapter, an institutional sensemaking model is developed which integrates factors from the three analytical levels. In the model, managing uncertainties is conceived of as a process of sensemaking.

Chapter 3 describes the research design of this dissertation. In this chapter, the concepts are defined and the dependent and independent variables are operationalized. A qualitative method (comparative case analysis) has been used in the empirical part of the study. Organizations with

different institutionalization levels that experienced major crises have been selected as cases for the empirical analysis. Within-case inference and cross-case comparative analysis have been used to explore the influence of institutionalization on sensemaking strategy selection.

Chapters 4 to 7 describe the four cases that form the empirical part of this study. In each case, the institutionalization level will be identified based on the organizational life history; uncertainties and coping actions are identified for each crisis as well. The central research question is how organizational institutionalization influences the selection of strategies to cope with uncertainty in each case.

Chapter 8 presents a comparison of the four cases analyzed in the empirical chapters and generates propositions regarding the institutional influence on sensemaking, specifically on strategy selection when coping with uncertainties. The chapter also outlines the limits of the study and implications for crisis managers.

Chapter 2 Coping with uncertainty: towards an institutional sensemaking model

2.1 Introduction

In order to understand the strategies adopted by crisis managers to cope with uncertainty in crises, this chapter offers an inventory of relevant research insights and results from social psychology, organization theory, political science, public administration and crisis management literature. Unfortunately, the existing crisis management literature leaves much of the territory unexplored. Consequently, this chapter sets out to identify factors in a range of rather disparate theories to develop an understanding of why crisis managers select different strategies to cope with uncertainty in crises.

Dealing with uncertainty poses an important and often inescapable challenge for crisis managers. If we ask why crisis managers adopt different strategies to cope with uncertainty in crises, we must first differentiate between types of uncertainty. Crisis managers do come across different kinds of uncertainties in crisis sensemaking. Different dimensions to categorize uncertainties are elaborated in section 2.2. Then, we will review theories that explain why crisis managers adopt different strategies to cope with similar types of uncertainty. The review is divided into three analytical levels. The micro individual level which captures individual cognition and critical choices is described in section 2.3; section 2.4 deals with the meso-organizational level, which analyzes organizational dynamics in strategy selection and section 2.5 describes the macro system level, which analyzes environments and institutions. For an overview of the different factors explained in this chapter, see [Figure 2-1](#). After reviewing factors from the different analytical levels, we will present a theoretical framework integrating sensemaking theory and institutional theory, which provides a comprehensive answer to the research question of this dissertation in the final section.

2.2 Causes of diversity in strategy selection: different types of uncertainties

Decision makers are believed to behave differently when they face different kinds of uncertainty (Thompson 1967; Duncan 1972; Duncan 1973; Lipshitz and Strauss 1997). The classification of uncertainty must be discussed to uncover how different kinds of uncertainties lead to the selection of different strategies. Students of naturalistic decision making theory, organization theory and disaster management suggest several classifications, which have been matched with different coping strategies (Thompson 1967; Cohen, Adelman et al. 1993).

Before embarking on a theoretical discussion, it must be pointed out that this section does not address statistical-oriented estimates of uncertainty. Although uncertainty statistics do appear frequently in risk-related research, a probability oriented strategy selection does not function well in a disaster or crisis context. Disasters and crises are characterized as having a low probability but high consequences or stakes for crisis managers (Camerer and Kunreuther 1989). Each crisis is

unique in its causes, development and consequences, for which a statistical base does not exist.¹² Therefore, the utility-probability functions of risk research are less useful in crisis and disaster management. Past cases, such as the 9/11 terrorist attacks¹³ (Hutter and Power 2005), demonstrate that calculation-based risk analysis cannot map out uncertainty imposed by potential disasters.

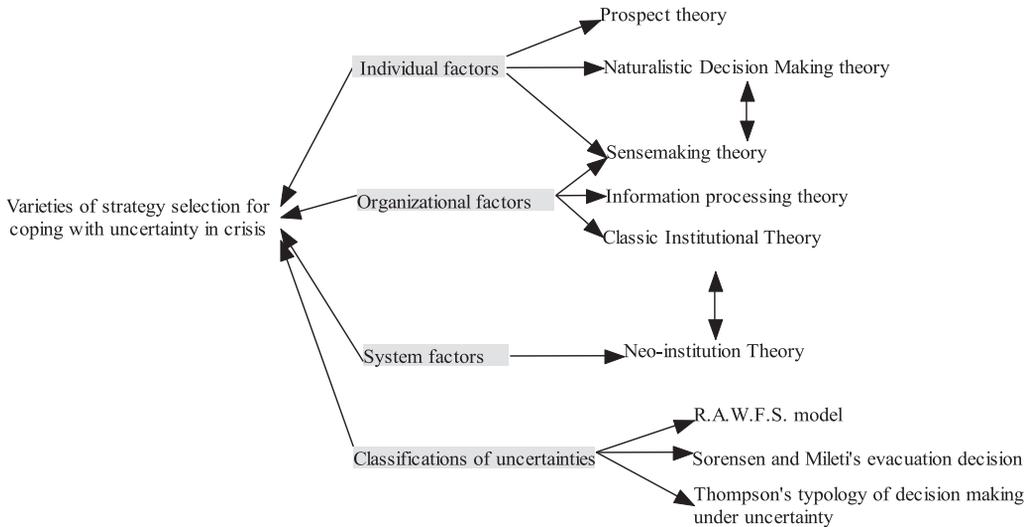


Figure 2-1 An inventory of different theories reviewed in this chapter

This section mainly discusses two classifications used in crisis and disaster management research that address this specific type of low-probability and high-cost situation: the so-called R.A.W.F.S. heuristic¹⁴ and Mileti's classification of uncertainty in evacuation decision. However, neither provides a direct answer to why crisis managers adopt different strategies to cope with uncertainty in crises. Nevertheless, these two classifications do provide cornerstones to conceptualize uncertainty in crises.

The R.A.W.F.S. heuristic was developed to conceptualize uncertainty and match appropriate tactics (Cohen, Adelman et al. 1993). As shown in **Figure 2-2**, the R.A.W.F.S. heuristic distinguishes three types of uncertainty that crisis managers encounter: 1) *inadequate understanding*, 2) *incomplete information*, and 3) *undifferentiated alternatives*. Strategies for coping with uncertainty are classified as: information reduction [for instance, collecting additional information, seeking advice, relying on Standard Operational Procedures], assumption-based reasoning [filling the information

12 See Boin et al. (2005: 4-7) regarding the uniqueness of crises.

13 Before September 11, the possibility of aircraft flying into the twin towers in New York was known to the designer of the building (Hutter and Power 2005).

14 These initials refer to five words and phrases: Reduction, Assumption-based reasoning, Weighing pros and cons, Forestalling, and Suppressing uncertainty, which is a model developed by students from naturalistic decision making theory.

gap with assumptions even when new evidence is in conflict with current assumptions or the situation does not match previous experience], weighing pros and cons of rival options [choosing among alternatives in terms of potential gains and losses], suppressing uncertainty [ignoring uncertainty, acting on the basis of intuition, taking a gamble], and forestalling [improving readiness, avoiding irreversible action, preempting] (Lipshitz and Strauss 1997).

In coping with these different types of uncertainties, decision makers have their preferences for specific tactics (Cohen, Adelman et al. 1993). Actors primarily adopt the *reduction* tactic to cope with inadequate understanding. Crises are characterized as demanding urgent decisions, which do not allow making clear every piece of vague information. As a consequence, simplifying vague information becomes indispensable in a crisis (Hermann 1979). Assumption-based reasoning is the primary strategy to cope with incomplete information. Crisis managers are most likely to weigh pros and cons in order to cope with the third type of uncertainty, i.e. contradictive alternatives. These matches between different kinds of uncertainty and primary strategies selected have been substantiated by empirical research on emergency operations. For example, Lipshitz and Strauss (1997) analyzed 102 self-reports of decision making by officers who were studying at the Israel Defense Forces Command & General Staff College, and Lipshitz et al. (2007) also studied senior station officers of the Melbourne Fire and Emergency Service Board based on the data collected by a head-mounted video camera.

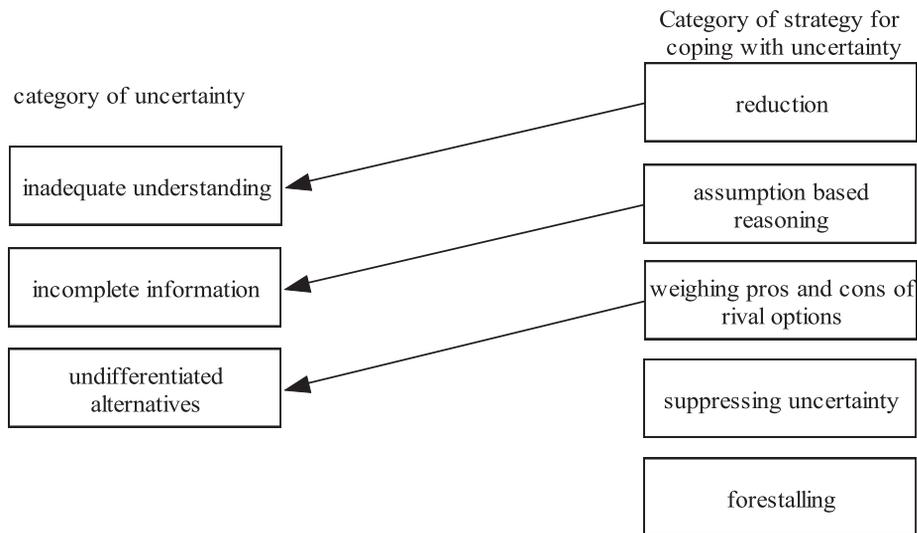


Figure 2-2 R.A.W.F.S. heuristic for coping with uncertainty

It is clear that different types of uncertainties require different strategies in crises. However, this conclusion was based on studies of operational crisis managers, whereas this dissertation aims to explain the selection of strategies to cope with uncertainty at the organizational level, including both operational-level and senior managers. Also, the RAWFS model does not provide clear ideas to conceptualize uncertainty.

The evacuation decision model created by Sorensen and Mileti highlights uncertainty in the decision process and provides another classification based on studies of emergency warning and evacuation decision processes in the face of natural hazards and man-made disasters (Mileti, Sorensen et al. 1985; Sorensen and Mileti 1987). Their research classified uncertainty into *interpretation, communication, perceived impacts, and exogenous influences* in the organizational warning process (Sorensen and Mileti 1987). This empirical research aimed to identify uncertainty in evacuation decisions; however, the authors did not study strategies to cope with these uncertainties. In the twenty years after Mileti and Sorensen’s landmark work in disaster research, this topic has not been explored by the disaster and crisis research communities. The evacuation decision model provides a process oriented classification of evacuation decisions based on crisis managers’ perception. But Mileti and Sorensen do not address the variety of strategies to cope with different uncertainties nor any direct relationships between uncertainties and strategy selection.

Broadening our perspective to a more general organization context, Thompson (1967)’s typology of decision making in his classic *Organizations in Action: Social Science Bases of Administrative Theory* provides inspiration to answer the research questions of this dissertation. A central theme of Thompson’s book is coping with uncertainty in complex organizations. He introduces the concept “environmental uncertainty”, which later became an important theme of organizational studies. Environmental uncertainty refers to the general impact of the organizational environment on organizations.

Thompson categorizes uncertainty based on two dimensions: preferences regarding possible outcomes and beliefs about cause-effect relations [see [Table 2-1](#)]. Each type of uncertainty is matched with a different decision-making strategy [in Thompson’s own words, decision style]. Thompson identifies computational strategy, compromise strategy, judgment strategy and inspiration strategy. A computational strategy fits best when both the cause and preference for outcomes are unambiguous. When the preference for outcomes is clear but the cause/effect relationship is unclear, judgment strategy will be adopted; when the preference for outcomes is uncertain but the cause-effect relationship is clear, a compromise strategy is called for. When neither the preference for the outcomes nor the cause-effect relationships is certain, decision makers will adopt an inspirational strategy.

Table 2-1 Thompson’s (1967) categorization for the process of decision making

certainty		preferences regarding possible outcomes	
		uncertainty	
Beliefs about cause-effect relations	certainty	computational strategy	compromise strategy
	uncertainty	judgment strategy	inspirational strategy

The typology offers a hypothetical answer to the research question.

[1] As the magnitude of uncertainty increases, different strategies will be selected. The variation ranges from a strategy based on rational calculation to a more flexible and intuition based strategy;

[2] Thompson identifies two dimensions of classifying uncertainty which might result in different strategies of coping with uncertainty: beliefs about cause-effect relationships and preferences regarding possible outcomes. It seems the dimension of preferences regarding possible outcomes is at odds with the concept of uncertainty. Preferences regarding possible outcomes presupposes a trade-off between different outcomes, which excludes situations in which the outcomes are uncertain. For instance, decision makers might encounter a situation with no clue on what alternative outcomes could be, in which case there is no question of preference. However, in the present research context, this dimension can be adjusted to the perception of future outcomes.

However, Thompson's point of view to reduce the impact of environmental influence [which is usually a time-consuming process], makes less sense when explaining strategy selection under uncertainty in crises [normally in an urgent situation or a short time span].

This section explains how types of uncertainty make a difference in strategy selection. However, the theories reviewed here do not explain why individuals or organizations select certain strategies. The next section introduces a set of theories that help to explain this point. These theories will be organized at three analytical levels: the micro- level of psychology, the meso- or organizational level and the macro- or system-level.

2.3 Causes of diversity in strategy selection: psychological factors

At the micro- or psychological level, two theories provide helpful perspectives in answering the research question: prospect theory and Naturalistic Decision Making theory. Both theories highlight cognitive factors and individual experiences that might contribute to the selection of different strategies in a crisis.

Coping with uncertainty: individual cognition matters

Prospect theory was initially developed by psychologists Daniel Kahneman and Amos Tversky as a psychologically realistic alternative to expected utility theory (Kahneman and Tversky 1979; Kahneman, Slovic et al. 1982; Einhorn 1986).¹⁵ Prospect theory looks at how people make choices between alternatives that involve potential risks or uncertainty. The research is predominantly based on laboratory experiments. The difference between conclusions drawn from laboratory experiments and their application to a crisis context may be significant. In the laboratory experiments, each choice is assigned a probability and an expected outcome, which is usually not realistic in a crisis. Crisis managers have no time to compare multiple choices, and may adopt the first available alternative to cope with impending threats. The cognitive mechanisms to deal with uncertainty that have been studied in laboratory experiments have been applied in economics (Kahneman and Tversky 2000)¹⁶ and international relations, especially international security

15 Expected utility theory suggests that decision makers select alternatives under uncertain conditions based on expected net utility, $\text{expected utility} = \sum \text{utility}[i] * \text{probability}[i]$.

16 Kahneman shared the 2002 Nobel Prize in Economics with Tversky [who died in 1996] for their contributions to knowledge of human judgment under uncertainty in decision making.

research (McDermott 1998; Mercer 2005),¹⁷ which makes prospect theory a good starting point for our inquiry. Two aspects of this theory are relevant to the research question of this dissertation.

Prospect theory suggests that different framings [as a gain or a loss] of potential outcomes of a decision can lead to different choices. Here, framing refers to the way the situation is described or presented (Tversky and Kahneman 1981). According to prospect theory, decision makers tend to make different choices when an option is framed as a gain or as a loss. Students of prospect theory often use Tversky and Kahneman's (1984: 343) classical *Asian Disease example* to explain this framing effect:

Suppose that

The United States is preparing for an unusual epidemic that has emerged in Asia, which is expected to affect 600 people. Here are two alternatives proposed with the exact estimates of the consequence:

[1] If program A is adopted, 200 people of those 600 will be saved;

[2] If program B is adopted, there is a probability of one third that all 600 people will be saved and there is a probability of two-thirds that no people will be saved.

Another way of framing the same question as follows:

[1] If program a is adopted, 400 people will die;

[2] If program b is adopted, there is a probability of one third that nobody will die and a two-thirds probability that 600 people will die.

This case demonstrates the second relevant aspect of prospect theory: the loss-aversion effect when making choices under uncertainty. When it comes to the first parallel options, both options produce the same expected consequence and are framed as gain situations. When most decision makers choose program A, it can be inferred that people tend to make risk-averse choices if the expected outcome is positive. By contrast, when most decision makers choose program b in the second parallel options, this indicates risk-seeking behavior in situations involving losses (Kahneman and Tversky 1979).

¹⁷ *Political psychology* journal published two special issues in 1992 and 2004 on prospect theory in political science. Political psychologists widely use prospect theory to explain decision maker's behavior in international crises or conflicts, and claim that decision makers "hate to lose even more than they love to win" in the face of uncertainty [Mercer 2005]. McDermott [1998] examined how decision makers adopted risk taking strategies in loss situations and how they selected risk avoidance strategies when they could gain from the situation based on four foreign affairs crisis decisions: the 1956 Suez crisis, the 1960 U-2 crisis, the 1979 decision of admitting Shah, and the Iran hostage crisis from 1979 to 1981.

Research in the US indicates that crisis managers tend to avoid blame instead of claiming credit (Weaver 1986; Hood 2007).¹⁸ Political leaders tend to avoid negatives or failures because voters appreciate them less for their successes than they sanction them for their failure or disappointing performance (Kernell 1977; Lau 1985; Fiorina 1986; James and John 2006), even in natural disaster response (Achen and Bartels 2004). The widespread use of the Internet makes negative information or risk information freely accessible to citizens, which goes hand in hand with a decrease of people's trust in government (Chung 2011). Therefore, we may conclude that avoiding errors or blame is a critical factor in strategy selection in times of crisis (Brecher 1979; Janis 1989).

Coping with uncertainty: prior experience matters

In contrast with prospect theory drawn from a laboratory setting, Naturalistic Decision Making theory [NDM] aims to explain decisions made by operators [instead of decision made on a strategic level] under uncertainty in a real-world setting (Kahneman and Klein 2009).¹⁹ NDM researchers especially focus on complex situations marked by time pressure, vague goals, high stakes, team and organization constraints, changing conditions, and varying amounts of experience (Orasanu and Connolly 1993).²⁰ A series of research findings were generated from operational-level decision making in emergencies, such as fire fighting (Klein 1989) and military decision making (Klein 1999), that have partly been applied in the US army operation manual, the *Field manual (FM) 6-0, Mission command: Command and control of army forces* (Klein 2008).

Recognition Primed Decision [RPD], one of the NDM models relevant to this research, highlights the role of *prior experience and expertise* in coping with uncertainty (Klein, Orasanu et al. 1993; Lipshitz 1993; March and Heath 1994; Lipshitz, Klein et al. 2001). NDM suggests experienced decision makers tend to use a situation assessment ability, which can help decision makers come up with quicker decisions (Scott 2008). Experienced decision makers adopt the first workable solutions instead of comparing different options as suggested by prospect theory (Klein 1999).

Essentially, RPD tells us that the variety of selected strategies is determined by the extent to which decision makers' experience and expertise can help a first responder understand the uncertain situation and evaluate possible response actions to cope with uncertainties. Three variations can be distinguished concerning the role of prior experience and expertise in decision making.

18 This is also called "negativity bias", which means "the cognitive tendency for more attention to be paid to negative than to positive information and for losses to be valued more highly than gains of an equivalent" (Hood 2007: 197).

19 The idea of NDM originated at a conference in Dayton, Ohio in 1989 (Klein 2008), and resulted in a book edited by Gary Klein, Judith Orasanu, Roberta Calderwood, and Caroline Zsombok (1993).

20 It is hard to isolate factors contributing to uncertainty from the general complex situations mentioned in the Naturalistic Decision Making theory (for research that especially investigates uncertainty in NDM, see the R.A.W.F.S. model as elaborated in section 2.2). Therefore, the review and argument made in this section are based on a complex situation in general instead of only an uncertain situation.

In the first variation [the “if...then” form], experienced decision makers match the situation with a typical or familiar one that they have encountered in the past. *Recognizing the situation* includes identifying goals [setting a priority], cues [picking up important information], expectations, and action. Once the typical situation is recognized, a typical response action will follow.

In the second variation [the “if (??)...then” form], decision makers cannot recognize or match a typical pattern based on the available information. They may search for more information to further examine the situation and try to build a story to interpret the inconsistencies. Building the story can help organize inconsistencies into a meaningful interpretation framework. After interpreting the uncertainty, decision makers accordingly choose a response action.

In third variation [the “if...then??” form], the situation is clear to the decision makers, but they find it difficult to figure out the proper response action. Experienced decision makers conduct mental simulations, and come up with an appropriate action quickly in urgent situations (Klein 1999). Mental simulations require experience, but cannot guarantee success in a complicated situation under time pressure and uncertainty. In other words, novice decision makers are especially vulnerable to failure when carrying out a mental simulation.

In sum, research at the individual level suggests that the variety of selected strategies for coping with uncertainty is caused by different understandings of loss and gain, and different prior experiences and expertise. But neither of the theories does take into account the context in which individuals make these decisions, such as the organizational dynamics and the institutional and political environment. The following part will discuss how these environmental and organizational characteristics influence strategy selection when dealing with uncertainty.

2.4 Causes of diversity in strategy selection: organizational factors

Organization theorists have long studied how uncertainty in an organization’s environment influences organizations and how organizations adapt to these uncertainties (Dill 1958; Crozier 1964; Lawrence and Lorsch 1967; Thompson 1967; Duncan 1972). In organization theory, the information processing perspective, sensemaking theory and classic institution theory provide three candidate answers to the current research question.

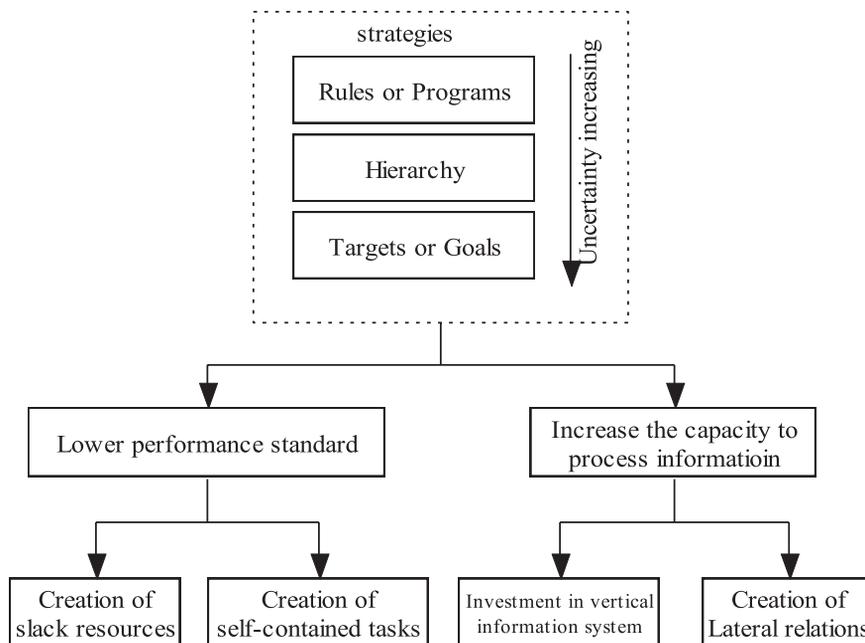
The information processing perspective originating from the contingency school in organizational research highlights structural factors and information processing ability of an organization as contributing to the selection of different strategies. Sensemaking theory depicts a process perspective on resolving uncertain situations. Classic institutional theory doubts the pure influence of organizational structure factors, and claims that “social-culture pressures”, which hide behind formal organizational structures, influence strategy choice (Scott and Davis 2007, 276). Most of the work that has been done from these theoretical perspectives has not been applied to crisis situations, but these theories do provide helpful insights to explain the research question of this dissertation.

Coping with uncertainties: Information processing matters

The ability to process information is an important factor for organizations to cope with the inherent uncertainty of their environments [see Figure 2-3] (Galbraith 1974). The logic is simple because “the greater the uncertainty of the task, the greater the amount of information that has to be processed between decision makers” (Galbraith 1974: 28). The information processing perspective provides useful insights to answer the research question in the following aspects ways:

[1] As uncertainty increases, different kinds of strategies should be adopted for coping with uncertainty. In a predictable context, organizations can use rules and plans that are set up prior to upcoming events. When unexpected situations emerge, reporting to its superiors will be required. When uncertainty exceeds the capacity of its superiors, decision makers may choose to reset the targets or goals.

[2] Galbraith (1974) proposed two design options to cope with the influence of environmental uncertainty: reducing the need for information and increasing the capacity of processing information. For information reduction, organizations mainly use two methods. The first one is to create slack resources. For example, if the organization knows that there might be a shortage of some critical resources in preparing for some potential crisis, they may create a buffering inventory [like sand bags for floods]. The second is to create self-contained tasks that require less coordination among organizations. For example, if community A and community B have a joint command center for emergency medical and rescue service in normal times, it is better for both communities to operate independently to reduce the amount of information exchange and coordination during a crisis.



Adopted and modified from Galbraith (1974)

Figure 2-3 Organizational strategies for dealing with uncertainties: information processing

Two measures stand out as critical for increasing the capacity of information processing. The first is to invest in vertical communication systems among different hierarchies which may speed up information processing under uncertainty. When unexpected situations emerge, an integrated vertical communication system could allow organizations to call upon their superiors more quickly. The second is to create lateral relations. During a crisis response, setting up a multi-department leadership group to cope with an unexpected crisis can help share the information load among lateral organizations and reduce the information load on the vertical dimension (Galbraith 1974).

For example, during the 2008 ice storm in southern China, the Chinese government encountered an unexpected breakdown of its infrastructure systems: the low temperature caused ice formation on the transmission lines and towers, and unexpected large amounts of ice exceeded the designed capacity of the tower, causing the collapse of the power transmission towers. The collapse of the towers further led to the breakdown of the railway system, the postal service, the communication system, and the banking system. All these infrastructural systems were interconnected but managed by different governmental agencies. Therefore, the Chinese government set up a command center to coordinate contingency measures for coal, oil and power supply, transportation and disaster relief (Li 2008).

The organizational information-processing perspective suggests that organization structure matters in the following aspects: a better vertical communication system and creating lateral relations could facilitate information exchange and help clarify uncertain situations; organizations that create slack resources and have an organizational structure ensuring a decreased reliance on other organizations are better prepared for a crisis in terms of unexpected resource demands and uncertainty caused by coordination, respectively.

Coping with uncertainty as a sensemaking/organizing process

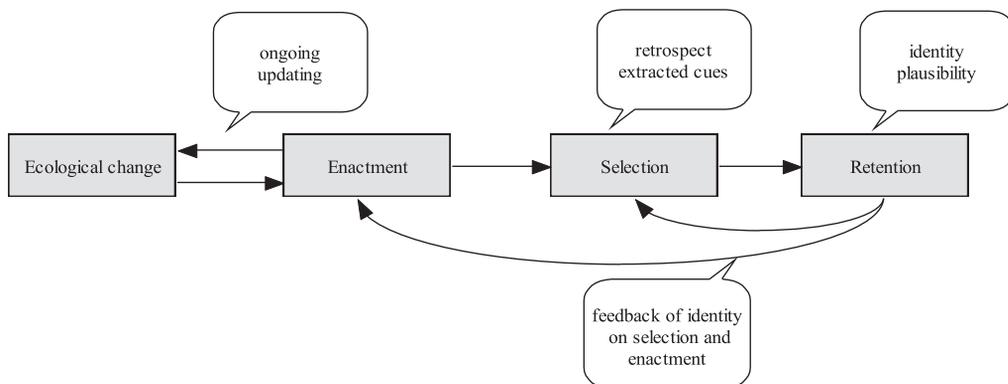
Weick's sensemaking model explains the organizational process of resolving equivocality or uncertainty.²¹ In 1969, Weick's book *the Social Psychology of Organizing* introduced a view that different from mainstream organization theory, intending to "break the stranglehold that decision making and rational models have had on organizational theory" (Weick 2003: 186). Weick defined "organizing" as "the resolving of equivocality in an enacted environment by means of interlocked behaviors embedded in conditionally related processes" (Weick 1969: 91). Weick subsequently developed his idea of organizing into a theory of sensemaking.²² Through the lens of sensemaking

21 According to Weick (1979: 174), "An equivoque is a pun, a term with at least two meanings, two disparate strings of thought tied together by an acoustic knot". Uncertainty means a situation with limited knowledge about what happened, what caused this, and what the future outcome will be.

22 Weick (2003) explained the difference and relations between sensemaking and organizing. According to Weick (2003: 186), "organizing refers to the modified evolutionary process of ecological change-enactment-selection-retention, while sensemaking implies key organizational events happen long before people even suspect that there may be some kinds of decision they have to make". Sensemaking connects with organizing in the following aspects, "ecological change and enactment in organizing = ongoing updating and enactment in sense making; selection = retrospect, extracted cues; retention = identity, plausibility; feedback from retention to subsequent enactment, and selection = feedback of identity and plausibility to subsequent enactment and selection. And all of these organizing and sense-making events are presumed to be social." (Weick 2003: 186).

theory, we see how organizations take in uncertainty from environments, try to make sense of that information, remember what is learned, and put it to use in the future. Weick described sensemaking as “the experience of being thrown into an ongoing unknowable, unpredictable streaming of experience in search of answers to the question ‘what’s the story?’ ‘Now what should I do?’ ” (Weick, Sutcliffe et al. 2005: 410).

In his sensemaking theory, Weick highlights three key phases in the organizing process: enactment, selection and retention as depicted in Figure 2-4 and Table 2-2. According to Weick (1988), the enactment perspective could be understood as both a process (enactment) and a product (enacted environment). The former includes two aspects: a process of bracketing and singling out elements based on preconception and a process of reinforcing preconceptions after acting within those bracketed elements. The latter is the result of the enactment process, which is recognized by organizational members as an explanation of a cue in certain situations. In short, the enacted environment serves as “if-then assertions” or causal maps of action and related outcomes, which are also expectations of future actions and focused perceptions.



Note: adopted from Jennings and Greenwood (2003: 202 adapted from Weick 1979)

Figure 2-4 Weick’s view of the relationship among enactment, organizing and sensemaking

Table 2-2 A process demonstration of the sensemaking model

	<i>Inputs</i>	<i>Processes</i>	<i>Outputs</i>
Enactment	Ecological changes	Notice and bracket	Equivocal data
Selection	Equivocal data Enacted interpretations that worked before [might not exist]	Select plausible interpretations	Enacted environments
Retention	Enacted environments	Stored as a successful sensemaking	Enacted interpretation

Sensemaking starts with ecological change, which could be a discontinuity of organizational routines, something unexpected or something expected that did not happen (Weick, Sutcliffe et al. 2005). The discontinuity provokes a search for certainty and provides raw data for the sensemaking process (Weick 1995).

The “basic raw materials” of Weick’s organizing and sensemaking model consist of “informational inputs that are ambiguous, uncertain, equivocal” (Weick 1969: 40), which emerge naturally in almost every crisis. Crises present organizations with disturbance, disorder, and interruption of normal routine operations (Weick 1988; Maitlis and Sonenshein 2010). These ecological changes cannot be addressed through normal routines, and pose high demands on organizational sensemaking (Weick 1988). Questions like “what ‘the hell’ is going on?”, “What happened?”, “What is the story”, are often asked during a crisis (Colville, Pye et al. forthcoming). Lagadec (1993: 54) helps to catch the dynamics of ecological changes in a crisis: “The event can in some ways be considered as an abrupt and brutal audit: at a moment’s notice, everything that was left unprepared becomes a complex problem, and every weakness comes rushing to the forefront.”

Below we will discuss the three core elements of the sensemaking process and its relevance for explaining how organizations cope with uncertainty in a crisis.

Enactment is the process generating equivocal data²³ (or “might have beens”) that are eligible for further analysis, by which ecological changes are selectively noticed and bracketed according to the organizational flow of experience (Colville, Pye et al. forthcoming). This enactment process links objective realities [ecological changes] and organizational subjective construction of those realities. The process involves two mechanisms: noticing and bracketing. Noticing filters ecological changes inconsistent with organizational experience. The noticed cues could be some changes inconsistent with the framework, or expected events that do not occur (Starbuck and Milliken 1988). After ecological changes are noticed as cues, bracketing serves to bring cues to further attention and attach a label to cues based on existing frames (Weick 1979: 45&147). Both mechanisms are influenced by organizational experiences cumulated in the organization’s history. Organizations tend to have different experiences which lead to different noticing and bracketing mechanisms. These different experiences create different filtering processes when facing ecological changes, which influences strategy selection.

Turner (1997)’s incubation theory which explains the organizational causes of a crisis describes parts of the enactment process. After studying 84 British industrial accidents, Turner (1997: 72) found an “incubation period” before a disaster, involving “a number of events which are at odds with the picture of the world and its hazards represented by existing norms and beliefs”. These events are filtered as irrelevant to normal operations as a result of communication and intelligence failures within organizations. Therefore, the incubation theory highlights failures of the filtering process when organizations cope with ecological changes [events at odds with organizational norms in the disaster incubation theory], while Weick explains both the successful (helping to pick up important cues) and failing parts of the filtering process.

23 Equivocal data are the ecological changes with at least two possible meanings that are perceived by organizational members.

Selection produces an interpretation of equivocal data generated from the enactment process. In the selection process, organizations can either connect the equivocal data with an enacted interpretation that worked before [stored in the retention which will be explained in the next paragraph] or create a new interpretation of the equivocal data. This provides two different ways of coping with equivocal data [uncertainty]. If the selection process discredits an enacted interpretation, organizations give a specific interpretation to the equivocal data which creates a plausible story to cope with the emerging uncertainty. Weick describes this type of selection as a specific interpretation. By contrast, if organizations connect the equivocal data with an existing enacted interpretation, organizations tend to match an interpretation to an uncertain situation. Weick names this type of selection as the stabilization of the figure-ground arrangement, or a scheme interpretation (Weick 1979: 45). Maitlis (2005) has adopted other terms to distinguish these two kinds of selection: the production of accounts (similar to a specific interpretation) versus the “activation” of existing accounts (similar to a scheme interpretation).

Retention is the process of storing successful sensemaking for future use. The result is a causal map that connects cues with an interpretation framework. When such a causal map is considered successful, it tends to be stored in the organizational memory for future use. In future sensemaking, retention thus guides and constrains enactment and selection. Here, sensemaking theorists do not distinguish different kinds of strategies but only describe the sensemaking process in a general way. Obviously, if the successful selection is stored as retention, organizations have an additional way to interpret ecological changes [uncertainty], which might lead to the selection of a new strategy.²⁴

Coping with uncertainties: institutions matter I

The Institutional school provides two theoretical perspectives to explain the variety in strategy selection under uncertainty (Zucker 1987). *Classical institutionalism* focuses on the institutionalization process of organizations and how institutionalization contributes to organizational actions [strategy selection as an action]. *New institutionalism* explains how strategy selection is not just determined by individual choices and organizational structures, but how it is also shaped by organizational contexts or macro-environments. These environments consist of informal or formal rules and procedures [either current or historical choices]. Such rules, procedures and norms are embodied in the organizational environments and influence organizational actions as coercive, normative and mimetic forces (Hannigan and Kueneman 1977; DiMaggio and Powell 1983; March and Olsen 1984; Wildavsky 1987; DiMaggio and Powell 1991; Vaughan 1997).²⁵ This section highlights how institutions influence strategy selection at the organizational level [classical institutional perspective]. In the next section, the influence of institutional environments at the macro-level [neo-institutional perspective] will be discussed.

The question of what institutions are will be addressed before elaborating the two institutional perspectives. According to New institutionalism, organizational environments can be seen as

24 Students of sensemaking theory assume that the action and interpretation cannot be separated in the organizing process, and insist that actions persist once the uncertainty is interpreted.

25 This will be elaborated in the neo-institutionalism section.

institutions. Here, institutional environments must be distinguished from technical environments: the latter are “those within which a product or service is exchanged in a market such that organizations are rewarded for effective and efficient control of the work process”, whereas the former are “characterized by the elaboration of rules and requirements to which individual organizations must conform if they are to receive support and legitimacy from the environment” (Meyer, Scott et al. 1983: 140). In this view, an institution could be an organized procedure, a shared system, social pattern or arrangement of laws, rules, norms, symbolic, and cultures, which can reproduce itself and is “external to the consciousness of the individual” (Jepperson 1991: 145; Ferris and Tang 1993).

Classical institutionalism defines an institution as an organization that is *infused* with *values*, and is characterized by “a distinctive competence or a trained or built-in incapacity” (Selznick 1957; Selznick 1996: 271). In this perspective, institutions are specific organizations (Ferris and Tang 1993), and “organizations vary in the degree of institutionalization” (Scott 2008: 79). Members of a highly institutionalized organization are committed to the organization and its way of working (Selznick 1948).²⁶ The institution is valued by relevant actors in the organization’s environment as well, which provides the organization with legitimacy and support from its constituents.

Classical institutionalism mostly studies how an organization becomes institutionalized (Selznick 1949; Brewer 1989).²⁷ This theory also helps us understand how the level of institutionalization shapes, guides and constrains organizational actions and strategy selection, as is relevant for this dissertation. Scott (1998: 66) defines institutionalization as a “process by which an organization develops distinctive character structure”. In the process, “unstable, loosely organized, or narrowly technical activities” turn into “orderly, stable, socially integrating patterns” (Broom and Selznick 1968: 238).

Varying degrees of institutionalization tend to impact differently on organizational actions. Selznick proposed two extreme types of organizations in terms of institutionalization: organization versus institution. The types of organization might influence strategy selection when coping with uncertainties. Institutions have a stable and orderly pattern of working, and tend to be confident in their way of working and their capacities of coping with problems faced. The orderly and stable patterns are taken for granted, and supported and endorsed by the organizational environment. Therefore, strategies for coping with uncertainty tend to be predictable and based on these stable patterns. By contrast, organizations do not have stable patterns of working, and organizational members and constituencies lack commitment to the organizational values. Organizations have to serve the interests of stakeholders. Organizations have no deeply embedded and valued practices and schemes to rely on, but tend to select strategies based on ad hoc analysis and discussion (Boin and ‘t Hart 2000)

²⁶ In this dissertation, the term “highly institutionalized organization” refers to an institution. Conversely, “lowly institutionalized organization” refers to an organization.

²⁷ Some important works include Selznick’s (1949) study *Tennessee Valley Authority* and Brewer’s (1989) study on *NASA*.

2.5 Causes of diversity in strategy selection: the macro environment Coping with uncertainties: institutions matter II

This section focuses on institutions as organizational environments and reviews insights from New Institutionalism on how institutional environments and pressures influence organizational actions [again action refers to strategy selection under uncertainty].

Mainstream New institutionalism holds that institutional environments affect organizational actions through so-called isomorphism effects (Meyer and Rowan 1977; DiMaggio and Powell 1983). Isomorphism captures a process that organizations in a similar 'niche' tend to become more alike. When some practices or procedures are believed to be externally validated and enjoy high legitimacy among stakeholders in the organizational environment (DiMaggio 1988), organizational actions become predictable and are considered as taken for granted and "obvious" (Berger and Luckmann 1967; Zucker 1977; Vaughan 1996).

The effects that organizational environments have on organizations can be coercive, mimetic and normative (DiMaggio and Powell 1983). Mimetic means learning from other successful practices, procedures or organizational structures in order to cope with high environmental uncertainty. Normative effects originate from similar attitudes held by professional groups and associations and passed on via hiring and training. Coercive effects describe the influence of legal mandates or regulation forces, or other sources affecting organizations. The institutional environment may sanction the organization when its behavior is perceived to be inconsistent with dominant social values and norms (Dowling and Pfeffer 1975). If organizations follow the procedures and rules, they show that they have done everything possible to reduce a risk or address an uncertainty. They demonstrate their responsibility to the community and "avoid claims of negligence" (Meyer and Rowan 1977: 344; Vaughan 1997). If they do not, organizations can become the object of intense critique (Boin and 't Hart 2000).

Organizational environments also vary in terms of institutionalization, which tends to impact organizational actions differently. Some organizational environments may have no formulated rules or norms [which could be referred to as a state of institutional void], and then the adoption of an institutional structure or procedure is less influenced by existing norms. By contrast, when the environments have been infused with publicly accepted norms and rules, adopting a strategy tends to be more a response to pressures from the institutional environment "regardless of their value for the internal functioning of the organization" (Tolbert and Zucker 1983: 26; Donaldson 1995).

Additionally, Oliver (1991) argues that organizations do not just react passively to their institutional environments, but act strategically (Perrow 1986; DiMaggio 1988; Scott 2008: 169). According to Oliver (1991), these strategic responses vary from imitating successful models from other organizations to actively manipulating the environment.²⁸

28 For more about these classifications, see Oliver (1991: 151-159).

Although Oliver (1991) does not give us a clear empirically based conclusion on what makes organizations choose to conform to or resist institutional pressure, she does provide a framework to map out different factors of institutional environments. These factors cover the main framework of institutional theory,²⁹ including [1] the causes of organizational conformity to institutional pressure, which might be perceived legitimacy or economical gains; [2] the multiplicity of constituents or the extent to which organizations depend on constituents; [3] the extent to which the institutional pressure is consistent with organizational goals, and the perceived discrepancy after conforming to institutional pressure; and [4] legal coercion and voluntary diffusion.

In conclusion, these different perspectives offer a variety of theories and concepts that help explain how crisis managers may select different strategies to deal with critical uncertainty in socially organized settings. Based on these theories, a series of factors contributing to the variety of strategies selected under uncertainty have been identified. As shown in [Figure 2-1](#), these factors include different types of uncertainty, individual cognitive bias regarding loss and gain, experience, information-processing capacities, the sensemaking process, the degree of organizational institutionalization and institutional environments. Two preliminary conclusions can be drawn from the theories reviewed:

Firstly, most of these theories are based on the functioning of organizations in normal times, not on crisis states of organizational life. Whether these theories are sufficiently suited for crisis states needs to be examined.

Secondly, these contributing factors operate at different analytical levels: the environmental level [such as institutional environments], the organizational level [organizational institutionalization, sensemaking process and information processing capacities], and the individual level [cognitive bias regarding loss and gain, and experience]. These factors all seem to have an impact on strategy selection, but there has not been much effort to synthesize the different levels of analysis, which might provide a more comprehensive answer to the research question.

Although the efforts are to incorporate different levels of analysis, the analysis unit of this study centers on the organizational level—an individual organization. To understand the organizational behavior of coping with uncertainty, studying intra-organizational and inter-organizational relations becomes an indispensable part. Among the reviewed theories, sensemaking theory and institutional theory are not confined to a single analytical level, but try to focus on the intra-organizational and inter-organizational relations. As can be seen in [Figure 2-1](#) and [Figure 2-5](#), sensemaking theory provides a general framework to describe the organizational process of coping with uncertainty, which mainly connects the individual and organizational level. Institutional theory explains factors both at the organizational level and the environmental level. In the next section, an institutional sensemaking model will be proposed integrating both theories to explain how an organization coped with uncertainties during a crisis.

29 Here Oliver also integrated the resource dependence theory. Basically, Oliver tried to explore how institutional factors impact organizations regarding resisting or conforming to institutional pressure.

2.6 Towards an institutional sensemaking model

Sensemaking and institutional theory have been developed as two parallel theories, and only limited efforts have been made by researchers to connect them (Weick, Sutcliffe et al. 2005; Powell and Colyvas 2008). Sensemaking focuses more on cognitive complexity, less on social and historical contexts (Jennings and Greenwood 2003; Weber and Glynn 2006). When it comes to Institutional theory, it provides an explanation on the influence of organizational factors and organizational contexts, but focuses less on the individual actions (Oliver 1991). Researchers in the field of New institutionalism, such as Zucker (1991: 105), have called for opening the black box of institutionalization at the organizational level instead of focusing on the macro institutional analysis only. Organizational actions cannot be explained without the social context either, whereas the social context can only be understood through organizational cognition (Friedland and Alford 1991). This dissertation relies heavily on classical institutional theory, because it has a similar central focus on organizations but still connects well between organizations and their environment.

Theorists from both sides [sensemaking and institutionalism] have called for research to link micro and macro elements (Weick 2003; Powell and Colyvas 2008). However, only some theorists, such as Wick (2001), Jennings and Greenwood (2003), Weber and Glynn (2006), and Jeong and Brower (2008) have initiated preliminary dialogues aiming to link both theories. There is even less research focusing on the impacts of institutionalization on sensemaking in the context of crises (Maitlis and Sonenshein 2010). An important aspect shared by both institutional theory and sensemaking theory is that both theories acknowledge the influence of historical and cultural factors. The very idea of an institution captures historical and cultural elements embedded as recurrent routines, procedures, cultural beliefs, scripts or appropriate actions. Sensemaking theory features the concept of retention, which is a historical and cultural factor influencing the enactment and selection process.

The institutional sensemaking model [see [Figure 2-5](#)] views coping with uncertainty as a process of sensemaking, and tries to explore the influence of institutionalization on sensemaking.³⁰ In the following section, we will explore how institutionalization may influence sensemaking.

Institutionalization sets boundaries for organizational members' perception, including the process of sensemaking. To be specific, institutions provide taken-for-granted cognitive constraints for organizational actions (Taylor and Van Every 2000; Weber and Glynn 2006; Maitlis and Sonenshein 2010). Cooley and Angell (1956) and Jepperson (1991: 153) take a more extreme view, suggesting that individuals and organizations are always influenced by the "effects of institutions". Powell and Colyvas (2008: 277) indicate more specific impacts of institutions:

"Institutional forces shape individual interests and desires, framing the possibilities for action and influencing whether behaviors result in persistence or change. Macro

30 In this section, we will only discuss the impacts of institutions on the sensemaking process. We will not focus on how sensemaking actions remold the organizational institutionalization process (as marked with a dotted line in [Figure 2-5](#)) [these actions were named "transformational mechanisms" by Weber and Glynn. For details, read Weber and Glynn (2006)].

institutional effects, through processes of classification and categorization, create conventions that are the scripts for meaning making”.

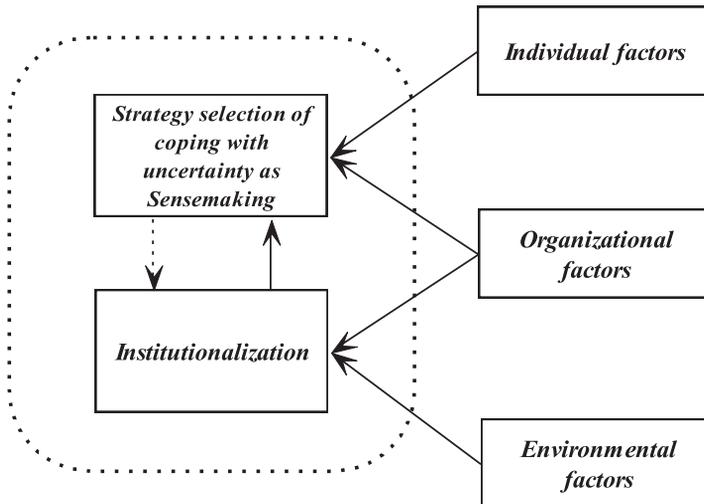


Figure 2-5 An institutional model of sensemaking

As discussed in section 2-4, organizations vary in terms of their degrees of institutionalization (Jepperson 1991; Tolbert and Zucker 1996). Organizations with a high degree of institutionalization have shared typifications [usually some taken-for-granted categories and appropriate actions], generalized expectations of a situation and common interpretations of behaviors (Barley and Tolbert 1997; Weber and Glynn 2006). These highly institutionalized organizations are confident of their institutional way of working, which consistently encourage the selection of typified actions and interpretations [or causal maps] (Meyer and Rowan 1977; Grandori 1987: 86; Wicks 2001; Jeong and Brower 2008), and decreases opportunities for understanding unexpected emerging cues or selecting alternative interpretations (Barley and Tolbert 1997; Weick and Sutcliffe 2001; Weber and Glynn 2006).

The Federal Aviation Administration’s initial response to the 9/11 attacks is a case in point to explain this simple matching of cues with typified situations and identities in a highly institutionalized organization during a crisis. The FAA is well-known for its high reliability in air traffic control and has been identified as a model High Reliability Organization (Roberts 1990; La Porte 1996; O’Neil and Krane 2012). The FAA has created and institutionalized very specific procedures to prevent errors in air traffic for both controllers and the aviation industry (Spencer 2008). On the day of the 9/11 attacks, when *American Airline 11* lost communication with the Indianapolis Air Traffic Control Center, the controllers assumed that there was a temporary communication problem or the captain forgot to change the channel of communication equipment when the flight arrived in the service area of the other air traffic control center. The controller just waited and continued to try to contact the aircraft. The aircraft had not been registered as being hijacked, because the FAA guidelines specified that the pilot must notify the control center with a special code for a hijack. At the FAA, all controllers were trained to follow existing guidelines and

procedures and they heavily relied on these procedures to cope with uncertainties. Therefore, the FAA did not change its institutionalized perception until the second aircraft crashed into the Twin Towers (The 9/11 Commission 2004).

In sharp contrast, under-institutionalized organizations lack clear ideas on what they are expected to do, what their appropriate roles are, or even internal or external consensus on what to do, and how to do it. In other words, there is no typified experience to help extract cues from ecological changes. Instead, there might be controversy between different actors within organizations regarding cue extraction. Such controversy might hinder the generation of a mental picture that is shared between different organizational groups. Weick's (1993) classical case study of the Mann Gulch disaster demonstrates that a temporal organization [which is an under-institutionalized organization] failed to build up a shared understanding to cope with uncertainties during a crisis response. During a response to the wildfire in the Mann Gulch area of the Helena National Forest in Montana (United States, a temporary team consisting of sixteen members was dispatched to fight the fire. The team leader), Wag Dodge, did not know most of the crew in the temporary team. When Dodge realized that their fire fighting method might be ineffective in coping with the fire, he ordered the crew to "drop their tools" [such as shovels and saws] and improvised, lighting a fire in front of them and ordering them to lie down in the area it had burned [a so-called escape fire].³¹ For most crew members, keeping "their tools" in hands was standard procedure and was required according to their training. Dropping their tools and starting the escape fire was novel to them and was at odds with the method they had trained. Therefore, none of the crew members adopted the escape fire method. As a result, two of them survived on an unburned ridge, and the other thirteen died.

Institutionalization sets boundaries for organizational perception, but can also help to figure out cues during a sensemaking process. In the enactment process, institutionalization helps to define a situation of interruption and generate cues for further attention through comparing ecological changes with organizational expectations according to past experiences. Highly institutionalized organizations tend to produce scripts [typified actions to situations] as an anchor to judge ecological changes.³² If an ecological change does not match typified scripts, the ecological change is considered a cue for further attention. Organizations may not generate a single expectation in response to the ecological change, but rather multiple and possibly contradictive expectations.

After cues are recognized by organizations as requiring continuous attention in the enactment process, the selection process relies on institutionalization to narrow down the equivocality and decide what to deal with and what to leave alone, or ignore. The selection process relies on existing interpretation frameworks which have gained the "moral and ontological status of taken

31 Escape fire is a method to set some fires nearby before wildfire comes close to firefighters. The burnt areas can provide a life-saving space when the wildfire approaches. In the Mann Gulch fire, this method has not been taught to the firefighters.

32 Here I adopt the definition from Barley and Tolbert (1997: 98): "Scripts are observable, recurrent activities and patterns of interaction characteristic of a particular setting".

for granted facts”, as retentions in the previous sensemaking cycle (Barley and Tolbert 1997: 94).³³ Facing an existing interpretation framework and the enacted cues, organizations must decide to either reinforce the existing interpretation framework, or reframe or alter it. In the enactment process, organizations might produce contradictory expectations in response to the cue, which could be an interpretation based on an institutionalized framework versus a specific interpretation discrediting the current framework.

Based on the theoretical discussion of institutional influence on sensemaking actions, the following general hypotheses have been constructed about the relationship between institutionalization and strategy selection to cope with uncertainty in a crisis:

Organizations with a high degree of the institutionalization tend to stick to existing scripts or frames to interpret uncertainty.

Organizations with a low degree of institutionalization do not use an existing interpretation framework to match enactment cues, but instead these organizations create an interpretation framework from enactment cues.

These hypotheses will guide the empirical research in the following chapters.

2.7 Conclusion

This chapter has reviewed relevant theories at three analytical levels, and concluded that there is a need for integrating these analytical levels in order to provide a more comprehensive answer to the research question. An institutional sensemaking model is proposed which combines sensemaking theory and institutional theory. The former explains coping with uncertainty as a process of sensemaking which integrates the micro and meso level factors. The latter serves to bring together the meso and macro level factors, which impacts on the sensemaking process. The aim of this research is to explore how institutionalization influences sensemaking actions, and if it influences strategy selection when coping with uncertainty in crises. Chapter 3 will operationalize key concepts and variables of the institutional sensemaking model used in the empirical part of the research.

³³ Weick (1969) states that “organizing serves to narrow the range of possibilities, to reduce the number of ‘might occurs’. The activities of organizing are directed toward the establishment of a workable level of certainty”.

Chapter 3 Exploring the influence of institutionalization on sensemaking in crises: a research design

“Because of their low probability, these events [crises] defy interpretations and impose severe demands on sensemaking.”

Weick (1988: 305)

3.1 Introduction

The previous chapter examined various theories that provide potential answers to the research question of this dissertation: why do crisis managers select different strategies to cope with uncertainty in crises? After reviewing these theories, the previous chapter built an institutional sensemaking model which aims to integrate separate contributing factors from different theories operating at three analytical levels. In order to explore the soundness of the institutional sensemaking model empirically, this chapter will [1] define and operationalize variables and concepts in the theoretical model, including institutionalization, strategy selection and uncertain situations, and [2] outline the methodology that guides the empirical research.

3.2 Defining and Operationalizing key variables

Defining uncertainty in a crisis

This research aims to explore the influence of institutionalization on strategy selection in coping with uncertainty in crises. The operationalization starts with defining and identifying uncertain situations that organizations encounter during a crisis. In the academic literature, specialists from different disciplines offer potentially useful definitions of uncertainty (Noordegraaf and Abma 2003).³⁴⁻³⁵ Early on, economist Frank Knight (1921) distinguished uncertainty from risk, and suggested that “risk” means randomness with knowable probabilities [“a quantity susceptible of measurement”], whereas “uncertainty” cannot be assigned such a probability. Information scientists Shannon and Weaver (1949) proposed that uncertainty means that *possible alternatives* exist and the *probability of their event* is relatively equal. Berger and Calabrese (1975) defined

34 Scholars from different disciplines use different terms with similar meanings, for example, “incomplete information” (Lipshitz and Strauss 1997), and “substantive uncertainty” when not all necessary information for decision making is available (Koppenjan and Klijn 2004). Apart from the term uncertainty, the following words expressing a similar meaning often appear in the crisis literature: “unexpected”, “ambiguity”, “turbulence”, “risk”, “task uncertainty”, “equivocality”, “conflict” and “vague”.

35 Weick (1995) made a distinction between ambiguity and uncertainty. In his distinction, ambiguity refers to the situation with too much information, while uncertainty refers the ignorance of the current situation. Noordegraaf and Abma (2003) made a sharp distinction between these two concepts. They defined uncertainty as a state of lacking of information to predict future consequences while ambiguity referred to a state with different interpretations. This study adopts a broader definition, which includes not only a lack of information about the current situation, but also the causes, consequences and coping actions. To make it simple, too much information or a state with different interpretations all lead to uncertainty for crisis managers, which are defined as a type of uncertainty in this dissertation.

uncertainty as the “*number of alternative ways in which each interactant might behave*”. In decision theory, Doug Hubbard (2007) defined uncertainty as “*the lack of certainty, a state of having limited knowledge where it is impossible to exactly describe an existing state or future outcome, more than one possible outcome*”.

These definitions illustrate uncertainty with a common feature, i.e. a lack of information, whether it is for prediction or alternatives selection. This dissertation defines uncertainty as:

a situation of having limited knowledge about what happened, what caused this, what the future outcome will be, what the appropriate coping method to the situation is.

This dissertation discusses uncertainties in crises. In **Chapter 1**, a crisis is defined as:

“...a serious threat to the basic structures or the fundamental values and norms of a social system, which -under time pressure and highly uncertain circumstances -necessitates making critical decisions” (Rosenthal, ‘t Hart et al. 1989: 10).

Table 3-1 Operationalization of uncertainty

Components	Indicators
State	Crisis managers cannot answer these questions about the current situation of the crisis: “what is happening?”, “what is the damage situation?”, “who or what is affected by the crisis?” or “what happened?”
Cause	Crisis managers cannot answer the questions about the causes of the crisis: “what caused the current state of affairs?” “who or what is responsible for the crisis?”
Consequence	Crisis managers cannot answer these questions about the consequences: “what is next?”, “will the crisis expand to other areas?” or “can we control the situation?”
Response options	Crisis managers cannot answer these questions about how to respond to the crisis: “how can we deal with this?” “whom can we ask for help?” “which alternatives will be effective?”

Uncertainty can be operationalized by distinguishing between different phases in the development of a crisis (as shown in **Table 3-1**). Crisis managers may have little information about the *current state* of a crisis [this is the case when crisis managers cannot answer typical questions like “what is happening”, “what is the damage situation”, “who or what is affected by the crisis” or “what happened”] (Lawrence and Lorsch 1967; Huber, Oconnell et al. 1975; Leifer and Huber 1977; Milliken 1987). Crisis managers may not know *what caused the* current state and who or what is responsible for the crisis (Lawrence and Lorsch 1967; Thompson 1967). Crisis managers may not be able to anticipate the *consequences* or impact of the ongoing crisis [this is indicated when crisis managers cannot answer these typical questions: “what is next?” “will the crisis expand to other areas?” “can we control the situation?”] (Wolfson and Carroll 1976; Milliken 1987; Sorensen

and Mileti 1987).³⁶ Crisis managers may not know what available *response options are* [this is the case when crisis managers cannot answer these typical questions: “how can we deal with this?” “whom we can ask for help?”] (Wolfson and Carroll 1976; Milliken 1987) or crisis managers cannot determine which alternatives will be effective (Lawrence and Lorsch 1967; Thompson 1967; Wolfson and Carroll 1976; Billings, Milburn et al. 1980; Cohen, Adelman et al. 1993).

The dependent variable: strategy selection

In defining the dependent variable, strategy selection, Mintzberg’s (1978: 935) definition of strategy is adopted: “a pattern in a stream of decisions”. Mintzberg and Waters (1985) propose two ideal types of strategies: deliberate strategy and emergent strategy (Mintzberg 1978). The former is based on existing organizational intentions, and executed without interference from organizational environments; the latter is not based on intentions from the organization. In practice, most strategies used are combinations of both ideal types.

This research adapts Mintzberg and Waters’ (1985) typology of strategy in accordance with the sensemaking theory outlined in [Chapter 2](#). Sensemaking theory provides two ideal types of actions under uncertainty: schema-based and specific interpretations. These two types of actions are classified based on whether the cues are connected with an existing frame or not. The definition of strategy adopted in this dissertation emphasizes the pattern [which refers to a series of actions or decisions] instead of a single action. To put it another way, strategies can be operationalized as a series of sensemaking actions, whether schema-based or specific interpretations. Moreover, an existing frame from sensemaking theory is comparable to organizational intentions as indicated in Mintzberg and Waters’ (1985) typology. In another word, a specific interpretation is not based on organizational intentions, and can be classified as an emergent strategy, while a rule-based interpretation is based on organizational intentions, and can be classified as a deliberate strategy.

However, these two ideal-type strategies (schema-/rule-based or deliberate versus specific/ad hoc or emergent) cannot cover all possible ways of coping with uncertainties during a crisis. Therefore, we add two additional types in the classification: ‘no strategy’ and ‘semi-rule-based strategy’. The following sections describe these four types of strategies and explain how they be measured (as shown in [Table 3-2](#)).

When using a *rule-based* strategy, organizations act according to either plans or rules with limited adaptation. The sensemaking actions can be based on formal plans which have been formulated before a crisis arises. These plans specify the actions to be taken in the face of uncertain situations. Once the conditions for executing the formal plan are satisfied, organizations take measures based on the plan, and rely less on flexible actions in order to adapt to changes in the environment. Rule-based strategies can also be based on a shared vision, shared intentions, or shared expectations of all relevant actors.

36 Milliken (1987) uses “effect uncertainty” to represent uncertainty regarding “causes” as well as “consequences”.

Organizations that use a *semi-rule-based strategy* do not have rules or plans that clearly specify how to deal with uncertain situations, but are constrained by specified visions, boundaries, processes or structures. Crisis managers select strategies under the influence of a central vision, intention or expectation from superior organizations or stakeholders. Strategies can be selected within boundaries and guidelines that are provided by superior organizations or stakeholders. Within these boundaries, organizational members can be flexible in coping with uncertainties. In terms of adapting structure or process, organizations might devise temporary organizational structures/procedures to cope with problems.

The third type of strategy is *ad hoc*: organizations are free from the influence of internal and external expectations. This strategy might be used in situations that are unexpected for the organization and its stakeholders, in which organizations have not built shared expectations of strategies to cope with the uncertainty, or are autonomous in coping with the uncertainty. This could happen when the institutionalized framework collapses after it has proved ineffective. In these situations, organizations analyze uncertain situations or rely on professionals; existing rules or frameworks are ignored.

The last type, *no strategy*, occurs when organizations do not select any strategy or are excluded from selecting strategies. This may happen under the following conditions: organizational capacities are overwhelmed in a crisis; organizational strategies are imposed by external actors; organizations think that the situation is still under control and that they can afford to wait for more information to better understand the uncertainty.

Table 3-2 Operationalization of strategies to cope with uncertain situations

<i>Components</i>	<i>Indicators</i>
Rule-based strategy	Organizational series of sensemaking actions according to formal plans or rules
Semi-rule-based strategy	Sensemaking actions are constrained by boundaries temporarily created by superior organizations or stakeholders. The boundary could be a new or adjusted mission, or increased external intervention or supervision.
Ad hoc-based strategy	Sensemaking actions are to a limited degree influenced by existing frameworks or expectations. Organizations investigate uncertain situations and give meanings to each uncertainty based on deliberate analysis.
No strategy	Collapse of organizational sensemaking when the organizational capacities are overwhelmed; Organizational sensemaking strategies are imposed by stakeholders; Organizations may consider the situation is still under control and wait for further information.

Mapping out the dimensions of institutionalization as independent variables

Operationalizing institutionalization is notoriously difficult. Little research has been conducted that has measured institutionalization in a valid and reliable way. The present research builds on Selznick's (1957) definition of institutions, which defines an institution as *an organization that is infused with values and achieves a distinctive character*. Boin and Goodin (2007: 42) have given a more precise definition of public institutions: "we use the term 'institution' for those entities that are marked by a coherent and dominant way of working that is valued internally and externally". Selznick and his followers highlight that institutions are valued by both the internal members and external actors (Schein 1992; Boin and 't Hart 2000; Boin and Goodin 2007; Boin and Christensen 2008; Groenleer 2009). Accordingly, we will measure the level of institutionalization on both the internal and external dimensions.

Institutionalization: the internal dimension

The internal institutionalization refers to the degree to which organizational members and sub-organizational groups value the way of working in the organization. In an organization with a high level of institutionalization, organizational members and sub-organizational groups share the organizational mission, general beliefs and underlying philosophy of the organization, develop necessary expertise and capacities to accomplish critical tasks, and are committed to established organizational practices, such as scripts, rules and classifications.

The first component of the internal dimension is shared missions and general beliefs about the organizational way of working (Wilson 1989). Organizations are created with a mission or goal in mind, whether the mission has been imposed by a regulating agency or superior organization, or defined by the organization itself. The mission that an organization has from the outset may be characterized by ambiguity, multiplicity or conflict or may be impractical (Scott and Davis 2007; Rainey 2009). An institution adopts an achievable mission from ambiguous, multiple and conflicting goals, and prioritizes the adopted mission in its organizational development process. Moreover, organizational members share similar beliefs and assumptions about the organizational role in performing critical tasks, and about the ideal organization. These beliefs and assumptions are not vulnerable to a desire for short run financial gains and efficiency (Collins and Porras 1994: 71). By contrast, members of organizations with a low level of internal institutionalization generally do not have a common understanding of the organizational mission and critical tasks, and there are no widely accepted assumptions or beliefs about how the organization should be run to achieve its mission and perform its critical tasks (Boin and 't Hart 2000)

Organizations with varying degrees of internal institutionalization differ in their commitment to organizational procedures and the established way of working (Bass and Stogdill 1990). In an organization with a high level of internal institutionalization, organizational members widely endorse the critical tasks defined, share organizational values, feel a sense of mission that prescribes what they should do and why they should do it in this way instead of relying on individual preferences and choices (Kaufman 1960; Kelman and Hamilton 1989; Schein 1992; Boin and 't Hart 2000; Scott and Davis 2007). In such an organization with a high level of internal institutionalization, organizational members "act in the name of the institution, because they identify with the institution and are prepared to sacrifice some aspects of themselves for it"

(Pfeffer 1990: 72-74; Levitt and March 1995: 13). They strongly believe in the effectiveness of their way of working (Wilson 1989), and take pride in it. In some organizations, they may even believe that as long as everybody follows rules and procedures, they will always be successful. By contrast, members and subunits in organizations with a low degree of institutionalization tend to be autonomous and act in rather fragmented ways according to different values and beliefs (Boin 1998: 72).

To measure the first component, we can observe policy plans that the organizations have formulated in their organizational history. By analyzing these policy plans over the years, we can conclude whether they have consistently formulated a central mission. Based on policy plans, organizations have to develop ways of working to achieve missions. By reading manuals developed by the organizations, we can see whether organizations have implemented the mission and developed their own way of working to solve problems. To measure whether organizational members have their shared way of working, we can assess whether organizational members have the freedom to deviate from the uniform way of working (all these indicators have been summarized in [Table 3-3](#)).

Table 3-3 Operationalization of the internal dimension of institutionalization

<i>Components</i>	<i>Indicators</i>
organizational missions, general beliefs and working philosophy	Whether policy plans were accepted and supported by organizational members
	Whether organizational members implemented plans based on working manuals
	To what extent organizational member could deviate from organizational ways of working
Necessary expertise and capacities to accomplish critical tasks	To what extent selection standards are based on demands of capacities and expertise
	Did the organization provide training to staff to sustain its expertise and organizational way of working?
	Was the promotion of staff based on his/her professional expertise?

To support an organization in achieving its mission and to translate general beliefs into operational practice, a second component, developing necessary expertise and capacities, is indispensable. An organization with a high level of internal institutionalization develops effective ways of working to solve problems encountered in pursuit of organizational missions (Boin and Christensen 2008). This requires organizational expertise. An organization with a high degree of internal institutionalization is composed of staff with professional backgrounds, and maintains a reasonable level of staffing with a low vacancy rate. Such an organization attracts talented staff to sustain its expertise and organizational capacities and provides training for staff to maintain organizational expertise and capacities. To measure the second component, we can analyze the organizational recruitment, training and promotion system.

Institutionalization: the external dimension

The second dimension of institutionalization focuses on the organization's relations with its environment. An organization that is valued by external actors is an organization that enjoys high legitimacy among stakeholders (Hannigan and Kueneman 1977). Legitimacy can be defined as a sense of "appropriateness", "taken for grantedness", "obligation or willingness to obey" or as something "desirable", "proper", and "fair" (Suchman 1995; March and Olsen 2004). Legitimacy gives the organization a "normative dignity" (Berger and Luckmann 1967), which decouples the organization from its internal structure and activities (Meyer and Rowan 1977). This research will adopt Suchman's (1995, 574) definition of organizational legitimacy:

"a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions".

Although the literature on organizational legitimacy offers different perspectives with regard to the way of gaining legitimacy (Dowling and Pfeffer 1975; DiMaggio and Powell 1983; Zucker 1987; Ashforth and Gibbs 1990; Gladwin, Lazo et al. 2009), the authors tend to agree that legitimacy comes from organizational constituents or stakeholders (Suchman 1995).³⁷ We adopt Ancona's (1998: 11) definition of stakeholders, as "the social actors who play a role in the survival and success of the organization who are affected by the organization's activities".

A high level of external institutionalization means an organization's way of working is legitimized, accepted and supported by different external stakeholders, actors or interests groups in the organizational field, such as mass media, law makers, professional societies (Berger and Luckmann 1967; DiMaggio and Powell 1983; Scott and Meyer 1991; Scott and Davis 2007: 269; Scott

37 One group of scholars postulates that organizational legitimacy is the outcome of a purposely symbolical design of gaining public support, which is consistent with the bottom-up process from classical institutionalism as discussed in [Chapter 2](#) (Ashforth and Gibbs 1990; Dowling and Pfeffer 1975). The purposeful design might include actions of framing favorite organizational choices and creating rituals, symbols, and ideologies of choices (Gladwin et al. 2009). Other scholars emphasize that pressures from social norms, values, and beliefs determine organizational legitimacy, which is consistent with the top down process as suggested in the Neo institutionalism (DiMaggio and Powell 1983; Zucker 1987). Although both streams of literature offer different ways of gaining organizational legitimacy, they all agree that support comes from constituents.

2008).³⁸ These organizations have stable mechanisms of negotiation with stakeholders in their organizational set², which guarantees its resource and support (Scott 1991; Blau and Scott 2003; Scott 2008). This usually translates into an autonomous status which allows the organizations to maintain its distinctive identity (Selznick 1957; Wilson 1989).³⁹

By contrast, an organization with a low level of external institutionalization finds itself in a state of institutional void. The organizational field and organizational population² have few shared norms, cultures, customs, codes of conduct, traditions regarding what the organization should do and how the organization can do this to solve encountered problems (DiMaggio and Powell 1983; Williamson 2000). In this institutional void, organizations find it hard to maintain a stable coalition with stakeholders, and their way of working has little legitimacy among stakeholders. Stakeholders might not agree on what role an organization with a low level of external institutionalization should play or how it should play it.

38 Three concepts, i.e. organizational sets, organizational populations and organizational field, proposed by Scott and Meyer (1991), can help us provide a full map of stakeholders and draw the boundaries regarding constituents. Organizational set refers to the relationships with certain organizations, which can be based on being accountable to, information, resources, authority or power dependence, or legitimacy needs (Blau and Scott 2003). Organizational set maps out organizational relationships with external actors. For example, some coercive pressure is imposed by the external authorities or organizational superiors, like the government, regulatory actors, superior organizations, professional, judicial and political organizations (Scott 1991; Scott 2008), and some normative forces mainly come from the professional communities (DiMaggio and Powell 1983). Organizational population refers to “aggregates of organizations that are alike in some respect” (Scott and Davis 2007: 127). Organizational population can explain the organizational ecology in the horizontal dimension, which can assist to describe the competition, coalition or cooperation among organizations with similar functions or relying on similar resources or legitimacy. Under the isomorphism effects, organizations face mimetic pressures of copying or emulating successful practices from these similar types of organizations identified in the organizational population (DiMaggio and Powell 1983). Organizational field is a new meso-level concept, which was created to map out the environmental factors impacting organizational actions (DiMaggio and Powell 1983; Scott 2008). Organizational field consists of diverse organizational populations and their organizational sets that “operate within an institutionally constructed framework of common meanings” (DiMaggio and Powell 1983; Scott and Davis 2007: 269). The public and interests group can shape the constructed framework of the field. Moreover, the media’s framing contributes to the perception of stakeholders in the field.

39 Wilson (1989: 195) defined autonomy as “the agency has a supportive constituency base and a coherent set of tasks that can provide the basis for a strong and widely spread sense of mission”.

Table 3-4 Operationalization of the external dimension of institutionalization

<i>Components</i>	<i>Indicators</i>
Political support	Did the organization use public relations efforts aimed at political stakeholders?
	Did regulatory and/or supervisory agencies regularly challenge the organizational way of working?
	resource allocation (in public organizations with a high level of external institutionalization, a stable budget means the support from presidents; in private organizations with a high level of institutionalization, stable stock prices mean support by investors)
Public Support	Did mainstream media hold a positive or negative tone towards the organization
	Did the organization use public relation efforts aimed at interest groups and professional organizations
	challenges in court or complaints from stakeholders
	opinion polls about the organization

Measuring external institutionalization is facilitated by typologies of stakeholder support (as shown in Table 3-4). The first component is political support, which can be measured based on the following indices: the use of public relations efforts aimed at political stakeholders; whether regulatory agencies regularly challenges the organizational way of working; the resource allocation [in public organizations with a high level of external institutionalization, a stable budget means the support from presidents (Meier 1980); in private organizations with a high level of institutionalization, stable stock prices mean support by investors]. The second component is the degree of general public support, which can be measured with the following indices: exploring whether mainstream media held a positive or negative tone towards the organization; the use of public relation efforts aimed at interest groups and professional organizations; challenges in court or complaints from stakeholders; opinion polls about the organization.

A new typology of organizations based on institutionalization

The present research will be based on a typology of organizations, which is constructed in terms of internal and external institutionalization. The typology of organizations is depicted in Figure 3-1. In the typology, there are four ideal types of organizations, referred to as the *Organization*, the *Institution*, the *Arrogant Organization*, and the *Mythical Organization*. Each ideal type will be explained in this section. In real life, organizations will be found in the white circle area of Figure 3-1, and their positions evolve over their organizational life history.

Selznick's (1957) distinction between *Organization* and *Institution* is adopted to define the two extreme types of organizations [*Organization*⁴⁰, with a low level of institutionalization on both the

40 Here, the word "Organization" as a type of organization classified based on institutionalization is different with the general meaning specified in other sections of this manuscript.

internal and external dimensions as shown in the top-left cell of **Figure 3-1**, and *Institution*, with a high level of institutionalization on both the internal and external dimensions as shown in the bottom-right cell of **Figure 3-1**]. *Organization* refers to a rational tool to achieve a goal. Once the goal is achieved, the organization can be terminated. By contrast, an *Institution* is an organization that has been infused with values and has internally developed a distinct character, and externally gained support and acceptance among stakeholders in its organizational environment.

The other two ideal types of organizations that are placed between the two extreme types have been developed based on the internal and external dimensions of institutionalization [the *Mythical Organization*, with a high level of external institutionalization but its internal institutionalization remaining low as shown in the top-right cell of **Figure 3-1**, and the *Arrogant Organization*, with a high degree of internal institutionalization and a low level of external institutionalization as shown in the bottom-left cell of **Figure 3-1**]. The *Mythical Organization* lacks a shared mission and working philosophy and has not developed necessary expertise or organizational capacities. What makes this type of organization “mythical” is that these organizations maintain a high level of external support that is not based on their actual performance. By contrast, the *Arrogant Organization* possesses deeply cherished values and missions, and has developed organizational capacities and expertise to accomplish critical tasks. However, its organizational way of working has not gained acceptance among its stakeholders.

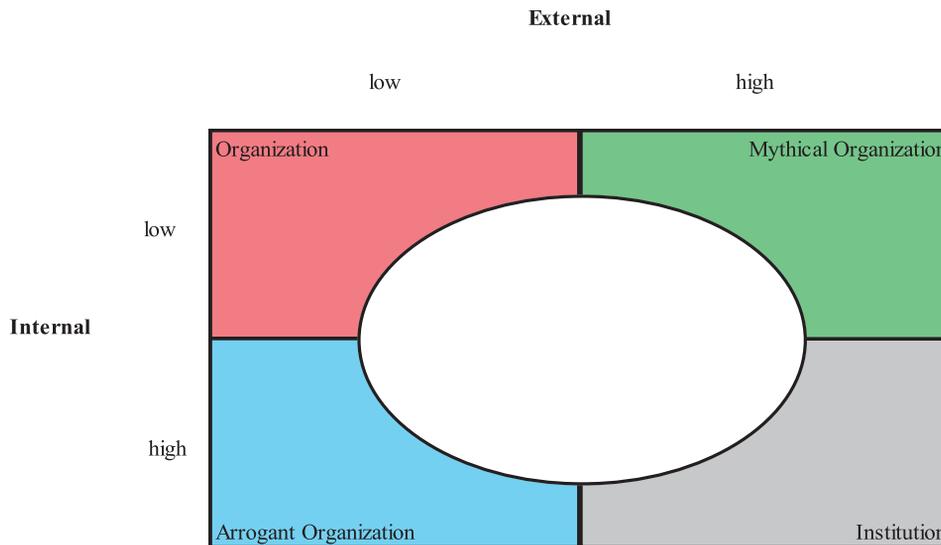


Figure 3-1 A typology of organizations based on institutionalization levels

3.3 Towards an empirical exploration of institutional sensemaking: integrating comparative-case study and within-case analysis

This research aims to extend Weick's sensemaking theory by studying organizations with different degrees of institutionalization in the context of crises. Building on the ideas of Karl E. Weick, this research generates theories based on inductive analysis. It uses qualitative methods to study organizational strategy selection in the face of uncertainties in a crisis. When exploring a new topic that has so far generated a limited amount of research, case studies and an inductive method can help to generate new propositions by analyzing how causal relationships actually occur. Using the within-case analysis, qualitative research can help to investigate the dynamic process of sensemaking in organizations when responding to a crisis (Pettigrew 1992). Uncertainty and coping strategies are identified using rich descriptions (Siggelkow 2007), and mechanisms whereby institutionalization affects sensemaking strategy selection are uncovered. Cross-case comparison helps to provide a base to build a theory of sensemaking under different degrees of institutionalization (Yin 2003).

The following section will elaborate the research design of the comparative case analysis and in-depth case study. It starts with a description of the case selection method and data sources, and then presents the data analysis method.

Case selection and data sources

The case selection was done in two steps:

Step 1: identification of potential crises and organizations involved, both of which have to be richly documented.

The following conditions apply to the crisis cases: [1] the threat agents of the crises have been identified either within the crisis response process or before; [2] selected organizations have been recognized by a major actor as responsible for responding to the identified crisis; [3] both the selected organization and crisis have to be carefully documented in reports or other monographs. The documented sources regarding the organizations should record the organizational life history, allowing the institutionalization level of the selected organizations to be established. The data on the crisis should document the crisis response of the selected organizations. Generally speaking, no single document could satisfy the purpose of this study; thus a large number of documented resources have been examined.

Step 2: based on the typology of institutionalization identified in the conceptual framework, organizations figuring in four crises have been selected to fill each cell of [Figure 3-2](#).

In order to make the four cases comparable, selected cases have to satisfy the following criteria: [1] the time frames of selected crises are kept relatively comparable, ranging from twenty days to three months (thus excluding "long" crises such as climate change or the financial crisis). [2] Each case starts when cues of the impending crisis have been perceived by selected organizations. [3] All cases are selected within the same political and social contexts, in this dissertation from the United States, as these cases are unusually well documented.

Following these two steps, a great number of crises and response organizations have been studied. However, most crises and major response organizations were not well documented based on available materials. Four organizations that have experienced a major crisis stood out as key examples of the particular types identified based on levels of institutionalization. As shown in [Figure 3-2](#), these organizations are the Los Angeles Police Department (LAPD) in the 1992 Los Angeles riots, the National Aeronautic Space Administration (NASA) in the 2003 Space Shuttle *Columbia* Disaster, the Federal Emergency Management Agency (FEMA) in the 2005 New Orleans Flood, and BP in the Deepwater Horizon Oil Spill in 2010.

The “*Organization*” cell is filled by FEMA. At the time of the 2005 New Orleans flood, this organization lacked external support and acceptance among stakeholders, and had an eroded capacity to accomplish its conflicting goals. In the 1990s, FEMA was a shining star under the Clinton Administration (1993-2001). After the 9/11 attacks, FEMA experienced a major reform, which turned this independent cabinet-level organization into a sub-organization in the newly created Department of Homeland Security. The reform put FEMA in the midst of a deinstitutionalization process when Hurricane Katrina struck in 2005.

NASA is selected as an “*Institution*”. NASA has always been well known for its advanced technological capacity and culture embedded in space exploration, and maintained a relatively high safety record in launching space shuttles. In spite of a period of diminished political support and waning public interest in space exploration, NASA has adapted to a shrinking budget environment and maintained its distinctive character in space exploration.

BP fills the cell of the “*Arrogant Organization*”. BP, as one of the major international energy companies, was well known for its efficiency and management style in oil and gas production. BP’s safety record had not been that good and regulatory agencies lacked sufficient technical capacity to monitor its performance. BP was internally infused with its value of achieving efficiency, but suffered externally from a declining reputation.

The cell of “*Mythical Organization*” is filled by LAPD, that once had a distinctive character built on an aggressive and pro-active approach to policing. However, LAPD could not maintain its performance level, and its character as a quick response force quickly eroded. Externally, LAPD long maintained its autonomous status and enjoyed support from major stakeholders.

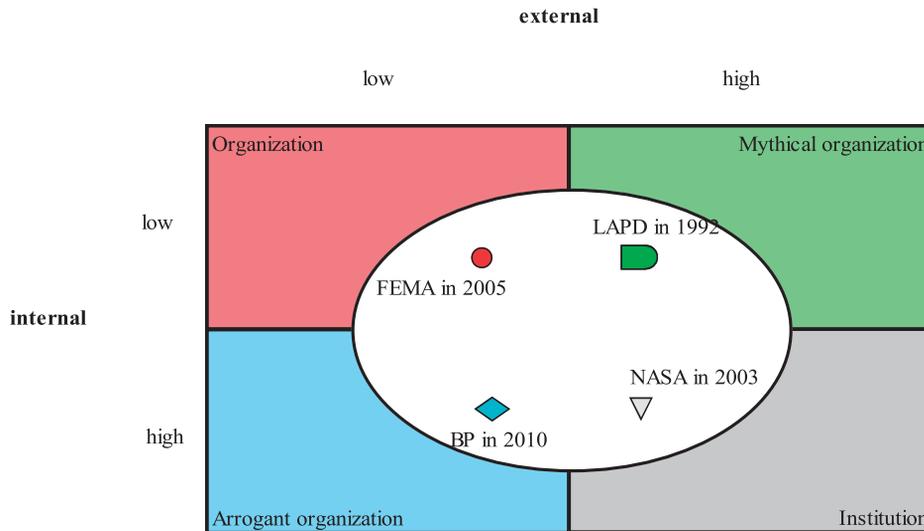


Figure 3-2 Case selections under the typology of institutionalization

Available documents for these four cases are descriptively rich which allows triangulated verification. These selected cases have been extensively excavated in various reports or monographs compiled after long-term and thorough investigations. For example, in the Hurricane Katrina case, there are reports from Congress, the White House, the Senate Committee on Homeland Security and Governmental Affairs, the US Department of Homeland Security, and CNN. These documentations and archival records provide multiple data sources to verify the longitudinal process in each case (Yin 2003). Moreover, these documents [mostly public documents or investigation reports] were put together by professional teams based on hundreds of interviews, public hearings, inside stories, and documental analysis. Few academic field work reports contain such detailed accounts of a crisis.

Clearly, understanding how American organizations work and why organizations select certain strategies in a specific uncertain situation is not an easy task for a researcher from another country. The following measures helped to better master the American situation and context. Personal experience of living in the United States for seven months and travelling several times to conferences in different parts of the US helped to get a general sense of the society. Watching documentary films and movies related to the cases helps to gain insights on how the organizations work and to build a general storyline of the crisis. Reading classical books on the organizational history and culture helped to understand the degree of institutionalization of an organization, based on which how the organization developed in terms of institutionalization was pieced together. In order to further understand the organizations, the internet tools [mostly the RSS functions of Google reader]⁴¹ were used to follow recent news and information from professional

41 When Google stopped its Reader service in 2013, I continued with *Xianguo*, a China based RSS service provider.

blogs, websites of selected organizations, and news portals and academic journals of selected policy domains, which provide more details on recent developments in the field, and on the organizational way of working to deal with similar cases [a selected list of these web sources has been summarized in [Appendix 1](#)].

Data Analysis: process tracing and theory development

To study the influence of institutionalization on organizational sensemaking in crises, a process tracing method can help to map out the the process that links causes to outcomes (George and Bennett 2005; Bennett 2010; Mahoney 2012). As such, the analysis of each case starts with describing the state of institutionalization of each identified organization, and tracing how each organization developed that degree of institutionalization. The description of institutionalization levels became the causes of the inference. Secondly, the storyline of each crisis will be described and uncertainties faced and strategies selected will be identified based on the operationalizations explained in the previous section. Strategies selected are outcomes in the inference. Thirdly, relationships between institutionalization and the organization's strategy selection will be explored.

The process tracing method requires a careful description of cases. Collier (2011: 823) claims that "'static' description is a crucial building block in analyzing the process being studied". In contrast to data-set observations or statistical oriented causal inference,⁴² process tracing relies on data that can provide rich information on context, process, conditions and outcomes, which is indispensable to generate causal inferences (Brady and Collier 2010; Mahoney 2010).

The process tracing method helps to catch the dynamics of uncertainty and organizational coping strategies. In a crisis, as more information becomes available, one perceived uncertainty may turn out to be a certainty, but another uncertainty may become an organization's central focus (Stinchcombe 1990). A failed attempt to make sense of an uncertainty might lead to a change in coping strategy. Process analysis can help to trace the changes in perceived uncertainties and the switch of coping strategies, and record the context in which the change happens.

In crisis research, countless cases have been studied, but most focus on the uniqueness of a single case instead of cross-case comparison or theory development (Weick 2007). Dynes (1989) realized the danger of focusing on the uniqueness of single cases in crisis and disaster research, and called for comparative research to develop theories. Early crisis theorists studied examples to generate crisis theories based on rich materials. For example, Weick's (1993) single case study on the Mann Gulch Disaster used rich materials from Norman Maclean's (1993) book *Young Men and Fire*, and Weick developed a theory on the collapse of sensemaking during a crisis. Turner's (1978) study is based on more than eighty reports of industrial accidents in the United Kingdom and served as the basis for the disaster incubation theory. Following in the footsteps of Weick and Turner, this research employs multiple cases and tries to generate an institutional sensemaking theory.

42 Collier, Brady and Seawright (2010) refer to the data matrices analyzed in quantitative research as the data-set observations.

The cross-case comparison serves to explore the impact of different levels of institutionalization on sensemaking actions (to be specific, strategy selection). The “structured, focused comparison” will be conducted with a combination of the analyses and induced propositions generated from each case (Eisenhardt 1989; George and Bennett 2005; Eisenhardt and Graebner 2007). After examining the dynamics of sensemaking in each case, the difference in the evolution of sensemaking strategies will be examined. Based on this cross-case comparison, the institutionalization conditions that influence the selection of each type of sensemaking strategy can be found. Besides, the influence of institutionalization levels on an organization’s tendency to switch strategies or to show rigidity in adhering to a selected coping strategy will be examined. The following four chapters (Chapters 4 to 7) describe the empirical exploration of how institutionalization influences organizational sensemaking.

Chapter 4 The U.S. Federal Emergency Management Agency and the 2005 Great New Orleans Flood: A deinstitutionalized response organization facing unknown unknowns

“When normal plans do not work and new working procedures are required, managers need to demonstrate competencies in sense-making and adaptation. But, rigidity in plans inhibited them from exerting leadership in adapting to changing factors of Hurricane Katrina.”

— Oh (2012: 9)

4.1 Introduction

The New Orleans Flood in the summer of 2005 caused by Hurricane Katrina ranks as one of the biggest US natural disasters in terms of human and economical loss (Howitt and Leonard 2006; Waugh 2006). The Federal Emergency Management Agency [FEMA] describes Hurricane Katrina as the “most devastating natural disaster in the US” (FEMA 2011). The flooding put over 80 percent of New Orleans under water (Morris 2006; Select Bipartisan Committee 2006), which had never occurred in US history in such a highly urbanized area (Leonard and Howitt 2006). Historian Douglas Brinkley (2006) used the phrase “the great deluge” to describe the devastation.

FEMA, as a federal agency responsible for coordinating emergency management, was at that time in the midst of a deinstitutionalization process. In the 1990s, FEMA was well known and well respected for its role in coordinating federal agencies in natural disaster response, mitigation, preparedness and recovery (Schneider 1998). After the 9/11 terrorist attacks in 2001, however, counter terrorism became the central focus of the federal emergency management policy. In 2003, FEMA lost its status as an independent cabinet-level federal agency; it was absorbed into the newly created Department of Homeland Security [DHS] as a sub-agency. After the reform, FEMA’s capacities eroded. FEMA was fighting with its mother organization DHS for maintaining its core tasks in the cycle of emergency management and for resources and an autonomous status (Corrêa d’Almeida and Klingner 2008). When Katrina hit, FEMA was still experiencing the challenges brought by this organizational reform.

This chapter will examine the process of FEMA’s deinstitutionalization, and explore how this influenced FEMA’s selection of strategies to cope with uncertainties encountered in the response to the 2005 Great New Orleans Flood. Section 4.2 gives an overview of the city of New Orleans and the Flood in 2005. Section 4.3 describes the organizational history of FEMA’s deinstitutionalization process. Section 4.4 identifies the uncertainties encountered by FEMA and the way FEMA dealt with them. The chapter ends with an exploration of how organizational deinstitutionalization influenced FEMA’s selection of strategies to cope with uncertainty. The theoretical framework presented in Chapter 2 will be applied here.

4.2 The Big Easy: a vulnerable city hit by a predictable top 10 catastrophic event

In the morning of August 29, 2005, the fast moving category III Hurricane Katrina made its second landfall in Southeast Louisiana after it first hit Florida on August 23 as a Category I hurricane (as shown in [Figure A2-2 in Appendix 2](#)). The hurricane caused the levees that protected New Orleans against the water of Lake Pontchartrain and the Mississippi River to break, as shown in [Figure A2-1 in Appendix 2](#) (Brinkley 2006).⁴³ After the levees failed, around 80 percent of the city was flooded. It took 43 days to pump the water out of the city (Federal Coordinating Officer 2006).

Before the landfall of Hurricane Katrina, many citizens in New Orleans had evacuated. Over 80 percent of the citizens had fled the city and around 60,000 people had been moved to public shelters before the hurricane made landfall. However, around 10,000 to 20,000 citizens, mostly poor, carless inhabitants, remained stranded in the city (Nigg, Barnshaw et al. 2006).

After the hurricane struck, the capacities of shelters (whether predesigned or not) were exceeded by the crowds of stranded citizens. The Superdome, a pre-designed shelter of last resort, was overwhelmed by the unexpectedly large number of stranded disaster survivors. The nearby Convention Center was temporarily established as a shelter for disaster survivors who could not be accommodated in other shelters (Select Bipartisan Committee 2006). The available food and water could not meet the needs of the unexpected number of disaster victims; the hot and humid tropical weather in Louisiana worsened the situation [a lack of electricity generators for air conditioners did not help either]. For the people in the Convention Center, the situation was even worse as no supplies had been prepositioned there. Looting and crimes near the Convention Center were reported and amplified by the media, which caused a sense of panic among survivors (Dwyer and Drew 2005).

Governmental response at the federal level proved to be slow. The media broadcasted the terrible situation in the Convention Center, but FEMA director Michael Brown did not learn about this temporary shelter before hearing about it during a radio interview. It was not until September 1 that FEMA began to coordinate critical supplies and buses to evacuate disaster survivors from the Superdome and the Convention Center (Nigg, Barnshaw et al. 2006).

New Orleans had always been recognized as a vulnerable city both geographically and social-economically (Fischetti 2001; Cutter and Emrich 2006). In the *Scientific American*, New Orleans was described as “a disaster waiting to happen” (Fischetti 2001).

In a geographical sense, New Orleans had lost large amounts of wetlands as a natural protection and there had been insufficient maintenance of its artificial levee structures used for protecting the city against flooding. Historically, wetlands have served as buffering zones to protect against the high surge caused by hurricanes in Louisiana, but around 1.2 million acres of Louisiana’s coastal wetlands had disappeared between 1930 and 2005 (Barras, Beville et al. 2003). The decrease in

43 The levee system in New Orleans is the most complex one in terms of water control in the United States.

areas of wetland increased the exposure of the city to higher surge tides over a shorter distance. According to the America's Wetlands spokesperson King Milling, "for every 2.7 miles of marshes/swampland that disappeared, there was a corresponding increase of one foot of storm surge" (Brinkley 2006: 13). The decrease in coastal wetlands shortened the distance of the city to the Gulf from 50 miles in the past to 20 miles (Perin 2003).

The decrease in the areas of wetland is a result of the flood control system in the Mississippi River, which stopped the deposit of sediment necessary for wetland sustenance. Perin (2003) attributed the decrease in wetlands also to other factors, such as the oil production and shipping industry in Louisiana. Apart from the natural protection zones, dams and canals played an important role in preventing the city from flooding. However, levee maintenance in New Orleans was hampered by budget cuts in the US Army Corps of Engineers and poor local economical conditions (Brown and Schwarz 2011).

In a social-economical sense, New Orleans suffered from long-existing poverty problems which increased the social vulnerabilities of the city (Brinkley 2006). For instance, around 51,000 people in New Orleans did not have a car (Cutter and Emrich 2006),⁴⁴ which had been ignored by local authorities in the pre-hurricane evacuation and increased the exposure of these people to hurricane-induced hazards.

FEMA placed preparing for a catastrophic hurricane hitting New Orleans high on its agenda after Michael Brown took over as administrator. A catastrophic hurricane hitting New Orleans, also named "the New Orleans Scenario", together with an earthquake in California and terrorist attacks in New York, were ranked as the major threats to the US (Brinkley 2006). But only limited measures were taken to improve the resilience of the city before Hurricane Katrina hit, according to Brown (2006)'s testimony. In order to improve preparedness for a catastrophic hurricane hitting New Orleans, FEMA planned a disaster exercise named Hurricane "Pam" in 2004. A private company named *Innovative Emergency Management* designed the scenario for this exercise: a slow-moving category III hurricane hitting southeastern New Orleans. The exercise lasted for five days with a broad involvement of the main actors like FEMA, the Louisiana Office of Homeland Security and Emergency Preparedness [LOHSEM]⁴⁵, and the National Weather Service. However, lessons learnt from this exercise, such as a lack of preparedness for long-term shelter and temporary housing, were not implemented in time for the 2005 hurricane season due to an insufficient budget from DHS, according to Brown (2006) in his testimony before the Selected Committee public hearing. For instance, FEMA could not allocate 15,000 dollars for travelling which delayed a workshop to further explore the simulation results (Moynihan 2009).

44 According to Senator Mary Landrieu (D-LA) in CNN's report on August 27, 2005, the figure is about 30 percent of the population in New Orleans.

45 Currently the organization falls under the governor's office, which is named the Governor's Office of Homeland Security and Emergency Preparedness.

4.3 The deinstitutionalization of FEMA

Federal emergency management policy in the United States

The federal government has played an increasingly important role in disaster relief in the United States (Schroeder, Wamsley et al. 2001; Sylves 2008; Kapucu, Van Wart et al. 2011). Before 1950, disaster relief was the responsibility of neighbors, churches, charities, and local governments. Federal government had provided some financial assistance to states by ad hoc legislation for over a hundred times since 1803 (FEMA 2011). For instance, the Flood Control Act of 1936 was passed after the Ohio and lower Mississippi river floods (Rubin 2007).

The Disaster Relief Act of 1950 [PL 81-875] is marked as a watershed of federal disaster assistance. It officially indicated a role for federal government in disaster relief (FEMA 2010). Under the Disaster Relief Act, federal government began to assist local governments upon request (Birkland 1997; Wilson and Oyola-Yemaiel 2001; Cooper and Block 2007). To this day, this local-centered approach dominates disaster relief response; federal assistance plays a supplemental role in providing aid upon request from states when local capacities are overwhelmed (Bourgin and Agency 1983; Popkin 1990; Sylves 2008). The Robert T. Stafford Disaster Relief and Emergency Assistance Amendment [the Stafford Act] of 1988 connects long-term mitigation efforts with federal disaster assistance and authorizes FEMA to coordinate federal disaster relief efforts (Rivera and Miller 2006; Sylves 2008).

A shining star among federal agencies: FEMA before 2001

FEMA's internal institutionalization

Today FEMA is responsible for coordinating the activities of the federal government in emergency management. FEMA's task is not just to respond to events declared disasters by the president and helping to rebuild damaged communities, but also to prepare for emergency response and mitigate the influence of disasters on communities in the United States.⁴⁶ FEMA coordinates federal emergency response efforts, but does not possess much resources as a small federal agency (Roberts 2010). Former FEMA director Brown (2011: 6) describes FEMA as a "broker within the federal government" for emergency response in president-declared disasters.

The idea behind establishing FEMA in 1979 was to unify federal disaster management programs into one single agency. Before the birth of FEMA, the tasks of federal disaster management were scattered over a hundred different federal agencies (FEMA 2011), which increased the complexity of disaster relief requests from local authorities. When a disaster overwhelmed state capacities, governors had to communicate with many different federal agencies about aid (Bosner 2011). The fragmentation of federal emergency management programs was criticized by the National Governor's Association (1979), and the association proposed to unify these emergency management functions (Rubin 2007).

⁴⁶ The Mitigation function is becoming weak according to a recent GAO report released on September 7, 2011, Department of Homeland Security: Progress Made and Work Remaining in Implementing Homeland Security Missions 10 Years after 9/11. There is no section in the report mentioning the mitigation function or the National Flood Insurance Program.

In 1979, FEMA was set up as an independent federal agency under the Carter Administration [1977-1980], integrating disparate agencies and programs in the fields of civil defense/national security and natural and environmental disaster preparedness and response. These agencies included the National Fire Prevention and Control Administration, the National Weather Service Community Preparedness Program, the Federal Insurance Administration, the Federal Preparedness Agency of the General Services Administration, the Defence Civil Preparedness Agency, and the Federal Disaster Assistance Administration (Sylves 2008; FEMA 2010; FEMA 2011).⁴⁷

FEMA took a long time to formulate its organizational mission and core tasks. According to FEMA veteran Leo Bosner (2011), who started working for FEMA in 1979 and retired in 2008, FEMA was in a process of “searching for missions” until 1993. The National Academy of Public Administration (1993: 41) describes FEMA in the period before 1993 as “an institution not yet built” in its report *Coping with Catastrophe*. After its establishment, FEMA had to integrate various supportive functions, existing programs, and resources which used to be managed by different agencies (GAO 1993; Robinson, Liu et al. 2011). When President Reagan took office two years after FEMA’s birth, most decisions made by his predecessor Carter were challenged, including the establishment of FEMA (Bosner 2011).

Under Reagan, FEMA’s director Louis Giuffrida concentrated on the civil defense program which prepared for the consequences of a nuclear war with the Soviet Union, leaving natural disaster response to local and state governments (NAPA 1993; Schroeder, Wamsley et al. 2001; Wilson and Oyola-Yemaiel 2001). In the extreme situation of a national crisis, FEMA intended to take control of the country after a declaration of martial law and the suspension of the constitution (Roberts 2004; Roberts forthcoming). President Reagan never accepted this plan. In the field of civil defense, FEMA, as a junior agency in preventing external threats, competed with other agencies such as the FBI, CIA, the Nuclear Regulatory Commission, the Departments of Justice and the Defense Department (Bosner 2011; Comfort, Waugh et al. 2012). In 1985, FEMA struggled with internal corruption and sex scandals. Giuffrida resigned due to these scandals (Schroeder, Wamsley et al. 2001).

In these “searching” years, FEMA’s response to natural hazards was slow and ineffective (OIG 2009). According to reports from NAPA (1993) and the Governmental Accounting Office⁴⁸ (1993), FEMA lacked sufficient resources. In responding to several publicized disasters, FEMA displayed a weak response capacity (Comfort, Waugh et al. 2012). In the 1989 Hurricane Hugo response, the first FEMA relief office did not open until one week after the hurricane struck. In the 1992 Hurricane Andrew response, FEMA arrived late again and could not provide sufficient food, water and mobile hospitals. President Bush replaced FEMA director Wallace E. Stickney with then Secretary of the Transportation Department Andrew Card as the coordinator of federal response to speed up the response (Franklin 1995).

47 According to the history section on FEMA’s website, Federal Disaster Assistance Administration in the Department of Housing and Urban Development established in 1949 managed most major federal disaster response and recovery operations before FEMA was created.

48 The agency was later renamed as the Government Accountability Office.

FEMA suffered criticism from Congress members for its poor response. The criticism towards FEMA peaked after Hurricane Hugo in 1989, the 1990 Loma Prieta earthquake and the Hurricane Andrew in 1992. Congressman Mineta described FEMA as an organization that “could screw up a two-car parade”, and South Carolina Senator Ernest Hollings criticised it as “the sorriest bunch of bureaucratic jackasses I’ve ever known” (Franklin 1995).

The failed response to Hurricane Andrew even threatened FEMA’s existence as an independent organization. Congressmen and senators, such as Norman Y. Mineta, Barbara A. Mikulski, and Pete Stark, called for the abolishment of FEMA and proposed to move disaster relief functions to military or other federal agencies. Congressman Stark criticized FEMA as a “a blizzard of red tape, a hurricane of hot air, but no avalanche of help—more like a glacial mountain of delay” (Wamsley and Aaron 1996).

The turning point came when James Lee Witt was appointed as FEMA director by incoming President Clinton in 1993. Witt was the first FEMA director with state emergency management experience (FEMA 2011).⁴⁹ He served as the director of Arkansas emergency office when Bill Clinton was Governor. The reforms after Witt took the helm, referred to by some as the *Witt Revolution* (Schroeder, Wamsley et al. 2001; Corrêa d’Almeida and Klingner 2008), made FEMA a shining star among federal agencies in the late 1990s. In the next section, the critical factors will be outlined that helped FEMA develop from “an example of governmental inefficiency and incompetence” into an institution described as “the most dramatic success story of the federal government in recent years” (Wilson and Oyola-Yemaiel 2001: 68).

FEMA’s reform under Witt started with accepting several key recommendations made in reports by NAPA (1993) and GAO (1993) as to shifting priorities and speeding up disaster response. Following up on these recommendations, Witt shifted FEMA’s priority from civil defense towards natural hazards. FEMA’s response avoided unnecessary bureaucratic procedures and turned to a more proactive mode (Wamsley and Aaron 1996; Wilson and Oyola-Yemaiel 2001). The response speed improved significantly. In the 1994 Northridge Earthquake, a FEMA response team arrived at the stricken area just hours after the earthquake, and they opened a telephone registration center to manage disaster aid applications the second day after the earthquake (Cooper and Block 2007). Moreover, FEMA changed its role as “a responder of last resort” and became more proactive in distributing disaster aid resources, such as food and water, before a disaster struck (Schneider 1992; Schroeder, Wamsley et al. 2001: 380). FEMA’s progress in delivering disaster aid was praised by Congressman Dick Gephardt; Director of emergency management in Minnesota Jim Franklin observed that “this is the first time we have had this kind of coordination in my experience” (Schroeder, Wamsley et al. 2001: 393).

49 Conventional emergency management professionals and scholars argue that Witt was the first FEMA director with emergency management experience. However, Julius Becton, who served as the director of FEMA from 1985 to 1989, had been the administrator of US office of Foreign Disaster Assistance before came into FEMA. Becton’s experience with disaster response [maybe mostly in foreign countries] is acknowledged, and Witt was truly the first director with experience of domestic emergency management in the US (Bosner, 2011). Witt is described as the “first agency director with experience as a state emergency manager” on the history section of FEMA’s website.

Witt introduced and institutionalized a new emergency management philosophy, known as proactive all-hazard comprehensive emergency management (Schneider 1998; Cooper and Block 2007).⁵⁰ The all-hazard philosophy built on the idea of the “Integrated Emergency Management System” [IEMS] introduced by the first director of FEMA, John Macy. The idea of IEMS stressed similarities in the fields of natural hazards and civil defense, such as “direction, control and warning systems which are common to the full range of emergencies from small isolated events to the ultimate emergency-war” (FEMA 2011). The definition of an all-hazard approach originated from the Defense Civil Preparedness Agency. This philosophy was to emphasize using resources not just in wartime but also in peacetime emergencies, given the extreme focus on preparing for a nuclear war in that period. However, FEMA did not effectively act on this philosophy in the 1970s and 1980s (NAPA 1993). Later, Witt institutionalized these basic ideas and norms in FEMA on three dimensions:

- All-hazard: FEMA’s focus on disaster agents shifted from nuclear war preparedness-centered civil defense to natural hazards-centered emergency management (Franklin 1995; Wilson and Oyola-Yemaiel 2001; Lewis 2008). It emphasized common elements in every disaster, such as warning, shelter preparedness and evacuation. In this perspective, there is no need to prepare separately for different types of natural disasters.
- All-phase: mitigation, which had been ignored in the past, was now emphasized. *Project Impact* was designed to improve community resilience. Through this project, relationships with local governments’ leaders, volunteer groups, private businesses and individual citizens were built and strengthened. FEMA helped individuals, businesses and community leaders to identify hazards in their community and organizations, set priorities and allocate resources to prevent or mitigate and prepare for identified hazards in a cost-effective way (Bosner 2011). FEMA organized various activities to promote mitigation efforts, such as public awareness campaigns, and the selection of pilot communities for disaster mitigation. According to a FEMA press release on November 22, 1999, nearly 200 communities and over 1,000 business partners participated in *Project Impact*.⁵¹ The mitigation programs saved money for emergency response. According to the study by the Multi-hazard Mitigation Council of the National Institute of Building Sciences (2005: iii), “on average, a dollar spent by FEMA on hazard mitigation [actions to reduce disaster losses] provides the nation about \$4 in future benefits”. By becoming more active in the mitigation phase, the task of FEMA was no longer constrained to the response and recovery phase as a “fire-fighter” after a disaster happened. Instead, FEMA could play a proactive role in normal times through mobilizing state and local governments and communities in preventing potential disasters and thus reducing costs of disaster response and recovery. Mitigation programs helped break the vicious circle of disaster aid, “damage-repair, damage-repair” (Beatley 1989; FEMA 2010). Additionally, FEMA could use its economic incentives to partly overcome its shortcomings as a governmental organization lacking regulation power (Sylves and Cumming 2004).

50 The National Governors’ Association initiated Comprehensive Emergency Management in 1979.

51 FEMA press release number 1293-71 “Project Impact, building a disaster resistant community”.

- All-stakeholder: FEMA used long-term mitigation programs to build strong relationships with local governments and communities (Waugh 2006). FEMA mobilized various stakeholders to involve them in disaster mitigation and risk reduction via economical incentives. For instance, in the Hazard Mitigation Grant Program, local governments were encouraged to apply for aid after a presidential declared disaster, and it was specified that local government should spend up to 15% of the money on mitigation. The percentage of funding from federal government increased from 50% to 75% under the Volkmer Amendment in 1993. Under the influence of these economic incentives, local communities and governments were encouraged to emphasize long-term mitigation in the post-disaster recovery phase as well. Other programs, such as the National Flooding Insurance Program and floodplain buyout projects, provided economic incentives to reduce flood risks in vulnerable communities.

Several factors helped to turn this new approach into a success:

- Reorganization of FEMA's structure

Stressing the all-phase dimension of the all-hazard approach, FEMA correspondingly streamlined its offices, such as setting up the Mitigation Directorate, Preparedness, Training and Exercises Directorate, and Response & Recovery Directorate in 1993 (Roberts 2006).

- Improving the morale and professionalization of FEMA staff

Before the Witt era, more than half of FEMA's employees preferred to work elsewhere and four-fifths of employees considered the agency poorly managed, according to a survey in 1992 by the American Federation of Government Employees (Galvin 1995). Witt's extensive efforts to improve the morale and professionalization of FEMA's staff started from as soon as he became FEMA director. In the morning of his first working day, Witt stood at the entrance of FEMA headquarters and shook hands with everybody, which marked a change in the relationship between the organization's leader and staff.⁵² Witt set up an "open-door policy" for employees, inviting them to meet with him to discuss unresolved problems after they had tried the usual chain of command (Bosner 2011). The "open-door policy" helped increase mutual understanding between Witt and FEMA staff. To improve the professionalization of the staff, FEMA trained them with customer service technology, which embedded customer centered ideas in their minds (Roberts 2004; FEMA 2010), and empowered them, giving them more autonomy and responsibilities in their operations (Schneider 1998). Moreover, the fast development of the emergency management profession since the 1980s provided FEMA with more qualified staff (Wilson and Oyola-Yemaiel 2001).⁵³ FEMA employees' morale sharply rose with the increasing praise for their successful response to several disasters, such as the Northridge Earthquake in 1994 and the Oklahoma City Bombing in 1995 (Mann 2004).

52 According to Bosner in the PBS interview. <http://www.pbs.org/wgbh/pages/frontline/storm/view/#morelink> (accessed on August 30, 2011).

53 Notably, the International Association of Emergency Managers and the National Emergency Management Association provided certified emergency managers and associated emergency managers credentials (FEMA 2010).

- Limiting the number of political appointees and increased promotion of emergency management professionals

Witt was given a “veto”, a refusal right, on political appointments suggested by the president and White House Personal Office, preventing FEMA from being considered a “turkey farm” or “dumping ground” for political appointees any longer (Waugh 2000: 29; Schroeder, Wamsley et al. 2001: 380; Cooper and Block 2007).⁵⁴ There were only 10 political appointees in FEMA in the first term of the Clinton Administration, which was the lowest level in FEMA’s history (Lewis 2008). Controlling the number of political appointees left room for the promotion of career emergency management professionals (Schroeder, Wamsley et al. 2001). Moreover, Witt initiated a cross-training program for all senior staff in order to let political employees learn more about emergency management and the career staff learn more about other programs than the ones they specialized in (Schroeder, Wamsley et al. 2001).

FEMA’s external institutionalization

In the Witt era, FEMA gradually built relatively stable relations with its supporters and watchdogs, which guaranteed resources and effective coordination during an emergency. These stakeholders included the President, Congress, state governments, tribes, local governments and communities, interests groups, the media and the public (Sylves 2008).

- The President

Witt and FEMA kept close ties with the Clinton Administration. The close personal relationship between Witt and Clinton and the political damage suffered by the Bush Administration after the failed response to Hurricane Andrew reminded the Clinton Administration not to neglect emergency management (Adams and Balfour 2009). Therefore, emergency management received a high priority in the Clinton Administration. FEMA’s good performance helped Witt win a cabinet position in the Clinton Administration in 1996, which further strengthened the support from the White House (Kapucu, Van Wart et al. 2011).⁵⁵

- Congress

FEMA operated under the supervision of various Congressional committees representing different political interests. According to the National Academy of Public Administration (1993: 69), “about 20 committees in the House and Senate have legislative jurisdiction over emergency management programs and appropriations operated by FEMA”. Witt spent much time in communicating with Congress members to gain support and learn about issues they found important (Corrêa d’Almeida and Klingner 2008). After a disaster, Witt called each Congress member of the affected states to discuss emergency response demands.

- Relations with local governments and communities

Under Witt, FEMA replaced its bureaucratic approach with a more collaborative attitude to work

54 For more about relationship between political appointment and performance, see Lewis (2008), chapter 6, on the case of FEMA.

55 For more about the evolution of the presidential role in emergency and disaster management in the US, see Kapucu, Van Wart et al. (2011: 1-3).

with local authorities and emergency managers in the preparedness phase. FEMA promised state governors to answer all their letters within ten days (Wilson and Oyola-Yemaiel 2001). FEMA changed its previous approach of providing guidelines and standards for state program managers: FEMA worked shoulder to shoulder with states to establish state-based planning (Schroeder, Wamsley et al. 2001). In the implementation process of emergency plans, FEMA negotiated with local partners to build a comprehensive agreement regarding issues mentioned in the plan and met regularly with these local partners to improve emergency plans (Schroeder, Wamsley et al. 2001).

- The media

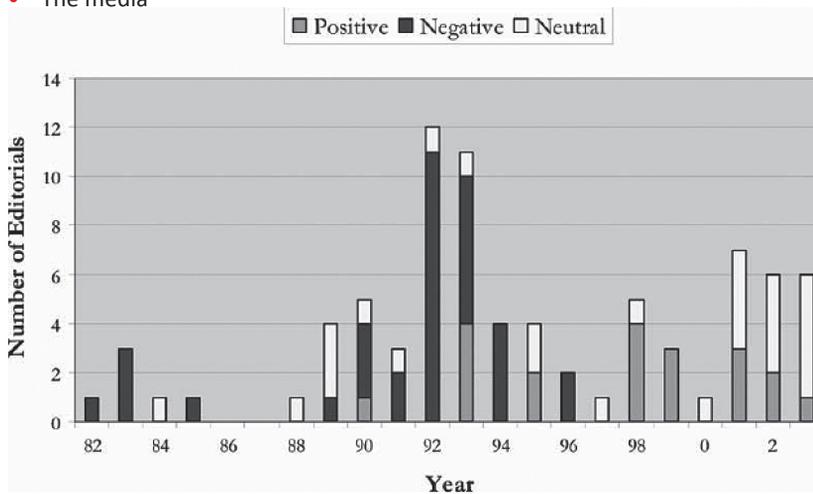


Figure 4-1 Tone of major newspapers editorials' coverage of FEMA (1982-2003)
[adopted from Roberts (2006: 63)]

FEMA increased its transparency to the media. As mentioned in the previous section, FEMA had remained a closed agency in the first ten years of its history. To get closer to the public, FEMA gave news reporters access to its headquarters and let them observe how FEMA works when a disaster strikes (Bosner 2011). As a result, the media's attitude towards FEMA changed significantly from very negative to positive (Roberts 2004). In the early 1990s, the media cast FEMA as a typical failed bureaucracy due to its poor performance in responding to disasters (NAPA 1993). After the Witt revolution, FEMA experienced less critique from the media and began to win praise. As shown in **Figure 4-1** compiled by Roberts (2006), the negative tone regarding FEMA in editorials of major newspapers diminished after 1997 while there were substantial positive reports after 1993. In 1994, the *Los Angeles Times* praised Witt's efforts and praised him as "A True Master of Disaster" (Miller and Rivera 1994). In 1995, the *Washington Monthly* reported FEMA's reform process and described it in terms of the rising phoenix (Franklin 1995).

FEMA's deinstitutionalization after 9/11

Under the Clinton Administration (1993-2001), FEMA enjoyed a relatively high autonomy and a solid reputation as the federal coordinating agency in emergency management (Schneider 1998; Wilson and Oyola-Yemaiel 2001). After President Bush took office in 2001, this level of

institutionalization eroded quickly due to the governmental reorganization of agencies related to homeland security (Birkland 2009). This section will outline the deinstitutionalization process that characterized the period from “9/11” until Hurricane Katrina.

FEMA’s internal deinstitutionalization after 9/11

FEMA’s central focus shifted back towards civil defense with president Bush’s reorganization (Sylves and Cumming 2004).⁵⁶ When President Bush assumed office in 2001, civil defense or counterterrorism was made a priority because terrorism was considered the main threat to the US homeland by the Bush Administration (Roberts 2004). There were growing concerns about terrorism on American soil after the World Trade Center bombing in 1993 and the Oklahoma City bombing in 1995. When Bush’s campaign manager, Joe Allbaugh, was appointed the FEMA director in 2001, he attempted to shift the focus to counterterrorism with the reestablishment of the Office of National Preparedness (Wilson and Oyola-Yemaiel 2001).⁵⁷ After the September 11 terrorist attacks, civil defense was put into an even more salient position. A new concept, homeland security, was introduced by the Bush Administration (Farazmand 2001; Nicholson 2005; Tierney 2006). After FEMA was absorbed into the newly created Department of Homeland Security on March 1st, 2003, FEMA’s distinct role as a coordinator in federal emergency management was challenged by the new priority of domestic security, and preventing potential terrorist threats became the central focus (Perl 2004).⁵⁸

In the original design, DHS was supposed to be a FEMA-like organization at the cabinet level, and it was intended to copy FEMA’s success in emergency management and apply it in the broader homeland security area under the jurisdiction of DHS (Bosner 2011). FEMA would be the model for other sub-organizations within DHS. As a consequence, DHS would become an organization with an “all-hazard” mission, not just focusing on natural hazards but also on national security. The intention is reflected in the report by the United States Commission on National Security/21st Century (2002: viii):

“NHTSA [NHTSA stands for the National Homeland Security Agency, the designed (original) name for the new organization as an expansion of FEMA] would be built upon the Federal Emergency Management Agency, with the three organizations currently on the front line of border security—the Coast Guard, the Customs Service, and the Border Patrol—transferred to it. NHTSA would not only protect American lives, but also assume responsibility for overseeing the protection of the nation’s critical infrastructure, including information technology.”

However, in the reorganization process, FEMA’s established norms and routines encountered challenges under the new homeland security framework. The long-standing four-phase emergency

56 For more about the US history of focus shift after leadership change in relation to different disaster agents, like terrorism events, environmental hazards, nuclear attacks, see Sylves and Cumming (2004).

57 This office was created in the 1980s, which did not draw much attention in Witt’s era.

58 The creation of DHS ranked as the most substantial federal agencies reorganization after the 1947 National Security Act, which put all the military agencies under the Defense Department.

management paradigm [mitigation, preparedness, response and recovery] was reframed and some of the tasks were moved from FEMA to other sections within DHS (FEMA 2010; Bourrier 2011).⁵⁹⁻⁶⁰ Emergency preparedness functions were transferred to the new DHS office of State and Local Government Coordination and Preparedness, which included Emergency Management Performance Grants, the Citizen Corps, the Metropolitan Medical Response System, and Assistance to Fire-fighters Grants (FEMA 2010). The mitigation programs mentioned above were either cancelled or taken over by other sub-organizations (Allbaugh 2001; Tierney 2006; Birkland 2009).⁶¹⁻⁶² Information collection and response coordination were assigned to the newly created Homeland Security Operations Centre [HSOC]; FEMA became one of the supporting agencies. Only functions related to the response and recovery phases were still kept within the jurisdiction of FEMA (Wilson and Oyola-Yemaiei 2001).

Chertoff expressed the DHS perspective during a hearing of the House Committee on Homeland Security (2005: 44-45) in the following way:

“What the restructuring proposes to do is to take out of FEMA a couple of elements that were really not related to its core mission, that were more generally focused on the issue of preparedness in a way that I think was frankly more of a distraction for FEMA than an enhancement to FEMA. Obviously, FEMA’s expertise as a response and recovery agency and as an operational agency is very important to our preparedness effort as is the expertise of a number of our components, like the Secret Service or Coast Guard, which are also going to be obviously working very closely with our preparedness component. But we wanted to make sure that FEMA was, as an operational agency, capable of focusing on its core mission, that it was a direct report to the Secretary so it gets the direct attention that it needs.”

In short, FEMA’s old emergency response framework was replaced with a new one under the new concept of homeland security (Beresford 2004).⁶³ DHS created a new federal response plan, named the Nation Response Plan [NRP]⁶⁴, to replace the Federal Response Plan. The NRP was composed

59 Although the circle was broken in FEMA, the newly created DHS still held a leading position in emergency management among federal agencies. It is fair to say that FEMA itself as an independent organization was downplayed to implement parts of its emergency management functions as a sub-organization of DHS. For the customer of homeland security service, there is still one unified organization, DHS, to represent the federal government.

60 After Hurricane Katrina, the *2006 Post Katrina Emergency Management Reform Act* relocated most preparedness programs to FEMA, which restored the cycle of emergency management [preparedness, response and recovery].

61 The mitigation programs were criticized as a waste of money with little improvement in the performance, as lacking responsibilities, and being full of moral hazards. For more, see Platt (1999).

62 Local partners protested the cancelation of the mitigation program. For instance, just after the magnitude 6.8 Nisqually Earthquake in the Puget Sound area of Washington State in 2001, Seattle’s Mayor strongly praised strongly the *Project Impact* program for reducing the damage of the earthquake in his city (Bosner 2011).

63 For details about the historical origin and evolution of the concept and ideology of homeland security, see Beresford (2004).

64 The National Response Framework replaced the National Response Plan in 2008.

by the Rand Corporation, an organization with little emergency management experience (Bosner 2011). DHS released the NRP in December 2004, leaving no time to implement it before Katrina hit (Leonard and Howitt 2006; Kapucu and Van Wart 2008). In this new plan, many new terms and definitions replaced old ones and reflected perspectives of law enforcement rather than emergency management. For instance, NRP used the term “awareness and prevention” to replace the widely known concept “mitigation” (Roberts 2004). In the eyes of those specialized in emergency management, acts of terrorism or civil disorder could be prevented; but not natural disasters.

FEMA’s supporting functions changed under the newly created National Response Plan (a comparison between NRP and the Federal Response Plan regarding Emergency Supporting Functions [ESF] can be found in Table 4-1) (DHS 2006; Waugh and Streib 2006). Table 4-1 shows that ESF-15, external affairs, is a brand new function added to FEMA. In the NRP, the Homeland Security Operations Center [HSOC] was responsible for collecting disaster information and FEMA’s unit, the National Response Coordination Center [NRCC], was one of the components affiliated with HSOC. In the previous Federal Response Plan, FEMA was in a leading position for the entire information collecting and dissemination process. Potential role conflicts existed between the new positions of Principle Response Officer [PFO] and Federal Coordinating Officers [FCO]. According to the Stafford Act, a FCO is appointed from the ranks of FEMA by the president to lead the federal response, including mission assignment, establishing field offices and resource coordination (DHS 2006). The PFO is appointed by the DHS Secretary to represent the Secretary as the leading federal official. It did not make clear who was in charge if these two positions co-existed.

Table 4-1 Comparison of Emergency Support Functions under the old Federal Response Plan and the new National Response Plan

<i>Federal response plan</i>	<i>ESF</i>	<i>National Response Plan</i>
Information & planning mass care	5	Emergency management
	6	Mass care, housing, & human services
Urban search & rescue	9	Urban search & Rescue
—	15	External affairs

Note: adjusted from the US Department of Homeland Security (2006: 31)

FEMA resisted the changes of the new emergency management framework NRP imposed by DHS. FEMA had gotten used to the FRP and found it hard to accept the new NRP given that the new plan was mostly created by Rand having little emergency management experience (Bosner 2011). The FEMA union chief commented on the NRP by saying that “they had an extremely simplistic view, as though the whole country was the army and we were the generals....the gist was: we will give orders and everybody will jump and say, sir, yes, sir” (Grunwald and Glasser 2005: 6).

FEMA maintained its old coordination structure with very limited adaptation to the new framework (Brown and Schwarz 2011). During the 2004 Hurricane Charley response, FEMA still played its traditional role in coordinating the response with Florida, and had limited contact with DHS

Secretary Chertoff. FEMA director Brown attributed the successful response at the time of the four hurricanes [Charley, Frances, Ivan and Jeanne] in Florida in 2004 to sticking to its old response framework, according to Brown (2006)'s testimony before the Senate Committee Homeland Security & Governmental Affairs. Brown criticized the new framework as "a logical merger except that the two groups were at odds with one another" (Brown and Schwarz 2011: 107). FEMA kept resisting the new framework and the DHS intervention, which became evident during the response to Hurricane Katrina (Cooper and Block 2007; Birkland 2009).

FEMA's capacity was further undermined by a brain drain of emergency management professionals at both the senior and operational levels (Rood 2005). At the senior management level, there was a significant increase of political appointees (Lewis 2008). The number of political appointees in FEMA increased from less than ten in Witt's era to thirty-eight in 2002 (Roberts 2010). The first FEMA director under the Bush Administration, Joe Allbaugh, used to be Bush's first presidential campaign team manager and had no experience in emergency management. Appointees for the subsequent key senior positions, such as FEMA director Michael Brown and the deputy director and chief of staff Patrick Rhode, had little emergency management experience (MSNBC 2005). At the operational level, many experienced staff disagreed with the structural changes and chose to move to the private sector capitalizing on the booming market in emergency management and homeland security (Dart 2004; Menzel 2006; Select Bipartisan Committee 2006; Bourrier 2011; Eriksson and McConnell 2011). In a survey conducted by the *American Federation of Government Employees* in February 2004, 60 percent of the respondents indicated they were considering to leave FEMA (Barr 2005; Bosner 2011).

FEMA's capacity was reduced by budget cuts, leaving vacancies frozen. After being absorbed by DHS, FEMA lost around 500 positions (Rood 2005). Before Katrina struck, FEMA's vacancy rate was about 15-20% (Senate Committee 2006)], and more than 100 positions in FEMA's response division were left open (DHS 2006; Select Bipartisan Committee 2006). FEMA's core response forces, the Mobile Emergency Response Support detachments that are responsible for setting up immediate communication and power generation facilities for local coordination, experienced a loss of muscle. Each team used to consist of 60 members, and was depleted to around 42 members on average before Katrina struck (Rood 2005). The team responsible for coordinating medical assistance forces was reduced to only 10 full time members of staff while it used to have around 18 members of staff (Rood 2005).

Organizational morale of FEMA staff eroded significantly in the Bush era. FEMA ranked at the bottom in a survey on satisfaction of federal employees with their organizations in 2003 (Barr 2005). In the 2004 survey by the *American Federation of Government Employees*, around 80 percent of the respondents stated that FEMA had become worse after merging into DHS (Barr 2005; Bosner 2011). In the list "Best Place to Work" run by the *Partnership for Public Service* and the *Institute for the Study of Public Policy Implementation* in 2005, DHS in general (including FEMA) ranked #29 among 30 surveyed agencies (Barr 2005; DHS 2006; Menzel 2006; Morris 2006).

FEMA's external deinstitutionalization after 9/11

On the external institutionalization dimension of FEMA, one important indicator was that FEMA's

links to the White House and Congress eroded. After its cabinet status was eliminated, FEMA's direct access to the White House was gradually channeled into a new chain of command. FEMA had to communicate through the new cabinet-level organization DHS (Wilson and Oyola-Yemaiel 2001). Because he was not satisfied with the new structure, Brown reportedly tried to use his personal relations with the White House Staff, with officials such as Joseph W. Hagin and Clay Johnson III, to influence the reorganization process. Most of his appeals were rejected (Grunwald and Glasser 2005). According to Brown's (2006) testimony before the Senate Committee Homeland Security & Governmental Affairs, there was less communication with Congress as during the Clinton Administration.

In the restructuring process, FEMA suffered budget cuts with the elimination of its functions. As can be seen from [Table 4-2](#), FEMA's budget had been cut annually since 2003. In the financial year 2003, more than \$80 million dollars were sliced from FEMA's budget base, with an additional \$90million and \$30 million in the following two financial years. For the financial years 2003-2005, permanent reductions from FEMA's budget base amounted to about \$77.9 million, which was 14.8% direct spending cuts since merging into DHS. Most preparedness grants which used to be managed by FEMA had been given to DHS' Office of Domestic Preparedness, which were subsequently mostly used for counterterrorism (Fields and Rogers 2005). According to Brown (2011), there was only \$180 million left for FEMA's grants for local governments, which had been reduced by one third by the time Hurricane Charley hit Florida in 2004.

Well-built relationships with local governments and communities weakened following the loss of experienced regional managers (Lieberman 2006; Cooper and Block 2007). In the Congress hearing of March 2004, Witt (2004) testified that FEMA staff "are concerned that the successful partnership that was built and honed over many years between local, state and federal partners and their ability to communicate, coordinate, train, prepare and respond has gone downhill. And they are at a loss as to how to work with the federal government now and fear for their communities should a catastrophic disaster occur". FEMA was experiencing a loss of key middle management positions connecting with states and local governments, for instance, three of the five operations chiefs for natural disasters and eight of the ten regional directors (including FEMA Regions I, II, III, IV, V, VI, VIII, and IX) were in acting capacities (Hsu 2005; Select Bipartisan Committee 2006).

The new priorities and budgets favoring civil defense pushed local partners out of FEMA's "all-hazard" emergency management related activities (Harrald 2007; Roberts 2008). There were more funds on counter-terrorism than local governments knew how to use, especially in rural states (Murphy 2004). Michael R. Patterson, an emergency program manager from Juneau, Alaska, claimed "I don't have to go looking for grants, they are coming to me". With these funds, local emergency managers had to spend more time on terrorism-related preparedness instead of "all-hazard" related emergency management. According to Phil Roberts, the deputy director of the Indiana State Emergency Management Agency, "Our priorities used to be placed primarily on mitigation, preparedness, response and recovery for natural disasters and haz-mat incidents, with a minor emphasis on terrorism issues. Now, I would have to say that we spend probably 75 percent to 80 percent of our time strictly on homeland security/terrorism issues. September 11th changed our lives, I believe, forever" (Roberts 2005: 442).

Table 4-2 Reductions to FEMA budget base (FY 2003-2005)

Dollars in thousands

<i>Financial Year</i>	<i>Reduction amount</i>	<i>purpose</i>
2003	30,600	*Transfers to DHS from FY 2002 un-obligated balances
	12,000	*Transfers to DHS from FY 2003 Annual Accounts
	10,598	*Transfer to BTS (ODP) from FY2003 Annual Accounts
	21,437	Transfer to IG for audits and investigations
	5,500	Transfer to TSA from Liberty Shield Fund
Subtotal	80,135	Total FY 2003 reductions
2004	22,000	Transfer to IG for audits and investigations
	6,779	Charges for DHS working Capital Fund
	28,000	National Preparedness Transfer to BTS-Office of Domestic Preparedness
	21,000	Reduction to base-Disaster Relief Fund
	13,000	*Reduction to base-Operating expenses
Subtotal	90,779	Total FY2004 Reduction
2005	11,679	*DHS mandated Efficiencies
	18,501	Charges for Working Capital Fund
Subtotal	30,198	Total estimated FY2005 reductions
	77,900	*total Permanently lost from the base

Note: this table was adopted and revised from Select Bipartisan Committee (2006: 142)

In summary, FEMA reached its institutional “peak” as a well-functioning federal coordinating agency in comprehensive emergency management in the 1990s (for a depiction of the evolution of FEMA’s level of institutionalization, see [Figure 4-2](#)). FEMA’s then director Witt and professional staff carefully protected the established norm of comprehensive emergency management. Internally, FEMA replaced its working philosophy with a customer-centered attitude and active cooperation with stakeholders. With close collaboration and economic incentives in the mitigation and preparedness programs, FEMA’s dominant norm of comprehensive emergency management was supported by local governments, organizations and communities. FEMA strengthened its relationship with the Clinton Administration, and the relationship peaked with a cabinet position for its director Witt in 1996. Witt’s consistent communication efforts and FEMA’s support in elections of congress members helped gain strong support from Congress. In the media’s perception, FEMA changed from a very negative federal organization to a shining star among federal agencies.

After Bush's inauguration and the 9/11 terrorist attacks, national priorities shifted towards civil defense. In the reorganization process, FEMA was absorbed into the newly created DHS. Although the organizational environment changed significantly, FEMA resisted the restructuring imposed by DHS and tried to maintain its administrative structure and distinctive character as a federal emergency management coordinator under the comprehensive emergency management philosophy. FEMA's key preparedness and mitigation programs were transferred by DHS to other agencies or cancelled, and FEMA experienced major budget cuts. FEMA shied away from its mother agency DHS and tried to maintain direct contacts with the White House but to little effect. Internally, FEMA's capacities eroded with the brain drain in the emergency management workforce, high vacancy rates and increasing numbers of political appointees with little emergency management experience. Externally, relations with local partners eroded with the brain drain of experienced emergency professionals and the removal of economic incentives in mitigation and emergency preparedness programs. In short, FEMA was caught in a deinstitutionalization process when Hurricane Katrina hit the Gulf Coast of Mexico.

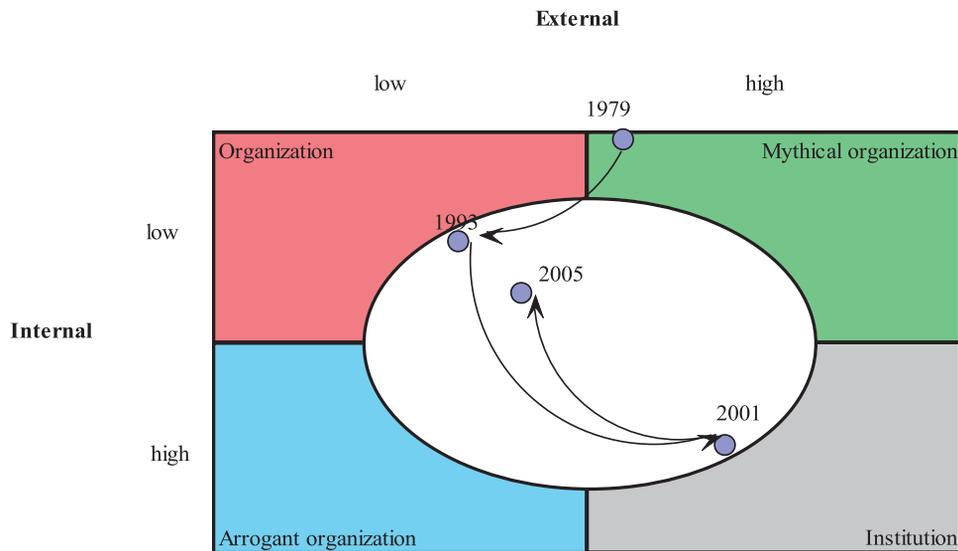


Figure 4-2 FEMA's evolution in terms of its institutionalization status

4.4 FEMA and the Great New Orleans Flood: identifying uncertainties and coping actions

This section will identify uncertainties that FEMA encountered in the wake of Hurricane Katrina's landfall in New Orleans in 2005 and describe FEMA's actions in coping with these uncertainties. This analysis covers the time span from the second landfall⁶⁵ of Hurricane Katrina in southern Louisiana on August 29 until FEMA director Michael Brown resigned and Vice Admiral Thad W. Allen, the chief of the Coast Guard, took his position as the immediate supervisor of the Hurricane Katrina Task Force on September 12, 2005. The focus will mainly be on uncertainties related to flooding in the New Orleans area (because they are best documented).

For this case study, qualitative data from the following sources were systematically analyzed: [1] six in-depth governmental reports on Hurricane Katrina;⁶⁶ [2] public hearings by the U.S. Senate Committee on Homeland Security and Government Affairs, and the Selected Committee of the U.S. House; [3] mainstream media reports; [4] selected books on Katrina and the response process, primarily Cooper and Block (2007), Brinkley (2006) and Brown (2011); and [5] National Situation Reports [NSR] of FEMA.⁶⁷

In order to visualize the information flow on flood areas and levee breaches, maps and a chronological table have been added [see [Figure A2-1](#) and [Table A2-1](#) in [Appendix 2](#)]. Three major breaches are outlined by ovals, circles, and rounded rectangles in [Figure A2-1](#), indicating the Industrial Canal, London Avenue Canal and 17th Street Canal in St. Bernard Parish, New Orleans. Other breaches and flooding areas are indicated in [Table A2-1](#).

Preparing for Hurricane Katrina

This section describes how the main actors (including the New Orleans municipal government, Louisiana State government, and FEMA) prepared for the coming landfall of Hurricane Katrina.

FEMA activated its command center and repositioned survival resources according to plan as early as August 24. After announcing a state emergency in Louisiana and Mississippi on August 26, FEMA began to reposition its rescue teams and survival resources at Camp Beauregard, LA, as planned, which included 540,000 liters of water, 680,000 pounds of ice, 15,120 tarps, and 328,320 Meals Ready to Eat (MRE) (United States Executive Office of the President 2006: 35; Brown and Schwarz

65 Hurricane Katrina made its first landfall in Florida in the morning of August 25 as a tropical storm.

66 These include reports from the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina and from the United States House of Representatives and its supplements [Selected Committee], US department of Homeland Security, White House, Governmental Accountability Office, Federal Coordination Officer, and U.S. Senate Committee on Homeland Security and Government Affairs.

67 A NSR is sent at 5:30 every morning by email to top officials at FEMA, DHS, DoD, and other relevant agencies and key organizations, such as the Red Cross. The report summarizes the daily information on the potential disaster threats and preparedness situations, ongoing disaster response and recovery. Currently, only NSRs issued after Hurricane Katrina can be found on FEMA's website. The web address is <http://www.fema.gov/emergency/reports/index.shtml> (accessed on October 10, 2011). The reports issued during Hurricane Katrina was removed from the FEMA website. I downloaded these reports from <http://www.hazus.org/KATRINA/> (accessed on October 10, 2011).

2011). FEMA deployed its mobile emergency operations vehicles in Camp Beauregard, LA, which could provide satellite communication (DHS 2006).

The National Hurricane Center [NHC] and FEMA's National Situation Report especially warned the New Orleans municipality of the potential impact of the coming hurricane. NHC director Max Mayfield personally phoned Governor Blanco and Mayor Nagin about the possible landfall of Katrina in New Orleans on August 28 (Brinkley 2006). FEMA's National Situation Reports specifically mentioned the danger to the city of New Orleans, singling out the threat of rising waters in Lake Pontchartrain.⁶⁸ The report of August 28 indicated Hurricane Katrina "could be especially devastating if it strikes New Orleans because the city sits below sea level and is dependent on levees and pumps to keep water out. A direct hit could wind up submerging the city in several feet of water".⁶⁹ The reports of August 27 and 28 analogized the approaching Hurricane Katrina to historical catastrophic hurricanes that hit New Orleans (Category IV Hurricane Camille in 1969 and Hurricane Betsy in 1965).⁷⁰

In New Orleans, the evacuation began 72 hours prior to the hurricane strike as specified in the emergency plan (Staff writer 2005; Brown and Schwarz 2011). After receiving the phone call from Mayfield on August 27, Nagin did not immediately order a mandatory evacuation, which had never been issued in New Orleans' 287-year history, but started to order voluntary evacuation (Brinkley 2006). New Orleans' mandatory evacuation finally came through in the morning of August 28 leaving less than 24 hours before the expected landfall to allocate buses to bring people without cars to the designed shelter, the Superdome (Select Bipartisan Committee 2006).

In Louisiana, Governor Blanco requested a presidential disaster declaration on August 27. President Bush issued the declaration and appointed FEMA official Lockey as the Federal Coordinating Officer (FCO). Lockey and the Emergency Response Team-National [ERT-N] arrived in Baton Rouge on August 27 (Hayes 2012). When ERT-N arrived, limited space in the Louisiana Emergency Operation Center did not allow the FEMA team to co-locate with state officials. ERT-N had only half of its 25 members arriving in Baton Rouge before Hurricane Katrina struck. The staff responsible for writing the daily Incident Action Plan (IAP) did not show up, which meant that a fundamental component of the National Incident Management System-Incident Command System [NIMS-ICS] was missing⁷¹. FEMA's counterpart the Louisiana Office of Homeland Security and Emergency Management could not match trained staff to positions required by the Incident Command System that helped to coordinate emergency response among stakeholders.

68 FEMA's National Situation Reports on August 27, 28 and 29.

69 FEMA's National Situation Report on August 28.

70 FEMA's National Situation Report on August 27 and 28.

71 NIMS-ICS is a framework and command system adopted by different levels of government for a quick mobilization during an emergency response, which originated from the response to wild land fires by the US forest service in South California.

FEMA's actions to cope with uncertainties during the response to the New Orleans Flooding

This section presents uncertainties encountered by FEMA and its coping actions during its response to the New Orleans flooding.

Uncertainty A: What happened immediately after Hurricane Katrina struck New Orleans? The damage situation in New Orleans.

In the morning of August 29, Hurricane Katrina made landfall in New Orleans. After the landfall of a major hurricane, making sense of the damage situation (what happened? What is going on?) is a primary task for FEMA. A hurricane usually presents a “known-unknown” type of uncertainty for FEMA. The damage situation includes economic losses and loss of lives, and damage to critical infrastructure. Making sense of the damage situation in New Orleans was difficult, as New Orleans and the surrounding area lost their communication infrastructure [including the communication with the National Guard base at Jackson Barracks in New Orleans as shown in [Figure A2-1](#)] in the morning of August 29 shortly after Hurricane Katrina hit New Orleans. The loss of communication facilities meant individual victims and local governments could not call for help using routine ways of communication, such as landlines, mobile phones, or the internet. FEMA thus had no eyes and ears on the ground and no idea what damage Katrina had caused.

Action A: While waiting for accurate information, FEMA allocated more resources to New Orleans as a precautionary strategy.

FEMA usually deploys an official to the city where a hurricane is expected to make landfall. The FEMA official serves as a primary information source for damage evaluation. This time, Marty Bahamonde was sent to the New Orleans Emergency Operations Center [EOC] on the evening of August 28 (Senate Committee)(Senate Committee)(Senate Committee)(Senate Committee)(Senate Committee)(Senate Committee)(Senate Committee)(Senate Committee)(Senate Committee). After landfall, FEMA headquarters communicated frequently with Bahamonde for more information [Bahamonde was the only FEMA official at the New Orleans EOC and he relied on information collected by the New Orleans EOC].

Meanwhile, fragmented information reached FEMA from various sources indicating that there was flooding in New Orleans. In the early morning, Bahamonde received information from the New Orleans EOC about only “low level flooding, no levee breaks, and limited wind damage”(Senate Committee 2005). At around 8 am, Bahamonde saw some wind damages near the EOC, but he could not assess the damage in the whole city. The first piece of information regarding flooding in unknown locations reached FEMA at 8:30 am. It came from Col. Terry Ebbert, New Orleans Director of Homeland Security, in a conference call with FEMA area command. A representative of FEMA region VI was involved in this meeting and learnt that eastern New Orleans and airport Lakefront might have experienced a flood caused by a twenty feet tide surge⁷² (Bourrier 2011) [as shown by

72 Terry Ebbert, LOHSEP, Katrina Conference Call Number 10, 7:30am CT, August 29, 2005.

Arrow K in [Figure A2-1](#)). It is usual to have major flooding in these waterfront areas caused by a hurricane triggered storm and tide surge. There was no reason at this point for FEMA to suspect a catastrophe happening in New Orleans.

On August 29, Louisiana Governor Blanco thought the state could “handle it”, and sent 68 school buses to evacuate survivors from New Orleans. FEMA director Brown planned to respond after states made their requests for assistance. FEMA urged all FEMA staff “not to respond to hurricane impact areas unless dispatched by state, local authorities”.⁷³

At 11am on August 29, Brown made a formal request to DHS secretary Chertoff for 1,000 more FEMA employees to the Gulf coast area, who should be in position in two days (Brinkley 2006). Meanwhile, FEMA was waiting for more precise information, and preparing for the coming requests from state governments. FEMA at this point was in its routine mode of hurricane response.

Uncertainty B: Causes of the flooding: were the levees breached or overtopped? Where were the breaches?

Scattered information indicated that there was flooding in different areas, but the causes of the flooding remained unclear: it could be caused by rain brought by the hurricane, water-overtopping levees⁷⁴, or water from breached levees. At the conference call at 8:30 am on August 29, FEMA Regional VI learned about a potential breach of the levee system, but the information was not confirmed by other information sources. Email communication between FEMA hurricane Liaison Team Coordinator, Matthew Green, and FEMA’s Deputy Director, Michael Lowder, indicated that the breach was in Arabi (see [Figure A2-1](#)). At 11:51 am, Bahamonde confirmed severe flooding in St. Bernard/Orleans parish line, and he also reported what he heard at the EOC: the 17th street canal was breached but the information source was unknown (Senate Committee 2005; Select Bipartisan Committee 2006). In a meeting at noon, Governor Blanco and Mayor Nagin said that they did not have any information on the state of the levees. Most of the levee information was reported by FEMA’s external channels, such as the National Weather Service, the Transportation Security Administration [TSA], and later the Louisiana State Police Emergency Operations Center, the American Red Cross, the US Army Corps of Engineers, and the local radio stations (Select Bipartisan Committee 2006). Until 9pm that evening, Michael Brown was still in doubt about the state of levees when interviewed by CNN’s Larry King (CNN 2005):

73 This release on FEMA’s website has been deleted, retrieved from http://www.zijin.net/get/englishversion/en_COMMUNICATION/2005_09_11_9279.shtml (accessed on Oct. 2, 2012).

74 Overtop means water comes over the top of levee, but the levee structure still stands well.

“...We have some, I’m *not going to call them breaches* but we have some areas where the lake and the rivers are continuing to *spill over*. The flood waters are still spilling into those neighborhoods, so it’s frankly unfortunately going to get worse before it gets better.” [Emphasis added by the author]

Action B: Waiting for a helicopter view to provide accurate information

When Bahamonde reported the information on the breach of 17th street levee he received from the New Orleans EOC to the front office at FEMA headquarters, the front office did not believe it, according to Bahamonde (Senate Committee 2005)’s testimony. This initial information did not enter into FEMA’s chain of command. More exact information was received by Brown during the morning of August 29 which convinced him and other FEMA officials that levee breaches occurred in New Orleans at around 12-13pm that day (Select Bipartisan Committee 2006).

As communication infrastructures were destroyed, exact information about the damage in New Orleans did not come to EOC until information from the helicopter overflight was sent by Marty Bahamonde at 22:30 pm in the evening of August 29 (Bourrier 2011).⁷⁵ At around 5pm, the Coast Guard notified Bahamonde that the weather situation allowed for an overflight. In the overflight report to Brown at around 7pm, Bahamonde confirmed the devastating flooding in New Orleans, the breach of the 17th street levee, the breakdown of road transportation around the city, thousands of stranded people waiting for rescue and urgent needs for housing. Moreover, he reported the food and medical care shortage in the Superdome as well.

Uncertainty C: Information about stranded survivors: [1] numbers, [2] their locations, and [3] evacuation possibilities.

Bahamonde had learned that the Superdome was crowded with evacuees. How to deal with these survivors became essential given that New Orleans was extensively flooded with breached levees. When it came to dealing with the survivors stranded in the city, understanding the breach situation to some extent determined whether to move these survivors out of the city. If there were moderate breaches, the army corps could repair the levees and pump out flood water quickly; then evacuating stranded survivors would not be necessary; providing life-sustaining resources would have been sufficient. If there were severe breaches, evacuating stranded refugees needed to be quick (Select Bipartisan Committee 2006). If the choice would be to evacuate, the number of the stranded refugees remained unclear, and FEMA did not know how many buses were needed to transport these survivors (Select Bipartisan Committee 2006).

Action C1: FEMA ignored uncertainty regarding the situation of stranded people but turned to investigate the preferences and demands of local governments regarding rescuing stranded survivors

FEMA did not try to learn more about the situation of stranded survivors, but asked the New

75 HSOC spot report #013. Bahamonde planned the helicopter overflight by the Coast Guard on August 28 when he came to New Orleans.

Orleans municipality to formulate a list of demands. At the operational level, after sharing the overflight reports with New Orleans municipal officials, Bahamonde suggested to New Orleans Homeland Security director Terry Ebbert to list their requests to FEMA and send the list through the state (Senate Committee 2005). The list included search and rescue assets, resources for the Superdome, law and order on the streets, and communication capabilities (Senate Committee 2006). At the strategic level, Brown visited the Superdome together with Governor Blanco and Senators Landrieu and Vitter in the morning of August 30, and tried to learn what New Orleans and Louisiana needed exactly (Brinkley 2006).

FEMA was not aware of survivors in other venues. When the Superdome became too crowded, Mayor Nagin ordered the Convention Center to open as a temporary shelter for refugees in the afternoon of August 30. However, this decision was not passed through to the state and federal governments (Senate Committee 2006). FEMA received conflicting information on the Convention Center (Brown and Schwarz 2011), but the information did not draw much attention from FEMA. The media learned of the Convention Center earlier than FEMA, which made FEMA seem out of touch (Bourrier 2011).

Action C2: FEMA's operational staff initiated the Superdome evacuation bypassing the command chain

While FEMA's top-level administrators failed to understand the urgent situation in the Superdome and the convention center, the operational level improvised to initiate the evacuation. FEMA's top level administrators discussed whether to evacuate stranded survivors until early morning of August 31 (during the video conference at 2pm).⁷⁶ In that discussion, some officials still believed that the breach could be fixed and water would be pumped out quickly.⁷⁷

In the Superdome, after observing the rising water nearby, FEMA official Phil Parr and his colleagues did not see any planning efforts from the top-level administrators. Parr and his colleagues started to plan to evacuate refugees stranded in the Superdome on August 30 (Select Bipartisan Committee 2006). Later on, they bypassed the state and city government to discuss their plan directly with FEMA Regional Response Center, and got the plan approved. The plan was cancelled when the Joint Taskforce Katrina [JTK]⁷⁸ Commander General Russel Honoré arrived to assume a leading role in disaster relief in Louisiana on September 1st (AUSA 2005; Select Bipartisan Committee 2006).

Uncertainty D: It was unclear whether the commodities (such as water and meals) were properly delivered to destinations.

After learning of the destruction in New Orleans, FEMA began to respond to requests from state and local governments by sending their prepositioned commodities. However, the logistical system

76 HSOC spot report #30, 2am, Aug. 31, 2005

77 Video conferences on Aug. 30 and 31, 2005

78 JTK was activated on August 30, 2005 by the North Command, which was designed to coordinate the military efforts in disaster relief, including National Guard and Coast Guard.

did not work well: it failed to track commodities delivery (Brown and Schwarz 2011). Complaints about the failed delivery of commodities reached FEMA's command center from state and local governments. According to FEMA's status report on September 5, 2005, published by the Joint Field Officer [JFO], less than half of the requests for water, ice, and Meals Ready to Eat (MREs) had been complied with. For example, Red Cross made a request for 300 thousand MREs on September 1. FEMA finally sent these MREs on October 8 after a tortuous cancellation-reorder-delivery process (Moynihan 2009).

The delivery process was hampered by the destroyed infrastructure, poor coordination with partners and contractors, and problems with tracking delivery trucks. The flooding and debris had destroyed roads to New Orleans. Partners for transportation like the Department of Transportation and the Department of Defense, could not guarantee delivery to the right place at the promised time. The main logistic contractor, *Landstar*, did not have its own drivers, but needed to hire drivers after FEMA made the delivery requests. However, *Landstar* could not hire enough drivers, which further delayed the delivery (Senate Committee 2006). The drivers also had security concerns. The drivers communicated with each other and stopped their trucks on the road if they were not sure about the security of the road to the city (Brown and Schwarz 2011).

FEMA began to equip trucks with a logistic tracking system in 2004 to improve visibility of logistics, but FEMA still could not track and trace the supplies due to the deficiencies of its software system. Moreover, some scheduled deliveries were canceled at the last minute, or there were no commodities when evacuees went to a shelter (Moynihan 2009). Just as Mike Beeman, FEMA's liaison to coastal Harrison County in Mississippi, said in the Lieberman report (2006: chapter 1-10): "[We'd] go over and find out who he was, what he had in the back end, because... many times [we] knew items were sent to us, but we didn't know where they were. ... We'd finally find maybe five or six truckloads of water or ice that were sitting off the roadway in some apron at a supermarket. ... Some of them sat sometimes two or three days. I found 25 trucks one day. ... They were just sitting there, waiting for somebody to tell them where to go. ... I have no idea where they came from."

Action D: FEMA failed to reduce the uncertainty and delegated the logistics mission to the Department of Defense (DoD)

Its logistic system failing, FEMA gave up and delegated the mission of logistics to the DoD. Although FEMA could not ensure the reliability of its logistic system, FEMA still tried to find out whether its prepositioned commodities were sufficient or not (Senate Committee 2006). As criticism mounted, FEMA realized that its own logistic capacities and those of its partners had been overwhelmed by the devastation. In a phone call with the White House and DHS secretary Chertoff on August 30, Brown realized that "this was a big one", and informed them that the response effort needed more assistance from the military (Lieberman 2006). FEMA delegated the mission of logistics to DoD on September 1st (Senate Committee 2006).⁷⁹

79 FEMA's Mission assignment #1509-32649, Sep 2nd, 2005

Uncertainty E: Confusion over vertical and horizontal coordination

The NRP (National Response Plan), replacing the FRP (Federal Response Plan), was tested for the first time during the response to Katrina. Several changes in the NRP regarding the role of federal leadership in coordination remained unclear to FEMA and local governments:

- FEMA's role as a leading coordinator of intelligence gathering was taken over by the DHS' Homeland Security Operation Center [HSOC] in the framework of the NRP, and FEMA was one of the supporting organizations for situation awareness (Brown and Schwarz 2011). No standard operational procedures existed in the new response plan to implement the collection of intelligence.
- The position of Principal Federal Official (PFO) was introduced in NRP to help the DHS secretary improve situational awareness, coordinate the federal response and facilitate a unified response structure. However, the PFO had no directive authority (United States Executive Office of the President 2006). The FCO (Federal Coordinating Officer), according to the Stafford Act, still maintained its authority to coordinate the federal response after being appointed by the president (DHS 2006). Involved actors could not distinguish between the roles of PFO and FCO (Senate Committee 2006). Leaders from hurricane response organizations confirmed the vagueness of these roles under the NRP: "If you need to invoke the Stafford Act for whatever reason, you're always going to have an issue with the relationship of the PFO and the FCO together", according to the U.S. Coast Guard Vice Admiral Thad Allen (Senate Committee 2006: 553).

The Joint Task Force Katrina created on August 31, which was directed by the Department of Defense, further increased the confusion of leadership in the response process. The task force directly responded to requests from state and local governments bypassing the coordination of the Joint Field Office. According to Louisiana Office of Homeland Security and Emergency Preparedness [LOHSEM] Deputy Director Jeff Smith, "[w]henver the task force commander of Hurricane Katrina, General Honoré, came onto the scene, he was also operating independently with little regard whatsoever for the Joint Field Office, which should have been the only unified command" (Select Bipartisan Committee 2006: 189).

There was confusion about the field command at the state level as well. The unified command with LOHSEM responsible for coordinating the state response was not set up by FEMA, although this should have been ready before the hurricane arrived (Hayes 2012). FEMA found that Louisiana state officials lacked basic knowledge of the National Incident Management System-Incident Command System. Two days after the hurricane made landfall, the state hired Colonel Smith, the leader of unified command in Louisiana, to teach the senior officials including the governor about ICS and NRP. On the same day, consultants began to teach staff in the Louisiana state command on ICS and NRP (Hsu, Warrick et al. 2005).

Action E1: FEMA circumvented the DHS and reverted to its old way of working

The NRP had introduced a new coordination structure, but FEMA's management and operational staff lacked confidence in DHS, which had assumed the role of leading coordinator in the emergency

response. FEMA director Brown believed that communicating with DHS only added another layer of hierarchy (Brown and Schwarz 2011). He thought the emergency management system and DHS' new homeland security system were disconnected: "so you now have these two systems operating one which cares about terrorism, and FEMA and our state and local partners, who are trying to approach everything from all hazards. And so there's a disconnect that exists within the system that we've created because of DHS" (Brown and Schwarz 2011: 100). The operational staff maintained similar attitudes towards DHS. For instance, according to former president of the FEMA Headquarters employees' union Bosner (2011), DHS managers often distracted FEMA's attention with unnecessary questions when preparing for the DHS executive's speech. For instance, the DHS manager phoned Bosner at 2am in the morning about the number of people that had been rescued [the manager was not sure it was 25 or 35] and ordered Bosner to phone the rescue team. Bosner did not want to interrupt the rescue team with such a "minor" question (Finally, Bosner just hung up and phoned back after a while with an excuse of not getting through) (Bosner 2011).

FEMA ignored the new coordinating structure of the NRP, and maintained its familiar way of coordinating the emergency response, in particular concerning intelligence collection and dealing with the new role of Principle Federal Officer [PFO]. The NRP specified that HSOC was to coordinate intelligence collection, which used to be a responsibility of FEMA (DHS 2006). HSOC itself did not build up sufficient structures and capacities for information collection. FEMA still maintained its old ways of working and sent acquired information to relevant actors, including DHS. On August 30, 2005, DHS secretary, Michael Chertoff, announced an incident of national significance and appointed Brown as the PFO according to the National Response Framework (DHS 2006). According to his testimony in the public hearing, Brown did not consider the position of PFO necessary as it "established more bureaucracy" (Senate Committee 2006). Instead, Brown reverted to his method of contacting the White house directly without the inference of DHS, which had worked well during the response to the 2004 Florida hurricanes (Senate Committee 2006).

However, the White House did not tolerate Brown's bypassing DHS during the response to Hurricane Katrina. The White House told Brown to "follow the chain of command" (Bourrier 2011), which meant that he needed to contact DHS and lost his direct contact with the White House. Brown was told in a phone call by the White House Chief of Staff, Andrew Card: "Mike, we are going to have to follow the protocol. We are going to have to follow the chain of command on this one. And I took that to mean that the way we have played ball for the past couple of years, we are not going to play ball that way, and now we are going to play ball by 'if you really need something, you need to go to Chertoff or back though HSOC or whatever you are going to do and do those requests that way' " (Select Bipartisan Committee 2006: 8).⁸⁰ Chertoff could not bear Brown's bypassing the chain of command, and finally ordered him to stay in Baton Rouge. Chertoff removed Brown from his PFO position on September 9 (Brown and Schwarz 2011).

Action E2: FEMA informed the White House and DHS of uncertainties in cooperating with the state of Louisiana, and cooperated ad hoc with other organizations.

80 The exact date and time cannot be confirmed in the testimony document.

FEMA's coordination with Louisiana state government and other response organizations ran into chaos following the leadership void. Learning of the incapacity of LOHSEM, Brown informed his superior, the White House, and DHS secretary Chertoff, about the uncertainty in the coordination with LOHSEM (Kirkpatrick, Shane et al. 2005). Moreover, local government and other response organizations ran their operations without central coordination. For instance, The Coast Guard, state agencies, the National Guard and DoD teams ran their urban search and rescue operations separately, which led to duplication in the search search in some areas. Local governments made requests directly to FEMA or the Joint Taskforce Katrina, leaving no coordination from the State government or FEMA. FEMA did not resume its role as a coordinator, but only worked with local governments ad hoc to fulfill their demands (FEMA 2006: 24). The lack of coordination was left unresolved by FEMA.

Uncertainty F: How to deliver expedited assistance to disaster victims?

The unprecedented scale of cross-state relocation of evacuees prohibited FEMA from checking the eligibility for assistance of disaster victims through its routinized procedures. FEMA could not check the damage to disaster victims' houses in New Orleans. FEMA authorized the expedited assistance to disaster survivors especially used for extraordinary disasters since September 6 (DHS 2006). Differing from other individual housing disaster assistance programs, the expedited assistance program allowed FEMA to provide disaster assistance without an on-site inspection. The program provided 2000 dollars to each displaced family in need of shelter. It was obvious that the traditional method of delivering individual assistance, i.e. sending checks or giving a direct bank deposit after damage estimation, did not work (DHS 2006), because many evacuees had no access to direct deposit bank accounts or no address to receive a check for disaster assistance. Therefore, a new mechanism to deliver the assistance had to be invented.

Action F: Improvised response

FEMA developed a new method, the debit card program, to provide expedited assistance for disaster victims on September 7 (Rein and Lee 2005). The debit card program was designed for those evacuees who had no access to direct deposit bank accounts, or were unable to receive checks. Completing the registration in the shelter, applicants would receive a debit card. FEMA would verify if the applicant's social security number matched with the name. If there was a match, \$2000 would be transferred to the bank account within four hours after receiving the card.

FEMA stopped its pilot program two days later after handing out cards in three shelters: Reliant Arena (Astrodome) in Houston, Kelly Air Force Base in San Antonio, and Reunion Arena in Dallas (The Associated Press Staff 2005). The program could not identify these applicants' eligibility for aid, or prevent the abuse of assistance for other non-emergency purposes.

Table 4-3 A summary of uncertainties, coping actions and strategies in the 2005 New Orleans flooding

#	Uncertainty	#	Action	Strategy
A	What happened immediately after Hurricane Katrina struck New Orleans? The damage situation in New Orleans	A	While waiting for accurate information, FEMA allocated more resources to New Orleans as a precautionary strategy	routinized
B	Causes of the flooding: were the levees breached or overtopped? Where were the breaches?	B	Waiting for a helicopter view to provide accurate information	routinized
C	Information about stranded survivors: [1] numbers, [2] their locations, and [3] evacuation possibilities.	C1	FEMA ignored uncertainty regarding the situation of stranded people but turned to investigate the preferences and demands of local governments regarding rescuing stranded survivors	routinized
		C2	FEMA's operational staff initiated the Superdome evacuation bypassing the command chain	Ad hoc
D	Were the commodities (such as water and meals) properly delivered to destinations or not?	D	FEMA failed to reduce the uncertainty and delegated the mission of logistics to the Department of Defense (DoD)	No action
E	Confusion over vertical and horizontal coordination	E1	FEMA circumvented DHS and reverted to its old way of working	routinized
		E2	FEMA informed the White House and DHS of uncertainties in cooperating with the state of Louisiana, and cooperated ad hoc with other organizations	Ad hoc
F	How to deliver expedited assistance to disaster victims?	F	Improvised response	Ad hoc

4.5 Analysis: a deductive sensemaking model in a deinstitutionalized response organization

This section will explore how FEMA's deinstitutionalization influenced the strategy that gave rise to its sensemaking actions based on the institutional sensemaking framework proposed in Chapter 2. All the actions of coping with uncertainties have been summarized in Table 4-3. In the analysis, a strategy type will be assigned to each series of sensemaking actions (the types of strategies have been defined and operationalized in Section 3.2 of Chapter 3). The influence of FEMA's institutionalization on its sensemaking strategies can be discerned in the following phases.

- Phase I: FEMA's sensemaking strategies were still under the retention effects of its long-standing and institutionalized comprehensive emergency management paradigm.

When Katrina hit, FEMA was in a deinstitutionalization process. FEMA resisted the pressures of the restructuring process, and tried to stick to its long standing and institutionalized comprehensive emergency management paradigm. The long standing and institutionalized frames, which were stored in the organizational memory based on successful historical interpretations, took effect in the current sensemaking⁸¹, as reflected in FEMA's actions of coping with **Uncertainty A and Uncertainty B**. Making sense of the post-hurricane damage, such as losses caused by wind, storm, and flood, is a routine task for FEMA. In order to clarify the unknown damage situation [**Uncertainty A**] and the causes of damages [**Uncertainty B**], FEMA relied on its routinized sensemaking actions developed in history, such as deploying officials to the city's EOC for information updating, and contacting the Coast Guard for an over-flight review [**Actions A and B**]. In the New Orleans flooding case, FEMA official Marty Bahamonde was sent to New Orleans one day before the hurricane strike and commodities were repositioned.

In this phase, a deinstitutionalized FEMA showed its rigidity by adhering to its routine sensemaking strategy, in spite of warnings from the National Weather Service before the landfall of the hurricane and other scattered information about the levee breaches. The National Weather Service forecasted that Katrina would be larger than expected, but FEMA still stuck to its routine way of working with no significant additional proactive preparedness for worst-case scenarios. Even after scattered information from other organizations indicated this hurricane strike might have triggered unusual consequences, such as the information on the potential breach of levees from the Transportation Security Administration and Corps of Engineers, FEMA adhered to its routine ways to understand the damage situation instead of developing specific strategies to clarify the situation.

- Phase II: learning about the catastrophic situation in New Orleans, FEMA continued to rely on its institutionalized framework.

After the over-flight report, FEMA had become aware of the catastrophic situation in New Orleans. For example, levees were breached in New Orleans, large amounts of survivors stranded and only one ground access to the city was available. In general, the impact of Hurricane Katrina and the resulting flooding was larger than expected, if not catastrophic. Facing the unexpected disastrous impact, FEMA did not initiate a visible specific-based strategy to cope with uncertainties in the response, but was still trying to resume a rule-based strategy under the institutionalized emergency response framework, as shown in coping with **Uncertainty C, D and E**.

In coping with **Uncertainty C**, learning about the stranded survivors in the city, FEMA did not try to make sense of the uncertainty regarding these survivors, such as the number and locations of survivors, or the way to evacuate them. Instead, FEMA insisted on the routine reactive response model: "response upon requests" (FEMA would only act on requests from local governments and communities) [**Action C1**]. As an example, Brown visited New Orleans with the Louisiana Governor

81 In sensemaking theory, the term "retention" is used to describe how the successful interpretation of uncertainty is stored for future use. For detailed information, see the section Coping with uncertainty as a sensemaking/organizing process in chapter 2.

and Senators to learn their demands. Brown asked them to provide a list of their demands and their priorities.

FEMA's adherence to a reactive response model in interpreting uncertainties was probably the result of its resistance to the imposed new framework NRP during FEMA's deinstitutionalization process. Although DHS set up a new response framework NRP was put in use during the response to Hurricane Katrina, FEMA did not accept this new framework. Under the new framework, FEMA and DHS were given the responsibility to "push" the federal response instead of waiting for local requests in a catastrophic situation. Obviously, FEMA did not adopt the NRP framework to interpret the uncertainty.

The deinstitutionalization process in FEMA's transition affected coping with **Uncertainty E** as well. As described, the new institutional framework did not take root in FEMA during the response. DHS secretary Chertoff did not declare the "Incident of National Significance" until August 29. During the response, FEMA adhered to its familiar model of emergency response under the Federal Response Plan and ignored the coordination uncertainty caused by the new emergency response framework. FEMA believed in the importance of direct contact with the White House in emergency response, which had facilitated an effective response to the four hurricanes in Florida in 2004. Although realizing the existence of the new framework [communicate with DHS instead of directly contacting the White House], FEMA still ignored the new framework as can be read in Brown's book on Hurricane Katrina, "There was never any question in my mind that I should deal directly with the White House" (Brown and Schwarz 2011: 218). Therefore, FEMA insisted on its familiar strategies in reporting to White House, although the organization was in the process of deinstitutionalization. In the other two instances of organizational changes (ignoring the PFO position and HSOC under the NPR), FEMA maintained the same strategy to bypass DHS and adhered to its routine way of working.

As an organization in deinstitutionalization, FEMA could not handle some "known unknowns" (**Uncertainty D**) due to its eroding capacities. Acknowledging uncertainty in the logistic system, FEMA did not proactively take measures to cope with this known uncertainty. Before Hurricane Katrina, FEMA tried to fix its long-existing problems in disaster aid delivery. As an organization with low external support and budget constraints, FEMA could not convince DHS to make the necessary investments to solve the problems in the logistic system. During the response, FEMA faced the uncertainty concerning the unsatisfactory delivery of commodities to disaster survivors. Instead of initiating solutions internally to reduce the uncertainty caused by the unreliable logistic system, FEMA made no specific changes but carried on until its capacities were totally overwhelmed by the large demands and catastrophic events.

- Phase III: the outcomes of FEMA's actions interrupted its ongoing activities, triggering scattered specific-based sensemaking actions.

In this phase, various failures appeared in the feedback loops of FEMA's sensemaking. In other words, FEMA's adoption of its routinized strategies led to systematic failures as demonstrated in the outcomes of coping with **Uncertainties C, D and E**. FEMA failed to provide buses and other immediate resources via its logistic system as promised after several rounds of requests by local governments. The White House did not appreciate FEMA's attempts at direct communication (bypassing DHS) and wanted it to follow the chain of command based on NRP. FEMA's operational staff and officials in New Orleans did not see the buses promised by FEMA director Brown to evacuate stranded survivors from the Superdome and the Convention Center.

Failures in the feedback loop of sensemaking eroded the appropriateness of FEMA's institutional way of working. The empirical research shows that scattered specific-based sensemaking actions were triggered after these failures, as described in coping with **Uncertainties C, E, and F**. In the face of the slow response by Louisiana State EOC and FEMA, FEMA's operational officials in the Superdome began to create a plan to evacuate the stranded survivors [**Action C2**]. In terms of uncertainty of coordination, FEMA disregarded the institutionalized coordinating framework and began to inform its superior organization and to coordinate with other separate organizations in an ad hoc way [**Action E2**]. In order to deliver expedited assistance to disaster victims in the catastrophic situation, FEMA initiated the debit card program that could speed up the process of aid delivery and cope with the unexpected large-scale relocation of disaster victims who did not have an address to receive checks [**Action F**]. Moreover, after FEMA confirmed the dysfunctioning of the logistic system, FEMA could not reduce uncertainties caused by the logistic system but instead delegated its logistic service to DoD and DoT [**Action D**]. The delegation of its tasks to wipe out uncertainties is a result of its weak organizational capacity (FEMA failed to upgrade its logistic system due to budget constraints).

Scattered specific-based sensemaking lacked robust support internally and/or externally regarding resources, capacities and legitimacy, which appeared to be deficient. Consequently, most specific-based sensemaking tended to fail as demonstrated in coping with **Uncertainties C, D and F**. The improvisation of the debit card program failed to eliminate potential fraud by applicants in the implementation process, which caused criticism from the media and the public. As a result, FEMA cancelled the debit card program. FEMA's initiative to evacuate people stranded in the Superdome did not gain external support from DOD. Consequently, the Joint Taskforce Katrina took over the evacuation task and terminated FEMA's initiative. The leadership conflicts and coordination problems could not be solved by FEMA itself, but were finally addressed when the Coast Guard Chief Vice Admiral Thad W. Allen was appointed on September 12, 2005. Altogether most efforts to initiate specific-based strategies tended to end in failure.

In summary, this chapter presents how FEMA as a deinstitutionalized organization coped with uncertainties during flooding on an unprecedented scale in New Orleans. Organizational institutionalization influenced sensemaking strategies in the following ways:

- In the deinstitutionalized organization, organizational inertia still dominated the initial sensemaking actions, and consequently organizations tended to adopt rule-based sensemaking actions.
- Even though the deinstitutionalized organization learned about the unexpected situation, the organization still tended to resume its institutionalized way of working and adhered to the rule-based strategy with little flexibility.
- Continuous failures in the feedback loops of sensemaking delegitimized the institutional way of working. Scattered specific-based strategies were likely to emerge in sensemaking, but tended to fail due to weak external support or eroded institutional capacities. A take-over by external actors seemed to be inevitable.

Chapter 5 NASA and the Space Shuttle Columbia disaster: an institution coping with “unknown unknowns”

“...we will always have big uncertainties in any transport/trajectory analysis and applicability/extrapolation of the old Arc-Jet test data until we get definitive, better, clearer photos of the wing and body underside.”

—Email from Alan R. Rocha to Paul E. Shack on January 21, 2003

5.1 Introduction

The story of the National Aeronautics and Space Administration [NASA] and the Space Shuttle *Columbia* disaster is a story about how an institution faced and responded to deep uncertainties in the pursuit of its core mission: space exploration. Although there has been great progress in space exploration since the founding of NASA, the conditions for human spaceflight are still inadequately understood by scientists and engineers (Petroski 1994; McCurdy 2001). Validating the complex engineering design of the vehicle is essentially an impossible task because it is impossible to simulate space conditions exactly (Vaughan 2009). The space shuttle was considered the “most complex machine in the world” by Rick Husband, shuttle commander of STS-107⁸² (Cabbage and Harwood 2004: 2). Therefore, uncertainties concerning space conditions and space shuttle designs have been recognized as an integrated part of NASA’s work (McCurdy 1993). Actual flights are the only way to test space shuttle designs. In this sense, NASA has been exploring the “unknown frontier” under the conditions of “perfection is simply impossible” (Boin and Fishbacher-Smith 2011: 6).

After over 50 years of experience in exploring this “unknown frontier”, NASA had developed its unique ways of dealing with the inherent uncertainties of complex science and technology. Although NASA experienced human and vehicle losses in several accidents, the organization was still recognized as one of the high-performance federal agencies (McCurdy 1993; Boin and Schulman 2008; Partnership for Public Service 2012); the National Performance Review report recognized NASA as the “poster boy” and “the star” in the reinventing government campaign (Lambright 2007: 38). NASA had managed many large and complex technology systems for space exploration, like the Apollo program, the International Space Station, the space shuttles, the X-33 shuttle successor project, the Earth Observation System, the Hubble Space Telescope and the robotic Mars exploration program (Donahue and O’Leary 2011). The Apollo program, which landed a man on the moon in 1969, became a symbol of American achievement. Facing budget cuts after the Apollo program, NASA convinced presidents and Congress to launch new exploration missions and accomplished those goals in an economically and timely efficient way (Lambright 2010). NASA staff were confident in their work routines and procedures.

82 This is the flight number of Columbia’s final flight.

On February 1, 2003, the Space Shuttle Columbia (STS-107) exploded over Texas after a 16-day space trip. The disintegration occurred during the re-entry to earth. This tragedy caused the death of all seven crew members (all are Americans except one from Israel) and the loss of the \$4 billion spacecraft. The debris from the disintegrated shuttle was scattered over an area of 2,000 square miles from Texas to Louisiana. After the disaster, the space shuttle program was suspended until July 26, 2005 when Space Shuttle *Discovery* was launched again.

According to the *Columbia* Accident Investigation Board (2003), the explosion was caused by a damaged wing that had suffered aerodynamic stress. Around 81.7 seconds after the launch, three pieces of foam broke off from the left bipod ramp of the External Tank, and struck the left wing of the Orbiter.⁸³ The strike did not cause problems during the 16-day voyage in space. During re-entry, however, the aluminium struts in the wing melted when the superheated air entered the wing because the Thermal Protection System [TPS]⁸⁴ had been damaged by the foam debris. This subsequently caused the disintegration of the *Columbia*.

This chapter explores how NASA, which was highly institutionalized, responded to uncertainties caused by a potential threat to the safety of a complex technical system voyaging far up above. First, NASA as an institution will be outlined, based on its organizational life history; second, uncertainties and actions to deal with these uncertainties, will be identified in the in-depth case study; and finally, the influence of NASA's institutionalization on the selection of coping strategies will be explored according to the analytical framework presented in chapter 2.

5.2 NASA: an American institution

NASA is the federal agency responsible for the nation's space program. It also conducts civilian and military aerospace research. This section describes NASA's institutionalization process and the way it maintained its institutional identity in the face of changes in the organizational environment.

NASA in the Apollo era

The external dimension

In 1958, NASA was on an important national mission: beating the Soviet Union in the Space Race. At the beginning of the space race, the US fell behind the Soviet Union (Launius 2002; McDougall 2008).⁸⁵ When the Russians launched their first space satellite *Sputnik 1* on October 4, 1957, Americans were shocked. In January 1958, the US followed with its first satellite, *Explorer*, which triggered the space race as an extension of the arms race between the two military superpowers. In April 1961, the Russians sent Yuri Gagarin to space in a Vostok spacecraft orbiting the earth.

83 The space shuttle includes three main components: the External tank, the Solid Rocket Boosters, and the Orbiter. The External tank contains liquid fuel for the main engine, which is the only component that cannot be reused. The Solid Rocket Boosters [SRBs] thrust the shuttle into the orbit, and are jettisoned after reaching certain altitude and recovered for reuse.

84 The Thermal Protection System is a barrier protecting the Orbiter against extreme high temperatures, typically occurring during re-entry.

85 For more about the origins and process of the space race, see McDougall (2008).

In response, President Kennedy made a speech before Congress on May 25, 1961 in which he announced the plan of landing a man on the Moon by the end of the 1960s (Farjoun 2005; Logsdon 2010).⁸⁶ The Apollo program consisted of 11 manned flights. Under this program, Apollo 11 landed on the moon with the first man, Neil Armstrong, setting foot on the surface of the moon.

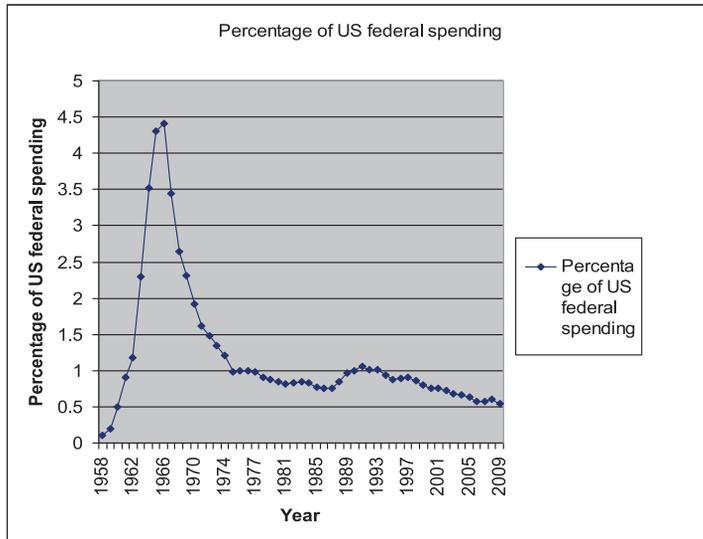


Figure 5-1 NASA's budget as a percentage of the Federal Budget (1958-2009)⁸⁷

The national commitment to NASA in the space race with the Soviet Union provided NASA with sufficient political and public support. In this era, space technology was considered “a symbol of national prestige and power” (Lambright 2010: 152), and nearly unlimited resources were allocated to the space industry with very little opposition (Day 2006; Logsdon 2010).⁸⁸ Figure 5-1 shows that NASA's budget experienced a sharp increase in the first three years of the Apollo project, increasing from \$0.964 billion in 1961 to \$3.674 billion in 1963. The budget kept increasing and peaked in 1967, amounting to almost 4.5 percent of the federal budget.

⁸⁶ For more on President Kennedy and the Apollo mission to the moon, see Logsdon (2010). His earlier book on the same topic in 1970 is based on interviews with key stakeholders and concentrated on the political decisions regarding Apollo 11 while the recent book in 2010 presents new perspectives based on the newly released documents. The Soviet Union developed their space technology with the aim of building a space station, and their first space station was completed in 1971.

⁸⁷ The recent data from the White House is slightly different with that used in the CAIB report; Source of data: <http://www.whitehouse.gov/omb/budget/Historicals/> (accessed on April 20, 2011) <http://www.richardb.us/NASA.html#graph> (accessed on April 20, 2011)

⁸⁸ According to Logsdon (2010), President Kennedy was concerned about his re-election the next year because of the increasing criticism on the Apollo project in 1963. He discussed with then NASA administrator Webb whether to put a national security label on the project or cooperate with the USSR in the project. Subsequently, President Kennedy talked with the USSR about cooperation in the mission to send a man to the moon. However, the cooperation was not achieved due to the assassination of Kennedy.

The internal dimension

After the establishment of NASA, integrating independent centers to work on the Apollo project became essential for implementing the imposed mission of landing a man on the moon (Boin 2008). NASA brought together different agencies and laboratories (Figure 52), including the National Advisory Committee for Aeronautics, the Naval Research Laboratories and the Army Ballistic Missile Agency [which became the Marshall Space Center in 1960]. These centers engaged in research and development and provided technical management, while the small Headquarters in Washington D.C. was responsible for leadership and strategy management.⁸⁹ These centers kept their autonomy after merging into NASA (McCurdy 1993), and maintained their respective engineering cultures to produce components of the Apollo aircraft. NASA continuously overran its budget and repeatedly missed schedule milestones (Boin 2008).

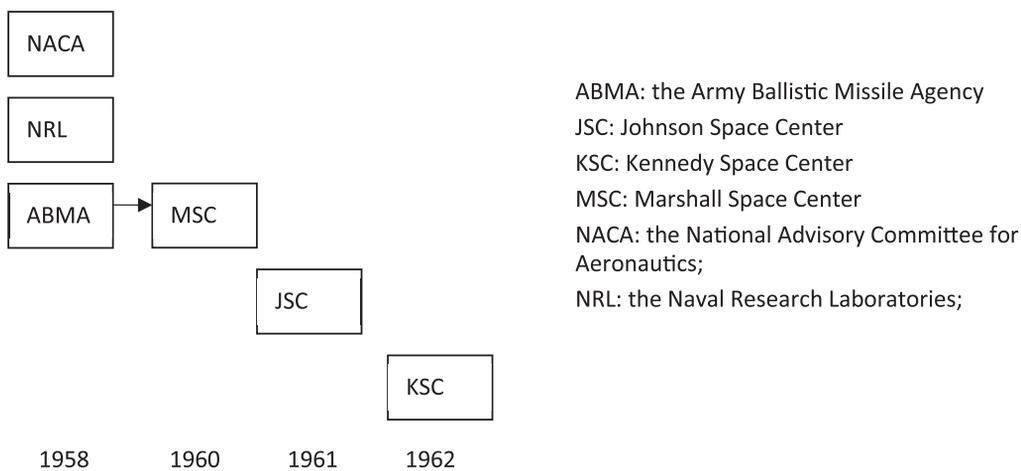


Figure 5-2 the historical evolution of NASA’s centers

In order to overcome schedule delays and budget overruns (Logsdon 2010), NASA’s then associate administrator George Mueller introduced a new management philosophy and related techniques, called system engineering, which originally was used in military defense projects in the 1950s. This helped NASA to integrate the design, creation, and operational work that was done in different centers (Johnson 2006). The system engineering approach created an overall picture of this complex project and tied together loosely organized research teams into an integrated development organization (Johnson 2006).

Mueller also introduced the all-up testing method, which terminated endless testing on each single

⁸⁹ Three centers are relevant to the space shuttle program: Johnson Space Center (JSC) in Houston, Texas, which mainly manages the space shuttle and space station; Kennedy Space Center (KSC) in Merritt island, Florida, which is responsible for launching and landing facilities for the space shuttle; Marshall Space Center (MSC) at Huntsville, Alabama, which manages the rocket propulsion (CAIB 2003; Farjoun and Starbuck 2005); contractors are in charge of hardware construction (Lambright 2010)

component and helped to speed up the design and development process (Cortright and Dickson 2009). The all-up testing method facilitated a new engineering logic: “design it right, fabricate it per print, and the component will work” (Murray and Cox 1989: 103), which nurtured an important risk philosophy in NASA persisting until today. The risk philosophy states that not all unknown interaction in the complex system can be tested before the flight; it accepts that space exploration is a risky business filled with uncertainties [in other words, failure is inherent to space exploration]. The Apollo 15 Commander David Scott described this risk philosophy clearly: “Everybody was aware of the high-risk nature of this new venture, and everybody was encouraged to speak up, to express an opinion or define a concept, without fear of retribution or reprisal (although sometimes friendly ridicule would occur)” (Scott 2008: xxvii).

The risk philosophy was complemented by the belief that established procedures would help to maintain a reliable engineering system. The tragedy of losing three astronauts in the Apollo 1 fire in 1967 taught NASA not to rely on individual experience and judgment. Instead, NASA placed its faith in established procedures (Murray and Cox 1989: 203). NASA documented anomalies in its Mission Evaluation Reports (Donahue and O’Leary 2011). Before each flight, a Flight Readiness Review would help to identify all documented anomalies resolved. NASA staff believed that as long as everybody obeyed established procedures they had done everything possible for the launch. This risk philosophy was emphasized by former flight director Kraft: “We said to ourselves that we have now done everything we know to do. We feel comfortable with all of the unknowns that we went into this program with. We know there may be some unknown unknowns, but we don’t know what else to do to make this thing risk-free, so it is time to go.” (Logsdon 1999: 23). The success of landing on the moon in 1969 legitimized these procedures and the underlying risk philosophy.

In spite of a heavy reliance on established procedures, NASA demonstrated its flexibility and capacities to cope with the unexpected in the Apollo 13 accident (Boin 2008). After the explosion of the number-2 oxygen tank, crew and staff did not just follow the routine procedures, but improvised. For instance, during the re-entry process, NASA ordered the crew to drop the service module first, which was at odds with the routine procedure of dropping the Lunar Module (Lovell 1975).

In each center, NASA relied heavily on exceptional scientists and engineers to build components of the Apollo spacecraft. NASA attracted excellent people with high salaries (McCurdy 1993). The organization experienced a fast expansion of its workforce, which increased from 17,500 in 1961 to 34,300 in 1965. The number of contractors responsible for most of the productions also expanded from 57,000 in 1961 to 376,700 in 1965.

NASA in the post-Apollo era: doing more with less

The external dimension

Political support

After the Apollo program, the public and Congress began to doubt the value of further investment in space exploration (McCurdy 1993). In the early 1970s, key figures in Congress demonstrated their opposition to space exploration, including Ed Koch (D-NY) and James Fulton (R-PA) in the House, and Walter Mondale (D-MN) and William Proxmire (D-WI) in the Senate (Conley and Cobb 2012). Neither did space exploration enjoy a high priority on the presidential agenda any more (Donahue and O’Leary 2011; Mahler 2011; Conley and Cobb 2012). Nixon’s speech in March 1970 clarified the new status of NASA: “We must think of [space activities] as part of a continuing process and not as a series of separate leaps, each requiring a massive concentration of energy. Space expenditures must take their proper place within a rigorous system of national priorities... What we do in space from here on must become a normal and regular part of our national life and must therefore be planned in conjunction with all of the other undertakings which are important to us” (cited in Logsdon 2012: 1). Consequently, space exploration lost its status as a national priority and became a normal national policy domain. Most presidents (except President George W. Bush and George H. W. Bush) maintained a relatively low commitment to NASA and seldom bargained with Congress for higher budgets supporting NASA’s long-term programs.

Facing eroding public and political interest in space exploration, NASA experienced a sharp budget decrease after the Apollo program. As can be seen in [Figure 5-1](#), NASA’s budget was less than one percent of the federal budget after 1974. In the last two decades, NASA’s budget went down every year, and shrank to around a half percent in 2009. The shrinking budget was a result of declining support in Congress. An exception was the congressmen from the eight states where NASA’s centers are located, who helped to limit budget cuts because these centers brought jobs and contracts to their constituencies. NASA enjoyed little support from Congress members from the other 42 states (Conley and Cobb 2012).

Experiencing a decrease in political support, NASA compromised with the White House and Congress regarding its continued pursuit of the next Apollo-like project (Handberg 2003; Paxton 2006). NASA’s deputy director Lori Garver expressed the situation of pursuing ambitious missions in a harsh organizational environment clearly in a breakfast speech hosted by Women in Aerospace: “The fact is that we have been trying to relive Apollo for the last 40 years. We have not been able to recreate that since, and I am not even sure that we would want to, given even that did not provide us with a sustained presence in space” (cited in Foust 2010: 1). In the post-Apollo plans, NASA proposed to explore planet Mars with permanent space stations in the Earth and Lunar orbits and less expensive routine access to space stations (McCurdy 1993). The White House initially rejected the plan, but the development of a low-cost routine space transportation system gained attention from the Department of Defense and the President’s Science Advisory Committee. Finally, President Nixon approved it in 1972 (Logsdon 1986; McCurdy 1993).⁹⁰ NASA’s pursuit of new space programs continued in the 1980s and 1990s, which included the space station program (McCurdy

90 The purpose of approving of the space shuttle program was partly to save the Californian economy after the Vietnam War.

2007), and the next generation space transportation system, X-33 and X-34 (which was supposed to replace the space shuttle) (Launius 2004; Logsdon 2009).⁹¹

In order to gain support from Congress and the White House, NASA actively used its discretion to serve the political interests of stakeholders (Handberg 2003; Lambright 2010). For instance, in order to gain support from President Carter for the space shuttle program, NASA promised to use the space shuttle to launch spy satellites (Lambright 2010). Under the Clinton administration, NASA brought in expertise from Russia, which served Clinton's post cold war foreign policy (Cabbage and Harwood 2004; Lambright 2007). In terms of the space station program, Cabbage and Harwood (2004:32) even claimed that it "had been driven by politics first, and science second". In order to facilitate negotiations with Congress, NASA maintained frequent missions with low costs to show efficiency (Langewiesche 2003). Moreover, NASA located its track facilities in Texas, President Johnson's and Bush's home state, and awarded the contract for the rocket engines production to Morton Thiokol Corporation in Utah, the home state of the chairman of the senate committee on Aeronautical and Space Sciences, Frank Moss (Jensen 1996).

After the *Challenger* Disaster, NASA's budget increased and the organization experienced less performance pressure from Congress and the White House. NASA gained funding from Congress and the White House to implement recommendations of the Rogers Commission (a presidential commission created to investigate the causes of the *Challenger* disaster). Congress set an annual flight rate for NASA, which, before the disaster, had been reduced from 16 flights per year to 10 (Mahler and Casamayou 2009). The reduction of the annual flight rate relieved NASA's performance pressure.

During the 1990s and the early 2000s before the *Columbia* disaster, NASA's legitimacy as perceived by Congress and the White House declined to some degree (Blount, Waller et al. 2005; Mahler and Casamayou 2009). Ever since the 1990s, NASA's space station program had been challenged in Congress. Between 1991 and 1997, there were around 19 Congressional votes on whether to terminate the space station program (Klerkx 2005). Building the International Space Station (ISS) was behind schedule with budget overruns by 2001. Congress and the White House began to impose strict schedule and budget pressures on NASA. The shuttle program was connected with the ISS program, and NASA had to complete the Node 2 that the US was responsible for in the ISS program by February 2004. This meant that NASA had to launch five flights from October 2003 until February 2004. By then, NASA had been put on probation by Congress, meaning that it would lose its credibility if the agency failed to complete the ISS on time (CAIB 2003). Moreover, the appointment of new Chief Administrator O'Keefe, who was the US former budget director, indicated that NASA's problems were mainly managerial and financial in the eyes of the White House (Farjoun 2005; McDonald 2005).

91 For a comprehensive explanation on the policy failure of developing the next generation space vehicle, see Logsdon (2009) and Launius (2004).

Public support

In response to the waning public interest in space exploration, NASA's new missions increasingly focused on planetary research and civil use of its advanced technology to regain public support. NASA launched more Earth-oriented satellites, which helped with agricultural production, and observing ozone depletion, global warming and climate change related problems. For instance, NASA provided hard evidence for ozone depletion, based on satellite images, and became the leading scientific agency on this issue (Lambright 2006). *Skylab*, the first US space station, conducted numerous scientific experiments and tested the effects of long-term space flights on the human body. Moreover, NASA intentionally used the manned space shuttle program to attract public interest (Morring Jr. 2008). For instance, in the *Challenger* mission, an elementary school teacher was selected as crew member to teach students (from space). NASA further proposed a mission to look for water on Mars. Such missions could "give taxpayers a much better return on their investment", according to Scott Hubbard, a top jet propulsion lab manager (Dickey 2000: 7).

Notwithstanding the tragic *Challenger* disaster and the failure of two Mars orbiters, the public still believed that NASA was exceptional in space exploration (Launius 2003). According to a survey by the *New York Times* after the *Challenger* disaster, over 80 percent of the respondents had a high confidence in NASA (Waldrop 1986). Miller's (1987) survey drew a similar conclusion. According to the Gallup polls in 2009, the public believed that the benefits of the space programs justified the costs (Jones 2009). Fifty percent of Americans thought NASA did a good job before the Columbia disaster in 2003.

Contractors

To reduce costs, NASA increasingly relied on private contractors in operating the shuttle (Mahler 2011). In the Apollo era, NASA contracted out the launch system to contractors which was considered to "enhance American technical capacity" by then Administrator Webb (Bromberg 2000: 61). Following the recommendations in the Kraft Report (1995), NASA adopted a prime contractor (or single contractor) method to reduce costs. Under the prime contractor method, NASA's space shuttle program was conducted mainly by the United Space Alliance [USA], a joint venture between Boeing and Lockheed Martin. The contract with USA replaced 86 previous contracts with 56 companies (CAIB 2003). The contractor workforce [mostly USA's] for Johnson Space Center almost doubled in 1997 [from 5,442 in 1996 to 10,556 in 1997]. In the shuttle program, around 90 percent of the whole workforce were contractors (CAIB 2003). Moreover, NASA encouraged its contractors to reduce costs as well. For instance, USA was encouraged to reduce costs by promising it 35 percent of the money thus saved. The Kraft report (1995: 10): "people used to come to NASA for information, now they come for a contract".

NASA continued to maintain close working relationships with engineers from contractors (Lambright 2007: 36). These contractors were involved in the whole process of shuttle launch, including planning, construction and maintenance. Actually, NASA relied on feedback from contractors for the design and maintenance of space exploration facilities. As Robert Caste from Mission Operations Directorate said in the CAIB (2003: 174) public hearing, "Even on the flight control team, the people that I know, I'll tell you their names and their wife's name but I can't tell you whether they're a contractor or a civil servant because it's not really important".

This close working relationship reflected NASA's engineering culture, which concentrated on technical solutions instead of focusing on the supervisory relations between NASA managers and contractors.

The internal dimension of institutionalization

After the end of unlimited budgets, a cost efficiency philosophy took hold in NASA's space shuttle program (McCurdy 1993).⁹² Given the large costs of the Vietnam War, a relatively cheaper space transportation system as NASA's routine transportation means was approved by Congress and the White House, which could support research in the low Earth orbit (Logsdon 1986; Cabbage and Harwood 2004). In order to gain Congressional approval, NASA proposed to design the vehicle as a completely reusable spaceship. NASA reused most of the components of the space shuttle except the External Tanks (Cabbage and Harwood 2004).⁹³ In the United States, the space shuttle served as the only manned space vehicle after the Apollo program until the retirement of the final shuttle after the return of space shuttle *Atlantis* on July 21, 2011 (Dick and Launius 2009).

Because the main destination of the space shuttle, the space station, had not been approved by the Nixon Administration, NASA had to look for "customers" who could share the cost of the space shuttle. NASA collaborated with its former competitors in space exploration, which included DoD, the intelligence communities, and commercial and scientific actors (McCurdy 2002; Cabbage and Harwood 2004; Kay 2005). NASA changed the shuttle design to carry heavy payloads for these "customers" (Lambright 2010), and adopted cheaper and lighter materials to minimize the weight of the shuttle and thus increase carrying capacity to save costs. A crew escape system, which could separate the crew capsule from the launch vehicle in an emergency, was not taken into consideration in the space shuttle design due to budget constraints (Farjoun 2005).

NASA made a commitment to providing frequent flights and to controlling its cost (Logsdon 1986; Cabbage and Harwood 2004; Kay 2005). In 1981, the space shuttle program was slightly over budget (only 15 percent) and behind schedule. In 1982, after only four flights, President Reagan announced that the space shuttle was operational and could provide routine access to space. The operational space shuttle helped to pursue the space station program.⁹⁴ During the first half of the 1980s, NASA maintained a good record in the space shuttle program which won praise from the NASA Aerospace Safety Advisory Panel (Farjoun and Starbuck 2005). NASA successfully launched all its 23 missions from the first flight in 1981 until 1985. In the 1985 annual report, the NASA Aerospace Safety Advisory Panel acknowledged that NASA's achievement was "noteworthy" given the limited human and physical resources.

92 The current manned space vehicle is operated through the space shuttle program [also named the Space Transportation System (STS)] which began in 1981. The US space shuttle program is one of three the human spaceflight programs in the world [together with Russia's Soyuz Program and China's Shenzhou Program]. The space shuttle-other than the Chinese and Russian system,-includes a reusable launch system and orbital spacecraft.

93 Reuse of External Tanks was considered to be too expensive, and these were dropped in the atmosphere.

94 The other function was to compete with the European Space Agency.

Experiencing successful missions, NASA grew more confident about its way of working and institutionalized its routine procedures and chain of command (Starbuck and Milliken 1988; McCurdy 1993; Adams and Balfour 2009). In the following flights, NASA staff gradually formed a belief as described by Vaughan (2009: 353), whose theory on the organizational causes of the *Challenger* disaster has been cited in the CAIB report: if “managers and engineers obeyed the cultural mandates of hierarchy and protocol” and “followed all the rules”, “the anomalies were not a threat to flight safety”. Obeying procedures meant that “they had done everything possible to assure mission safety”. Moreover, the CAIB report also asserted that “NASA’s culture of bureaucratic accountability emphasized chain of command, procedure, following the rules, and going by the book” (CAIB 2003: 20).

After President Reagan announced in 1982 that the space shuttle was operational and approved to develop a space station, NASA reduced its research and development budget on the space shuttle program, and shifted its focus towards the space station. However, the decision to declare the shuttle operational proved to be premature as became evident in the *Challenger* disaster in 1986 (Roger Commission 1986). The space shuttle *Challenger* exploded 73 seconds after liftoff, causing the death of all seven crew members on January 28, 1986. The technical cause of the *Challenger* disaster was that the O-rings could not withstand stress in low temperatures during the launch, which led to erosion by hot leaking gases in the liftoff process. The O-rings erosion had been labeled as a potential problem in 1981. Both NASA and its contractor Morton-Thiokol knew that O-ring erosion occurred frequently. NASA’s internal risk assessment classified the O-ring erosion as an acceptable risk. The acceptance of O-ring erosion proved to be disastrous (Vaughan 1996).

After the *Challenger* disaster, NASA adopted the advice of the Roger Commission (1986) in terms of center management and schedule pressure, but it reverted to its old routines in the year thereafter. The rivalries [typically between Marshall and Johnson Space Center] and communication barriers between different centers were identified as contributing factors to the *Challenger* disaster (Dunar and Waring 1999).⁹⁵ In reaction, NASA streamlined the shuttle program management by imposing a program manager. Afterwards, NASA reverted to the previous management approach with a center leading the shuttle program in order to improve efficiency and safety as suggested by the Kraft Report (1995). When O’Keefe took office in 2001, the management of the space shuttle program was shifted back to headquarters again (CAIB 2003). Although the power structure of center management shifted back and forth several times, the change of power structure did not influence NASA staff and its way of working, according to a CAIB public hearing (2003).

Schedule pressure was highlighted in the Roger Commission Report (1986) as a potential failure factor, but it did not change after the *Challenger* disaster (Brown 2009; Vaughan 2009; Donahue and O’Leary 2011). After the *Challenger* disaster, DoD withdrew its support for the shuttle program, and removed all its payload that used to be launched by NASA (Cabbage and Harwood 2004). NASA’s space shuttle provided no commercial services to other “customers”. Instead, it focused more on the science and technology mission, leaving the space station as the only visible

95 For more about the rivalry between Marshall and Johnson, see Dunar and Waring (1999).

“customer” to share the costs.⁹⁶ As a result, the flight rate of the space shuttle directly influenced the progress of the assembly of the space station. By 1988, the International Space Station (ISS) experienced serious problems of schedule delay and budget overruns. The first launch was delayed from 1992 to 1995 while the cost estimate tripled. By contrast, Russia by then had had its space station in orbit for two years (Farjoun 2005). Moreover, the space shuttle was necessary for repairing the *Hubble Space Telescope*. NASA had to resume its fast pace of launching flights to build the space station and repair the *Hubble Space Telescope*. Any delay in these projects could easily erode public and political confidence in NASA, which would influence the budget allocation for the following year (Mahler and Casamayou 2009).⁹⁷

In the 1990s, a new philosophy “faster, better, cheaper” advocated by then NASA director Goldin deepened the cost-efficiency philosophy (Brown 2009; Dick and Launius 2009). Under this philosophy, NASA worked to increase the number of small missions with lower costs (McCurdy 2001; Lambricht 2007).⁹⁸ However, the philosophy was challenged within NASA. Notably, between 1994 and 1998, Donn Shireley, manager of the Mars exploration program at the Jet Propulsion Laboratory, questioned the definition of “better” and the impossibility of balancing the three goals: “We’ve never been able to define what better is in any meaningful way...What is better? More science with simultaneous observations? Incredible resolution with no coverage? You need both. As the joke goes, you can’t have faster, better and cheaper. Pick two.” (Dickey 2000). Similar criticism came from former astronaut Sally Ride: “‘Faster, better, cheaper’ when applied to the human space program, was not a productive concept. It was a false economy. It’s very difficult to have all three simultaneously. Pick your favorite two. With human space flight, you’d better add the word ‘safety’ in there, too.” (Dreifus 2003: 1).

In the post-Apollo era, NASA’s workforce was slimmed down due to shrinking budgets, which eroded its organizational capacities. The NASA workforce fell from 31,733 in 1969 to 25,955 in 1973. From 1970 to 1985, NASA lost 31 percent of its workforce (Heimann 1993). As can be seen from [Figure 5-3](#), NASA’s total workforce was sharply reduced from around 24,000 in 1993 to 18,000 in 1998, and the technical workforce was slashed from over 13,000 to less than 11,000. Since 1998, NASA’s total workforce and technical workforce have kept stable. By 2003, around one quarter of the remaining qualified workforce would reach their retirement age in five years.

In the post-Apollo era, NASA attracted fewer talented scientists and engineers for two reasons: the first was that there were fewer American students studying engineering and natural sciences. The second was that the industry could provide better terms of employment for university graduates, making a civil servant position in NASA relatively unattractive.

96 Two important stakeholders, DoD and some European countries, who used to share large amounts of costs in the space shuttle program turned to other transportation means. For example, DoD started to use its *Titan 4* rockets and European customers turned to rockets based in France.

97 By 1990, the space shuttle and the space station were managed by the same administrator which strengthened the interdependence between them (Farjoun 2005).

98 For a detailed analysis of Goldin’s “faster, cheaper and better” philosophy and its application, see McCurdy (2001).

However, NASA maintained very high cohesion and commitment among its employees when compared to other federal agencies (Augustine, Austin et al. 1990). The consultancy company Behavioral Science Technology Inc. (2004) gave high praise to NASA regarding its internal cohesion. In another survey conducted by the Partnership for Public Services (2003), a nonprofit, non-partisan organization, among public agencies NASA staff ranked very high in terms of employee satisfaction and commitment [ranked in the top 5 in most indices].

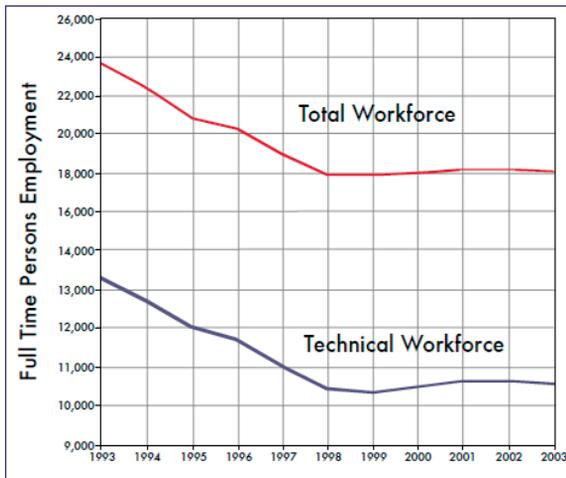


Figure 5-3 Downsizing of NASA’s overall workforce and technical workforce (1993-2003) (CAIB 2003: 110)

During the 1990s, NASA’s safety system was not upgraded due to budget constraints. The budgets of the space shuttle program decreased from 48 percent of the NASA’s total budget in 1991 to 38 percent in 1999 (Blount, Waller et al. 2005: 135). According to Bloomberg in the CAIB’s public hearing, NASA simultaneously conducted technology development and vehicle development of the next generation spacecraft, leaving very little budget for the maintenance of the safety system in the space shuttle program. The percentage of shuttle safety and performance upgrades in the total shuttle budget dropped from 49 percent in 1988 to 19 percent in 1999 (Pollack 2003). Bloomberg also witnessed NASA’s “failure to put money into the long term and to plan for flying this vehicle in the years 2012, 2015 and beyond”, which sows “the seeds for a decrease in safety” (CAIB 2003: 194). However, NASA failed to develop a new generation space transportation system by 2002. After O’Keefe took office, NASA decided to upgrade the shuttle to sustain it until 2020 (Lambright 2005; Lambright 2008).

By the end of the 1990s, NASA’s two Mars orbiters failed. According to the SIAT (2000) report, NASA was confronted with several near misses and in-flight anomalies in 1999 as well, which were the result of erosion of safety procedures due to the reduced workforce. Goldin realized there was a safety problem and proclaimed a budget crisis in the space shuttle program. Goldin obtained approval from the Clinton Administration for an increase in the budget for the safety system which ended the downsizing of the space shuttle program. However, the safety upgrading had not been

fully implemented at the retirement of Joseph Rothenberg in 1999 (NASA's associate Administrator for human space flight) and the exit of George Abbey (the entry director at JSC), both of whom were very committed to the safety program (McDonald 2005).

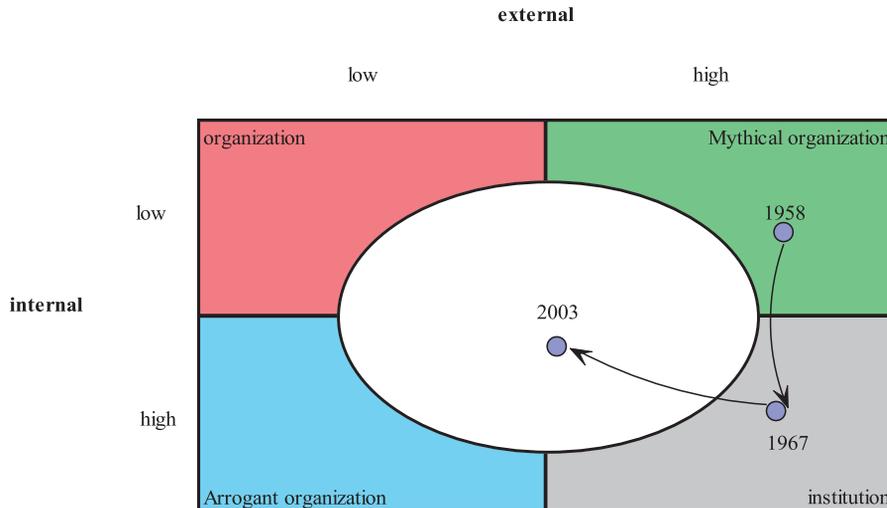


Figure 5-4 NASA's evolution in terms of its institutionalization status

In summary, as can be seen from [Figure 5-4](#), NASA reached its institutional “peak” as a federal agency with a well-functioning technical culture during the Apollo program, whose mission was supported by political stakeholders and the public. NASA was established with a given mission of competing with the Soviet Union to send a man to the moon. The mission was considered a national priority, and the White House and Congress provided nearly unlimited economical and political support to NASA. In this period, NASA nurtured a working philosophy, which accepted risk as part of space exploration and relied on established procedures to control risks. To support the mission, NASA built its capacities and expertise through integrating dispersed centers, introducing all-up testing and system engineering to manage the complex program, and attracting exceptional graduates and engineers.

After the Apollo program, NASA was past its institutional “peak” due to a loss of national commitment. Yet, it still kept a high degree of institutionalization. Although experiencing declining public and political interest in space exploration, NASA maintained its pursuit of ambitious missions. Under the shrinking budget, NASA was committed to improving its performance in a predictable way, for example by carrying out frequent flights with low cost (Paxton 2006). Therefore, cost efficiency became part of NASA's infused value. Respecting established procedures was still an indispensable part of NASA's working philosophy. Although there were experienced several failures, such as the *Challenger* disaster, NASA maintained a high success rate [87 successful missions in 17 years in the space shuttle program before the *Columbia* disaster]. During this period, NASA's workforce decreased, but in 2002 NASA still ranked as the best place to work among ten surveyed federal agencies, according to the surveys by the US Office of Personal Management (Partnership for Public Service 2003). Externally, NASA forged necessary coalitions

with stakeholders to protect its missions and program budgets (Logsdon 2009). NASA used its discretion to support the political interests of stakeholders and maintained close working relationships with its contractors. In short, NASA experienced a decrease of its internal and external institutionalization, but was still relatively high on both dimensions when the Space Shuttle *Columbia* disaster occurred.

5.3 NASA and the space shuttle *Columbia* disaster: identifying uncertainties and coping strategies

In the case analysis of the Space Shuttle *Columbia* disaster, the time span is from 81.9 seconds after liftoff when foam broke off from the External Tank (January 16, 2003) to the moment when the shuttle exploded during the re-entry process on February 1, 2003. The data in this section mainly come from the Columbia Accident Investigation Report [Volume I-VI], selected academic and newspaper articles, and monographs and edited books.

Before going into details of the case analysis, we will provide some background information on space shuttle *Columbia* (the US' first space shuttle). Before the *Columbia* disaster, space shuttle *Columbia* had just undergone an overhaul. The *Columbia* had similar overhauls in 1984, 1991 and 1994. This recent overhaul was triggered by a wire problem which caused the shutdown of two engine controllers five seconds after a launch in July 1999. The overhaul lasted 17 months and cost \$145 million. In the overhaul, NASA's contractor *Boeing* helped to replace the cockpit equipment and thermal tiles, and repair wires (Fordahl 2003; Pollack 2003).

On January 16, NASA launched the STS-107 [*Columbia's* flight number] mission which seemed to be successful. Exactly 81.9 seconds after liftoff, a piece of bipod foam broke off from the External Tank and struck the left wing of the Orbiter (CAIB 2003). The incident was initially not observed by engineers from the Inter-Center Photo Working Group (IPWG) at the Kennedy Space Center (KSC), which is an agency-wide organization responsible for film coverage of shuttle launches, missions and landings (Cabbage and Harwood 2004). The next day at 9:30 am EST, the IPWG members at Johnson Space Center (JSC) noticed the foam strike in their film review process. After around an hour, KSC confirmed the occurrence of the foam strike. After that, a series of uncertainties emerged regarding the impact of the foam strike and actions taken to cope with these uncertainties. This section will describe the uncertainties NASA encountered and the actions NASA took.

Uncertainty A: The potential impact of the foam strike.

Although NASA learnt from the film review that foam had struck the Orbiter, the photos available were not clear enough to evaluate the impact to the vehicle. The foam could have hit the Orbiter, somewhere on the left wing near the leading edge, instead of on the Solid Rocket Boosters [SRB] as had happened before (Cabbage and Harwood 2004: 94). The damage to the vehicle caused by foam strikes is determined by several factors, such as the size of the foam, "apparent momentum of the strike" influenced by the density of the foam, hitting angles of strike, and initial velocity of the foam (CAIB 2003: 14), and the impact area (Dunbar and Garud 2009). Unfortunately, none of these factors could be identified from the available images. From these available video clips,

engineers could only see that the foam pieces looked larger than ever and might be the largest pieces of debris ever hitting the Orbiter (CAIB 2003; Cabbage and Harwood 2004: 94).

Action A1: IPWG looked for further information within NASA, then requested imagery externally; NASA shared information with relevant actors; NASA formed a temporary team to investigate the situation.

Learning about the debris strike, IPWG looked for better available images from other cameras to reduce uncertainty (CAIB 2003), including the ground-based camera sites and the Cape Canaveral Air Force Station runway (Cabbage and Harwood 2004). However, none of these images could provide a clear view of the impact of the foam strike.

When images from available channels could not help to determine the foam strike impact, IPWG Chair Bob Page requested images from DoD, which used the military facility to image the shuttle in orbit. Page contacted Wayne Hale, who was the Shuttle Program Manager for launch integration at KSC, regarding the procedure of requesting military imaging. Hale agreed to help Page (CAIB 2003). This was the first of the three image requests made by the engineering group during the flight.

At the same time, IPWG shared available foam strike information with other actors. For instance, IPWG emailed a situation report and clips of the strike to relevant NASA organizations. The email triggered an active information exchange among engineers and managers at KSC, JSC and their contractors, mainly USA and Boeing. Moreover, IPWG kept its upper management updated on the available information and actions taken. IPWG alerted senior managers in the Mission Management Team (MMT, the project leader) by phone, and informed them that a formal report was forthcoming (CAIB 2003). The information was recorded in the Mission Evaluation Room's (MER, the team responsible for engineering issues during a flight) daily log: "The debris appears to originate from the ET Forward Bipod area...travels down the left side and hits the left wing leading edge near the fuselage...The launch video review team at KSC thinks that the vehicle may have been damaged by the impact" (CAIB 2003: 141).⁹⁹

IPWG classified the foam shedding as an "out of family event", which required contractors Boeing and USA to form a joint analysis team with NASA experts to investigate the impact of the foam strike. This was according to standard operational procedures. The team would present their results to MMT. The team was named the Debris Assessment Team [DAT], and was co-chaired by NASA's Chief Engineer of the Thermal Protection System (TPS) Rodney Rocha and USA engineering manager Pam Madera.

Action A2: The Debris Assessment Team used Crater for the analysis and involved more experts in the discussion.

⁹⁹ The reader should understand the difference between Mission Evaluation Room and Mission Management Team. The latter is responsible for making almost all decisions, while the former mainly focuses on the technical problems.

On January 18, DAT began to use software named Crater, which was one of the few available tools for analyzing the impact of debris on a space shuttle. Crater was developed during the Apollo program to predict threats to spacecraft from tiny rock fragments in space. This was the first time that Crater was used to analyze a flight in orbit. In order to predict the impact of the foam strike during the flight, the algorithm was modified, and data used mainly came from impact tests in 1979 and 1999. However, the validity of the modified formula and database used for prediction was still unknown (see [Uncertainty B](#)).

DAT involved more experts from NASA and contractors such as USA, Science Application International Corporation and Boeing in the discussion. They concluded that the size of the foam was larger than ever before. The strike area could be the main landing gear door, which would threaten the safety of flight during re-entry. Moreover, the team suggested seeking images from other military sources in order to further identify the damage area (Cabbage and Harwood 2004: 98, 102-103).

Action A3: Mission management classified the foam-shedding event as an “In-Flight Anomaly” based on historical analogy.

The foam strike did not draw much attention from mission management because it was not considered a “safety of flight” event in NASA’s official risk parlance (Langewiesche 2003; Dunbar and Garud 2005). Foam insulation is designed to prevent ice on the surface of the super-cold External Tank from damaging the Orbiter during the launch process (CAIB 2003). In the 20 years of flight history, foam was shed from the external tank in almost every flight, an event which occurred in 65 out of 79 previous flights according to the available data (Cabbage and Harwood 2004). In 14 of these flights, the foam shedding caused significant damage to TPS systems.

In the original design of the space shuttle, debris strike was strictly prohibited, as can be seen from the guideline of the Ground System Specification Book – Shuttle Design Requirements: “...no debris shall emanate from the critical zone of the External Tank on the launch pad or during ascent except for such material which may result from normal thermal protection system recession due to ascent heating” (recited from CAIB 2003: 122). Initially, foam strike was classified as an event of “serious safety concern”, later on as an “in-flight anomaly” to be resolved and understood before the next flight. In 1992, foam loss was re-categorized as “no safety of flight issue” (CAIB 2003). The foam-shedding event had been classified as an “In-Flight Anomaly” in the post STS-112 review meeting in 2002.¹⁰⁰ Therefore, it is understandable (but in hindsight not correct) that the foam strike in STS-107 was classified as an “in-flight anomaly” by mission management (CAIB 2003: 125). Mission management instructed engineers to analyze the rationale used in the cases of STS-87 and

100 The reason why STS-112 was launched earlier than STS-107 was that the latter was delayed due to various safety or other reasons.

STS-112 showing similarities in the source and size of the foam (CAIB 2003).¹⁰¹

Uncertainty B: Uncertainty with regard to the analytical tool, Crater.

As mentioned in the previous section, DAT doubted the validity of applying the analytical tool Crater, because Crater had not been designed for shuttles and the analysts had never worked with Crater. When applying Crater to analyze the impact of the foam on the shuttle, the size of the foam was considerably exceeded Crater's validity range [around 640 times]. The analysis also did not consider the significance of the striking area. Some areas such as the landing gear door seal area and lower surface area are more vulnerable to foam strikes than other areas in the Orbiter. Moreover, the analysts from Boeing using Crater were not familiar with the software; they had only used it twice before (Dunbar and Garud 2005).¹⁰²

Action B: DAT tried to reduce the uncertainty caused by the software through adjusting the algorithm and testing the validity based on historical data.

Apart from image requests, Crater was the only tool available to estimate the size of foam and impacts on the Orbiter. DAT adjusted the algorithm of Crater to let it fit with the foam strike damage to the Thermal Protection System, and tested the validity of Crater based on historical data. The test results showed that the prediction by Crater was conservative, predicting more severe damage than actually occurred. Acknowledging the conservative estimates of the software, DAT continued to use Crater to predict the impact of the foam strike (CAIB 2003).

Uncertainty C: Uncertainties concerning the strike areas.

In an informal meeting on January 20, the ambiguity surrounding the impact area still challenged DAT, which had to determine whether the strike had caused disastrous damage to the vehicle. If the foam had damaged the area where the main landing gear door seal was located, the superheat would burn through the wing and cause the loss of the vehicle during the re-entry process (CAIB 2003).

Action C1: DAT insisted on image requests to reduce uncertainty and initiated various ways to acquire more information on the damage area.

DAT became increasingly convinced of the necessity of acquiring images in order to reduce uncertainties concerning the impact area. DAT asked Chair Rocha to request images through his JSC division on January 21, which was the second image request. However, this request did not run

101 The impact areas were actually different: the foam struck the orbiter in STS-107 and the SRB in STS-112. Since foam strikes had been recognized by NASA, engineers had made efforts to reduce damage to TPS caused by foam strike. For instance, based on historical data analysis, NASA engineers reduced the thickness of the foam in those areas where foams could possibly fall off, and poke holes in those areas to allow gases beneath to escape.

102 Most experts stayed in Boeing's Huntington Beach office when the office was moved to Houston a couple of months before the disaster.

through the formal channels to DoD [via MMT and then to the Flight Dynamic Officer] (Figure 5-5). DAT engineers expressed their desire to obtain additional image in order to reduce uncertainty, which can be seen from the email sent by Rodney Rocha to Johnson Space Center engineers on January 21, 2003: “The meeting participants ... all agreed we will always have big uncertainties in any transport/trajjectory analyses and applicability/extrapolation of the old Arc-Jet test data until we get definitive, better, clearer photos of the wing and body underside. Without better images it will be very difficult to even bind the problem and initialize thermal, trajectory, and structural analyses. Their answers may have a wide spread ranging from acceptable to non-acceptable to horrible, and no way to reduce uncertainty... can we petition (beg) for outside agency assistance?” (CAIB 2003:152). Rocha also emailed Engineering director Shack at JSC to discuss the possibility of asking the astronauts on board to take a look at the potential damage areas, but did not get replies from mission management on January 19 (Langewiesche 2003). On the same day, USA manager and DAT member Bob White phoned Austin (the space shuttle system integration manager at JSC) to discuss the procedure of getting images [the information flow of all three image requests can be seen in Figure 5-5]. Austin phoned DoD’s Manned Space Support Office representative to consult them about the image requesting procedure.

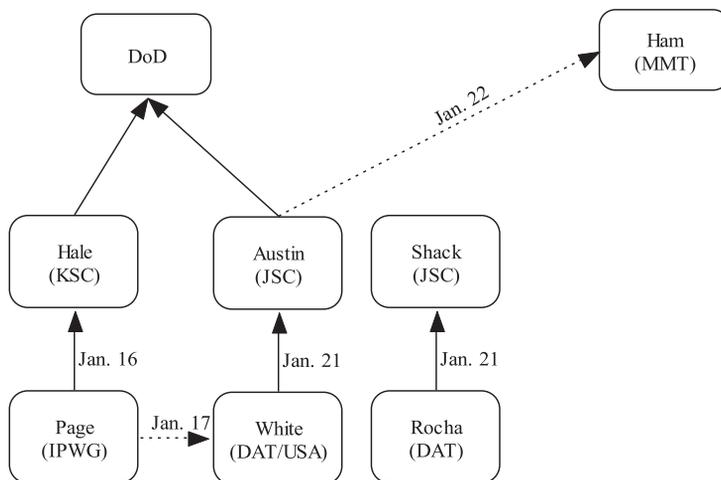


Figure 5-5 image request flow chart in STS-107

Action C2: Mission management ignored the uncertainty, and resumed the image request procedure.

As shown in Figure 5-5, two requests made by Page and White at the operational level had gone through their respective managerial levels (Hale at KSC and Austin at JSC), and reached DoD. After receiving the requests, DoD actually started its preparation to obtain such images (Langewiesche 2003). On January 22, after Austin informed Mission Management Team Chair Ham of the request, Ham started to investigate the source of the request and the reason that the request was made without authorization by the MMT chair (CAIB 2003). NASA’s procedures specified that DoD would be called upon for assistance when there was a mandatory need for such a service. After contacting

the vehicle engineering office, MER, and USA¹⁰³, Ham found no more information on the source of the request and terminated the request. To resume the institutionalized procedure, Ham instructed a NASA official to send an official email to the Air Force (CAIB 2003: 159).

Action C3: DAT kept requesting images and used simulated scenarios to demonstrate all potential damage to tiles.

After learning about the cancelation of image requests, DAT engineers expressed their dissatisfaction and insisted that images were necessary to assess the extent of the damage. DAT discussed the possibilities of reversing the decision to cancel the image requests in a second meeting on January 22, but did not take any substantial action (Glanz and Schwartz 2003). In the third meeting, DAT again stressed the need for images because the size of the foam debris was larger than ever before, but it still failed to convince mission management (CAIB 2003).

Failing to convince mission management, DAT turned to simulating possible scenarios to reduce uncertainties regarding the damage situation. On January 24, DAT used five simulated scenarios provided by contractors Boeing and USA to demonstrate the potential damage to the tiles. However, these simulated scenarios could not provide a clear answer regarding the extent of the damage, because of uncertainties in the results of the analysis with the Crater software. From 25 until 31 January, there continued to be discussions about the potential damage to wings and landing gear door, but DAT never arrived at a clear conclusion (CAIB 2003).

Uncertainty D: Conflicting intelligence on potential effects of damage to the Orbiter during re-entry

The potential effects of damage to the Orbiter during the re-entry remained unknown because of the uncertainty concerning the strike area. DAT still could not determine whether the foam hit the leading edge of the RCC panel or the underside tile in the Orbiter (Langewiesche 2003).¹⁰⁴ If the main landing gear door on *Columbia's* left wing had been hit, the super-heated gas during re-entry might destroy the landing gear's tires (Cabbage and Harwood 2004). If the foam had hit common tiles in the TPS, this would be an in-flight anomaly event.¹⁰⁵ DAT's simulated scenarios mostly concerned impacts on TPS, and only one concentrated on the potential damage to RCC panels.¹⁰⁶ As mentioned in the previous paragraph, these simulated scenarios could not provide a definitive answer regarding the damage situation.

103 Loren Shriver from USA later heard of the demand for images from Page and White, but failed to avert decisions to turn down the request.

104 The Orbiter is coated with thermal tiles that protect against searing heat during re-entry, but are easily shed by strikes. By contrast, the Chinese Shenzhou spacecraft has adopted a special insulating mould coating that can resist high temperatures. The Reinforced Carbon-Carbon system [RCC] covers special materials in the TPS to protect the leading edge of the wing and the nose cap where temperatures could exceed 2,300 F during re-entry.

105 An in-flight anomaly event or in-family event is a problem that has been experienced, analyzed and understood, and needs to be resolved before the next mission; An out of family event is something unusual and has not been experienced before, which requires more data for further analysis.

106 In the information exchange process, engineers from USA and NASA using their conventional rationale did not realize that the foam shedding would be a threat to RCC (Cabbage and Harwood 2004: 98, 101).

In discussing the potential damage to the Orbiter, conflicting opinions were presented to MMT by DAT and another tile expert, Calvin Schomburg. DAT engineers still insisted that clearer images were needed. If the heat tiles would be burnt through during the re-entry process, there were some possibilities of losing the Orbiter. By contrast, TPS expert Schomburg suggested that the foam strike was an “in-family” acceptable risk (Dunbar and Garud 2009). The expert assured that RCC could withstand the strike as indicated in his email “TPS took a hit-should not be a problem-status by end of week” (CAIB 2003; Glanz and Schwartz 2003).¹⁰⁷ The conclusion of this expert could be traced back to another risk assessment in 1990, which suggested the RCC panels were more resilient than tiles in terms of tolerating strikes. However, this conclusion had never been tested in real flight situations (Ocasio 2005: 113-114).¹⁰⁸

Action D: Mission management ignored the uncertainty and adopted advice from tile expert Schomburg.

Mission management ignored the uncertainty of the potential effects of damage to the Orbiter and treated the foam strike as a post-landing maintenance issue. In the 3rd DAT meeting, Schomburg maintained that “even [if there was] severe damage to the tile, nothing could be done” (CAIB 2003). Ham assumed “I don’t think there is much we can do, so it’s not really a factor during the flight, since there is not much we can do about it” (CAIB 2003). *Columbia* flight director LeRoy Cain concluded in an email “I consider it to be a dead issue” (Glanz and Schwartz 2003). Finally, NASA accepted the tile experts’ rationale.

Uncertainty E: The possible flat-tire scenario for the landing

After the information on the foam strike was circulated within NASA, some of the landing gear engineers, such as Carlisle Campbell, began to worry about possible landing problems caused by potential damage of the foam strike. The foam strike might cause hot gases to burn through TPS, which would allow the hot gases to reach the wheel during re-entry. The hot gas might damage the landing gear or flatten the tires, which would consequently affect the landing. From 27 until 31 January, engineers from JSC and Langley Research Center exchanged ideas on the foam strike and the potential scenarios of flat tires.

Action E: NASA’s engineers from Langley Research Center and JSC ran simulations to test landing with two flat tires, and kept the issue out of the chain of command

Engineers finally decided to run simulations on January 29, and also reported to the mechanical system lead engineer for landing hardware at JSC. During the flight control discussion, JSC engineers offered possible options for flight control in the landing process. The simulation result was that “the condition [two flat tires] was survivable/controllable” (Cabbage and Harwood 2004: 141). However, the discussion and information exchange mainly happened among engineers,

¹⁰⁷ Email from Schomburg to other colleagues, January 21, 2003.

¹⁰⁸ The foam shedding hitting RCC only happened twice during the flights in 1991 and 1999 respectively; however, the impact of the foam strike on RCC had never been explained (Cabbage and Harwood 2004: 98, 101).

without the participation of mission management. In using facilities to run simulations, engineers did not want to go through the official channels, but relied on their networks to run the simulations outside office hours (Cabbage and Harwood 2004:137-138).

Table 5-1 A summary of uncertainties and actions taken by NASA in the 2003 Space Shuttle *Columbia* Disaster

<i>Uncertainties</i>		<i>Actions</i>		<i>Strategies</i>
A	The potential impact of foam strikes	A1	IPWVG looked for further information within NASA, then requested images externally; shared information with relevant actors; formed a temporary investigation team.	Routinized
		A2	DAT: used Crater for analysis and involved more experts in the discussion.	Routinized
		A3	Based on historical analogy, mission management classified the foam-shedding event as “In-Flight Anomaly”.	Routinized
B	Uncertainty concerning the available analytical tool, Crater	B	DAT tried to reduce uncertainty relating to the software through adjusting the algorithm and testing the validity based on historical data.	Semi-rule-based
C	Uncertainties concerning the impact areas	C1	DAT kept making image requests to reduce uncertainty and initiated various ways to acquire more information on the damage area	Specific
		C2	Mission management ignored the uncertainty, and resumed the image request procedure.	Routinized
		C3	DAT insisted that it required images and used simulated scenarios to demonstrate all potential damage to tiles	Semi-rule-based
D	Conflicting intelligence on potential effects of damage to the Orbiter during re-entry	D	Mission management ignored the uncertainty and adopted the advice from the tile expert.	Routinized
E	The possible flat-tire scenarios for the landing	E	NASA’s engineers from Langley Research Center and JSC ran simulations to test landing with two flat tires, and kept the issue out of the chain of command	Specific

5.4 Analysis: the collapse of collective sensemaking in an institutionalized organization

The previous section has identified uncertainties encountered by NASA and its coping actions, which have been summarized in [Table 5-1](#). This section will explore how institutionalization influenced NASA's sensemaking strategies. The analysis will assign a strategy type to each series of sensemaking actions (the types of strategies have been defined and operationalized in [Section 3.2 of Chapter 3](#)).

In the selected time span, most coping actions were influenced by NASA's internal institutionalization. It might be argued that NASA's contractors and the Department of Defense (DoD) were at least to some extent involved in the response. However, NASA's 'hands-on' working relations traditionally blurred the boundary between NASA and its contractors as described in the previous section. NASA battled internally to request images from DoD, but then cancelled the request itself. DoD did not influence NASA's decision concerning image requests. Therefore, the external institutionalization played a limited role in this case.

- Phase I: NASA's initial sensemaking strategies were influenced by retention effects of its institutionalization; however, NASA internally generated divergent interpretations of the uncertainty.

After IPWG discovered the foam strike, it notified the mission management, which means the uncertainty was perceived by NASA (sensemaking started in NASA). As an organization with a high degree of internal institutionalization, NASA had developed procedures to cope with similar uncertainties, given that these uncertainties were often encountered by NASA in exploring the "unknown frontier". The procedure and framework of coping with similar unknown situations was embedded as existing frames in the organizational retention¹⁰⁹. NASA's initial response to uncertainties followed these prescribed procedures, which have been indicated in [Actions A1, A2, and A3](#) in coping with [Uncertainty A](#). After detecting the foam strike, engineers at IPWG started to look for more information to reduce the uncertainty, shared information with other actors and formed a specialized group, DAT, to study this anomaly after the event was classified as "out of family". After learning of the foam strike, the mission management analogized it as an "in-flight anomaly" based on a similar uncertainty encountered in previous flights. These actions are all routine procedures in NASA's operations.

The divergent interpretations of an uncertainty in a highly institutionalized organization seem to be at odds with the hypothesis that highly institutionalized organizations tend to rely on rule-based strategies in their sensemaking. Actually, both the engineering group and mission management relied on the institutional procedures, but their interpretation of the uncertainty was based on divergent frames. The mission management's interpretation of the uncertainty was based on existing frames and a historical analogy, labeling the foam strike as a "not safety of flight" event. In the recent post STS-112 flight review in 2002, the foam strike had been classified as an "in-flight

¹⁰⁹ As described in sensemaking theory, the organizational retention stores the successful interpretation of uncertainty for future use. For details, see the section of Coping with uncertainty as a sensemaking/organizing process in [Chapter 2](#).

anomaly” according to its internal risk management procedures. As an organization respecting and trusting procedures, NASA’s mission management selected the existing frames to cope with the uncertainty and adopted an analytical rationale used in previous flights (STS-87 and STS-112).

The engineering group’s response to the uncertainty was consistent with NASA’s working philosophy as well. The engineering group reported the anomaly (a foam strike of unknown size and unknown impact area) they found in their routine film review procedures. They considered that the possibly large shedding of foam and unknown impact area might have unknown consequences for the flight and that the existing classification of foam strikes might not be appropriate to interpret the uncertainty. Therefore, they activated routine procedures to reduce uncertainties caused by the incident and communicated with other sub-groups in NASA regarding these uncertainties.

- Phase II: the syndrome of institutional rigidity

In this phase, the institutional “iron cage” was so indestructible that mission management failed to “drop its tools” [existing enacted interpretation of the uncertainty] (Weick 1993). After numerous successes in launching space shuttles, mission management became confident in its enacted interpretation of uncertainties caused by foam strikes. Mission management interpreted the uncertainty based on its selected classifications under enacted environments, and they were comfortable with the existing procedures and classifications. The adherence to existing procedures and classifications seemed to reduce the possibility of making new interpretations of uncertainties (Action C2 and D). Although acknowledging the image request, mission management maintained its interpretation according to its institutional rules and procedures, and paid less attention to the rationale of the image request [as shown in Action C2]. Even when facing divergent intelligence regarding the possible impact to the orbiter, mission management favored the intelligence supporting its existing interpretation, and adopted the intelligence from tile expert Schomburg who assured the strike area (RCC) could bear such a hit from the foam strike. Members of the mission management team used previous cases and the existing classification to support and confirm the interpretation instead of investigating the opposite interpretation showed by the engineering group. Moreover, although DAT’s six simulated scenarios provided possible orbiter damages caused by foam strikes (the analysis could not provide a definitive answer to end the uncertainty), mission management focused on the previous classification and its institutionalized way of working, and ignored the analytical process, assumptions and uncertainties in available results.

The finding that NASA’s mission management adopted advice from experts to reduce uncertainty confirms Rosenthal and ‘t Hart’s (1991) inference. This research confirms that decision-makers are likely to adopt advice from trusted experts (Schomburg is the trusted expert for the mission management). When coping with unknown situations, experts relied on analogies to fill in information gaps. Experts in the mission management provided more evidence based on historical cases to support the selection of existing classifications. This finding also supports the confirmation effects proposed by Kahneman (1974), suggesting that decision-makers tend to focus on the similarity between the new situation and an old crisis instead of examining the reasons for this situation and the probability that it will happen.

In this phase, mission management as an institutional defender maintained low tolerance for actions inconsistent with institutional procedures. After learning about the image requests, the initial response of mission management was to look for the source of the requests via non-institutional channels, and it immediately cancelled the requests after finding no sources. In addition, NASA's mission management focused on social policing in response to the deviant actions. After terminating the image requests, NASA's mission management enacted the institutional procedure in its email to the military (which meant the official image request procedure to the Air Force).

The divergent interpretation caused intra-organizational tensions between mission management and the engineering group, and communication between them did not continue as usual. When the engineering group heard of the decision to reject image requests, it did not understand the rationale of this decision, which provided a discontinuity in DAT's feedback loop of the sensemaking process. DAT even considered that the classification was not in line with NASA's institutional character in terms of safety management. NASA's philosophy held that engineers had to prove safety to fly instead of proving unsafe conditions of a flight. Without clear images, DAT could not confirm the safety of the flight during re-entry, and consequently insisted on requesting images. As an organization with a heavy reliance on existing procedures and rules, however, DAT found it hard to communicate or reverse the mission management's interpretation.

Acknowledging the institutional character of respecting to procedures, DAT did to take actions to reverse the decision, but only expressed its dissatisfaction in the engineering group.¹¹⁰ The engineering group feared entering the institutional channels to express their reservations, and turned to semi-rule-based strategies and specific-based strategies to cope with uncertainties, as demonstrated in **Actions B, C1, C3 and E**. DAT still believed that the existing classification was inadequate to interpret the uncertainty regarding the impact area. The existing classification did not consider some vulnerable impact areas, such as the landing gear. Clarifying the uncertainty became indispensable to guarantee the safety of the space shuttle. Therefore, DAT adopted a specific-based strategy to reduce the uncertainty as demonstrated in **Action C1**. The engineering group initiated three image requests via its familiar channels instead of the official channels [actually it was not clear to them what the official channel was and they failed to check]. In the investigation of the possible flat-tire scenarios for the landing, engineers from Langley Research Laboratory did not report to any mission management officials, but only initiated a simulation to study the possible scenarios of flat tire situations. The simulation was run by engineers out of office hours based on friendship instead of institutional procedures (**Action E**).

Meanwhile, DAT adopted a semi-rule-based strategy to cope with the subsequent uncertainty, within which the mission management's decision served as a boundary constraining its sensemaking (**Actions B and C3**). Without clear images, Crater became the only tool to analyze the potential impact of the foam strike. However, the software could only provide results with

¹¹⁰ In the hindsight evaluation report, the mission management team indicated that they did not consider the rejection as the final decision, but engineers took the mission management's decision very seriously, and assumed it to be final without further appeals (CAIB 2003).

uncertainties. DAT engineers accepted the uncertainty and tried to reduce it by adjusting the algorithm and testing the validity based on historical data (**Action B**). DAT simulated six different scenarios based on the available data and using the available tool, Crater. However, the simulation results did not prove that the foam strike posed a threat to the shuttle.

In summary, this chapter discussed how NASA as an institution coped with uncertainties in an impending disaster. Institutionalization influenced sensemaking strategies in the following ways:

- In an institution, sensemaking starts with a rule-based strategy. However, sub-groups in the institution might generate divergent interpretations of uncertainties in their sensemaking based on different existing frames.
- Facing divergent interpretations of uncertainty, the institution may suffer from the symptom of “institutional rigidity”, under which a sub-group of institutional defenders rejects non-institutional procedures while another sub-group (named institutional challengers, who have begun to doubt the appropriateness of the institution), due to the institutional pressure, fears entering institutional procedures to deny the interpretation given by institutional defenders. The lack of communication undermines the possibility of breaking the institutional “iron cage”. Consequently, these institutional challengers bypass the institutional channels and turn to initiate specific-based strategy or semi-rule-based strategy in their sensemaking.

Chapter 6 BP and the 2010 Gulf Coast Oil Spill Disaster: an arrogant organization coping with a “known unknown”

6.1 Introduction

The previous chapter studied an organization exploring a complex frontier: space. This chapter is about the exploration of another largely uncharted territory: the deep sea.¹¹¹ Offshore oil extraction and deepwater drilling are relatively new phenomena to the oil industry; the companies involved have continued to break new depth records. The deepwater drilling process is surrounded by many unknown factors. For instance, the rigs used for drilling are not fixed but float on the surface of the sea and are linked to the ocean floor with steel cables (Banerjee 2002). The oil rig relies on satellite signals to stay in the right place on the sea surface and is vulnerable to severe weather impacts. The unknown geology and pressure situation of the well makes the drilling process even more difficult (Joint Investigation Team 2011; NAE and NRC 2011). Injecting improper amount of mud during the drilling process might lead to a blowout, which could damage the oil platform (National Commission 2011).¹¹² Moreover, machinery used for drilling and extracting oil from deepwater is highly complex. According to a presentation made by BP’s experts in a 2004 conference, “none of the projects (deepwater drilling projects) can be categorized as ‘business as usual’” (Thurmond, L. Walker et al. 2004: 1).

The Gulf Coast oil spill disaster occurred in the Macondo well owned by BP¹¹³, which is located around 42 miles southeast of Venice, Louisiana. The Macondo well has been described by engineers as “the well from hell”, “crazy well” or “nightmare well” for its high pressure in the well and risks of a well blowout (2010: 10; Barstow, Dodd et al. 2010; National Commission 2011).

BP is a multinational company well known for its oil exploration and production skills. BP’s business covers the whole oil industry chain. The reform in the 1990s led by BP’s former CEO John Browne transformed the company from a bureaucracy to a modern corporation. After the reform, BP introduced contract-based performance management mechanisms, which improved efficiency within the company. After improving its internal efficiency, BP initiated mergers with other oil companies, such as ARCO and Amoco, which helped it further reduce production costs and increase market share at the end of the 1990s and the beginning of the 21st century. BP was recognized as one of the most admired companies and its CEO Browne as an outstanding leader (Managementtoday 2004; Managementtoday 2004); Browne was called “the Sun King of

111 There are still disputes regarding the boundary between shallow water and deepwater. Some considered 500 feet as the boundary, while some others defined 1000 feet.

112 A blowout is an uncontrolled release of hydrocarbons from the reservoir when the reservoir pressure goes beyond that of the injected mud in the well control. Drilling mud is a mixture used to balance the well pressure during the drilling process.

113 The company was formerly known as British Petroleum.

oil industry” and “the oilman with a conscience” (Prokesch 1997; Buck and Buchan 2007; Steffy 2010).¹¹⁴

This chapter will explore how BP as an “arrogant organization”¹¹⁵ coped with uncertainties in its response to the 2010 Gulf Coast oil spill disaster. The chapter begins with an introduction of the 2010 Gulf Coast oil spill disaster; then BP’s institutionalization process is analyzed in Section 6.3. Section 6.4 conducts an in-depth case study to identify uncertainties faced by BP and describe its coping actions in responding to the Macondo accident. The final section explores how BP’s institutionalization influenced its strategy selection in coping with uncertainty.

6.2 The 2010 Gulf Coast Oil Spill Disaster

On April 20, 2010, an explosion occurred during the drilling process at BP’s Macondo well in the Gulf of Mexico. The explosion happened on a floating offshore oil rig, named Deepwater Horizon, which was owned by the world’s largest offshore drilling contractor, Transocean (Urbina 2010). The explosion caused 11 deaths and 17 people were injured (National Commission 2011). After a second explosion two days later, Deepwater Horizon sank into the ocean. The Deepwater Horizon could not be disconnected from the wellhead when it sank, which caused oil to spill from the Macondo well. The oil spill was not capped until 87 days later (Joint Investigation Team 2011).

With around 206 million gallons of oil spilled in the Gulf of Mexico, the 2010 Gulf Coast Oil Spill Disaster ranks as the largest oil spill disaster so far, and is around 20 times the *Exxon Valdez* oil Spill in Alaska in 1989 (Freudenburg and Gramling 2011; Joint Investigation Team 2011). The spill caused “the worst environmental disaster America has ever faced”, according to President Barak Obama. The oil spill threatened rare wild life and marine life, and hit the fishing and tourism industries in the Gulf Coastal states (National Commission 2011; Rushe 2013).¹¹⁶

Technically, the explosion was caused by a surge in oil and gas; but the preventer system of valves which was designed to seal the well failed to be activated after the explosion. The explosion happened in the “temporary abandonment” process, during which the drilling team put a temporary tap over the wellhead to secure the well after completing the drilling and testing whether the well could supply a reliable oil flow. During the temporary abandonment process, cement had not adequately sealed the well when replacing mud with cement at the bottom of the well. As a result, oil and gas passed the failing part of the cement barrier in the pipe system. When the mixture of mud, oil and gas that went up through the pipeline and reached the surface of the oil rig, the oil and gas ignited, triggering the explosion (Raloff 2010; Joint Investigation Team 2011).

114 Although Browne quitted BP because of problems in his private life, his contribution to the institutionalization of this global corporate organization remains undeniable.

115 The arrogant organization has a high degree of internal institutionalization whereas its external institutionalization is low. This is defined in [Section 3.2](#) in [Chapter 3](#).

116 For instance, from February 13 to 14 of 2013, 13 dolphins were found dead on the beaches of Gulf in two days, while the average death rate had been 25 to 30 per year from 2000 to 2009 (Rushe 2013).

After learning about the oil spill, on April 23 the Coast Guard set up a Unified Area Command in Robert, LA to coordinate the response.¹¹⁷ The Coast Guard announced a “Spill of National Significance”, which had never happened before in US history. The federal government relied on the Oil Pollution Act of 1990 (OPA) and National Contingencies Plan (NCP) as the response framework to coordinate the emergency response (Coast Guard 2011). However, the response framework was not used by local government in Louisiana.¹¹⁸ Given their limited understanding of OPA, local government preferred to adopt the Stafford Act (frequently used as their coordination framework in hurricane response) (Birkland and DeYoung 2011).

BP had no reliable plan to cope with such an oil spill in deepwater. The amount of oil and the state of the well remained unclear for a long time. BP tried different capping methods, which will be described in Section 6.4. The well was finally capped on July 15, 2010 and the well was permanently sealed on September 19, 2010 (Joint Investigation Team 2011).

In the after-incident investigation, the Presidential Commission and the Joint Investigation Team of the Bureau of Ocean Energy, Management, Regulation and Enforcement and the Coast Guard accused BP, Transocean and Halliburton (service providers of BP) of violating federal safety regulations. In November 2012, BP agreed to pay a \$4.5 billion fine in damages to the US government, which was the largest criminal fine in US history (Schiffman 2012). Transocean agreed to pay \$1 billion for violating the Clean Water Act and \$400 million of criminal fines for violating the federal offshore drilling safety regulations (Schleifstein and Thompson 2013). The civil trial regarding the liability of BP, Transocean, Halliburton and other contractors started in February 2013.

6.3 BP as an “arrogant organization”

BP was the third largest energy company and the fourth largest company in the world measured by revenues before the 2010 Gulf Coast oil spill disaster. Headquartered in London, United Kingdom¹¹⁹, BP is active in more than 80 countries including the United States (Joint Investigation Team 2011). BP’s division in the United States was its largest, and is also the biggest producer of oil and gas in the US with headquarters in Houston, Texas.¹²⁰ When it comes to deepwater oil drilling, BP owned the biggest oil and gas reserves in the Gulf of Mexico (Banerjee 2002; Joint Investigation Team 2011).

117 According to the Oil Pollution Act of 1990, the Coast Guard served as the coordinator in offshore oil spill response, while the Environmental Protection Agency was responsible for inland oil spill response.

118 According to Birkland and DeYoung (2011), the limited use of OPA in the Gulf oil spill is related to at least four aspects: OPA had been designed to cope with spills above the surface, while the Gulf oil spill happened in deepwater; OPA had been designed to handle a fixed amount of oil spill, while the spill in the Gulf coast continued for a long period; the Gulf oil spill impacted several states along the Gulf coast, while OPA assumed that an oil spill would only influence a single state; OPA hardly addressed mental health or rehabilitation issues, but, these issues became salient in the current response. The NCP was created in 1968 after the Torrey Canyon tanker spill and was last updated following the establishment of OPA after the 1989 Exxon Valdez oil spill.

119 http://money.cnn.com/magazines/fortune/global500/2010/full_list/ (accessed on August 10, 2011)

120 <http://www.BP.com/sectiongenericarticle.do?categoryId=488&contentId=2000734> (accessed on August 10, 2011)

BP's current business mainly covers four fields: exploration and production, refinery, distribution and marketing, and petrochemicals. Organization and business administration scholars long considered BP as an example of "the modern firm" with its "innovative and effective organizational design" and its cost efficient operations; BP was well-known for its exploration and production capacity in the oil industry (Roberts 2008: X IV). This section starts with a short introduction of BP's origin as a state-owned enterprise, and continues with a description of BP's institutionalization process after the privatization at the end of the 1980s. The section ends with a description of BP's deinstitutionalization on its external dimension.

BP's early years as a state-owned company (before 1987)

BP originated from a company named Anglo-Persian Oil Company (APOC), which was founded by William Knox D'Arcy in 1909 to exploit the first oil reserves discovered in Iran. In 1914, the British government realized the importance of oil as a strategic defense resource during World War I, and consequently became a shareholder of APOC. The then First Lord of the Admiralty spent 2 million British pounds to take control of APOC (Ritchie 1995). In 1954, APOC was renamed British Petroleum. Until the end of the 1980s, BP remained a quasi-government corporation. The British government invested pension funds in the company (Longhurst 1959). In foreign countries, BP was often considered a sub-agency of the British Foreign and Commonwealth Office (Browne and Anderson 2010).

BP's oil production in Iran lasted until the 1950s. When Mohammad Mosaddegh was elected as the prime minister of Iran in 1951, he seized BP's assets in Iran. Due to the opposition encountered in the Middle East, BP started to expand its business in Alaska and the North Sea in the 1950s (Steffy 2010). However, BP's expansion was not that successful. It took BP ten years to discover the first oil reserve in Alaska after spending \$30 million (Browne and Anderson 2010). During that period, BP's exploration technology and management fell behind booming US oil companies such as ARCO.

BP used a colonial management style (Ferrier and Bamberg 1994). BP only employed "white Anglos" and had almost no local employees. BP's business was protected by the British government in a political sense. For instance, after BP's assets in Iran were taken over by Mosaddegh, the British government responded with an embargo of Iranian oil, and ordered its navy to block the Persian Gulf. Thereupon, the British intelligence service together with the US Central Intelligence Agency subverted the Mosaddegh Administration in 1953 (Kinzer 2008). After the Shah returned to power, APOC changed its name into British Petroleum and shared its profits with the National Iranian Oil Company until 1979 (Ferrier and Bamberg 1994; Steffy 2010).

BP's institutionalization

Under Prime Minister Thatcher (1979-1990), Britain started the privatization of state-owned enterprises. BP was among these state-owned enterprises. From 1979 to 1987, the British government gradually sold its shares in the company. BP became a fully private company in 1987, with a huge debt and a low share price (around 1.85 British pounds) (Christiansen 2002; Browne and Anderson 2010). This section outlines BP's institutionalization process after privatization based on the internal and external dimensions as discussed in Chapter 3.

The internal dimension

BP became an international oil giant by developing a distinct working philosophy of pursuing efficiency. In its pursuit of efficiency, BP developed a performance management method, a horizontal peer-assist approach to help technology transfer within the organization, explored new frontiers to enlarge productivity, and merged with other oil companies to realize the economy of scale.

BP's institutionalization starts with its internal structural adjustment, shifting from a politicized, bureaucratic state-owned enterprise to a privatized organization (Steffy 2010). BP was a traditional bureaucracy, heavily centralized in its London headquarters (Roberts 2005). Under the *Project 1990* initiated by the new Chairman and CEO Robert Horton, BP changed its centralized bureaucratic structure through relocating its operations from the Head Office to three business streams: oil and gas exploration and production, petroleum refining and marketing, and petrochemicals (Roberts 2008). This reform broke down the matrix-like organizational structure, which decreased internal communication barriers and simplified management procedures. However, Horton's reform was not rewarded by the stock market. In this period, "BP's profits fell 20 percent against the oil sector, and 33 percent against the London Stock Market" (Stonham 2000: 416-7). Horton stepped down in 1992, and was succeeded by David Simon as the Chairman and John Browne as the CEO.

- *Cost-cutting based performance management*

Under the leadership of Chairman Simon and CEO Browne, BP made substantial progress in terms of its financial performance. BP's total market value increased fivefold from 1995 to 2006, oil production increased threefold, the natural gas reserves doubled, and earnings per share increased almost three times (Browne and Anderson 2010). Their reform of BP started with a "1-2-5" plan. The plan specified that BP would pay off \$1 billion of debt per year, increase profits to \$2 billion, and cut spending to \$5 billion by 1995 (Stonham 2000; Dumas 2010). BP achieved these goals before 1995.

BP excluded non-essential assets, such as BP Nutrition (Dumas 2010), and streamlined its business into three divisions: BP Exploration, BP Oil and BP Chemical. In each division, managers had full responsibility for the core assets (there were around 150 business units by 2000). Each asset group was embedded in a strong working philosophy: a performance management approach.

The performance management method originated in the exploration and production stream under Browne's leadership (Prokesch 1997). Browne divided his oil exploration and production stream into different Regional Operating Companies with their own technical and business staff, and promoted performance negotiation contract methods (Roberts 2005). Vertically, upper level management discussed and determined the performance goals with their subordinates, from Browne down to the individual staff in the field. Staff performance was reviewed over a fixed period, mostly quarterly. The earnings was determined on the basis of performance according to goals set beforehand (Roberts 2008). In order to measure the performance of each unit more precisely, the inflation of oil prices in the market was excluded (Roberts 2008). At the end of each review, new goals were set, (usually setting the bar higher). When Browne became CEO, he expanded the performance management approach to the whole company and institutionalized it, accompanied by layoffs to reduce costs

(Nocera 2010). In 1992, 14,500 employees lost their jobs, and another 9000 between 1993 and 1995 (Stonham 2000).

Apart from the vertical performance contracts, BP promoted another working philosophy to increase horizontal communication between its business units: the peer-assist method (Roberts 2008). The business units were divided into four peer groups according to the lifecycle of their assets. Units with assets in the same lifecycle group were encouraged to help each other when facing similar problems in different branches all over the world. A strong network was formed through mutual interaction, and best practices were promoted within the company. Moreover, the investment in a computer-aided communication system, named Virtual Team Network (VTN), helped business units within BP to share their knowledge around the world by allowing “people to work cooperatively and share knowledge quickly and easily regardless of time, distance, and organizational boundaries” (Prokesch 1997: 152; Kippenberger 1998).

These management techniques, which started in the exploration and production streams, were imitated in BP’s other streams when Browne became CEO. What is special in BP’s diffusion process of these benchmarks is that some of the best practices were promoted based on demand instead of coercive push. For instance, Virtual Team Network was available for every section within BP, but if these sections considered it valuable, they had to pay for it (Prokesch 1997).

In order to maintain the institutional philosophy of low costs in oil production, BP joined other research and development companies to develop new facilities for oil production. For instance, the oil companies wanted to learn more about the process of drilling horizontal wells, and BP cooperated with Schlumberger, an oil field service company, to develop new facilities to monitor the drilling process (Prokesch 1997).

- *Exploring new frontiers*

Apart from the performance management method, in the 1980s and 1990s, BP developed its organizational capacities by shifting its focus from traditional oil fields to new frontiers, which helped to further reduce production costs and increase competitiveness (Dumas 2010). In the early 1990s, BP only owned oil wells with declining production levels in Alaska and the North Sea (Prokesch 1997). Based on its strength in exploration, BP concentrated on the so-called “elephants”- large hydrocarbon deposits, which offered great economical possibilities regarding scale (Roberts 2008; Dumas 2010), and on the new frontiers where the old technologies or political barriers had banned it from entering before, such as the former Soviet Union countries, emerging economies, developing countries and the deep waters of the Gulf of Mexico (Roberts 2008; Steffy 2010). In the Gulf of Mexico, BP started deepwater exploration by cooperating with Exxon in the western Gulf, but initially failed to extract oil.¹²¹ In another field, BP started to cooperate with Shell, then the leading oil company in deepwater exploration (Browne and Anderson 2010). In total, from the middle of the 1980s until 2002, BP invested \$8 billion in exploring the Gulf.

121 The oil production from deepwater in the Gulf of Mexico surpassed that from shallow water for the first time in 1998. The deepwater oil production experienced a quick expansion in the 2000s, increasing twofold (NAE and NRC 2011).

- *More mergers to further save costs*

To further pursue efficiency and provide a buffer against external influences,¹²² private oil companies sought to merge with other oil companies to broaden oil exploration, which could help them to save costs via economy of scale. BP was one of these international oil companies that pursued its cost-saving working philosophy by merging with other major oil companies (Sampson 1991).¹²³⁻¹²⁴ In 1998, BP merged with Amoco¹²⁵, synthesizing their strengths to compete with other oil companies. BP was good at oil exploration and production, while Amoco had better store chains and gas and petroleum production facilities in the US. After the merger, BP broadened its market in the US and expanded its oil reserves in the Republic of Trinidad and Tobago, which became important oil reserves for BP. The merger ranked as the world's largest industrial merger, and after the merger BP became the largest company in Britain. The merger helped BP's stock price increase by 60 percent, and BP became one of the top-three oil companies globally (Christiansen 2002; Browne and Anderson 2010).

BP then merged with another oil company, Atlantic Richfield Company (ARCO) based in Los Angeles, CA. The merger could help BP expand its oil production in Alaska and its downstream refinery and marketing channels on the US west coast. In 1999, BP announced the acquisition of ARCO in the US, but was challenged by the Federal Trade Commission (FTC) for the possibility of violating Antitrust Law (GAO 2004).¹²⁶ BP did not choose to bring a lawsuit against FTC. Instead, BP agreed with the conditions provided by FTC under which BP sold ARCO's assets in Alaska to a third party (the oil company Phillips-Conoco) (Bulow and Shapiro 2002; Browne and Anderson 2010).¹²⁷ BP's acquisition of ARCO meant the expansion of its downstream business and oil fields into other countries, such as Indonesia (the Tangguh oil field), but it was not as successful as expected due

122 Major multi-national corporations faced intense competition in the global market and a low oil price at the end of the 20th century (Steffy 2010). In that period, the oil price had reached a low point, falling from \$25 dollars per barrel in the 1980s to around \$10 dollars (The Economist reporter 1999). Major international oil giants responded with oil exploration budget cuts in order to reduce output. Moreover, the privatization waves in oil producing countries brought in more private oil companies, which increased competition. In 1988, there were around 22 state-owned companies among the top 50 globally. The number fell to 19 in 1998. The number of companies with more than 50 percent state ownership fell from 28 in 1988 to 21 in 1998 (Energy Intelligence Group 1999). The remaining state-owned companies expanded their business from the domestic to the international market. Major companies dropped their non-oil related business and concentrated on petroleum and gas-related activities (Stonham 2000).

123 BP had carried out some mergers and made acquisitions before the 1990s. For instance, starting from the 1970s, BP bought in shares of Sohio. At the beginning of the 1980s, BP held about 55 percent of Sohio's shares. Later in the 1980s, BP acquired the British government owned oil company Britoil. However, the integration of three companies did not go well (Browne and Anderson 2010)

124 The major mergers and acquisitions in this period included Chevron and Gulf, Exxon and Mobil, Texaco and Getty, and Mobil and Superior.

125 Amoco was the fifth largest oil company in the US, originating from the Standard Oil Company (Indiana).

126 More about the merging of companies in the energy market can be found in United States General Accounting Office (2004).

127 For a detailed analysis of the merger process, see Bulow and Shapiro (2002). Bulow and Shapiro are both insiders of the merger process. Bulow was then Director of the Bureau of Economics at the Federal Trade Commission, while Shapiro was a consultant and expert on the BP and ARCO side in the review of the merger process.

to the loss of ARCO's oil reserves in Alaska. The acquisition helped BP become the biggest gas producer in the US. Although the merger was not that cost-effective, which influenced BP's stock price, the tripling of the gas price in the market helped BP to recover from the fall of its stock price (Steffy 2010).

The external dimension

- Harmonizing relationships with environmental organizations and human rights organizations Ever since the 1980s, environmental organizations have argued that oil consumption contributes to climate change (Skjærseth, Tangen et al. 2004). Oil companies, therefore, became targets of environmental organizations. Most oil companies simply did not cooperate with environmental organizations (Transnational Resource and Action Center 1999). However, BP initially became involved in climate change discussions and efforts to reduce carbon emissions, which buttressed BP's image in the eyes of at least some environmental organizations. The following points reflect BP's initiatives and actions:
 - ✓ BP's CEO Browne publicly announced his support for the climate change movement and set a goal for BP to reduce carbon emission by 10 percent by 2010 in his speech at Stanford University in 1997 (Ibrahim 1997; Pulver 2007; Dumas 2010).
 - ✓ BP spent more [around 4% of its exploratory budget] on developing alternative energy than other oil companies. For instance, BP donated \$500 million to the University of California, Berkeley to establish the Energy Bioscience Institute, directed by Dr. Stephen Chu, where bio-fuels were studied (Steffy 2010).
 - ✓ BP claimed to change from an oil company into an energy company. In 2001, the company changed its name to BP with a new tagline "Beyond Petroleum" and coloured its logo with an environmentally friendly green, yellow and white sunburst (Steffy 2010).
 - ✓ BP promoted an internal carbon trading system to reduce carbon emissions (Environmental Defense 2002). The carbon trading system was introduced to then British Prime Minister Blair and then US president Clinton. Blair initiated the carbon trading market in the UK in 2002.
 - ✓ Not agreeing with the American Petroleum Institute (API) regarding its climate change policy and the oil industry's response, BP quitted the API (Browne and Anderson 2010).

BP's environmental initiatives were appreciated by some environmental organizations. However, BP was criticized by environmental organizations (such as Greenpeace) and the media for "green-washing" because BP only invested a low percentage of its revenues in renewable energy technologies while most revenues were still used to explore carbon-based energy sources (Pearce 2010).

Exploring oil in politically unstable countries, especially countries with human rights problems, led to opposition by human rights organizations and to political inquiries in the UK. For instance, BP's activities in Columbia caused debates in the British House of Commons. NGOs such as Global Witness and Transparency International criticized BP's oil production in Angola for increasing poverty in poor oil production countries. Facing opposition, BP usually engaged in talks with these organizations to reduce mutual misunderstandings (Browne and Anderson 2010). BP also began to integrate societal concerns in its corporate social responsibility strategy while other oil companies such as ExxonMobil continued to provide cheaper and environmentally friendly fuel (Skjærseth, Tangen et al. 2004). One of the strategies was to commission a Social Impact Assessment

program which was conducted by an independent third party to evaluate BP's activities in Angola (Christiansen 2002). After consulting with NGOs regularly, BP won acceptance by NGOs and the media. For instance, BP's oil projects in Angola "set a benchmark for corporate transparency and accountability", according to Global Witness (1999: 9). BP was declared the 2001 Survey of the World's most respected company by the *Financial Times* and PricewaterhouseCoopers (Christiansen 2002). Since 1999, BP institutionalized the concerns regarding human rights and environmental issues into its performance contracts (Christiansen 2002).

- Political actors

BP maintained close ties with the British government and politicians who could help BP win contracts in a foreign country. For instance, in order to win a contract in Azerbaijan, BP lobbied the British Department for Business, Innovation and Skills to set up a trade office in the capital Baku because the Azerbaijani preferred to do business between governments instead of between private companies. At the same time, BP asked former Prime Minister Thatcher to help establish relations with the president of Azerbaijan (Browne and Anderson 2010).

When it comes to the United States, BP and other industry partners had kept friendly relations with the federal government because oil has long been considered a strategic resource for American's national economy and international relations (Dickinson 2010).¹²⁸ For instance, the State Department allowed payments by US oil companies to Saudi Arabia (classified as "tax") in order to guarantee oil imports (Freudenburg and Gramling 2011). Oil business in the Gulf States also provides employment opportunities for US residents (Geiger and Hamburger 2010).

Following the oil independence wave, offshore drilling expansion was encouraged by the US government and Congress (Vega 2010; Freudenburg and Gramling 2011).¹²⁹ Initially, offshore drilling was not a priority due to higher costs for extraction than when drilling on shore. For instance, evacuating staff from offshore rigs requires helicopters, that are an expensive means of transportation and are seldom used in the on-shore oil extraction (Banerjee 2002).

Government and Congress encouraged offshore drilling through large economical incentives. For instance, the 1995 Deep Water Royalty Relief Act started the royalty waiver program (Jones

128 The offshore oil drilling was regulated by the federal government ever since the 1950s. The legal framework for the ownership and responsibility of offshore oil drilling was initially formulated under the Eisenhower Administration (Freudenburg and Gramling 2011). In the 1953 Submerged Lands Act, States were given jurisdiction over any natural resources within 3 nautical miles (3.45 miles) [with the exception of Texas & Florida's west coast where the States' Gulf of Mexico jurisdiction was extended to 9 nautical miles after years of legal fighting]. In the 1953 Outer Continental Shelf Act, the federal ownership and responsibility for environmental protection and safety management was reaffirmed in the Outer Continental Shelf outside state jurisdiction.

129 Under the "energy independence" idea, federal governments expanded exploration in the Gulf deepwater to increase domestic oil supplies. In 1974, the Nixon Administration decided to reduce reliance on oil imports with "Project Independence" which aimed to make the United States independent from oil by 1980. Several subsequent presidents insisted on a similar policy to increase energy independence (Freudenburg and Gramling 2011). However, the percentage of oil imports still has been rising, to 66.2 percent in 2009 as compared to 36.1 percent in 1974 (Vega 2010).

1990; Geiger and Hamburger 2010).¹³⁰ The economical incentive programs were criticized by the Governmental Accountability Office for lacking flexibility to reflect the change of market conditions (Geiger and Hamburger 2010). When oil prices rose rapidly and the percentage of exploration costs consequently was relatively low, the incentive program was still promoted by government and Congress (GAO 2011). The statistical figure for 2002 illustrate the point. The cost of oil from deepwater is around \$5 to \$6 per barrel, while the industry average was \$3 to \$4 in 2002 (Banerjee 2002). However, the oil price was about \$25 per barrel.

BP and other industry partners maintained close ties with direct regulators, i.e. the Department of the Interior and its sub-agency, the Mineral Management Service (MMS) (Geiger and Hamburger 2010).¹³¹ MMS is not only a regulator responsible for supervising offshore oil production, but also collects revenue from oil companies. The revenue collected from the oil industry by MMS ranked as the second income source for the federal government. The revenue includes competitive bids and royalties. The former refers to oil companies paying the federal government to lease a field to explore oil and/or gas based on a competitive bid; the latter refers to oil companies paying a certain percentage of the value of oil or gas extracted (Gramling and Freudenburg 2009). When it comes to the transfer of personnel, senior officials easily switched between industry and the regulator, which blurred the boundary between the industry and regulator. For instance, former MMS director Randall Luthi became the president of the National Ocean Industries Association; former BP executive Sylvia Baca became the deputy assistant secretary for land and minerals management in June 2009 (Kane and Yourish 2010).

Rapid technology development by BP and industry partners surpassed MMS' weak regulation capacities (The Associated Press Staff 2010; Urbina 2010). As a result, they operated under very limited supervision. MMS was a small agency with inexperienced staff and insufficient resources to oversee so many oil rigs (Jonsson 2010; Robertson, Krauss et al. 2010). MMS had only around 55 inspectors who supervised around three thousand offshore oil facilities. MMS had to implement a lower inspection rate for the offshore drilling operations than standard [at least once per month]. MMS could not provide a full record of inspection data for those rigs; during an inspection, its staff stayed on the rig for only two and a half hours which was inadequate for such massive rigs (The Associated Press Staff 2010). According to the National Commission Report (2011), no one at MMS had specialized in petroleum engineering, or petroleum geology, or drilling safety, in its 30 years history. The safety documents provided by oil companies contained more than 500 pages, and MMS had insufficient staff to review them. Moreover, the agency itself was challenged by several corruption scandals. For instance, MMS officials accepted gifts from oil companies and wielded

130 With the expansion of oil drilling in the outer continental shelf, then secretary of the Department of Interior James Watt promoted a new leasing method: named Area-Wide Leasing [For a comprehensive review of area wide leasing method, see Jones (1990).] (Gramling and Freudenburg 2009). Area-Wide Leasing means the bid sale can offer the whole planned areas instead of splitting into small areas. This method put small and medium-sized companies involved in the exploration process at a disadvantage because of limited economical resources and technology to conduct exploration activities in such a broad area (Jones 1990; Gramling and Freudenburg 2009; Freudenburg and Gramling 2011). For instance, companies need to hire ships to gather geological data in the ocean, and need a supercomputer to analyze collected data (Banerjee 2002).

131 The MMS became the Bureau of Ocean Energy Management, Regulation and Enforcement in October of 2010.

power to assist the business of an official's friend (Savage 2008; Hoffman 2010). As a result, MMS presented almost no challenge to the offshore oil drilling operations of BP or any other oil company.

- Contractors

Oil production heavily relies on contractors to provide services regarding monitoring and operating facilities (NAE and NRC 2011). BP adopted a "gain sharing" strategy, which encouraged contractors to cut costs and share the revenue saved. Through this strategy, BP reduced development costs of the Andrew oil field in the Scottish part of the North Sea by 20 million British pounds (Stonham 2000).

BP took into account contractors' safety records when selecting contractors. Normally, contractors had to maintain a safety record above the industry average level. The safety record of Transocean that provided drilling services for BP was above the industry average (Read 2011).

- Other oil companies

Oil companies regularly cooperate in big oil fields to share costs. One common practice in the oil industry is to share the lease among different companies. In the Macondo well, BP shared the ownership with two other energy companies, Annadarko and MOEX (Joint Investigation Team 2011). BP owned about 65 percent of the lease, and the other two had the other 35 percent share (NAE and NRC 2011). In Azerbaijan, BP shared a contract with ten other foreign companies and a state-owned company to develop three oil fields (Browne and Anderson 2010).

When BP tried to step in a less-known market, BP often chose to cooperate with a local oil company or buy shares in local companies. For instance, BP was the first to buy shares in two Chinese state owned oil companies, Sinopec and China petroleum, and invested in Russia and other eastern European countries. BP started its cooperation with Mobil in downstream operations (such as refining and marketing) in Europe in 1996, which helped it to reduce surplus supplies and take an enlarged market share (Robson and Dunk 1999).

BP benefited from cooperation with other industrial partners in terms of technology transfer. For example, BP's deepwater oil business in the Gulf of Mexico started with cooperation with Shell. Before the cooperation, Shell was the leading company in deepwater drilling technology among the industry partners in the Gulf of Mexico. Shell chose to cooperate with BP because of financial constraints caused by the falling oil price in 1988. The cooperation with Shell helped BP learn how to conduct deepwater oil drilling projects. Afterwards, BP expanded its deepwater oil drilling in the Gulf of Mexico and became the biggest leaseholder in the Gulf (Steffy 2010).

- Local communities

Oil exploration and production in other countries often causes opposition by local communities. Lack of local knowledge might have created misunderstandings between BP and local communities. Therefore, BP changed its previous "colonial way" of working in which there was little active communication with local communities. Instead, BP created job opportunities for local residents. At the same time, BP set up funding for the development of local economy and education. In order

to facilitate communication with local communities, BP hired a third party to learn about local demands, a practice that was initiated in Indonesia and widely applied in other regions (Browne and Anderson 2010).

BP after the merger wave

This section will describe the negative effects of cost cutting after the merger wave at the beginning of the 21st century, which led to several major industrial accidents, such as the Texas City refinery explosion in 2005,¹³² the corroded pipeline spill in the Alaskan tundra in 2006,¹³³ and the near-disaster of the Thunder Horse oil rig.¹³⁴ These accidents set alarms for BP's internal safety management and prompted increased criticism and intense regulation by federal agencies. This section aims to demonstrate BP's deinstitutionalization curve after the merger wave.

- *The internal dimension: too much cost cutting?*

After the merger with Amoco and ARCO, BP integrated its performance management culture with Amoco's lawyer driven culture, leaving no space for ARCO's worker friendly culture (Steffy 2010: 48). Under BP's performance management approach, safety management did not gain an important status. In the performance contract, indicators related to safety, and environmental and occupational safety management occupied less than 20 percent of the performance matrix. In another incentive program named Variable Pay Plan (VPP), safety counted for less than 10 percent in the indices system (CSB 2007). Under the performance pressure, it seems that the failure of carrying out necessary maintenance led to accidents, as demonstrated in the 2006 Prudhoe Bay pipeline corrosion and the 2005 Texas City Refinery disaster (Lustgarten, Smith et al. 2010).

The Texas City refinery was founded in 1934 by Amoco. The safety situation in the refinery plant was bad even before the merger. According to safety consultant Mike Sawyer, "it was typical for them (workers in the Texas City refinery) to experience a fire every week, on average. A fire every week is a warning sign that something is critically wrong at the facility. It was the worst refinery around this area, for sure" (Lustgarten, Smith et al. 2010). Before the merger, the upgrading planned in 1991 had been postponed. The merger did not change the safety situation at the refinery which had been hindered by cost cutting. After the merger in 1999, cost cutting did not stop at this chemical plant and BP failed to upgrade the system. In 1999, Browne announced the goal of slashing a quarter of the costs based on the year 1998 level by 2001. Under this cost-cutting pressure, the Texas City Refinery could not allocate the necessary maintenance funding (CSB 2007).

132 On March 23, 2005, BP's Texas City Refinery experienced an explosion during the startup of an isomerization unit. The explosion and subsequent fires led to 15 deaths and 180 injured people, and ranked as "one of the worst industrial disasters in the US" (CSB 2007).

133 In March 2006, BP's Alaska pipelines in its Prudhoe Bay oil field experienced a corroded leak, which affected the tundra. The amount of leaked oil reached 200 thousand gallons. After the leak, BP closed its pipeline and the US government closed the oil production in the region which caused the rise of oil prices on the international oil market.

134 After the passage of Hurricane Dennis on July 11, 2005, BP's Thunder Horse oil platform in the Gulf of Mexico tilted to one side (nearly sank) due to an error in the installation of a valve in the bilge and ballast system. The subsequent investigation found other problems, such as a broken weld. The Thunder House platform did not resume production until 2008, which was three years behind schedule.

In the Prudhoe Bay oil field in Alaska's North Slope, the aging facilities had been used since the 1970s, even though they were not supposed to last beyond 1987. Due to the pressure to cut costs, managers did not adopt the "pigging" method to maintain the pipe system, which was considered by experts as a more effective and environmentally friendly way to clear the sediment from the pipes. Managers failed to adopt this method because it required the shut-down of the pipe line which would mean a loss of productivity and profits for the company (Lustgarten, Smith et al. 2010; Steffy 2010). Finally, an oil spill caused by corrosion in the pipe system was detected on March 2, 2006, and the spill polluted around 7,700 square meters tundra in five days. If managers had adopted the costly "pigging" method, the electronic scans could have helped to detect the vulnerable points in the pipe system, which might have prevented the occurrence of the corrosion (Steffy 2010).

Before the merger, Amoco and Arco maintained a centralized safety management organization in the company which conducted safety process management. After the merger, BP delegated safety process management functions to different business segments. Decentralized management led to divergent systems and cultures which made it hard to learn lessons from previous disasters (CSB 2007).

BP's safety management focused narrowly on certain safety outcomes, such as injury rates, but to some extent ignored the safety process (CSB 2007), which was highlighted by the US Chemical Safety Hazard Investigation Board (2007) and the Baker Panel report (2007). Before the 2005 Texas City refinery explosion, BP experienced improved safety performance according to its safety indicators. In BP's annual reports from 1999 to 2004, BP's major accident figures went down by around a third to 0.53, which was below the average of the American Petroleum Institute (1.09). BP's North Everest Platform in the North Sea was awarded a safety management prize by the Health and Safety Commission. BP was awarded the Frank Lee Medal in Safety and Loss Prevention by the Institution of Chemical Engineers in 2004 (Browne and Anderson 2010). However, the in-depth study made by non-profit newsroom *Propublica* denied the correctness of indices used by BP to show its progress in safety management. *Propublica's* study showed that the safety records of different locations or companies using different facilities could not be compared (Lustgarten and Knutson 2010: 2). Moreover, under its performance management approach, BP's frequent shift of division leaders emphasized performance goals with little focus on safety problems in the short term (Steffy 2010).

After the 2005 Texas City refinery disaster, BP adopted recommendations from Baker's panel to change its safety management. When Tony Hayward took the CEO position in 2007, he announced that his primary focus was safety. He allocated \$14 billion to upgrade facilities, and set up a safety group (Nocera 2010; Steffy 2010). However, the financial results in 2007 did not satisfy the share holders, and the financial recession in 2008 and 2009 worsened the situation (Mason 2010). Hayward returned to Browne's way of working, looking for big oil and gas reserves and maintaining performance management (Chazan, Faucon et al. 2010; O'Regan and Ghobadian 2010; Thompson

2013).¹³⁵ Looking for big oil and gas reserves means exploring new frontiers, which required advanced technology. BP's engineering capacities suffered considerably under the cost-cutting strategy in Browne's era. Hayward managed to bring in more engineers but cut 7500 jobs in other areas (Steffy 2010).

- *The external dimension*

Increasing challenges from safety and environmental regulation agencies

After experiencing a series of accidents, BP was increasingly challenged by federal regulatory agencies, such as the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA), which undermined BP's external institutionalization. In 2009, OSHA fined BP \$87 million for violating occupational safety, which ranked as the largest fine in OSHA history. OSHA identified 851 "wishful" violations in the refinery industry, and BP refineries were responsible for 829 of them (Hoffman 2010; Morris and Pell 2010). Moreover, EPA was considering to ban BP's federal contracts due to the frequent accidents (Lustgarten and Knutson 2010).

By contrast, MMS did not consider BP's safety management to be deteriorating, but still honored BP for its safety in production. According to *Fox news*, BP was supposed to be the nominee of two awards on safety in production of offshore oil by MMS on May 30, 2010 (Staff writer 2010). Transocean, the owner of Deep Horizon oil rig, received an award in 2009 in the same program (The Associated Press Staff 2010).

Stable connections with the White House, the Congress and the Courts

Notwithstanding the increasing challenges caused by industrial accidents, BP and other oil giants still maintained close ties with the White House. In the era of Presidents Bush and Obama, the White House maintained its support for the expansion of deepwater drilling with low royalty rates (Rushe 2013). These rates were lower than those in many other countries, such as Australia and Egypt (GAO 2007). The 2005 Energy Policy Act introduced new incentives for oil companies to drill in the Gulf of Mexico through another big tax and royalty waiver program and supported offshore oil extraction research and development in the oil industry (Jones 1990; Geiger and Hamburger 2010). On March 31, 2010, Obama announced the expansion of offshore drilling (Dickinson 2010).¹³⁶ BP was "the single biggest supplier of fuel to the Defense Department with an annual contract worth \$2.2 billion, contributing \$532 million in royalties to the federal government" (King and Trottman 2010: A8).

BP and other oil companies in the industry maintained close connections with Congress and the courts. According to the *Washington Post*, around 30 members of Congress who oversaw the oil and gas industry owned \$9 million to \$14.5 million worth of assets in the oil industry in 2009 (Kane

135 Whether cost cutting caused the safety erosion leading to the disaster became a central dispute during the civil trials in February 2013. Then BP CEO Hayward denied the casual relationship, while BP's former senior vice president for drilling operations in the Gulf Lacy acknowledged the pressure to reduce costs, and resigned four months before the Gulf oil spill disaster because the company was not committed to improving safety procedures (Thompson 2013).

136 President Obama supported offshore oil production to win votes for climate legislation in Congress.

and Yourish 2010). Some Congressmen invested directly in BP's stock; for instance, Fred Upton [R-Michigan] and John A. Boehner [R-Ohio] had \$100,000 and \$50,000 respectively (Kane and Yourish 2010). After the Gulf oil spill disaster, Joe Barton [R-Arlington] who owns a natural gas well "accused the Obama administration of conducting a 'shakedown' of the oil giant" (Mason 2010: 1 para). Moreover, more than half of the US judges in the Gulf States had close links with the oil industry. According to Anderson (2010: 1), "37 of the 64 active or senior judges in key Gulf Coast districts in Louisiana, Texas, Alabama, Mississippi and Florida have links to oil, gas and related energy industries, including some who own stocks or bonds in BP PLC, Halliburton or Transocean — and others who regularly list receiving royalties from oil and gas production wells, according to the reports judges must file each year."

BP kept hiring lobbyists to influence policy making. The oil industry invested around \$174 million in lobbying which ranked as the sixth largest spending group in Washington; there are around 788 registered lobbyists related to the oil industry (Geiger and Hamburger 2010). BP itself hired around 31 lobbyists with extensive governmental and Congress experience to serve its interests. From 2008 to 2010, BP's lobby investment was more than \$340 million (Eggen and Kindy 2010).

Less safety supervision for its contractors

The increasing division of labor between BP and contractors after the merger wave led to an erosion of safety supervision for its contractors. BP's risk management practice focused on its own assets and less on contractors' risk management processes and procedures. Instead, BP relied on indicators to assess contractors' risk management practices, such as personal worker safety (CSB 2012). The indicators did not measure the quality of the safety process management at BP's contractors.

In summary, BP reached its institutional "peak" as a top oil company in the 1990s (for a depiction of the evolution of the institutionalization degree in BP's organizational history, see [Figure 6-1](#)). BP's then Chairmen Simon and Browne established an efficient, modern corporate organization with a philosophy of focusing on financial performance and cost reduction. Internally, BP transformed from a bureaucratic organization into a modern multi-national company using the performance based contract method to hold things together. The merger wave at the end of the 1990s helped BP expand its business in the US and emerging economies and developing countries, which further cut costs due to the scale effects of economy. Externally, BP and other oil giants received support in the national oil policy arena after building stable relations with the regulatory agencies and through active lobbying. BP's ongoing efforts to talk with human rights and environmental NGOs helped to win support from these organizations. The stable relations and support guaranteed a high level of external institutionalization during the 1990s.

After the merger era, BP faced several accidents which exposed the weak points of its safety process management. BP invested in its safety management after Hayward succeeded Browne as CEO, but pressure from the stock market forced him back to the old routine with an emphasis on efficiency. BP therefore maintained its focus on efficiency. BP's external institutionalization was increasingly challenged after several accidents. The challenges mostly came from regulatory organizations, EPA and OSHA. The relations with the White House and other federal agencies

(MMS) remained stable. The stock price remained stable as well. Therefore, BP was evolving from an institution into an organization with a high internal institutionalization but an eroding external institutionalization when the Gulf oil spill disaster occurred in 2010.

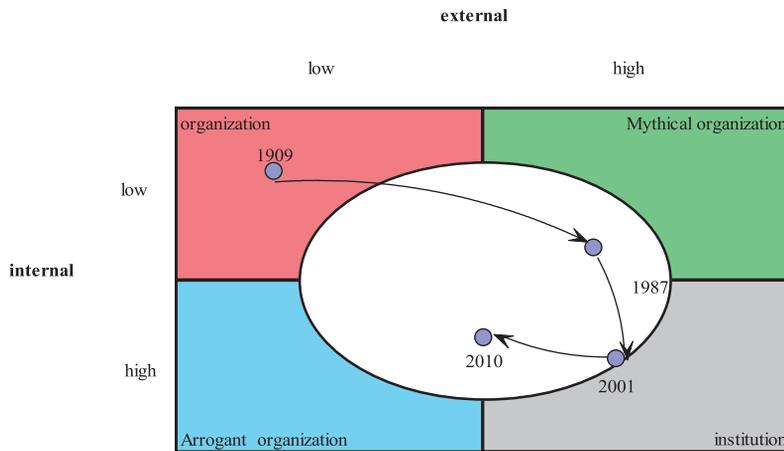


Figure 6-1 BP’s evolution in terms of its institutionalization

6.4 BP and the 2010 Gulf oil spill disaster: Identifying uncertainties and coping actions

This section aims to identify uncertainties faced by BP and its sensemaking actions in the 2010 Gulf oil spill disaster. The time span covers the period from the first explosion on the Deep Horizon oil rig on April 20, 2010 to the permanent sealing of the Macondo well on September 19, 2010. Data used for the analysis mainly come from [1] the public hearings, including the Joint United States Coast Guard/ Bureau of Ocean Energy Management investigation, the House Energy and Environment Subcommittee of the Energy and Commerce Committee Investigation; [2] reports from the National Commission on the BP Deepwater Horizon Oil Spill, Joint Investigation Team, the United States Coast Guard, Deepwater Horizon Study Group, and the BP Deepwater Horizon accident investigation team, and [3] selected monographs and media reports.

Uncertainties and coping actions

The organizational response to uncertainties in the oil spill disaster can be divided in two parts: the first is coping with uncertainties mainly caused by technological aspects of containing and stopping the oil spill and reducing oil impacts to the coast line; the other is coping with uncertainties caused by political, social and organizational factors. As both parts are intertwined in BP’s crisis response process, it is hard to distinguish them in a chronological order. Therefore, this section will first demonstrate the uncertainties related to technological factors, and then come to the social, political and organizational part.

Uncertainty A: BP engineers were uncertain about the causes of the dysfunctional blowout preventer

On April 20, 2010, an explosion caused by a blowout occurred on the Deep Horizon oil rig which was leased by BP. The explosion indicated an accident, which broke down BP's normal operations and triggered sensemaking. In the oil well design, the blowout preventer [BOP], a 450-ton facility above the wellhead, is supposed to be activated to shut the pipeline and prevent the release of hydrocarbons from the well. BP and its contractors tried to activate the BOP, but failed (National Commission 2011). As the well was 5000 feet below the sea surface, BP sent its Remotely Operated Vehicles (ROVs) to inspect the BOP in the deep water (National Commission Staff 2010). ROV footage revealed that the oil was leaking from components of the BOP, such as the shuttle valves leading to the blind shear ram¹³⁷, or shuttle valves connecting robots and the blind shear ram (Barstow, Dodd et al. 2010).¹³⁸ It was not clear to engineers from BP and Transocean which deficient components caused the dysfunction of the BOP (Kaufman 2010).

Action A: BP engineers repaired possible vulnerable components and tried to activate the BOP again; after several failed trials, BP accepted external assistance to account for the deficiency of the BOP.

BP used the underwater robot to repair the vulnerable components and tried to activate the BOP (Barstow, Dodd et al. 2010). After five trials, BP still could not activate the BOP. On the advice of Energy secretary Chu, in the middle of May BP accepted assistance from Scott Watson who is an expert in gamma ray imaging technology at the Los Alamos National Laboratory (Broder 2010). Watson used his gamma ray imaging technology to get a better view of the blind shear ram and clarified the situation of the BOP (Barstow, Dodd et al. 2010). The gamma ray image suggested that the blind shear ram could not be fully closed, letting the oil flow through. BP could not find other ways to close it. Therefore, Watson helped BP exclude further efforts to close the BOP.

Uncertainty B: BP did not know how to cope with the oil spill in deepwater.

After BP found oil spilling from the well, BP had to figure out how to stop the oil leak in deepwater. They did not have experience on how to stop an oil spill in deep water. After realizing that the BOP could not stop the oil spill, on April 23 BP discussed possible ways to stop the oil spill with its contractors. During the discussion, experts proposed two ways: one was a precautionary approach which tried to maintain the stability of the well; the other was to close the BOP directly (Fountain 2010). The effectiveness of each coping method depended on the well situation and the pipe system, which remained unknown to BP. During a meeting on April 23, senior management feared that closing the well might cause a disastrous outcome, an underground blowout (that occurs if the pressure of hydrocarbons in the oil reservoir exceeds the tolerance of the pipeline

137 The blind shear ram is a component of BOP used for cutting the pipeline when BOP is activated. However, sometimes BOP cannot cut through the pipeline in an emergency due to the increasing strength of the pipe, which has been recorded in three cases in the Gulf of Mexico in the 1990s. Therefore, the industry usually equips the BOP with two blind shear rams to increase the reliability. The rig owner of Deepwater Horizon, Transocean, equipped 11 of its 14 rigs with two blind shear rams, but not the Deepwater Horizon. The reliability of the BOP had not been tested regularly as required because of the high cost of losing productivity (around 193 million dollars a year for the test). MMS staff failed to inspect BOP operation as well (Barstow, Dodd et al. 2010).

138 Actually, 260 failure modes were detected in the BOP in 2001 (Hoffman 2010).

system) (National Commission Staff 2010). An underground blowout would make the oil enter and permeate the rock formation with the risk of oil reaching the seabed and the ocean in an unpredicted manner. If choosing to close the BOP, BP would have to examine the BOP via X-raying, put a dome above the wellhead to contain leaking oil, and then assess the well situation using sonar technology. Thus, BP had to choose between response options with uncertain consequences in the response process.

Action B1: BP continued to try to activate the BOP while discussing other methods to cap the well.

After keeping the well stable for two days, on April 25 BP again tried to activate the BOP, which was still considered the best solution to shut the well quickly (Allen 2010).¹³⁹ BP's efforts continued until May 5 (National Commission Staff 2010).

During the process of trying to activate the BOP, BP engineers proposed a relief well method. Drilling a relief well was the only tested technology for stopping such a blowout and was considered the "likely and accepted solution to a subsea blowout" (National Commission 2011: 132). When the relief well was connected to the Mancondo well, engineers could pump in cement to seal the well. However, this method takes a relatively long time (two or three months). BP started drilling two relief wells on May 2 and May 17 respectively (BP 2010).¹⁴⁰⁻¹⁴¹

Action B2: BP sought advice from other actors

BP asked advice from other stakeholders in the industry, such as Shell, Exxon, Chevron, and Anadarko (Chazan 2010). On May 1, BP contacted the Woods Hole Oceanographic Institute to seek assistance in measuring the flow rates of the spilled oil using a Remotely Operated Vehicle with sonar and acoustic sensors. But finally, BP canceled the request on May 6 because of its new attempts to lower the containment dome to collect the spilled oil. BP adopted the method suggested by Exxon Mobil to inject chemical dispersants in the emerging oil stream which could help to break up the hydrocarbons and consequently mitigate the environmental impact of the spill (Chazan 2010).

Uncertainty C: Uncertainty regarding the effectiveness of applying dispersant directly at the wellhead in deepwater

Realizing that large amounts of oil had spilled, BP activated its contracted oil removal company,

139 *Transocean* and the governmental investigation committee did not agree on whether BOP was operational after the explosion. The former insisted that BOP was still functional and the leak was caused by the high flow rate so that BOP could not seal off the flow. The US governmental investigation identified a flaw in BOP's design which leads to a failure in the sealing process.

140 BP started to consider drilling a relief well as early as April 21, which was deemed a standard operation in the industry by BP's Chief Operating Officer for Exploration and Production Doug Suttles (National Commission Staff 2010).

141 Interior Secretary Salazar insisted on drilling another well as a back-up (National Commission Staff 2010).

Marine Spill Response Corporation and National Response Corp in the Gulf, to collect spilled oil. This was part of BP's oil-response plan (Yang 2010). The mechanical oil skimmers, which were supposed to collect most of the spilled oil, failed to collect as much oil as expected (they actually collected only 3 or 4 percent of the spilled oil) (Coast Guard 2011). The actual capacity of both oil-spill removal companies was far below the claimed capacities (of 492,000 barrels oils per day) stated in BP's oil spill response plan (Kindy 2010; Anderson, Cohen et al. 2011: 28; Coast Guard 2011),¹⁴²⁻¹⁴³ which led to the new uncertainty of how to cope with these large amounts of spilled oil.

Using chemical dispersants, which is another common practice to contain the damage in an oil spill response, became an essential method to complement the use of mechanical tools. After dispersants had been used on the sea surface for several days, the public became deeply concerned about the toxic effects of dispersants (Coast Guard 2011). BP came up with the idea of applying dispersants directly at the wellhead, which was supposed to be a more efficient method requiring less dispersant. However, dispersants had never been used in deepwater before. The consequence of using dispersants directly at the wellhead was uncertain; several factors remained unknown to BP, such as the environmental impact, the appropriate volume or types of dispersants (Coast Guard 2011). Moreover, the Environmental Protection Agency (EPA) as the supervision agency had no existing approval mechanism for using dispersants in deepwater. Existing test protocols of environmental impacts in the National Contingencies Plan did not take the influence on organisms in the sea into account, and did not address the question of matching specific dispersants with different types of water bodies (Coast Guard 2011). EPA and other federal agencies concluded that there were very few studies on the effects of using dispersants in deepwater (National Commission 2011: 143-145).

Action C: BP improvised by designing a monitoring protocol to test the environmental impact of using dispersants near the wellhead

BP worked together with federal scientists to design a protocol for testing the environmental impact of using dispersants in deepwater. EPA adopted the protocol designed by BP and NOAA on May 10. The protocol proposed to limit the daily use to 15,000 gallons and to monitor the environmental impact according to federal environmental guidelines.

Uncertainty D: BP was not sure whether using the dome to collect the oil would work in deepwater.

After failing to activate the BOP to stop the oil spill, BP tried a method to contain the spilled oil described in its oil spill response plan, which could help to prevent the oil from flowing into the

¹⁴² The oil removal technology did not make much progress. For details, see Anderson, Cohen et al. (2011).

¹⁴³ The estimated worst-case flow rates (162,000 barrels per day) were far below the claimed oil collecting capacity in BP's plan. Moreover, the Coast Guard created a 5-mile safety zone around the Macondo well to ensure the safety of response teams, which prevented the responders from entering the zone. The establishment of the safety zone consequently reduced the skimming productivity. For details, see Coast Guard (2011: 26-28).

sea (Urbina 2010). The method would place a specially designed dome (also named the cofferdam approach) over the leaks to contain the oil (National Commission 2011). The containment dome was around four-stories tall and 70-ton in weight, and would be lowered over the leaking parts to collect the leaked oil and would be equipped with a pipe to transport the oil to a ship on the sea surface (Dolnick and Robbins 2010; Urbina, Gillis et al. 2010).

The cofferdam approach had been used in shallow waters (Fountain 2010; The Associated Press Staff 2010). For instance, a similar dome had been used to capture leaked oil after Hurricane Katrina (Casselman, Power et al. 2010). However, the cofferdam approach had never been used in deepwater, leaving BP uncertain about the effectiveness of this approach. Experts' worries of using the cofferdam in deepwater included: whether the dome could tolerate the pressure at a depth of around 5000 feet; whether the ice formed around the pipe in low temperatures might block the pipeline; whether failing to separate the mixture of oil, gas and water on the ship might lead to explosions (Dolnick and Fountain 2010; The Associated Press Staff 2010).

Action D: Experts created contingency plans to cope with uncertainties

Experts from BP and its contractors created several contingency plans to cope with uncertainties that they might encounter in implementing the cofferdam approach. For instance, experts decided to inject warm water and methanol into the oil flow to prevent the formation of ice (Dolnick and Fountain 2010). In the implementation process, the dome could not be lowered to the seabed because of the hydrates formed in the lowering process. These ice hydrates formed more quickly than expected and stuck to the dome, which made the dome lighter than the water. Consequently, the dome floated toward the sea surface instead of sinking to the sea bed (Robertson 2010).

Uncertainty E: BP did not know how to cope with the forming hydrates.

After a failed trial of lowering the cofferdam, BP's experts and engineers realized that the formation of hydrates on the surface of the cofferdam would prevent the cofferdam from sinking to the leaking points. How to cope with the forming hydrates became an impending uncertainty faced by BP.

Action E: BP improvised by using a machine, the Riser Insertion Tube Tool, to separate the mixture of hydrocarbons and water on the seabed to prevent the formation of ice hydrates.

BP improvised by using a machine named the Riser Insertion Tube Tool (RITT) to prevent the formation of ice hydrates. After lowering RITT to the sea bed, RITT's tube was inserted into the broken riser far enough to isolate hydrocarbons from mixing with sea water (National Commission Staff 2010). The hydrocarbons were guided to the ship on the sea surface. However, the RITT could not collect all the oil spilled from the broken riser because the flow rate was much higher than the collection rate.

Uncertainty F: BP was uncertain about the effectiveness of another oil containment method: the top kill method.

Given that RITT could not collect all the spilled oil, BP initiated another method to contain the oil spill: the top kill and junk shot. The former was to pump in mud, which relied on the mud flow rate and pressure to push the oil back into the reservoir. The latter complemented the former by pumping materials such as tire rubbers and golf balls into the BOP to block the hydrocarbon flow (Fountain 2010). Top kill had been a standard method to stop a blowout on shore, but it had never been used in deepwater (Nuckols and Bluestein 2010; Robertson, Krauss et al. 2010). The response team was uncertain whether the method would work in deepwater. The success of the top kill method depended on the following factors: the flow rate of hydrocarbons; the other potential flow paths in the well; the required flow rates of the mud (Tyagi, Smith et al. 2011). Moreover, governmental advisors considered that the junk might block the mud which was supposed to push the hydrocarbons back into the reservoir.

Action F: BP hired a company to analyze all possible outcomes under different flow rates.

BP hired a Norwegian company to model different scenarios of the top kill with different flow rates. The modeling results suggested that the top kill had a better chance to achieve success when the flow rate was less than 15,000 barrels per day. Acknowledging the result, BP implemented the “top kill” method on May 26. After pumping in thousands of barrels of mud, the oil was not pushed back to the reservoir: the top kill method failed. Then, BP tried another developed previously method, installing another BOP on the existing one.

Uncertainty G: BP was not sure whether the vulnerable rupture disk could hold pressure of the hydrocarbon after the shut-off of the well with another BOP.

After BP began to install another BOP and planned to shut off the well, engineers highlighted another vulnerable component that might lead to failure: the rupture disks in the casing system¹⁴⁴. In the casing system, three sets of rupture disks were designed to relieve pressure. If the pressure in the casing system reached a certain point after shutting the well, the disks would collapse with small holes to release pressure (National Commission Staff 2010). The collapse of rupture disks might lead to hydrocarbons flowing into the rock formation, which is known as “underground blowout”. When an “underground blowout” occurs, the oil goes through the layers of rock and spills into the ocean, which makes collecting the spilled oil even more difficult.

Action G: BP relied on scientific analysis from governmental experts to reduce the uncertainty, and adopted the temporary shutdown method to mitigate the possibility of an “underground blowout”.

Governmental experts analyzed the geological conditions and rock formation surrounding the well. The experts concluded on July 12 that filling in the paths of the rocky formation leading to the sea floor would require around 100,000 barrels of hydrocarbons. The experts further concluded that the hydrocarbons flowing into the rocky formation could be stopped when the well was reopened (National Commission Staff 2010).

144 The casing system is sections of steel pipe that are put into the drilled hole to withstand pressure from the rock formation.

Before closing the capping stack completely, BP ran a temporary shutdown of the capping stack to test whether the oil flowed into the rock formation (Tyagi, Smith et al. 2011). The temporary shutdown helped BP identify the well conditions, and especially made clear whether the rupture disks were functioning (National Commission Staff 2010). The temporary shutdown started on July 15, and proved successful on August 2.

Uncertainty H: BP did not have an accurate estimate of the flow rate.

When the leaks from the riser were found on April 24, the flow rate was unknown to BP and other responders. The unknown flow rate influenced the emergency response, for instance regarding determining the amount of dispersants (which has been elaborated in coping with **Uncertainty C**), calculating the storage capacity¹⁴⁵ or implementing the top kill method (which has been elaborated in coping with **Uncertainty F**) (Coast Guard 2011).

Action H1: BP claimed it was impossible to give an accurate estimate of the flow rate and withheld information on the situation of the wellhead from other stakeholders.

Technically, BP and federal responders claimed that there was no accurate way to estimate the volume of the spilled oil, because estimating flow rates in deepwater depended on many factors, such as the pressure and temperature of the oil, the reservoir and oil properties, the size of the well bore, the size of the blowout preventer (Coast Guard 2011). Moreover, most experts involved in the response did not believe that an accurate estimate of flow rates could influence the response process.

Action H2: BP had to follow instructions from the federal government to provide data for estimating the flow rate.

The failure of the top kill method at the end of May marked a turning point in governmental oversight: the federal government imposed more control on BP's response (Krauss, Fountain et al. 2010). The situation changed after the federal government felt pressure from the public and independent scientists to give an accurate estimate of the flow rates. On May 19, the federal responders set up an interagency Flow Rate Technical Group to estimate the flow rate (National Commission Staff 2010), which indicated that the federal government was taking a more active role in the crisis response. Upon request by the NIC, at the beginning of June BP began to use ROV to collect video data of the oil spill for NIC. On June 13, upon request by Secretary Chu, BP installed a sensor on the Top Hat to measure the pressure of oil on the wellhead. By mid-June, the government teams formulated a process of requesting information from BP. Moreover, based on available data about the oil spill, scientists from different institutions began to give their estimates about the flow rates, which challenged the estimate provided by the federal government and BP (National Commission Staff 2010).

¹⁴⁵ Actually, BP and National Incident Commands simply lacked facilities to collect spilled oil. Therefore, providing an accurate estimate of the oil spill rate was not very helpful in collecting the oil.

Uncertainty I: BP did not know how to deal with the political, social and financial fall-out of the oil spill disaster.

Immediately after the first explosion, BP was identified as the responsible party for the oil spill disaster according to the Oil Pollution Act (OPA) 1990. Accordingly, BP had to establish procedures of handling claims within 15 days (Weeks and Howitt 2012). BP did not know what to do with these claims because it had no established procedures. The procedure of dealing with claims and law suits included several specific questions, such as how much should be paid for claims, and how to establish criteria and procedures for identifying victims.

Action I: BP delegated dealing with uncertainties related to compensation to contractors.

BP began by delegating the claim processing to two contractors: Worley Catastrophe Response and ESIS. Both companies started call centers and opened on-site offices to handle claims. Approved victims would be awarded one month's salary compensation for their income loss caused by the oil spill disaster. At the same time, BP promised to pay additional compensation for income loss, and agreed that the payment would not prevent victims from suing them (Willis 2010).

In addition, BP contacted Kenneth Feinberg who had managed the federal compensation for victims after the 9/11 terrorist attacks in 2001 (Weeks and Howitt 2012). BP asked Feinberg to set up a third-party compensation fund similar to the one after 9/11. BP allocated \$40 million to Feinberg's Gulf Coast Claims Facility by June 1. By June 9, BP made another \$20 billion available to compensate victims in response to a demand by President Obama.¹⁴⁶ Moreover, BP initiated the "vessels of opportunity" program, which compensated the losses of fishermen by paying for the use of their ships for collecting oil along the Gulf coast (Coast Guard 2011; Schleifstein 2013).

Uncertainty J: BP was not uncertain about how much it be blamed in the media and by governmental investigation committees.

Although BP was identified as a responsible party, BP was uncertain about how much blame the media and governmental investigation committees would attribute to BP and about the extent of its responsibility. After a crisis, the causes of the explosion would be an important factor in attributing blame. Accordingly, the blame might be shared with BP's contractors. After all, the explosion happened in the oil rig owned by contractor *Transocean*, and the cement used to abandon temporarily the well was supplied by another contractor, Halliburton.

Action J1: BP tried to reduce blame by communicating with the public and stakeholders

To reduce blame attributed to BP in the media and by governmental investigation committees, BP communicated its active response efforts via various channels. Since April 21, BP had regularly released information about its response efforts in press conferences and on its website. The

¹⁴⁶ Until March 11, 2013, BP had paid \$2.4 billion to 30,589 claimants (Schleifstein 2013).

press releases covered updates on the response progress and BP's plans to contain the spilled oil and compensate the victims (Harlow, Brantley et al. 2011). On April 27, BP expanded its public relations campaign to the social media, directly releasing response information to internet users (Muralidharan, Dillistone et al. 2011).

Action J2: BP tried to share the blame with other actors

BP actively tried to minimize its own potential responsibility in the response and shifted part of the blame to its contractors. In its initial response (from April 21 to 28), BP regularly mentioned in its press releases that it worked together with contractor Transocean to respond to the explosion, which implied that they shared the responsibility (Harlow, Brantley et al. 2011). BP's CEO, Tony Hayward publicly said "what the hell did we do to deserve this?" (Krauss 2010). On May 3, Hayward said on ABC's "Good Morning America" that BP was not responsible for the accident. He also tried to shift the blame to contractor Transocean, because the failed equipment belonged to Transocean. On May 6, Hayward repeated this message to the BBC.

Uncertainty K: Uncertainty regarding the lack of a unified response framework to coordinate with federal and local governments

When BP coordinated with local governments and federal government, BP faced two response frameworks favored by the federal government and local government respectively. BP together and the federal government insisted on using OPA 1990 as the response framework, while local governments, especially Louisiana, preferred to rely on the National Response Framework that they were familiar with (National Commission 2011). Local governments continuously ignored the federal coordination and directly requested resources from BP. For BP, directly responding to local requests would mean bypassing the federal coordination while ignoring local requests would cause criticism from these stakeholders. Moreover, the novel response structure under the Department of Homeland Security added more uncertainties to the coordination process between BP and the federal government. For instance, it was the first time that the Secretary of Homeland Security had declared an "Oil Spill of National Significance" and established a National Incident Command (NIC) (Coast Guard 2011: 1).

Action K: BP coordinated with federal and local government separately to reduce confusion caused by different coordination frameworks.

After the start of the oil spill, BP actively coordinated with federal officials, including the unified command and the National Incident Command. BP employees liaised with governmental officials, and governmental officials relied on BP to provide response information. As regards coordinating with impacted states and communities, local government and communities bypassed the unified command set up by the federal and state government, and made direct requests to BP. BP satisfied demands from local communities with limited coordination with NIC.

Table 6-1 A summary of uncertainties, coping actions and strategies in the 2010 Gulf Coast oil spill disaster

#	Uncertainty	#	Action	Strategy
A	BP engineers were uncertain about the causes of the dysfunctional BOP	A	BP engineers repaired possible vulnerable components and tried to activate BOP again; after several failed trials, BP accepted external assistance to account for the deficiency of BOP.	routinized
B	BP did not know how to cope with the oil spill in deepwater.	B1	BP continued to try to activate the BOP, while discussing other methods to cap the well.	specific
		B2	BP sought advice from other actors	specific
C	Uncertainty regarding the effectiveness of applying dispersant directly at the wellhead in deepwater	C	BP improvised by designing a monitoring protocol to test the environmental impact of using dispersants near the wellhead	specific
D	BP was not sure whether using the dome to collect the oil would work in deepwater	D	Experts created contingency plans to cope with uncertainties	specific
E	BP did not know how to cope with the forming hydrates.	E	BP improvised by using a machine, the Riser Insertion Tube Tool, to separate the mixture on the seabed to prevent the formation of ice hydrates.	specific
F	BP was uncertain about the effectiveness of another oil containment method: the top kill method.	F	BP hired a company to analyze all possible outcomes under different flow rates	specific
G	BP was not sure whether the vulnerable rupture disk could withstand the pressure of the hydrocarbons after shutting the well with another BOP.	G	BP relied on scientific analysis from governmental experts to reduce the uncertainty, and adopted the temporary shutdown method to mitigate the possibility of an "underground blowout".	Semi-rule-based
H	BP did not have an accurate estimate of the flow rate.	H1	BP claimed that it was impossible to give an accurate estimate of the flow rate and withheld information on the wellhead from other stakeholders.	specific
		H2	BP had to follow instructions from the federal government to provide data for estimating the flow rate.	Semi-rule-based

I	BP did not know how to deal with the political, social and financial fall-out of the oil spill disaster.	I	BP delegated dealing with uncertainties related to compensation to contractors to.	Specific
J	BP was uncertain about how much blame it would receive in the media and governmental investigation committees.	J1	BP tried to reduce blame by communicating with the public and stakeholders	Rule
		J2	BP tried to share the blame with other actors	Specific
K	Uncertainty regarding the lack of a unified response framework to coordinate with federal and local government	K	BP coordinated with federal and local government separately to reduce confusion caused by different coordination frameworks.	Specific

6.5 Analysis: an arrogant organization playing with discretion

All the uncertainties and coping actions identified in the previous section have been summarized in [Table 6-1](#). This section explores how the institutionalization of BP influenced its selection of sensemaking strategies in the response to the 2010 Gulf Coast oil spill disaster. In the analysis process, a strategy type will be assigned to each set of sensemaking actions (the types of strategies have been defined and operationalized in [Section 3.2 of Chapter 3](#)). In responding to the 2010 Gulf Oil Spill disaster, the influence of BP’s institutionalization on its sensemaking strategies can be discerned in the following phases.

- Phase I: BP started with rule-based sensemaking, and then shifted to a dual strategy. The explosion in the Deepwater Horizon oil rig disrupted BP’s normal operation routines, providing an ecological change for BP’s sensemaking. After the accident, primary uncertainties for BP were the causes of the oil spill and the way to cope with the oil spill ([Uncertainty A and B](#)). It is not surprising that BP’s initial sensemaking strategy built on its routine way of working. BP as a highly institutionalized organization had various procedures to cope with uncertainties that it might encounter. Using Remote Operated Vehicles to assess the damage situation and efforts to repair the BOP to stop the oil from spilling into the ocean were all standard operations in deepwater oil drilling when an accident occurred. So far, BP’s use of standard operating procedures indicated that it still perceived the explosion as a “normal” accident, which could be interpreted based on existing frames.

In the feedback loop of the sensemaking process, BP learned that the BOP could not be repaired soon as expected, which was inconsistent with BP’s previous experience. The failure indicated existing frames were not sufficient to interpret encountered uncertainties, and there might be a possibility that existing frames might fail to cope with the uncertainty. Therefore, BP initiated specific-based sensemaking to complement its rule-based sensemaking, as has been shown in [Actions A, B1, B2, J1 and K](#). On the one hand, BP maintained its routine strategy, activating and repairing the BOP to stop the oil spill, activating contractors to collect spilled oil that might affect

the coast, and communicating regularly with the public and media regarding its progress and response plan. On the other hand, BP began an ad hoc analysis and sought the advice from others (including other oil companies and research institutes) to prevent the failure of its rule-based strategy. After the analysis, BP implemented a promising method that had not been tried before in deepwater drilling, i.e. drilling a relief well. When coping with coordination uncertainty caused by a divergent approach of federal government and local governments, BP used different coordination mechanisms with both stakeholders to satisfy their demands (Action K).

A dual strategy in coping with uncertainty is not an option in the hypothesis developed in chapter 3, but it seems to be the “normal” product of BP’s institutionalisation effect. The explosion had already announced an adversity (it was still not a crisis before the public saw the oil spreading on the sea surface). The explosion with the subsequent oil spill was a typical manmade disaster, which was more likely to provoke public criticism and a loss of legitimacy. The loss of organizational legitimacy might escalate after failing to mitigate the effects of the crisis. Sticking to the rule-based strategy offered the possibility for mitigating the crisis soon, while the failure of the rule-based strategy might lead to an escalated loss of organizational legitimacy. Initiating specific-based sensemaking complemented the rule-based strategy and would prevent a worst-case scenario if this strategy failed. This made it safe to try the rule-based strategy.

- Phase II: BP used trial-and-error to cope with uncertainties. After failing to activate the BOP to stop the oil spill, BP and its regulatory agencies, MMS and the Coast Guard, realized that responding to oil spill in deepwater was an unknown situation and that they had no prior experience or institutionalized framework to deal with it. BP knew that its existing response plan to the oil spill was just a “fantasy document”, which could not provide a framework to guide the response (Clarke 1999; Mohr, Pritchard et al. 2010). Moreover, BP’s failed attempts to repair the BOP signified the ineffectiveness of its last barrier of routine procedures to stop the oil spill. Therefore, BP’s sensemaking could not rely on frames embedded in the organizations to interpret the uncertainties.

BP’s external institutionalization was low, providing no expectations or regulations concerning its crisis response. There were mainly two factors that resulted in BP’s low external institutionalization:

1. BP’s regulators simply did not have the capacity to respond to an oil spill in deepwater.

According to the National Commission (2011: 136), the employees of MMS acknowledged their weak capacities in their answer to the question how they would cope with the oil spill if the federal government took over the response. The employees answered that they would hire BP or other oil giants. Although the National Incident Command (NIC) supervised BP’s response,¹⁴⁷ the federal government, typically MMS and the Coast Guard, mostly provided suggestions to mitigate hazards in BP’s plans (Krauss 2010; National Commission 2011). During the response, the Coast Guard and MMS acknowledged the partnership as well. In a press conference on April

¹⁴⁷ Louisiana announced a state of Emergency, and Coast Guard set up a unified area command on April 30.

On May 1, DHS secretary appointed the Coast Guard Commandant Admiral Thad Allen as the National Incident Commander. Thad consequently appointed Rear Admiral Peter Neffenger and Assistant Secretary for Intergovernmental Affairs at DHS Juliette Kayyem as his two advisors.

29, Coast Guard Rear Admiral Sally Brice O'Hara referred to BP as "our partner".

2. The governmental response framework was in a state of newness when the oil spill disaster hit. Federal government declared the "Oil Spill of National Significance" and for the first time activated the National Incident Command. Moreover, federal government's response framework, *Oil Pollution Action 1990*, was not accepted by local government. Therefore, the government response framework was in a state of low institutionalization, and could impose very limited intervention and supervision power regarding BP's response.

As a result, BP maintained its autonomy in sensemaking during the response to the oil spill. In other words, due to external de-institutionalization BP's sensemaking was scarcely influenced by external actors in this phase.

BP had no existing frames in the internal institutionalization dimension, and external stakeholders could not formulate expectations to influence its sensemaking, which allowed BP to initiate a trial-and-error mode of specific-based sensemaking. In the trial-and-error mode, BP and other actors made their analysis based on available information and technology, and experts from BP and the National Incident Command improvised with response options. In each trial of response options, BP gained new knowledge (enactment data that influenced the effectiveness of response options), and adapted its actions to cope with the salient emerging uncertainty. After analyzing the enactment data, BP improvised with a new response option. The trial-and-error mode has been shown in coping with **Uncertainties C, D, E, F, and G**.

BP and stakeholders believed that most promising approach, drilling a relief well, could not be completed within three months, during which the oil spill might have disastrous environmental consequences. While waiting until the drilling of the relief well had been completed, BP's trial-and-error strategy started with adapting methods used to stop onshore oil spills or spills in shallow water (such as the cofferdam approach and the top kill approach). BP's first attempt was the cofferdam approach which would not influence the integrity of the well and BOP (Tyagi, Smith et al. 2011). In the adaptation process, BP improvised to reduce uncertainties that it might encounter in applying this method in deepwater (see **Action D**). The failure of using the cofferdam demonstrated the influence of hydrates to BP. Learning from the feedback loop of sensemaking, BP improvised by using RITT to handle the formation of ice hydrates in the following attempts (**Action E**). Before trying the top kill and capping stack methods, BP relied on scientific analysis from engineers and experts to reduce uncertainties (**Action G**). In terms of coping with the uncertain impact of using dispersants over the wellhead in deepwater, BP improvised with a test mechanism to investigate the impact (**Action C**).

In addition to dealing with uncertainty related to stopping the oil spill, BP also selected ad hoc strategies to cope with uncertain consequences of the crisis (**Uncertainties I and J**). Both uncertainties were novel to BP and relevant actors, and there were no existing institutionalized procedures. BP delegated the responsibility of coping with the uncertainty regarding compensating victims to contractors. When coping with potential blame after the disaster, BP tried to share the blame with its contractors during media communications (**Action J2**).

- Phase III: under increasing governmental intervention, BP shifted towards a semi-rule-based strategy

After several failed attempts to stop the oil spill, federal government and the public lost patience with BP's autonomy in terms of handling the oil spill. According to a survey made by the Pew Research Center (2010) from May 6 to 9, around 54% of the public considered the federal government's response fair or poor, and 42% of the public did not approve Obama's way of handling the disaster. Around 63% of the public rated BP's performance as fair or poor. *USAToday* wrote that the Gulf oil spill was becoming President Obama's Katrina (Hall, Jervis et al. 2010).

In response to public opinion, the federal government began to intervene substantially in the crisis response. Governmental officials actively participated in BP's meetings which they had never done previously. The NIC started its solo press conferences instead of appearing together with BP representatives (Allen 2010). Energy secretary Chu started to seek advice from other companies in the oil industry. On May 21, BP was urged by the Obama Administration to report its daily efforts to contain the spill. On May 28, Obama publicly expressed his regret over having believed that the oil company was prepared to deal with a catastrophic oil spill, and announced that he would be responsible for the cleaning efforts and triple the response resource and personnel. The president's environmental advisor criticized BP for playing down the crisis. Since the middle of June, the incident command had begun to learn more from other oil companies and BP's plan was more substantially challenged by governmental officials. The increasing governmental intervention weakened BP's autonomy, and BP consequently lost its autonomy in its dimension of external institutionalization.

Due to the loss of autonomy, BP could not determine strategies of coping with uncertainty; instead, it became bound by increasing governmental intervention. This non-autonomous strategy selection is classified as semi-rule-based in this research. As demonstrated in coping with **Uncertainties G and H**, BP did not have the necessary information to estimate the unknown flow rate, but had to provide data to the federal government upon request to help estimate the flow rate (**Action H2**). At the same time, BP's way of coping with uncertainties regarding the response options was challenged by the governmental research team which became involved to reduce uncertainties of the response options by providing a more scientific analysis (**Action G**). BP's selection of response options had to be approved by the governmental research team as well.

In summary, this chapter presents how BP as an arrogant organization coped with uncertainties during the response to an oil spill disaster on an unprecedented scale. Organizational institutionalization influenced sensemaking strategies in the following ways:

- Sensemaking in an arrogant organization (with a high internal institutionalization and low external institutionalization) tends to start with rule-based strategies.
- When these rule-based strategies failed to reduce uncertainties, the organization swiftly dropped its institutional frames and initiated dual strategies (both rule-based and specific-based strategies) to cope with impending uncertainties. At the same time, the arrogant organization's unique organizational capacities and the newness of external network that had been built up temporarily helped it maintain an autonomous status. The lack of institutional frames and the maintenance of its autonomous status helped the organization to adopt specific-based strategies in coping with uncertainties.
- The repeated failure of specific-based strategies to cope with uncertainties might result in external intervention, which erodes the organization's autonomous status. The organization experienced a deinstitutionalization in its external dimension, and increasing external intervention constrained organizational strategy selection in coping with uncertainty. Consequently, the organization was more likely to adopt semi-rule-based strategies.

Chapter 7 The Los Angeles Police Department and the 1992 LA Riots: a mythical organization coping with known unknowns

“We (LAPD) had a meltdown that night (when the 1992 LA riots started). Everything we believed in went out the window.”

—Sergeant J.J. May (Braun and Berger 1992: 1)

7.1 Introduction

This chapter describes a mythical organization¹⁴⁸, the Los Angeles Police Department (LAPD), coping with expected riots after the trial of police officers from LAPD who were accused of beating a black motorist, Rodney King. The beating happened on March 8 1991. It was videotaped by a bystander. The tape was broadcasted by television stations around the country. The police officers involved in the beating were arrested and put on trial. The verdict was scheduled to be delivered on April 29, 1992. Riots were expected if the court would announce the acquittal of the police officers. However, LAPD did not know when and where exactly the riots would take place. Neither could they predict the scale of the coming riots.

LAPD had been well-known for its aggressive yet professional approach to policing (Sparrow 1992). In the 1950s, LAPD freed itself from corruption and built a professional organization around an aggressive policing approach. At the end of the 1970s, LAPD’s policing approach was challenged by the emergence of the so-called community policing approach which advocated collaboration with communities to prevent crimes. LAPD’s aggressive approach did not curb the increasing crime rates in LA, and the media ran stories about police misconduct, especially towards the minority communities. However, LAPD maintained its aggressive method. After the King incident, LAPD experienced an accelerated erosion of legitimacy among stakeholders. The post King incident investigation committee, the Christopher Commission (1991), and other political actors severely criticized LAPD’s aggressive approach to policing. Under external pressure, LAPD was switching to the community policing approach when the riots happened. When the Los Angeles riots occurred, LAPD was just entering an internal deinstitutionalization process while its external institutionalization encountered a step-back.

This chapter starts with an overview of the 1992 LA riots in Section 7.2. In Section 7.3, the organizational history of LAPD’s institutionalization process will be analyzed on both the internal and external dimensions. Section 7.4 will identify the uncertainties encountered by LAPD and the way LAPD dealt with them during the response to the 1992 LA riots. The chapter concludes with an exploration of how institutionalization influenced LAPD’s selection of strategies to cope with uncertainty. Here the theoretical framework presented in Chapter 2 will be applied.

148 The mythical organization has a high degree of external institutionalization whereas its internal institutionalization is low. For a more elaborate definition, see [section 3.2 in chapter 3](#).

7.2 An overview of the 1992 Los Angeles Riots

On April 29, 1992, a series of riots erupted in south-central Los Angeles, California.¹⁴⁹ The riots lasted for six days until May 4, causing fifty-three deaths, around 2500 people injured¹⁵⁰, over 700 burned down businesses and property damage of around \$1 billion (Rosegrant 2009). This riot ranked as “the most serious episode of race-related crowd violence in the US” in the previous century (Tierney 1993: 1), which impacted over 900 square miles in the Los Angeles area [the Watts riots in 1968 affected 46.5 square miles] (Schmidt 1993).

The riots started after the Simi Valley jury acquitted four LAPD officers, Timothy E. Wind, Laurence M. Powell, Theodore J. Briseno and Sergeant Stacey C. Koon, who were involved in the Rodney King beating.¹⁵¹ On March 8, 1991, Rodney King was pursued by California Highway Patrol [CHP] officers because he was speeding. After King stopped his car, a group of LAPD officers reached the scene. During the arrest, King was perceived by LAPD officers to charge at them, which led to a harsh baton beating. The beating process was videotaped by an amateur cameraman (LA Times Staff writer 1992). The cameraman sold the video to local television station KTLA, which broadcasted an edited version instead of the original version. A crucial part recording King’s charge towards an LAPD officer had been removed in the edited video. The broadcast of the beating was transmitted to different TV channels including CNN, which triggered criticism of LAPD for misconduct (Christopher Commission 1991; Webster, Williams et al. 1992). The King beating and the subsequent trial of the four LAPD officers involved in the beating attracted intense attention from the public, the media and activists.¹⁵²

After the trial, crowds began to surround the Simi Valley courthouse in Ventura County. In other hotspots, people gathered near Florence and Normandie Avenues in South Los Angeles and outside the Parker Center (the police headquarters) located in downtown Los Angeles (Whitman 1993).¹⁵³ At the Florence and Normandie Avenues, demonstrators threw bottles and bricks at passing vehicles (LA times Staff writer 1992). Mobs pulled a truck driver from his cab, and almost beat him to death, which was videotaped by a news helicopter and broadcasted on television. Late in the evening, the riots evolved into looting grocery stores, liquor shops and shopping malls, and even burning properties, which continued the next six days. During the riots, gangs in LA looted gun stores and shot at fire fighters and ambulances.

The riots were different from the one in Watts in 1968 which evolved from long-simmering black-white conflicts. The 1992 riots involved conflicts among different ethnic groups and clashes

149 During the late 1980s and early 1990s, riots happened in some other cities in the US, for instance, Greekfest Riots in Virginia, the Mount Pleasant Disturbances in Washington D.C., and the Denver unrest in Colorado.

150 See http://www.LAPDonline.org/history_of_the_LAPD/content_basic_view/1132 (accessed on May 15, 2012).

151 The jury consisted of ten whites, one Hispanic, and one Filipino, which was perceived to be unfair by African Americans (Webster, Williams et al. 1992).

152 According to a survey conducted after the arrest of four officers, a majority of the respondents [around 81 percent] considered the officers guilty (Cannon 1999).

153 Due to the massive media attention, the trial venue was changed from the Los Angeles County to the Simi Valley of Ventura County.

between ethnic groups and the LAPD. The riots started as a confrontation between blacks and the police in South Los Angeles. With the expansion of the riots, mobs targeted Korean shops, and Hispanics became involved in the looting.

Korean shop owners in particular became victims of the lootings: around 54% looted shops were Korean owned (Tierney and Reshaur 1994). Since the 1970s, Korean American merchants had bought most liquor and convenient stores in South Central LA (Sears 2000). Two weeks before the King beating, a Korean shop keeper Soon Ja Du had killed a 15-year-old African American girl Latasha Harlins for stealing a container of orange juice. In November 1991, Soon Ja Du was sentenced to ten years in prison and was placed on 5-year probation. This trial caused wide dissatisfaction among African Americans because they had expected a more severe punishment of the Korean shopkeeper. During the King riots, shop owners in the Korean town area organized to defend their properties and engaged in shoot-outs with mobs (Abelmann and Lie 1995).

LAPD's response was slow and the organization was overwhelmed during the first few hours. During the first night, LAPD retreated from the spot after a confrontation with the crowds. The police force did not fight back after retreating. After Mayor Bradley announced a dusk-to-dawn curfew and requested assistance from the California National Guard and federal troops, the riots were put down with the assistance of the military and other law enforcement agencies. The response process will be elaborated in [Section 7.4](#).

7.3 LAPD as a mythical organization LAPD and South Central Los Angeles

Before going into details about LAPD and the 1992 LA riots, this section will provide some background information on Los Angeles, especially the South Central part where the riots broke out.

The demographics of Los Angeles changed significantly with the growth of minority populations since the 1940s. Los Angeles used to be a "white spot". In the 1940s and 1950s, African Americans migrated to the city seeking jobs, followed by Mexican Americans and Asians (LA Times Staff writer 1992; Domanick 1994; Sears 2000).¹⁵⁴ In 1964, the Urban league designated LA as "the best city for blacks to live" (Jacobs 2000: 1). Most of these minorities, typically blacks and Latinos, lived in south central Los Angeles.¹⁵⁵ LA gradually became "a salad bowl of culture", with people "speaking 106 languages", as described by Cannon (1999: 4). By 1990, Anglo Americans made up 37 percent of the LA population, while Hispanic represents 40 percent, African Americans 13 percent, and Asian Americans 9 percent (Webster, Williams et al. 1992).

¹⁵⁴ According to Domanick (1994), two hundred thousand African American moved to LA who filled in the job positions in the aviation, steel, rubber and shipping building industries.

¹⁵⁵ Some Hispanics moved to the suburbs and eastern LA. Most Anglo Americans lived in the western portion of the valley, Hispanic in the central part, and mixed in the eastern portion.

Since the 1970s, South Central Los Angeles had experienced an economic downturn and high unemployment rates (Sears 2000). Under the Bradley Administration (1973-1993), LA mainly invested in downtown development, leaving very little for South and Central LA (Domanick 1994; Davis 2006). Since the late 1970s, the manufacturing-based economy had collapsed with major companies in steel, auto, and rubber industries (such as General Motors, Firestone, and Bethlehem Steel) moving their plants to Mexico and East Asia (LA Times Staff writer 1992). In the same era, the Reagan Administration cut the federal defense programs and grants which further decreased job opportunities, especially for blacks and Latinos in South Central LA (Domanick 1994: 15, 311). The unemployment rate of black and Latino males in South Central LA was around 45 percent by 1990, and around 20 to 40 percent of the residents there remained under the poverty line (while the city-wide rate was 18.5 percent, and the state-wide rate was 12.5 percent) (Webster, Williams et al. 1992; Domanick 1994: 15).

Los Angeles had experienced an increase in drugs trade and violent crimes since the 1980s. The gang killings reached 300 per year by the end of the 1980s, while LA County alone had about 700 (Domanick 1994: 15). LA ranked 12th among American large cities concerning violent rate, with an average of two gang-related murders per day. In 1992, LA was home to two notorious youth gang organizations: around 110 Crips sets and 60 Bloods sets.¹⁵⁶ Moreover, there were 250 Hispanic gang sets and 15 sets of Asian gangs (Delk 1995).

Similar to most major cities in the US, racial conflicts had never stopped in LA. There were roughly 1944 racial disturbances between 1965 and 1968 (Domanick 1994; Miller 2001), but the Watts riots in LA ranked as one of the most violent riots in the urban history of the US. The Watts riots caused 1,000 injured and 34 deaths. The riots were triggered by a California Highway Patrol officer's arrest of a black man for drunk driving on August 11 of 1965. The quarrel and scuffle between the black man, his mother and the patrol officers attracted a large number of people. The crowd began to confront the arriving LAPD officers. Later that evening, rioters struck passing vehicles, and assaulted motorists, mostly white Anglos. The next day, the riots spread throughout Los Angeles. Finally, the riots were suppressed with the assistance the National Guard on August 17. After the riots, the McCone Commission (1965) report acknowledged poverty and police brutality towards minority citizens as factors contributing to the riots.

The following section will describe LAPD's institutionalization process, which will be elaborated based on the internal and external dimensions as identified in [Chapter 3](#). LAPD's institutionalization process can be divided in two periods based on its organizational history: the first was the period under the administration of Chief Parker who built and maintained an organization that scored high on both dimensions of internal and external institutionalization. In the post-Parker era, LAPD's internal institutionalization eroded while a relatively high level of external institutionalization was maintained. After the King beating, LAPD experienced an immediate and deep drop in the level of institutionalization. I will now elaborate these three eras based on the internal and external dimensions.

¹⁵⁶ For more about these two gang organization and youth gang culture, watch the documentary film *Crips and Bloods: Made in America*.

Parker's "thin blue line"

The internal dimension

LAPD is the police department of the city of Los Angeles, California, responsible for local law enforcement. Los Angeles had been a city known for its violence and gambling before the establishment of LAPD. In order to cope with the violence, the city established its volunteer police force in 1853 and created its paid force in 1869 (LAPD 2012). The department was involved in serious corruption and subject to political interference in those early years (Sparrow 1992). Police historians named this period (1840-1920) the Political Era (Scott 2009; Uchida 2009).

In order to root out corruption, LAPD started its professionalism initiative, which later became popular among law enforcement agencies in the US (Cannon 1999). The professional and aggressive pro-active policing approach was advocated to build "a tough and corruption-free crime-fighting machine" (Christopher Commission 1991: i; McNamara 2000). This process of institutionalizing the professional policing approach started in the 1920s when August Vollmer served as the LAPD Chief (1923-1924). The approach was deeply embedded during the era of Chief Parker (1950-1966) (Kramer 2007).

The professionalism of LAPD was initiated by Chief Vollmer, who was a faculty member at the University of California at Berkeley and is known as "the father of professionalism in American law enforcement". Vollmer's reforms laid the foundations of police professionalism at LAPD (Douthitt 1975; Domanick 1994; Cannon 1999: 55; LAPD 2012), which included:

- [1] Setting up professional police standards with an emphasis on respecting the constitution and adhering to rules and instructions;
- [2] Recruiting officers based on entrance exams;
- [3] Using training programs to enlighten police officers;
- [4] Relying on modern technology;
- [5] Starting up a scientific investigation division and a daily crime summary report mechanism;
- [6] Establishing a mobile team to target high crime areas;
- [7] Creating a police crime prevention division including social workers to educate delinquent youths;
- [8] Starting the police training program for new officers in 1924.

Vollmer stepped down from the Chief position because of his disappointment with internal corruption and the lack of support from political parties in Los Angeles (Domanick 1994). However, his ideas on professionalism took root at LAPD and were further implemented by Chief James E. Davis (Domanick 1994). Davis fired around one fifth of the police officers at LAPD because they were involved in bad conduct or corruption. Later, Chief Parker institutionalized the professional proactive policing approach at LAPD which was continued and elaborated by subsequent Chiefs, most forcibly by Edward M. Davis and Daryl F. Gates, and supported by stakeholders.¹⁵⁷

The concept of professional policing emphasized a corruption free and disciplined environment. Parker deeply understood the importance of corruption free and disciplined environments before he took the Chief position. In Chief Worton's era, Bill Parker was appointed to create the Internal Affairs Division which investigated police misconduct and corruption problems (Domanick 2000; Newton 2006). Parker's experience at the Internal Affairs Division taught him the harm corruption and police misconduct did to the legitimacy of the police force. When he became Chief in 1950, Parker kept his department free from corruption and created an institution under the approach of professional policing (Morrison 2009). Parker became one of the most respected law enforcement officials in the US.

As the Chief, Parker prioritised the mission of LAPD in terms of law enforcement with less emphasis on maintaining public order (Wilson 1968; Wilson 1978; LA Times Staff Writer 1992).¹⁵⁸ The strict law enforcement relied on procedures and rules. Parker ordered Edward Davis to compose the LAPD manual which would guide the police officers' actions (Domanick 1994: 85). Based on these rules, LAPD worked in a highly regimented way, described by Domanick (1994: 289-290): "the department just does not like officers who do things on their own. They do not like officers who have their own ideas".

LAPD defined itself as an elite organization and distanced itself from the community under the "us vs. them" philosophy (McDermott 2000). LAPD officers were imbued with a sense of mission as the elite standing "between chaos and anarchy" (Glazer 2007). Officers strongly believed that the LAPD was "better than them [the world outside LAPD]" and "a cut above the people they serve"; They "know better, no one tells us better" how to police LA; LAPD served as "the last bastion of good people in a world that's crumbling" (LA Times Staff Writer 1992; Cannon 1999: 135; Domanick 2000).

The proactive policing approach was reflected in LAPD's patrols, which stressed preventing crimes from happening using an aggressive method. During patrol, LAPD officers were encouraged to stop citizens on the street, search and investigate these suspects (Domanick 1994: 328). A notable tactic of aggressive policing at LAPD was the Dragnet system, which was invented by James Davis to catch targeted criminals. In the Dragnet system, officers were ordered to control ten or twelve street

157 Gates used to be Parker's driver, then became the right hand of Parker in the department.

158 In other words, LAPD displayed the legalistic style of policing proposed by Wilson (1978), which emphasizes the confrontation with suspects, using threats and arrests to solve disputes and strict law enforcement, with less consideration for extra-legal factors.

intersections. Officers then started at opposite street corners working towards each other and systematically stopped and investigated all passing vehicles for suspects (Rabin 2001).

At LAPD, police officers operating according to the aggressive approach were labelled as efficient and thus had better promotion opportunities (Christopher Commission 1991). Efficiency was measured based on arrest numbers and marksmanship requirements. Areas with high crime rates, such as the Downtown Area, which offer more chances of arrest, became favourite destinations of internal transfer for police officers (Christopher Commission 1991). Moreover, LAPD encouraged police officers to master the marksmanship and firearm force, and elites were selected to join special units, such as Metro, Narcotics and Internal Affairs, which were the striking force in crime fighting (LAPD 2012). Officers in these special units received high respect as elite units at LAPD.

LAPD consisted of four geographic bureaus and an Operations Headquarters Bureau. Each geographic bureau managed four or five Areas. The Bureaus were managed by deputy chiefs and Areas were commanded by captains. The Operations Headquarter Bureau was responsible for the city-wide response, and consisted of several special units. Special units for quick response, mostly the “non-interchangeable tasks”, such as the Special Weapons and Tactics Teams (SWAT) and Special Investigation Section (SIS) became important subdivisions at LAPD engaged in crime fighting (Webster, Williams et al. 1992: 57; Domanick 1994).

SWAT is specially trained for handling high-risk operations, such as hostage negotiations, and this team became an example for other police departments in the US (LAPD 2012). In 1971, SWAT was incorporated into the Metropolitan Division (Metro). It has remained “an elite force within the force” (Cannon 1999: 268-269). Metro has been good at controlling areas with aggressive force, such as taking over streets with a mass of patrol cars and police officers.

Another example of aggressive policing is SIS, which was founded by Parker in 1965. SIS was responsible for dealing with those suspects that were difficult to apprehend by ordinary detectives. SIS sometimes waited until suspects had committed the crime, and then arrested the criminals when they left the scene. In the arrest process, SIS regularly triggered gun battles and sometimes caused deaths (Domanick 1994: 282). According to Lait (1998), SIS triggered more than 50 gun battles, caused the death of 34 suspects and was responsible for many wounded in 33 years. Compared with police departments in the other six largest American cities, LAPD officers killed and wounded more civilians. LAPD killed 3 persons per 1000 sworn officers and wounded 8.1, while the Detroit police department, ranking second, killed and wounded only 1.2 and 5 respectively (Domanick 1994: 276).

The other element supporting LAPD’s proactive policing approach was a qualified police force. Since the 1950s, in order to hire highly qualified officers, LAPD had used high salaries and its reputation to attract job applicants. In the middle of the 1950s, LAPD became the best-paid police department in the US, which attracted more job applicants (Domanick 1994: 108). After the Dagnet serials broadcasted on television and Hollywood movies that reflected heroic stories of crime fighting and investigations, LAPD became an attractive employer for many youths (Cannon

1999:60-61).¹⁵⁹ In the selection process, LAPD set up strict criteria to select applicants according to the requirements of its policing approach that had been introduced in Parker's era (Uchida 2009). The recruiting procedure included a physical standard, background investigation, and highly competitive exam. The training for the newly recruited police officers further strengthened the philosophy of professional policing (Domanick 1994). All newcomers were trained in a six-month program at the LAPD's police academy which was well-known in the police field for its quality of training (Christopher Commission 1991). After their training in the police academy, new officers entered the force under the supervision of a field training officer for one-year probation.

Institutionalization: the external dimension

In Parker's era, LAPD enjoyed an autonomous status free from political interference. Before the progressive era, LAPD was similar to other police departments in major American cities: filled with political appointees (Uchida 2009). LAPD had built its autonomous status since the 1923 city charter amendment (Cannon 1999: 65), which freed LAPD from City Hall's political influence. Moreover, the police Chief was entitled to life tenure and could only be fired in very serious situations, such as high crimes and misdemeanors, insubordination, or incapacitation (Domanick 1994: 94-95). In the decades before the 1992 riots, no police chief had ever been fired.

LAPD was an independent agency supervised by the citizen commission, commonly named the police commission (McNamara 2000). According to the City Charter, the police commission is responsible for the oversight and control of the police department.¹⁶⁰ In reality, the police Chief had the power and authority, leaving little space for the police commission to exercise power given its limited human resources and information, and lack of power to control budgets or appoint the police Chief (Domanick 1994: 152). The police commission, consisting of only five civilian members who met once a week, did not have enough supervision capacities.¹⁶¹ It lacked a professional supporting structure to gather information on LAPD operations and had limited budgets to hire external experts for the analysis of reports provided by LAPD.

The mayor exercised power over LAPD in an indirect way. The mayor can only appoint the police commissioners but not the police chief. The 1925 city charter had removed the mayor's authority to appoint the police chief. Instead, the police chief was appointed by the city council. After LAPD gained an independent position, the mayors did not seek more control over the department.

Chief Parker had established close ties with key stakeholders to maintain LAPD's autonomous status. Parker learned from the mistake that Vollmer had made, who solely advocated police professionalism with little consideration for politics (Gates and Shah 1992; Cannon 1999: 61). Instead, Parker developed close relations with city councilmen (Domanick 1994: 331). Parker regularly attended social events where he sold his ideas in speeches to these crucial stakeholders.

159 Among the well known TV series were *Adam-12*, *Hunter*, and *LA Confidential*.

160 The citizen commission method was brought to LA politics in 1878 during the Progressive Movement which aimed to weaken the power of city council and mayors.

161 The 1925 city charter standardized the number of citizen commissions in all Los Angeles city agencies to five with a five-year term (Webster, Williams et al. 1992).

The good relations with key political actors helped Parker guarantee stable budgets when he fought with the mayor and the City Administrative Officer (Kramer 2007).¹⁶²

Despite its high political and administrative support, LAPD's relationship with the minority communities had not improved due to an excessive use of force in South Central LA (Webster, Williams et al. 1992). LAPD officers treated minorities, especially black suspects, harshly in the law enforcement process (Cannon 1999: 85). The McCone Commission report (1965) referred to police brutality and racial discrimination as the cause of the Watts riots.

LAPD relied on TV programs and newspapers to build its public image. Parker regularly spoke with news reporters about stories and provided journalists access to cover policemen and their stories (Kramer 2007). The television director Jack Webb gained access to LAPD and created TV series, such as "Dragnet" and "The New Centurions", which cultivated a heroic image of the police force (McDermott 2000; Hayde and Morgan 2001; Newton 2006). Local media in LA, such as the *Los Angeles Times* remained highly supportive of LAPD (Jacobs 2000).

The Post-Parker era

The internal dimension

Since the 1970s, LAPD's proactive policing approach encountered increasing challenges with the widespread adoption of community policing elsewhere in the country. The community policing approach does not rely on crime-fighting alone. The assumption underlying community policing is that arresting criminals and deterrence of crime are not as effective as imagined (Goldstein 1979; Kelling and Wilson 1982; Goldstein and Hill 1990).¹⁶³

LAPD began to initiate several community policing programs in the 1970s. After the Watts riots, Chief Reddin created the position of Community Relation Officer to build close relationships with communities and neighborhood organizations. Chief Davis initiated the "basic car plan", which gave small teams 24-hour responsibilities for patrolling in given areas to prevent crimes in cooperation with communities. The "basic car plan" strengthened the ties between the police and the local communities they served. The "basic car plan" evolved into the team policing method, which gave more responsibility to develop relationships with communities and respond to community concerns (Christopher Commission 1991).

Programs related to community policing were terminated under Chief Gates due to budget constraints. Community policing demanded more police officers to prevent crimes; Due to shrinking budgets, LAPD could not maintain a large enough police force (McDermott 2000). After

162 According to the 1889 city charter, the city council was given budget control and legislative power.

163 In a theory on community policing called "broken windows", James Q. Wilson and George Kelling (1982) proposed that if the "signs of crime" are not taken care of, more serious and more costly crimes are likely to occur. The broken window theory calls for reducing crimes in the neighborhood, and increasing regular contacts between police officers and citizens. The idea is that crimes can be prevented more effectively through the collaboration of citizens and police effectively.

Proposition 13 was passed in California in 1978,¹⁶⁴ shrinking budgets caused LAPD to freeze the hiring of new officers, leaving a shrinking police force to cope with the growing LA population and crime.¹⁶⁵ By 1985, the number of sworn officers had fallen to less than seven thousand, while New York's and Chicago's numbers exceeded 28,000 and 12,000 respectively (LAPD 2012). At the beginning of the 1990s, the number of LAPD officers increased slightly to 8400 in 1990, but fell to 7800 in 1992 (Los Angeles Times Reporter 1992). The ratio of residents to police officers was lower than that in other major international metropolises. The ratio in LA was 432:1, while London's and Moscow's were 377:1 and 132:1 respectively (LA Times Staff Writer 1992). Compared with the other six largest police departments in the US, LAPD had the lowest ratio of police per resident, which was around 2 per thousand in 1986 (Pate, Hamilton et al. 1991; Domanick 1994: 13). LAPD officers [17 officers per square mile] needed to cover a larger area than their colleagues in the New York Police Department [89 officers per square mile] (Miles 1992).

The shrinking budget forced LAPD to rely more on volunteers and civilian employees (Webster, Williams et al. 1992; Cannon 1999: 89-91). In the neighborhood watch program, around 55,305 volunteers contributed 172,210 hours time in 1987. Since 1983, around 1300 civilian employees had begun to assume some of the responsibilities that used to rest with sworn officers, such as fiscal operations and information management (LAPD 2012). According to the *Los Angeles Times* (1992), most police officers were assigned paper work and other non-patrol duties, and only around 300 patrol officers remained to patrol the streets. The number fell further to 279 by the fall of 1992. The shrinking workforce could not guarantee a quick response under the aggressive policing approach.

LAPD's professional policing method could no longer control crime. Under the professional policing method, LAPD maintained high arrest numbers. However, the rate of violent crime in LA remained twice the national average from 1960 to 1989 (Christopher Commission 1991). In 1986, the crime rate peaked at 9.2 per 100,000 citizens, which was much higher than the second highest crime rate, found in New York (5.2). In the same year, both LAPD's average number of violent crime arrests and property crime arrests were the highest among the six largest cities as well (Pate, Hamilton et al. 1991). Before the King incident in 1991, the crime rates kept climbing annually.

In 1988, Gates initiated an aggressive program named "Operation Hammer" to arrest gang members in South Central LA. The operation did not reduce crime rates but increased complaints about police harassment (Whitman 1993; Cannon 1999). In 1989 and 1990, major crimes rose 8 percent and 1 percent respectively, murder increased by 18 percent and 11 percent, and robberies by 18 percent and 16 percent (Domanick 1994).

In spite of the negative consequences caused by the excessive use of force, LAPD maintained its aggressive policing model with light punishment of police officers involved in the police abuse cases. According to an investigation on police officers accused of misconduct (conducted by the

164 *Proposition 13* cut the property taxes by two thirds, which reduced the government revenues of local governments.

165 Actually, the city council had not allowed enlarging LAPD since World War II (Cannon 1999: 57).

Los Angeles Daily News), the Internal Affairs Division recorded 254 cases of officers who received three or more complaints for using unnecessary or excessive force from 1983 to 1988 (Domanick 1994: 336). After investigating the evaluation records of these potential “problem” officers, the *Los Angeles Daily News* found that most officers had been given positive evaluations, such as “strong” “competent” or “needs improvement” (Christopher Commission 1991). After the ‘39th and Dalton drug raid’ (in which no drugs were found but private property was damaged heavily), about half of the officers involved in the raid were promoted (Christopher Commission 1991). The internal discipline process was widely known as a “blue wash” (Rice 2006).

Internally, the police officers adhered to “a code of silence” which discouraged officers to speak up against police misconduct (Christopher Commission 1991). A former police officer told the *Los Angeles Times*: the officers knew “that when an officer finally gets fed up and comes forward to speak the truth, that will mark the end of his or her police career. The police profession will not tolerate it, and civilian authorities will close their eyes when the retaliatory machinery comes down on the officer” (Grinston 1991: 1; Skolnick 1991).

When it comes to the recruitment process, the Christopher Commission (1991) observed deficiencies in psychological evaluations and background investigations. The psychological investigation tended to symbolic, and applicants were rarely eliminated as a result of psychological tests. LAPD’s background investigations focused on use of drugs and sexual history, with less emphasis on violent tendencies.

The quality of training at the police academy deteriorated steadily. The graduate rates increased sharply from 60 percent at the beginning of the 1980s to 90-95 percent in the early 1990s. In the probation process, field training officers were hesitant to terminate a probationer’s contract even if they considered the probationer not qualified, because of the large amount of paperwork involved. Regular training of police officers and continuous in-service training became largely symbolic, leaving commanders simply reading instructions and memos. The in-service training, which aimed to teach officers how to use new technology and techniques, had not been mandatory in the department (Christopher Commission 1991).

Organizational morale at LAPD went down. Since the middle of the 1980s, more and more officers resigned from LAPD and moved to other suburban areas where they could get better salaries working under lower pressure (Cannon 1999: 545).

Institutionalization: the external dimension

In the post-Parker era, stakeholders such as the police commission, the city council and the mayor still gave very positive evaluations to Chief Gates. According to the Christopher Commission (1991), in the annual evaluation of the police Chief’s work in the last five years before the King incident, the police commission mostly gave the highest possible rating from 1986 to 1990; together with four other city managers, the city council gave the police Chief higher raises than any other administrator in the city government received at the beginning of 1991; in the annual salary review, the mayor gave the police Chief a high rating (Christopher Commission 1991).

In the 1980s, the police commission continued its role as a “rubber stamp” in the oversight process with limited intervention in LAPD’s policy under ever tighter budgets (Cannon 1999: 120-121). The budget was 79,000 dollars per year. By the end of the 1980s and the beginning of the 1990s, it had decreased sharply to less than 28,000 dollars per year (Christopher Commission 1991). Historically, there had been only very few occasions that police commissioners had challenged LAPD policies or operations. The only notable period in which the police commission had played an active role was at the end of 1970s and the beginning of the 1980s (Christopher Commission 1991). During that period, the commission changed the departmental policy on a number of issues, These included defining the circumstances of using deadly force and the shooting policy, restricting improper intelligence collection activities, and ordering the abandonment of using the “bar-arm” hold which can cause death during an arrest (Cannon 1999).

The powerful mayor Tom Bradley, the first African American mayor of LA since 1973, had been jointly supported by the African American communities in the South Central LA, whites and Hispanics, Jews in the Westside and San Fernando Valley, and the downtown business communities (LA Times Staff writer 1992; Sonenshein 1994). However, the mayor did not challenge the police Chief (Domanick 1994). When reviewing the relations between the police and the mayor in 1985, the Los Angeles County Commission on Human Relations (1985) found that the mayor mostly focused on the mission of building a metropolis and paid little attention to police affairs.

When Gates became Chief, he maintained close ties with the city council. According to former detective Zvonko G. Pavelic and city councilman Robert Farrell, Gates sent a police car patrolling near the houses of councilmen almost every day. When a councilman complained by telephone, an officer good at public relations and communication would be sent to the spot in order to guarantee satisfaction with the service (Domanick 1994: 302). Through these actions, LAPD gained support from the councilmen.

Even when the community policing approach became popular in other police departments, the city council did not challenge LAPD’s proactive policing approach. The damage caused by excessive use of force under the proactive policing approach led to increasing costs,¹⁶⁶ but the city council allocated new funding to the police litigation unit in order to protect the department against lawsuits. The city council considered it “cost effective, plain and simple” (Domanick 1994: 356).

166 In general, city hall’s payment for the costs excessive use of force by LAPD increased annually before the King incident. LAPD spent 20 million dollars in over 300 lawsuits concerning excessive use of force between 1986 and 1990 (Christopher Commission 1991). The annual costs of police brutality and excessive use of force increased steadily from 6 million dollars in 1989 to 11 million in 1990, and reached a peak of over 14 million dollars in 1991 (LA Times Staff writer 1992). In 1986, LAPD’s aggressive police force caused the highest number of wounded and deaths among police departments in the six largest cities in the US (Pate, Hamilton et al. 1991). A notorious example in that period was ‘the 39th and Dalton drug raid’ in 1988. When eight LAPD officers searched two apartments in the African-American and Latino neighborhood for a crack cocaine trade, the officers did not find evidence to charge the residents with a crime, but destroyed facilities and belongings in the apartment. City Hall had to pay 3.4 million dollars for the property damage (Christopher Commission 1991; LA Times Staff writer 1992; Cannon 1999).

When it comes to police-community relations, LAPD found it hard to address a classic dilemma faced by police communities (Wilson 1968): “Finding a strategy which permits the realization of effective law enforcement without alienating segments of the community”. The victims were mostly blacks and Latinos in areas with high crime rates, who demanded police solutions. As the chair of the city council’s public safety committee Richard Alatorre observed, “all wanted more police, and more people sent to jail. And they will almost tolerate anything” (Domanick 1994: 303).

LAPD’s relationship with minority communities deteriorated due to the police brutality inflicted on minority suspects (Cannon 1999; Uchida 2009). The black population found that they were not equally treated under the law (Kerner Commission 1968; LA Times Staff Writer 1992; Uchida 2009).¹⁶⁷ According to a survey conducted by the Christopher Commission (1991: xii), around 25 percent of the surveyed LAPD officers admitted the existence of “racial bias on the part of officers toward minority citizens”, and around 28 percent of officers agreed that prejudice may lead to the use of excessive force. Most African American males had experienced ethnic discrimination by LAPD officers in the name of law enforcement, such as use of excessive force, and unreasonable arrests following searches (LA Times Staff Writer 1992; Domanick 2000). The “prone out” tactics¹⁶⁸ and canine search were regularly used by LAPD in the minority communities to check suspects. According to the Christopher Commission report (1991), over seventy percent of canine use happened in the minority areas under the jurisdiction of South and Central bureaus, where nearly seventy percent of the dog bite accidents occurred. In the three years before the King incident, there were nine hundred biting accidents in LA (Philadelphia had only twenty accidents with twice as many dogs as LAPD).

The independence of LAPD and low political participation of minority communities in LA politics allowed it to ignore mistreatment of minorities (Webster, Williams et al. 1992; Cannon 1999: 66). Since the Eulia Love case¹⁶⁹ at the end of 1970s, news media had broken the silence and criticized police misconduct (Domanick 1994: 267). However, these challenges did not change the attitude of the mainstream media, such as the *Los Angeles Times*. LAPD still enjoyed strong support among the general public. According to a poll conducted by the *Los Angeles Times* in 1988, LAPD got a 74 percent approval rating (Domanick 1994). Those who relied on LAPD to keep their properties safe became the solid constituencies of the organization, which included the owners of real estate, insurance brokers, small business owners, downtown corporate CEOs, aerospace executives, the chamber of commerce, the merchant and manufactures association, and middle-class in the Valley (Clifford and Mitchell 1991; Domanick 1994). Although Proposition 13 cut the city tax significantly, voters in LA did approve tax hikes to support recruitment and purchasing equipment by LAPD. Even the minority communities supported the tax increase benefiting LAPD (Rosegrant 2009).

167 The social conditions were highlighted in different reports as well. For example, the Kerner Commission appointed by President Johnson described the US as “moving toward two societies, one black, one white—separate and unequal”. LAPD (2012) demonstrated the long existing discrimination written in law.

168 According to the Christopher Commission (1991: 75), the “prone-out” position is “a police control tactic that requires the suspect first to kneel, and then lie flat on his stomach, with his arms spread out from his sides or his hands behind his back”.

169 Eulia Love was shot by LAPD officers in her home, which happened after a police response to a dispute over an 20-dollar gas bill.

The courts were unable to cope with lawsuits against LAPD officers. Before 1979, the District Attorney received no claims against LAPD officers involved in shootings (Domanick 1994: 270-271). Between 1986 and 1990, 2500 LAPD officers were accused of abuse of power. However, most claims could not be pursued because of the limited resources of the District Attorney (Christopher Commission 1991). Moreover, LAPD had considerable autonomy in the investigation of police misconduct. Victims could make their complaints about abuse of power by the police to the District Attorney (or the city council, the mayor's office, or the police commission), but these complaints would finally be transferred to LAPD's Internal Affairs division for further investigation (Domanick 1994: 99). LAPD held the prerogative to interview accused police officers or witnesses before the district attorney's representatives (Christopher Commission 1991).

Outside Los Angeles, LAPD maintained its reputation as a professional police force. For instance, LAPD's success in ensuring the safety of the 1984 summer Olympic Games demonstrated LAPD's capacities to the world. During the Olympic games, LAPD performed safety operations with the help of the public, but did not rely much on federal or military forces (LAPD 2012). When President George Bush visited LA before the King incident, he praised Gates for preserving LAPD's professional tradition founded by Parker (Domanick 1994).

Cooperation between LAPD and other police departments was limited and LAPD felt a strong sense of superiority to other police departments (Webster, Williams et al. 1992). Therefore, it did not participate actively in the mutual assistance plan advocated by the California Emergency Operation Office and the LA County Sheriff's Office. LAPD was reluctant to share its limited resources with other partners, and did not believe that it would need help from others.

After the 1991 King incident: escalating deinstitutionalization

Institutionalization: the external dimension

After the King incident, LAPD's legitimacy eroded quickly among stakeholders. The video of King's beating shocked citizens, media and stakeholders, undermining the reputation of LAPD as a model of professional policing (Christopher Commission 1991). Although Gates quickly declared that the beating was an "aberration" from LAPD's normal police operations and that he would prosecute the four officers, stakeholders expressed criticism or took measures to investigate LAPD's misconduct (Domanick 1994: 380; Cannon 1999). These stakeholders included the city council, the Mayor of LA, the Police Commission, the Los Angeles District Court, President Bush, the Federal Bureau of Investigation, and the mainstream newspapers.

Mayor Bradley publicly called for the retirement of Chief Gates: "the public has lost confidence in Chief Gates since Rodney King was beaten. I have asked him to show the uncommon courage to retire for the good of the LAPD and the welfare of all of Los Angeles. ..his (Gates') reactions to the tragic Rodney King beating have made an ugly situation even worse" (Cannon 1999: 122-123). On April 1, the Mayor appointed Warren Christopher, former Deputy Secretary of State under President Carter, to head an independent investigation concerning LAPD and Chief Gates. Relations between the Mayor and the police Chief became so strained that they had not communicated for around 13 months when the riots broke out (Rohrlich 1992; Webster, Williams et al. 1992).

President Bush and the federal government began to focus on the LAPD. During Bush's visit to LA before the King incident, Bush had praised Gates as an "all American hero". Now the president's Justice Department began to review all complaints of police brutality over the past six years. The FBI started an investigation of LAPD in response to the demands of Congress' Black Caucus.

In Los Angeles, city councilmen and the police commission firmly criticised the police Chief and called for the resignation of Chief Gates. Councilman George Will called for the resignation of Gates on March 6. The opposition included councilmen John Ferraro, Joel Wachs, Henry Waxman, Howard Berman, Tony Beilenson, and Joan Milke Giores (Koven 1992). On April 4, the police commission temporarily suspended Gates, initiated a comprehensive investigation of LAPD, and the investigation was merged with the Christopher Commission's (Christopher Commission 1991).

The crisis evolved into a political conflict between the police commission and city council. The police commission insisted on forcing Gates to leave the chief position. The city council did not agree and considered that the forceful suspension would involve a large amount of compensation if Gates sued in court (Clifford and Mitchell 1991; Domanick 1994).¹⁷⁰⁻¹⁷¹ The city council attacked the police commission and Mayor Bradley for playing a power game regarding Gates' retirement. The criticism concentrated on the dependence of the police commission on the mayor. Finally, the council voted 10-3 to keep Gates in office. The police commission challenged the council decision in court, but did not succeed (Cannon 1999: 120-121; Jacobs 2000). Consequently, the city council determined to replace all police commissioners on June 4, 1991 (Webster, Williams et al. 1992).

The media severely criticised Gates and the LAPD (Jacobs 2000: 82). The mainstream media in Los Angeles, including *LA Opinion*, *the Daily News*, *the LA Weekly*, local television station KCBS, and the ACLU, all criticized LAPD's excessive use of force (Jacobs 2000: 86, 91). Long-time supporter *Los Angeles Times* illustrated the police brutality on its front page with a survey showing that two thirds of respondents believed that it was common in Los Angeles.

Public opinion was divided regarding whether Gates should resign from the department. According to a survey conducted by the *Los Angeles Times* in March, most blacks and Latinos wanted Gates to resign from the Chief position no matter the results of the investigation. By contrast, sixty percent of Anglo-Americans supported Gates and preferred Gates to stay in position (Cannon 1999: 120-121).

The internal dimension

The report of the Christopher Commission released on July 9 criticised the proactive policing approach admired by LAPD officers and commanders, and advocated adopting the community policing approach. Following the advice of the Christopher Commission, Gates began to implement

170 According to the city charter, a department head could be fired only if he had engaged in significant misconduct or willful neglect of official duties.

171 There had been two failed efforts to remove two department heads in the past few years (Clifford and Mitchell 1991).

the community policing approach. Gates took direct command of seven Areas¹⁷²⁻¹⁷³ to implement community policing (Webster, Williams et al. 1992).

Internally, the leadership of LAPD was in chaos. In the words of UCLA professor Samuel Culbert: “I see an institution that has been ravaged being further destroyed by internal combustion” (Connell and Serrano 1992: 1). After Gates announced that he would retire in April 1992, senior officers in LAPD began to compete for succession. There was increasing tension among seven top officials who competed for the Chief position (Cannon 1999). These candidates incriminated each other. For instance, Vernon was portrayed as a religious fanatic as not ethnical (Connell and Serrano 1992), Dotson was accused of improper relations with a female subordinate, and Parks of intervening to release his daughter’s boyfriend accused of attempted murder (Connell 1992).

At the same time, the key senior management was experiencing a transition because positions were left empty due to retirement. Gates did not fill the position of Assistant Chief when Jesse Brewer retired two days before the King beating (Rohrlich 1992). The Director of office of operations and Assistant Chief Robert Vernon had been out of town on vacation since April 24 until he retired in June 1992 (because he accumulated such a long vacation time). There was nobody to occupy Vernon’s place when he announced his retirement a few weeks before the riots (Rohrlich 1992).

An internal conflict between Gates and at least two other seniors had arisen within senior management (Abrahamson 1995). During the Christopher commission investigation, two senior officials testified that Gates and LAPD failed to police themselves (Rohrlich 1992). After the testimony transcripts were made public, Gates was no longer on speaking terms with these two senior managers. There had been no weekly meetings among senior management for a whole month before the riots happened (Connell and Serrano 1992).

In this leadership chaos, LAPD, an organization with a command and control structure, could not maintain its normal way of working. Police officers feared being investigated for excessive force when making arrests. As a result, the arrest number dropped significantly after the King incident (Rosegrant 2009).

In summary

In summary (as illustrated in [Figure 7-1](#)), Chief Parker developed LAPD into an institution well known for its pro-active policing approach. Parker gave priority to law enforcement and built a disciplined professional police team. The LAPD was freed from long-existing corruption problems and encouraged to make aggressive arrests to cope with violence in Los Angeles. Police officers felt pride in the aggressive policing approach and its organization, and believed that they were the ones guarding the safety and security of the city. Externally, LAPD was given an autonomous

172 It used to be named as the “Division”.

173 These seven Areas included the Hollenbeck and Northeast Areas which used to be policed by the Central Bureau, the 77th Street, Harbor and Southeast Area by the South Bureau, the Pacific Area by the West Bureau, the Foothill Area by the Valley Bureau.

status free from political intervention under the city charter. LAPD's supervising agency, the police commission, did not have sufficient capacity and resources to implement necessary oversight. Parker maintained close ties with the city council, the local media and business communities, which guaranteed sufficient public and political support.

In the post-Parker era, LAPD's aggressive policing approach was challenged by the emergence of community policing. Although the organization adopted some community policing programs, the tight budget and limited workforce constrained the implementation. Chief Gates maintained the old fashion policing approach, but LAPD could not reduce the crime and violence rate with growing gang-related crimes in the city. LAPD's strict training of new officers deteriorated in the 1980s. Externally, LAPD still kept its autonomous status and good relationships with stakeholders in city politics.

The King incident in 1991 was a turning point for LAPD's external institutionalization and an escalation point for its internal institutionalization. After the King incident, LAPD's legitimacy among stakeholders quickly eroded. Internally, Chief Gates adopted advice from the Christopher Commission Report to implement the community policing approach, which further undermined the professional policing approach. Senior management at LAPD competed for the Chief position after Gates announced his resignation. Arrest numbers went down significantly because police officers feared accusations of excessive use of force. Therefore, LAPD was in the middle of a deinstitutionalization when the riots took place in 1992.

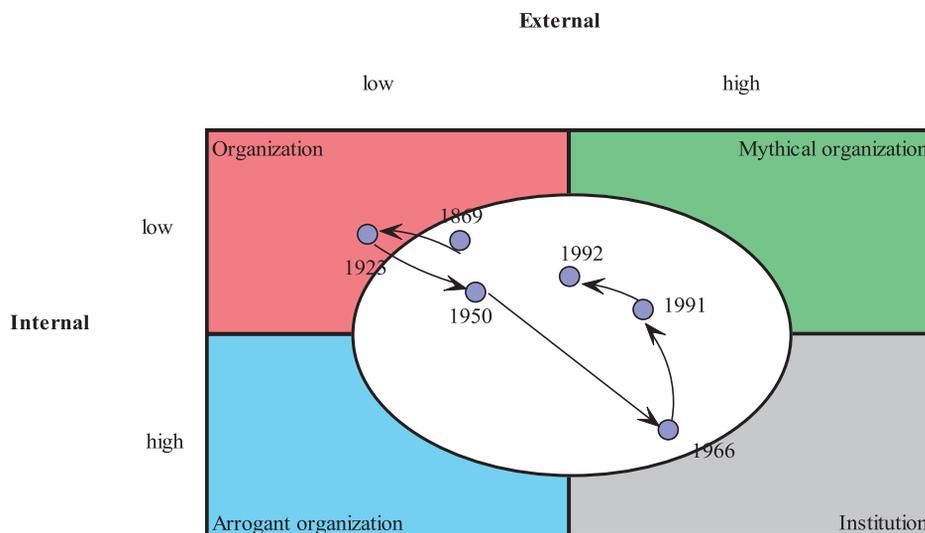


Figure 7-1 LAPD's evolution in terms of its institutionalization status

7.4 LAPD and the 1992 LA riots: identifying uncertainties and coping actions

This section will identify uncertainties that LAPD encountered during the response to the 1992 riots and describe actions taken to cope with these uncertainties. The analysis covers the time span from April 29, 1992 when the officers involved in the beating of Rodney were acquitted, to the cancellation of the curfew by Mayor Bradley on May 4, 1992.

The case study is based on qualitative data from the following sources: [1] two in-depth governmental reports on the 1992 LA riots;¹⁷⁴ [2] selected books on LAPD's response to the riots, primarily Domanick (1994), Cannon (1999) and Howitt, Leonard et al.(2009); and [3] selected mainstream media reports, primarily from the *Los Angeles Times*.

Los Angeles' emergency preparedness before the trial

Before providing a detailed analysis of uncertainties and coping actions, the city's emergency preparedness before the riots will be described. Los Angeles had an emergency management framework for contingencies, which identified the responsibilities of LAPD, the Mayor and other municipal agencies. **Figure 7-2** shows that the emergency management framework consisted of the Emergency Operation Organization [EOO], the Emergency Operation Board [EOB], the Emergency Operation Center [EOC], and the Emergency Management Committee [EMC]. In case of an emergency, the Mayor was given the power to declare a local emergency and activate the EOO, which was responsible for the city's emergency management. The Mayor would serve as the director of the EOO, while the police Chief would become deputy director. The EOO was supported by the EOB which supervised the EOO at all times, and most managers of the city's agencies were represented in the EOB. The police Chief chaired the EOB. The EMC was responsible for emergency planning and training, and was led by the City Administrative Officer. However, the EMC mostly concentrated on earthquake preparedness (Webster, Williams et al. 1992). The EOC was the information exchange hub between operational teams and the EOO during an emergency.

LAPD had developed a plan on riot control including tactical manuals after the 1968 Watts riots. The plan specified the response procedure with an assumption that future riots would be of the same magnitude in terms of impact areas. The plan had not been updated since Watts.

After the King incident, LAPD had maintained a low profile in preparing for potential riots (Webster, Williams et al. 1992: 80; Williams 1992). On April 10 1992, Chief Vernon organized a training meeting for captains from the Areas. This was in the last week before his retirement (Vernon and Vernon 1993). During the meeting, Chief Gates forbade giving any written instructions to captains in order to prevent the media from learning of LAPD's planning. Gates wanted his captains to understand that "[Gates] does not want to put the LAPD in the position of predicting a riot. I do not want us to be accused of issuing a self-fulfilling prophecy" (Cannon 1999: 270). During the meeting, officers updated their home phone numbers, and identified potential targets of looting (Useem

174 The report of the Los Angeles Office of the Special Advisor to the Board of Police Commissioners and the Report of the Joint Fire/Police Taskforce on Civil Unrest Recommendations for Organization and Operations during Civil Disturbance.

1997). However, what had been learned at the training had not been passed down to police officers in each bureau. Sergeant Moulin at the 77th station where the riot burst out explained after the riots that there was no specific preparation for possible riots (Connell and Newton 1992; Sahagun and Connell 1992). Officers in the station said that they only had received a very short [15-30mins] training seminar, while some others said that they had not been involved in any preparation at all (Braun and Berger 1992). The Webster report indicated that LAPD was “mentally unready to confront the disorder when it came” (Webster, Williams et al. 1992: 24). Chief Gates allocated one million dollars for overtime spent on responding to possible civil unrest after the verdict, but the fund allocation caused disputes among community leaders and congressmen who held that this fund allocation might inflame racial tensions (Hubler 1992).

Emergency Operations Organization

City of Los Angeles

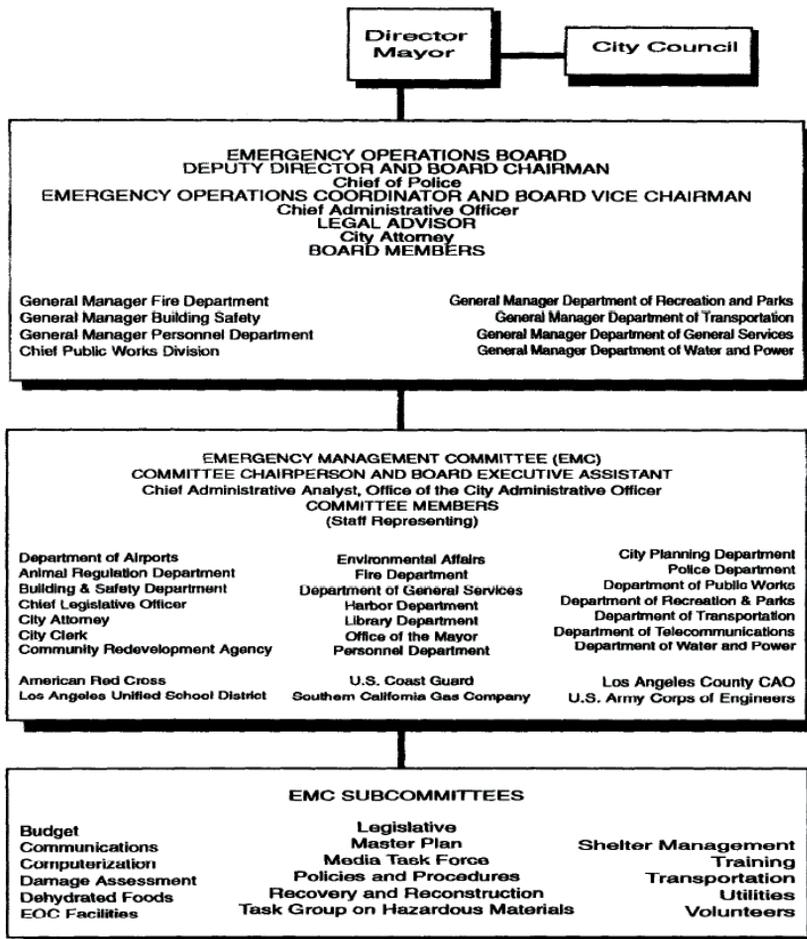


Figure 7-2 Los Angeles City’s Emergency Management Framework (Webster, Williams et al. 1992: 15)

Mike Hillmann, the new interim commander for the Metropolitan Division (Metro), recognized the urgency of preparing for riots and asked the Deputy Chief for riot control training (Cannon 1999: 271-273). However, he could not convince the deputy Chief. Hillmann then trained the Metro units secretly at Todd shipyards in San Pedro south of LA between April 20 and April 24. During the training, Hillmann borrowed necessary equipment, such as bullet-proof vests and helmets, from other law enforcement agencies (Cannon 1999). When Hillmann asked Deputy Chief Ronald Frankle to deploy Metro on the day the verdict was announced, his request was not approved. The Metro officers were scheduled to report at 6pm on April 29: the assumption based on the experience of the Watts riots was that riots only occurred after sunset.

Coping with uncertainties during the response to the 1992 riots

This section will identify uncertainties and LAPD's coping actions in the response process after the verdict.

Uncertainty A: LAPD was uncertain about the consequences of a non-guilty verdict.

At around 1pm in the afternoon of April 29, the court was adjourned for two hours, and the judge informed the police that they would announce the verdict in two hours. The verdict was announced at 3:10pm: the four officers were acquitted and released with a single charge against Officer Powell for excessive force. This outcome shocked both the public and LAPD including Chief Gates. The non-guilty verdict might have different consequences, such as peaceful protests, or violent disturbances like the Watts riots (Reich and Chavez 1992).¹⁷⁵ Officers had seen some indications during their patrols. For instance, LAPD officers including Lisa Phillips, Dan Nee, Kevin Robinson and David Brown from the 77th Station, had observed the outraged public and expected that something might happen, but they could not be sure what (Braun and Berger 1992).

Action A1: Operational commanders at LAPD ordered officers to monitor the situation.

After observing the outrage of the public, the watch commanders instructed patrol officers to monitor the situation carefully and report unexpected situations immediately. For instance, watch commander Moulin at the 77th street station warned his 30 officers that if riots occurred, they would regroup and have a command post at the 54th street and Arlington avenue, as specified in the plan (Braun and Berger 1992). Moreover, Moulin instructed his officers to request assistance from other units when they found crowds began to form and to identify their locations immediately.

Action A2: Strategic management activated the EOC to prepare for potential social unrest.

After the announcement of the verdict, at 4:45pm Chief Gates activated the Emergency Operation Center [EOC], which was located under City Hall.¹⁷⁶ The EOC did not appreciate the severity of the

¹⁷⁵ According to a poll conducted by the *Los Angeles Times* (May 6), 71% of the respondents did not agree with the verdict (Reich and Chavez 1992).

¹⁷⁶ However, supporting agencies did not learn about the activation until phoned by EOC operators.

situation, and most EOC operators left office after regular working hours. Besides activating the EOC, Chief Gates and other senior management at LAPD did not give substantial instructions on how to cope with the possible consequences.

Uncertainty B: LAPD officers at the operational level were uncertain about the possible consequences of the forming crowds and did not know how to deal with these possible consequences.

After the verdict, a crowd began to form near Florence and Normandie Avenue, expressing anger about the verdict. Police officers at the 77th Street Station received phone calls indicating that passing vehicles were being attacked with bottles and bricks. At 4:30pm, two police officers responded to a disturbance call about an attack on car windows by six black males at Florence and 71th. When they arrived on the scene, their cruiser was struck by a black youth. When the two officers tried to arrest the youth, they were confronted by around 100 rioters. LAPD officers could not predict the consequences if they continued with the arrest, and did not know how to cope with the crowd (Lacey and Humber 1992; Useem 1997).

Action B1: Two officers requested police assistance and made arrests when back-up arrived

Facing the uncertain consequence of arresting the youth, the two officers immediately requested assistance in controlling the situation, according to standard response procedure. Upon request, two sergeants and around twenty police officers arrived in five minutes. After their arrival, the officers arrested the 16-year old youth who had thrown rocks at their patrol car. The youth's mother protested against the arrest, which made more people gather around. Some officers tried to arrest more protestors, while some others tried to isolate protestors by forming a skirmish line (Braun and Berger 1992).

Action B2: The operational commander ordered officers to retreat from the scene, set up a staging area, and requested external assistance to cope with the escalation and the violent crowd.

The arrest of the youth aroused emotions in the crowd. The police tried to keep the crowd away from their patrol cars, but the crowd responded with rocks and bottles. During the confrontation, Lieutenant Moulin understood that the situation was beyond their control; they did not have helmets and other riot control equipment (Connell, Serrano et al. 1992). Moulin ordered his officers to retreat to the 77th Street Area station at around 5:43pm, which was not consistent with LAPD's aggressive policing method (LA times Staff writer 1992; Useem 1997). Although most officers did not consider the retreat a wise action in controlling the riot situation, they trusted that their superior understood the situation (Cannon 1999: 291). After the retreat, officers were still answering calls for help and rescuing people attacked by the mobs (Rohrlich, Serrano et al. 1992).

After retreating to the 77th Station, Captain Jefferson instructed Moulin to return to the intersection of Florence and Normandie at 6:00pm.¹⁷⁷ Moulin returned and established a staging area at 54th street and Arlington according to plan. At 6:20pm, Moulin ordered all police forces in the Area to stop rescuing victims, report to the staging area at 54th street and Arlington, and reroute all the 911 calls to the staging area (Useem 1997). At around 7pm, Commander Bayan Lewis designated the staging area as the field command post. By then, there were around 500 officers in the staging area waiting for orders.

At the field command post, Moulin and Jefferson did not find sufficient forces to cope with the overwhelming situation (Lacey and Humbler 1992). Two-thirds of the captains were at a training seminar in Ventura which was an hour and half away by car. At the 77th station, one captain attended the training in Oxnard, and the acting commanding officer had taken the day off (Connell and Newton 1992). Moulin instructed Assistant Watch Commander Sergeant Tatreau to ask Metro for help, according to standard operating procedure. The Metro force had been put on “soft patrol” mode by the Deputy Chief after the King verdict (Cannon 1999). In the “soft patrol” mode, officers wear common patrol uniforms instead of riots control gear and avoid making arrests.¹⁷⁸ Upon receiving the request from the field command, Metro started to mobilize for the riot control mission. The first squad of Metro officers did not report to the field command post until 7pm. This squad of officers was sent to the Florence and Normandie intersection after their arrival, but was blocked by the crowds. The first Metro squad finally reached the Florence and Normandie Avenue intersection at 8:30pm, and found that the situation had escalated beyond control.

Action B3: Strategic management took no substantial action

Until 5:38pm, Chief Gates believed that everything was under control and announced that “if we have disturbances, we are prepared”. Gates did not receive information on the riot situation at the Florence and Normandie intersection. At 6:30pm, Gates went to his scheduled political fund-raising event in Brentwood leaving no orders to his officers (Braun and Berger 1992; Sheinbaum 1992). Before he left, Gates put Deputy Chief Frankle in command.¹⁷⁹

Uncertainty C: Operational commanders and officers were uncertain about who was in charge in the field command post

After retreating, police officers at the command post at 54th street and Arlington were waiting for instructions from their commanders. In the evening, several commanders, including Area commanding officer Captain Jefferson, and assistant commanding officer of the South Bureau

177 There was a misunderstanding here. While Jefferson expected Moulin to restore the order at the Florence and Normandie intersection, Moulin thought that he only had to assess the situation there and firmly believed that his team was totally outnumbered in that area.

178 Before the patrol, Metro Lieutenant Hillmann asked senior management to equip them with riot control tools, but this request was rejected.

179 However, Frankle did not recall that he was put in command by Gates.

Commander Banks, appeared in the field command post. However, officers nor commanders knew who was in charge in the field command (Webster, Williams et al. 1992).

At the field command post, Banks was put in charge of the South Bureau by Deputy Chief Hunt when Hunt departed for the scheduled event at the first Ame church. Banks believed that Jefferson as the Area commander of 77th Station was capable of dealing with the situation at Florence and Normandie. However, Jefferson was surprised that Banks did not assume command, and expressed that “it was obvious to me that it was larger than 77th” (Cannon 1999). Watch Commander Moulin also thought that they had insufficient manpower to fight back, and believed that senior commanders were afraid that erroneous decisions might jeopardize their careers (Sahagun and Connell 1992). Banks thought that the riots would burn out by themselves, according to a Metro sergeant (Cannon 1999: 311).¹⁸⁰

Action C1: Commanders at the command post took no substantial action.

The chaos did not change until Deputy Chief Matthew Hunt reached the field command post at 9:15pm. After Hunt assumed command, he began to reorganize the staff in the field command. When Gates arrived at the field command post at 10pm, he blamed at Hunt for the failed response. Then, Gates immediately left. The chaotic situation did not change until the next morning.

Action C2: Metro set up its own command

Metro commander Hillman could not tolerate the indecisiveness of the commanders at the field command post; therefore, he ignored the command post and set up his own command post at the same site. The Metro command post ordered platoon C from the Parker Center to the command post, but Platoon C was stopped on the way to the command post. At the same time, the command post instructed platoon B at the command post to engage in riot control immediately. However, Metro’s force was too small to quell the riots.

Uncertainty D: LAPD could not fully grasp the riots dynamics and did not have a full picture of the response actions that had been initiated.

Due to the breakdown of communications, LAPD could not generate a full picture of the riot situation in the city and allocate resources to cope with the situation (Useem 1997). The telephone at the field command post could only be used within the transit-district system. The two available cellular phones could not cope with the large amount of communication. The rerouting of all 911 emergency calls to the field command post aggravated the workload of the command post. Within the command, officers relied on “paper and walking” to exchange information, a method that

¹⁸⁰ The police officers spent the evening at the field command post and did not receive any directions from their superiors (Cannon 1999: 281). There were 1790 officers staying in the command post during the night. Moreover, the assignment of police officers to patrol cars was badly organized at the command post. When some officers sent on patrol with other cars, these officers took the keys of their own cars with them, leaving their cars locked. Nobody was charged with collecting keys of patrol cars.

was simply insufficient to cope with the dynamics of the crisis. Moreover, the EOC often received conflicting information because of the rapidly changing situation. Without proper guidance from the EOC, operational officers in the field did not respond to rescue requests made by 911 callers, and failed to update field situations to EOC as well (Rohrlich, Serrano et al. 1992).¹⁸¹

Action D1: LAPD initiated scattered actions to increase its sensemaking capacities, but these actions failed in the end.

To make sense of the riots, LAPD initiated scattered actions, which included ordering communication facilities and helicopter over-flights. After failing to receive updates from the field, Commander Bayan Lewis went directly to the field command post at 7pm, and ordered two mobile telephone vans from the Tactical Planning section. Commander Moulin ordered one hundred handheld radios to replace the old radio system for police officers. A police helicopter took Sergeant Albanese from the field command post to the Florence and Normandie intersection at 6:44pm to assess the situation.

However, these initiatives failed to create a complete picture of the rapidly expanding riots. The truck drivers bringing communication facilities refused to continue their journey after a van was hit by rocks and bottles on the way to the field command. There were only seven handheld radios available for use. The direct phone line to the command post was not set up until late at night on April 29 (Webster, Williams et al. 1992). During the helicopter flight, the pilot thought that the helicopter was targeted by gunfire and he made an emergency landing at Slauson and Western. Albanese consequently had to wait for another helicopter.¹⁸²

Action D2: EOC collected scattered information from other sources.

After the breakdown of communication with the field command post, EOC had to rely on live television and emergency calls as information sources for that could give an update on the situation on site. At the same time, other actors voluntarily contacted EOC to provide updates on the riot situation. For instance, Chief of Staff Geroge Morrison learnt about the situation at Florence and Normandie from the news station KFVB, and informed the EOC at 5:45pm.¹⁸³ Having incomplete information, EOC dispatched officers to the riots areas broadcasted on television, even though they did not know what was happening in other areas (Rohrlich, Serrano et al. 1992; Rosegrant 2009).

181 During this period, most of the Metro force did not get ready for the response. The SWAT reported to the Metro headquarters at 4pm but did not receive any order there. Metro did weight training there and waited for further instruction. A platoon was on a training session 20 miles away in the San Fernando Valley. Another platoon was planned to report at 6pm. Two thirds of the LAPD's captains were on a training seminar in Ventura.

182 Actually, the helicopter was not damaged but influenced by an air flow.

183 The 77th station heard details about the situation from one of the officer's wives by telephone. After receiving the phone call, 77th street Commander Jefferson sent two squads of Metro out, but could not reach the scene (Connell and Newton 1992)

Action D3: LAPD's strategic management announced a tactical alert.

After more emergency calls to the 911 system, and the Denny beating¹⁸⁴ broadcasted live on television, Lieutenant George Godwin of the Communication Division at the Parker Center declared a tactical alert at 6:45pm, which formally announced the existence of a major emergency and a need for the redistribution of police officers in order to respond to the emergency. At that moment, the department formally shifted from a mode of routine response to a department-wide mobilization to deal with a non-routine emergency. At around 8pm, Deputy Chief Ronald Frankle announced the emergency mobilization. The mobilization changed 8-hour watches into 12-hour watches at the department, cancelled all leave and called upon off-duty officers (Webster, Williams et al. 1992).

Action D4: Chief Gates ordered a helicopter to get a better picture of the situation.

After Gates returned from the fund raiser at around 8:15pm, he immediately took a helicopter to assess the situation in the city (Webster, Williams et al. 1992). During the two-hour flight, Gates found that the radio in the helicopter did not work and he could not issue any orders to police officers. When Gates wanted to land at the field command post, flight regulations did not allow him to do so due so. Gates returned to the EOC. After a telephone conference with stakeholders in the city and the state at 10:13pm, Gates spent the rest of the night until 6am the next morning visiting different stations in the city to further assess the situation.

Uncertainty E: LAPD was uncertain about how to coordinate with other actors

With the rapid evolution of the riots, other stakeholders took various measures to assist in controlling the riots, which increased LAPD's uncertainties regarding the coordination with these stakeholders. After the police officers retreated from the scene, the crowds went out on a violent crime spree, including assault, robbery, and looting, and the riots spread to the north and west part of the city.¹⁸⁵ As a response to the escalating riots, the state government and law enforcement agencies from the County and other cities offered assistance for LAPD. Governor Wilson phoned Mayor Bradley to offer the National Guard for riot control. At 8:45pm, Mayor Bradley accepted the offer after discussing it with LAPD's Deputy Chief Frankle and two other police commissioners. The California Highway Patrol (CHP) and the LA County Sheriff's Office offered assistance for LAPD as well. Moreover, the fire department frequently requested police escorts. However, LAPD had no prior experience with coordinating with these organizations that offered or requested assistance. LAPD was uncertain about who would be in charge of the coordinated response (Webster, Williams et al. 1992).

184 Reginald Denny was pulled out from his truck and almost beaten to death by mobs when he drove through the Florence and Normandie Avenue. The beating was captured by the news helicopter and broadcasted to the whole nation.

185 As a response to uncontrolled riots, Mayor Bradley declared a state of local emergency at 9pm, Governor Wilson declared a state of emergency for Los Angeles County at 12:05am on April 30, and Mayor Bradley announced a dusk-to-dawn curfew for South Central LA at 12:15 am.

Action E: LAPD's strategic management used ad hoc discussions to determine the coordination protocol.

LAPD relied on ad hoc conference discussions to determine whether to accept assistance from other actors, during which LAPD shifted from passively accepting assistance to actively requesting coordination with other actors. During a conference call at 10:13 pm between Wilson, Bradley, Gates and the California Highway Patrol (CHP), Gates only accepted the offer from CHP Commissioner Maurice Hannigan to send 1,500 officers, and refused assistance offered by other agencies (Delk 1995).¹⁸⁶ Gates did not consider the assistance by the National Guard necessary for the response. After assessing the riot situation and LAPD's response capacities during the first night, Gates went to City Hall in the early morning of April 30 and discussed the coordinated response to the riots in the city with the Mayor, which terminated 13-month without communication between the Mayor and the police Chief. Moreover, Gates accepted two platoons from the Sheriff's office at 10:00am of April 30.

The uncertainties regarding responsibility for central coordination emerged during a conference call between the governor, the state emergency office, the National Guard, CHP, the fire department, the Mayor, LAPD and the Sheriff's office at 2pm on April 30. The Sheriff's Emergency Operation Center was identified as the coordinator of the response and CHP was charged with protecting the fire fighters in this conference.

Although the County Sheriff's Office was identified as the coordinating actor, LAPD still made direct requests to the National Guard (Webster, Williams et al. 1992), or directly requested assistance from other agencies that they were familiar with. Some ad hoc requests without central coordination led to chaos. For instance, when police officers from San Diego arrived in LA, the EOC could not identify who had requested them. These officers just returned to San Diego.

Uncertainty F: LAPD was uncertain about the coordination with the military after the federalization of the National Guard.

¹⁸⁶ Some CHP officers were sent to escort fire fighters, leaving the other 120 officers watching television in the command post.

On April 30, Mayor Bradley and Governor Wilson learned that the National Guard did not move quickly to LA due to a delay in deploying necessary equipment for riot control.¹⁸⁷ They had requested the federal troops after receiving suggestions from Warren Christopher.¹⁸⁸ When the federal military arrived, the National Guard was federalized on May 2 (Webster, Williams et al. 1992). The federalization of the National Guard changed the coordination between LAPD and the National Guard. LAPD had to request missions via Joint Taskforce-Los Angeles instead of coordinating directly with the National Guard to “rent” soldiers to conduct missions determined by LAPD. Moreover, the federal troops followed the *posse comitatus* act in terms of military involvement in the civil affairs; the troops were not allowed to perform law enforcement tasks.¹⁸⁹

These changes after the federalization imposed coordination uncertainties. Before the federalization, the National Guard approved almost all the requested missions. After the federalization, the Joint Taskforce classified most missions as law enforcement and disapproved them. Moreover, the military did not support a single police jurisdiction but several police Areas and operation bureaus, which did not match LAPD’s organizational structure. The change of assigned missions had to be approved by the Joint Taskforce, which made the coordination inflexible. Moreover, the Joint Taskforce required a daily revalidation of all assigned tasks (Schnaubelt 1997).

Action F: LAPD did not take action to reduce coordination uncertainties, but adapted to the new structure

Although not satisfied with the emerging coordination structure, there was nothing that LAPD could do about the coordination uncertainty imposed by the Joint Taskforce, which had been out of LAPD’s hands.¹⁹⁰ After federalization, the National Guard and military forces would not report to Chief Gates or Sheriff Block (Connell and Newton 1992); instead they only conducted assignments approved by the Joint Taskforce at Los Alamitos (Webster, Williams et al. 1992).

187 The first two National Guard platoons were ready for deployment at 2:35pm on April 30.

188 By May 1, with the appearance of National Guard and other law enforcement officers and the implementation of curfew, LAPD actively made arrests and the situation was becoming better in LA. By May 1 afternoon, there were around 3000 National Guard on duty and another 2300 available for missions. More federal troops were on their way to LA.

189 Actually, the president announced a proclamation which allowed the military to assume law enforcement functions in LA on May 1.

190 EOC began to run smoothly with an orderly coordination after May 2.

Table 7-1 A summary of uncertainties, coping actions and strategies in the 1992 Los Angeles Riots

#	Uncertainty	#	Action	strategy
A	LAPD was uncertain about the consequences of a non-guilty verdict	A1	Operational commanders at LAPD ordered officers to monitor the situation, and to prepare for possible riots.	Rule-based
		A2	Strategic management activated the EOC to prepare for potential social unrest	Rule-based
B	LAPD officers at the operational level were uncertain about the possible consequences of the forming crowds and did not know how to deal with these consequences	B1	Two officers requested police assistance and made arrests when back-up arrived	Rule-based
		B2	The operational commander ordered officers to retreat from the scene, set up a staging area, and requested external assistance to cope with the violent crowd	Ad hoc
		B3	Strategic management took no substantial action	No action
C	Operational commanders and officers were uncertain about who was in charge in the field command post	C1	Commanders at the command post took no substantial action	No action
		C2	Metro set up its own command	Ad hoc
D	LAPD could not fully grasp the riot dynamics and did not have a full picture of the response actions that had been initiated	D1	LAPD initiated scattered actions to increase its sensemaking capacities, but these actions failed in the end	Ad hoc
		D2	The EOC collected scattered information from other sources	Ad hoc
		D3	LAPD's strategic management announced a tactical alert	Rule-based
		D4	Chief Gates ordered a helicopter to get a better picture of the situation	Ad hoc
E	LAPD was uncertain about how to coordinate with other actors	E	LAPD's strategic management used ad hoc discussions to determine the coordination protocol	Semi-rule-based
F	LAPD was uncertain about the coordination with the military after the federalization of the National Guard	F	LAPD did not take action to reduce coordination uncertainties, but adapted to the new structure	Semi-rule-based

7.5 Analysis: a deinstitutionalizing organization caught short

This section explores how LAPD's deinstitutionalization impacted its sensemaking actions. The analysis is based on the institutional sensemaking framework proposed in [Chapter 2](#). All actions to cope with uncertainties have been summarized in [Table 7-1](#). In the analysis process, a strategy type will be assigned to each set of sensemaking actions (the types of strategies have been defined and operationalized in [Section 3.2 of Chapter 3](#)). In responding to the 1992 Riots, the institutional influence on LAPD's sensemaking strategies can be discerned in the following phases:

- Phase I: A lack of preparedness caused by low external institutionalization made LAPD rely on established routines to deal with uncertainties and led to the failure to initiate specific-based sensemaking actions.

LAPD did not prepare for the coming riots, which made them rely on established routines to deal with the uncertain situation. Before the verdict in the Rodney King case, LAPD incurred wide criticism from different stakeholders because of the King incident, but there was no preparation for a riot. Strategic management at LAPD considered that preparing for riots might trigger a riot, which would lead to even more intense opposition from stakeholders given the tension between LAPD and communities in South Central LA. After the court acquitted the four officers, the public, politicians and even police officers were shocked. The shock served as an ecological change that should have triggered LAPD's sensemaking (at least according to theory). However, the sensemaking of both the operational and strategic levels at LAPD was still bound by existing rules and failed to generate specific-based interpretations of the emergent uncertainty (as demonstrated in [Action A1 and A2](#)). After this ecological change, LAPD's operational commanders only took some precautionary measures based on existing protocol and framework to prepare for possible social unrest. These were all routines measures, such as instructing patrol officers to call for assistance when they encountered danger. The strategic management did not initiate specific actions to cope with emergent uncertainties but stuck to routine procedures, activating the city's EOC.

LAPD quickly became disorganized and could not even apply its old routines. At the strategic level, although the police chief activated the EOC immediately after the court announced the acquittal of the police officers, the activation of EOC did not work as specified in the city's emergency plan [an existing protocol]. The emergency plan specified the coordinating relationships and prescribed procedures during an emergency, which mostly applied to preparation for an earthquake instead of a riot. The expansion of the existing protocol to riot control did not work as expected. When the EOC was activated, representatives from supporting agencies did not report to the EOC. EOC staff had to call representatives from supporting agencies one by one.

- Phase II: The failure to deal with emerging uncertainties delegitimized the existing institutional framework. Without guidance from institutional frames, LAPD operational officials adopted a specific-based strategy to cope with uncertainties. However, eroding organizational capacities, such as the communication breakdown, leadership vacuum and outdated facilities, failed to support such specific-based-strategies.

When police officers on patrol saw the forming crowds after the announcement of the verdict, they immediately acted according to the procedures prescribed by their commanders: calling for assistance and making arrests after the arrival of assistance (**Action B1**). The arrests resulted in a confrontation between the forming crowd and police officers, and the available police force was outnumbered by the crowds. The confrontation was unusual for LAPD and served as an emerging ecological change. The police commander realized that the existing framework or protocol did not work in this situation, which was beyond its organizational coping capacities. The police commander therefore ordered his officers to retreat from the scene (**Action B2**).

The retreat signified that existing routines did not work in responding to the riots. The retreat was at odds with LAPD's long standing institutional philosophy, the aggressive policing approach. After the 1968 Watts riots, LAPD had learned that the police must strike quickly and with massive force in response to a riot (Cannon 1999). Since the 1970s, the aggressive policing approach had been increasingly challenged and the community policing approach had been widely adopted in the US. After the King incident, LAPD accepted the criticism from the Christopher Commission and rejected its traditional aggressive policing philosophy in favour of the community policing philosophy. During the transition period, police officers were afraid of acting aggressively, worrying they might cause another King case. Deciding to retreat was consistent with police officers' considerations in this transition phase in which a long-standing institutional philosophy became deinstitutionalized while a new philosophy had not yet been institutionalized.

Although a field command post was set up very soon after the retreat, the field command or senior management did not take substantial action to respond to the unexpected situation of escalating riots, leaving around one thousand officers in the field command post with nothing to do (**Action B3 and C1**). The inaction among the leadership resulted from low internal institutionalization, especially from the tensions within LAPD senior management that had increased during the temporal deinstitutionalization after the King incident. The unavailability of the police Chief at the onset of the riots left a leadership vacuum for LAPD which relied heavily on command and control (Webster, Williams et al. 1992; Miller 2001). At the same time, senior management was competing for the Chief position leaving nobody to fill the leadership vacuum (Gray 2007). In this vacuum, senior commanders' attitude was that "if you don't make any decisions, you cannot get hurt" (Cannon 1999: 267).

Staying in the command post without orders from the strategic level delegitimized LAPD's existing institutional framework in the eyes of stakeholders and police officers. At the onset of the retreat, most police officers believed that the commanders had reasons to order a retreat and would fight back soon. The inaction of LAPD's leadership indicated that the existing institutional framework did not work, given that LAPD was a professional force heavily relying on command and control. Externally, the failure to control the riots left the city in chaos, and tragedies had been broadcasted to stakeholders who believed that the LAPD had lost control of the city.

With the delegitimization of the existing institutional framework, LAPD's subsequent strategies to cope with uncertainties took place in an institutional void, which created opportunities for devising specific-based-strategies at the operational level and the EOC (as demonstrated in [Actions B2, C2 and D2](#)). To cope with the uncertain consequences of the escalation of the riots, Commander Moulin set up a field command post, requested professional assistance of the riot police, and tried to bring in communication facilities to share timely information with the EOC. Moreover, observing the paralysis of the field command, Metro initiated its specific-based sensemaking, setting up its own command post to fill the leadership vacuum. Due to communication problems, the EOC could not get a clear picture of the situation in the field, and relied on miscellaneous information sources to reduce uncertainties.

These specific-based strategies finally failed due to LAPD's eroding organizational capacities (an important consequence of LAPD's low internal institutionalization). LAPD's organizational capacities had suffered due to a lack of budgets, especially after the release of Proposition 13. LAPD did not receive funding from the city council and the voters for updating communication system and other facilities. The outdated communication system and problems with the deployment of helicopters during the response to the riots led to the failure of specific-based sensemaking.

Continuous failures prompted senior management to change its no-action mode and start a dual mode of coping with uncertainties, which consisted of efforts to resume the institutional way of working and to improvise. Concerning the former, the efforts started with announcing a tactical alert, which meant a shift to crisis response mode at LAPD ([Action D3](#)). Moreover, when Chief Gates returned to lead the crisis response, he filled the leadership vacuum. Concerning improvisation, Chief Gates tried on his own to generate a full picture of the situation in the city, as EOC still did not have the necessary information. Gates took a helicopter to assess the situation in the city as a whole ([Action D4](#)). However, once Gates had returned to the command position it was too late, because the organizational capacities had been fully overwhelmed by the rapidly escalating riots. Phase III: After LAPD lost its autonomy, the organization turned to a semi-rule-based strategy to cope with coordination uncertainty.

It was clear that LAPD's capacities to cope with the riots were overwhelmed during the first night. When LAPD's failed response was broadcasted on television, LAPD's inaction triggered external intervention from stakeholders. These stakeholders had lost trust in LAPD's capacities for dealing with the riots and acted without much reliance on existing frames or protocols. The intervention started with a call for the National Guard after the Governor had consulted with Mayor Bradley. This process was not consistent with the normal mutual assistance procedures in which assistance should be requested by a local law enforcement agency when the agency's capacity was overwhelmed and the mutual assistance network among law enforcement agencies was insufficient to cope with the situation (FEMA and United States Fire Administration 1994). In other words, the stakeholders ignored the existing coordination network (LAPD centered) and tried to build a new response network.

When the new response network was initiated, LAPD's institutional way of working broke down on both the internal and external dimensions. LAPD had never accepted assistance from other actors, and LAPD had been known for its autonomous status ever since the 1950s. Historically, LAPD never asked other actors for help, and did not participate in the California mutual assistance system. LAPD felt that the mutual aid would waste their limited resources because they never requested external assistance, but only provided assistance to others. During the first night, Chief Gates did not accept offers from other law enforcement agencies and considered it unnecessary to request assistance from the National Guard. After he assessed the situation and LAPD's response, Chief Gates concluded that LAPD's capacity was overwhelmed, which signified that LAPD's internal institutionalization had collapsed.

Senior management realized that LAPD's existing framework had stopped working, and adapted to the emerging response network (as demonstrated in **Action E**). LAPD's way to cope with coordinating uncertainty was to coordinate ad hoc with various stakeholders. In the morning of April 30, Gates went to City Hall to discuss the coordinated response which terminated the 13-month non-communication with Mayor Bradley. Upon another conference discussion, the coordinating center shifted to the County office, and Chief Gates began to accept the assistance of the National Guard.

The external coordination framework experienced another major shift after the federalization of the National Guard, after which LAPD could not receive similar assistance from the military as before. The military coordinating centre, the Joint Taskforce, imposed new coordinating rules which resulted in emerging coordinating uncertainty. According to the new rules set by the Joint Taskforce, the military including the National Guard were not allowed to conduct missions related to law enforcement any more. Facing the rapid changes in its external network, LAPD did not resist the new policy but only adapted to the new coordination framework.

In summary, this chapter described how LAPD as a mythical organization experiencing an escalating of deinstitutionalization coped with uncertainties during its response to expected riots in Los Angeles in 1992. organizational institutionalization influenced sensemaking strategies in the following ways:

- Sensemaking of a mythical organization experiencing an escalation of deinstitutionalization started with rule-based strategies.
- Continuous failures in sensemaking actions delegitimized existing institutional frames, and finally led to institutional voids which created opportunities for specific-based sensemaking.
- Specific-based sensemaking strategies were vulnerable to failure due to weak external support and internal organizational capacities. Resuming the institutional way of working seemed to be impossible and a take-over by external actors tend to be inevitable.
- In a situation of external take-over, organizations lost its autonomy (when they had a low level of external institutionalization), and their sensemaking was semi-rule-based and constrained by rules imposed by external actors.

Chapter 8 Towards a theory of institutional sensemaking: building on a comparison of four cases

8.1 Introduction

This research project studies the variety in organizational strategy selection when coping with critical uncertainties during a crisis. Dealing with uncertainty is an essential part of any crisis response, and poses enormous challenges to crisis managers. In dealing with uncertainties, some organizations rely on organizational routines developed over time, while some others analyze uncertainty in an ad hoc way to provide a workable interpretation of that uncertainty. The research question of this dissertation, therefore, is why some organizations select a rule-based strategy to cope with uncertainties whereas others follow a more ad hoc-based strategy.

To answer this question, this study formulated and applied an institutional sensemaking model to explain the selection of strategies to cope with uncertainties during a crisis. The institutional sensemaking model integrates sensemaking theory and institutional theory. Weick's sensemaking theory provides a general explanation of organizational processes of coping with uncertainties, identifying two basic strategies of dealing with uncertainties: a rule-based strategy and a specific-based strategy (Weick 1979; Weick 1995). This study builds on the insight that the general model might vary in different organizational contexts, which are defined by different levels of institutionalization (Jepperson 1991; Tolbert and Zucker 1996). This research aims to explore how different levels of institutionalization influence the selection of organizational sensemaking strategies during a crisis, thus explaining the selection of different strategies to cope with uncertainty in crises.

The empirical chapters describe four major crises in the US and the major response organization for each crisis. These were organizations with different degrees of internal and external institutionalization. The four case-studies concentrated on uncertainties that the organizations encountered during their response to the crisis and on sensemaking actions to cope with these uncertainties. Based on the collected data, the influence of institutionalization on organizational sensemaking strategies during the response to a crisis was analyzed.

This chapter summarizes the research findings of this dissertation. It also looks ahead and suggests propositions to be tested in future research. Section 8.2 compares the influence of institutionalization on the selection of organizational sensemaking strategies and provides an institutional sensemaking model that identifies the dynamics of selecting different strategies in organizational sensemaking by evaluating the four cases. Section 8.3 describes the theoretical implications of this study. Section 8.4 offers policy recommendations to crisis managers and Section 8.5 reflects on sensemaking and crisis management in China. The chapter ends with the research limitations and sets a brief research agenda (Section 8.6).

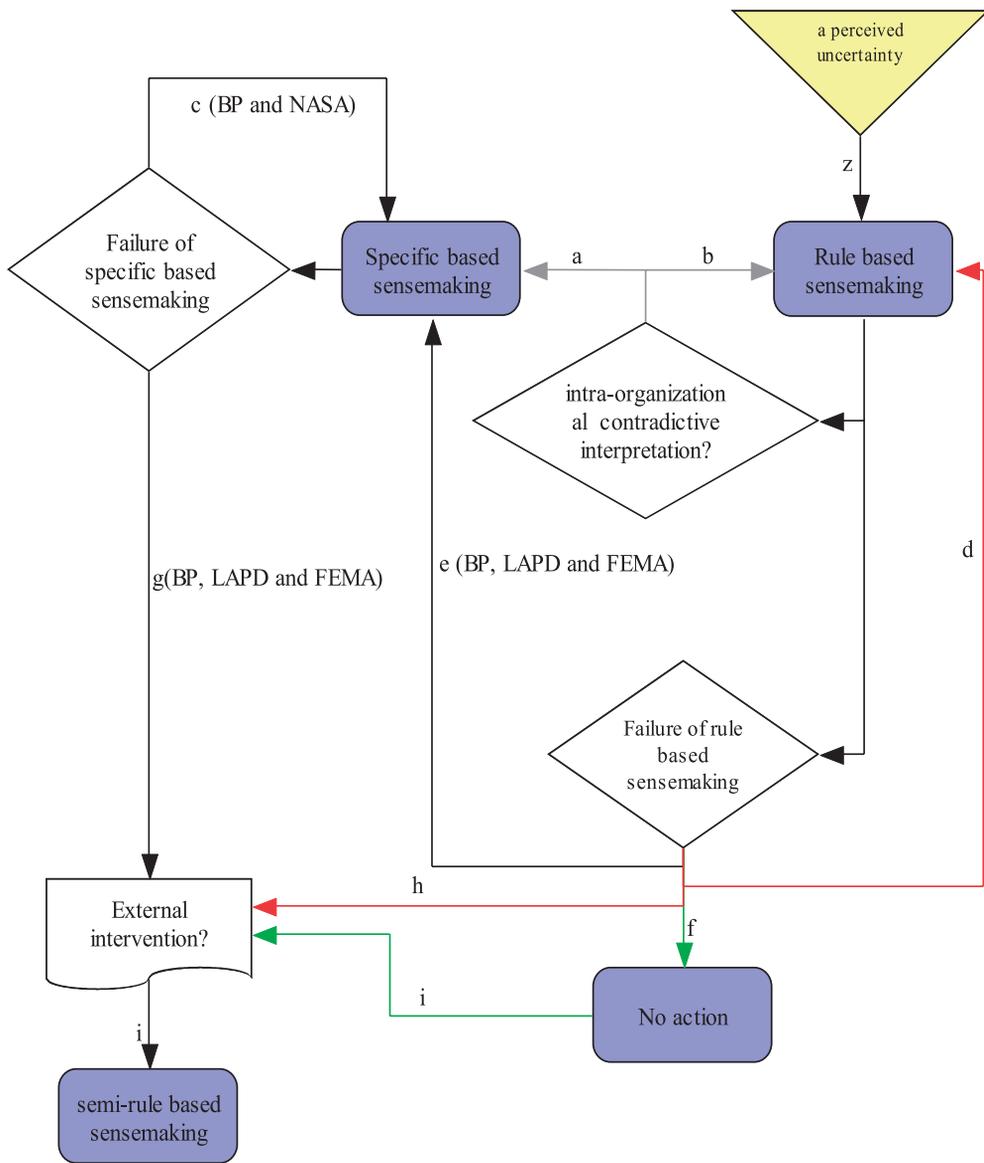
8.2 Comparing the influence of institutionalization on sensemaking strategies: towards a dynamic model of institutional sensemaking

The main empirical findings are specific for each single case and were summarized at the end of each empirical chapter (chapters 4, 5, 6 and 7). This section will synthesize the empirical findings across four cases, making cross-case comparisons to answer the research question and generate propositions to be tested in future research. As each case concentrates on the dynamics of strategy selection in coping with uncertainties, the cross-case comparison in this section provides a dynamic model that maps out the organizational process producing different sensemaking strategies based on a comparison of four empirical cases (for an overview of the model, see [Figure 8-1](#)). The institutional sensemaking model will be described in this section.

Organizational sensemaking starts with rule-based strategies

All four cases show that organizational sensemaking started with rule-based strategies. It is not hard to imagine that organizations with a high degree of internal institutionalization stick to a rule-based strategy. Previous research suggests that organizations with a highly internal institutionalization usually begin with taken-for-granted expectations when a situation develops and thus have common interpretations to uncertainties (Vaughan 1996; Turner and Pidgeon 1997). This is consistent with my findings from the NASA and BP cases. Both organizations quickly triggered their internal routines to cope with the perceived uncertainties. In its history of exploring the “unknown frontier”, NASA built complex institutional procedures to cope with uncertainties or risks, such as the Flight Readiness Review, Launch Readiness Review, and Post-Flight Analysis. These procedures gave clear guidance regarding coping with uncertainties. The foam strike was an anomaly that had frequently happened in past flights, which had therefore been categorized based on institutional procedures. NASA’s initial strategies to cope with uncertainties regarding the impact of the foam strike followed from these routine procedures. In the BP case, when the BOP (a designed facility to stop an oil spill in emergencies) proved dysfunctional and finding an appropriate method to stop the oil spill became an important issue for BP, BP still relied on repairing BOP (a routine method) to cope with the uncertainty of how to handle the oil spill.

It is interesting that organizations with *low* internal institutionalization also used rule-based sensemaking in the initial phase. The general hypothesis in [Chapter 2](#) proposed that organizations with a low level of institutionalization find it hard to use a rule-based strategy and will therefore tend to rely on a specific-based strategy to cope with uncertainties in crises. However, the findings in the FEMA and LAPD case contradict this hypothesis. FEMA and LAPD were both organizations with a low and declining degree of internal institutionalization, but neither initiated specific-based sensemaking strategies in the initial phases of their crisis response. Instead, their institutional way of working established before deinstitutionalisation influenced sensemaking, and their sensemaking strategies matched institutional rules and procedures that were supposedly deinstitutionalized.



Institutionalization level of an organization: (internal, external) "+" refers to "high"; "-" refers to "low"

- ▶ NASA case (+, +)
- ▶ BP case (+, -/+) -/+ a temporary autonomy
- ▶ FEMA case (-, -)
- ▶ LAPD case (-/+, -) -/+ a temporary autonomy

Figure 8-1 An institutional sensemaking process model in crises

During the response to the New Orleans Flood in 2005, FEMA was experiencing an organizational change, and its past comprehensive emergency management (CEM) philosophy was challenged by its mother agency, DHS. Although FEMA had lost manpower, some organizational tasks (such as mitigation) and funding, FEMA was fighting to maintain its previous CEM philosophy and upheld its routine way of working. At the onset of the crisis, therefore, FEMA applied its routine procedures to cope with uncertain consequences of the extremely devastating Hurricane Katrina. In the LAPD case, LAPD was in an accelerated transition phase from its long-existing aggressive policing approach to a community policing method after the King Accident. The change of approach was suggested by the post-accident investigation commission (namely the Christopher Commission 1991). Moreover, its organizational capacities had eroded since the 1970s due to budget cuts. When the riots occurred in 1992, the new community policing philosophy had not been embedded in LAPD. Nevertheless, LAPD fell back on a rule-based-strategy in line with its established aggressive policing approach to cope with the uncertain situation caused by the impending riots.

It can be concluded that organizations, whether highly institutionalized or with a low level of institutionalization, tend to select a rule-based strategy to cope with uncertainties encountered in the initial phase of a crisis. This conclusion confirms the hypothesis that highly institutionalized organizations are likely to select rule-based strategies, while it disproves the hypothesis that organizations with a low institutionalization tend to select specific-based strategies. This leads to a revised the proposition:

Proposition 1: In the initial stages of coping with uncertainty in a crisis, organizations tend to rely on rule-based strategies regardless of the level of institutionalization.

Proposition 1 might not apply to another context where the institutionalization level is low, i.e. to emergent organizations. These are organizations temporarily created to engage in non-regular tasks (Dynes and Quarantelli 1970; Dynes and Aguirre 1979; Saunders and Kreps 1987; Scanlon 2008).¹⁹¹ Due to the newness and temporary nature of these organizations, emergent organizations might find it hard to develop shared working practices, and formulate routines or an organizational philosophy that is accepted by organizational members and stakeholders (Boin and Christensen 2008). When coping with uncertainties, these routines or organizational philosophies are thus simply not available for use. These emergent organizations cannot find frames to generate rule-based interpretations to uncertainties. This leads to the following hypothesis:

Proposition 1-1: Emergent organizations are more likely to trigger specific-based strategies in the initial phase of crisis sensemaking [as shown in **line z** in **Figure 8-1**].

Rule-based sensemaking, discontinuities, and institutionalization

In all four cases, routinized strategies could not resolve all uncertainties, which made discontinuities or disruptions in the feedback loops of sensemaking inevitable. These

¹⁹¹ Emergent organization is a concept created by Russell Dynes from Delaware University's Disaster Research Center (DRC), which was further developed by DRC researchers, such as Joe Scanlon, Tom Drabek, Dave Neal and Gary A. Kreps.

discontinuities or disruptions were at odds with institutional expectations, which provided new ecological changes prompting a new cycle of sensemaking. Two types of discontinuities were found: [1] those coming from within the organization, providing contradictory interpretations by different sub-groups in the organization; [2] those resulting from the failure of rule-based strategies.

1. Discontinuities as internal contradictions

One discontinuity is a failure to generate a “collective” sense of the situation within the organization, as happened in NASA. Within the organization, NASA’s heterogeneous subgroups gave different interpretations of the uncertainty: mission management used rule-based sensemaking while the engineer group used specific-based sensemaking. Sensemaking theory does not explain how organizations should cope with discontinuities caused by these internal contradictions.

The divergent interpretations of uncertainty were not consistent with the expectations regarding a highly institutionalized organization such as NASA. A highly institutionalized organization has shared taken-for-granted actions in typical situations and relies on routines and procedures to cope with problems encountered. The contradictory interpretations of uncertainty were at odds with theoretical expectations. As a highly institutionalized organization, NASA’s mission management maintained “institutionalized mindsets of invulnerability” (Wicks 2001), and could not tolerate the specific-based interpretation that was at odds with its institutionalized procedures. Consequently, it did not give close scrutiny to the interpretation based on specific-based sensemaking.

Meanwhile, the engineering group could not understand that mission management could allow the existence of an uncertainty that might threaten the safety of the flight. The engineering group did not publicly resist the organizational decision based on procedures (NASA’s mission management’s interpretation was based on procedures and existing rules) and failed to provide evidence to reverse the rule-based interpretation given its limited available capacities. Instead, the engineering group turned to non-institutional channels to gain evidence to support its own specific-based interpretation. However, mission management as the institutional defenders who tried to maintain the institutional practices could not tolerate these non-institutional actions, and terminated these specific-based sensemaking actions. This interaction between mission management and the engineering group created a “vicious circle of intra-organization institutional sensemaking”:

This happens when sub-groups of a highly institutionalized organization arrive at contradictory interpretations of the uncertainty, and both sub-groups maintain their own sensemaking strategies. On the one hand, the sub-group that interprets uncertainties based on existing frames (the institutional defenders) adheres to its rule-based sensemaking strategy, and cannot tolerate deviations of the other sub-group (the institutional challengers) in such a highly institutionalized organization. On the other hand, the institutional challengers who created a new interpretation of the uncertainty adhere to their specific-based interpretation, but do not appeal to their institutional channels out of respect for routines and institutional procedures in such a highly institutionalized organization. As a result, the institutional challengers turn to non-institutional channels to seek more evidence to support

their specific-based interpretation, while the use of non-institutional channels is not tolerated by the institutional defenders.

Proposition 2: If a highly institutionalized organization develops intra-organizational contradictory interpretations of uncertainties, the institutional defenders will stick to a rule-based strategy to deal with uncertainty while the opposing sub-group [the institutional challengers] is more likely to adhere to its specific-based strategy [as shown in [line a and b in Figure 8-1](#)].

Proposition 3: In a highly institutionalized organization, the institutional challengers tend to initiate specific-based sensemaking via non-institutional channels [as shown in [line c in Figure 8-1](#)].

2 Discontinuities as failures of a rule-based sensemaking strategy

A second type of discontinuity follows when a rule-based strategy fails. BP, LAPD and FEMA all experienced failures of rule-based sensemaking in their sensemaking feedback loops, which created discontinuities, initiating the next cycle of sensemaking. However, their ways of coping with these discontinuities were different: some adhered to existing interpretations while others were more flexible and tried to generate new interpretations. After BP realized that repairing the BOP (a facility to stop the oil spill) failed to stop the oil spill, BP began to try different oil containment methods, and initiated compensation mechanisms for impacted communities to cope with unknown consequences of the oil impact. After FEMA learned the damage situation in New Orleans was worse than expected, FEMA did not change its routine procedures to cope with the uncertainties encountered but tried to resume its institutional procedures. LAPD's reliance on routine procedures was overwhelmed by the fast burning riots, leaving retreated officers staying in the command post without further actions.

The different adaptations to the failure of rule-based sensemaking strategies seemed to result from different levels of institutionalization. As demonstrated in the BP case, a highly institutionalized organization can maintain its autonomous status, even though its legitimacy among stakeholders rapidly erodes. Although BP failed to cope with the oil spill, BP's unique organizational capacities of coping with the deepwater oil spill could not be replaced by other responding actors. Internally, BP was in an institutional void after its institutional routines and procedures had proved ineffective. Moreover, coping with uncertainties in responding to the deepwater oil spill was novel to BP, and there were no appropriate existing frames that could help to interpret uncertainties encountered. Therefore, BP's autonomous status prevented external intervention while its internal institutionalized routine and procedures proved ineffective, which led to specific-based sensemaking.

Proposition 4: [1] If an arrogant organization maintains unique institutional capacities, it can maintain a temporarily autonomous status (even if it experiences a sharp erosion of legitimacy among stakeholders), and [2] if existing institutional routines and procedures are inadequate to deal with uncertainties, organizations are more likely to select specific-based strategies to cope with uncertainties [see [line e in Figure 8-1](#)].

An organization with a low level of institutionalization may find it hard to interpret uncertainty after failures of rule-based sensemaking. This was demonstrated during the LA riots and the New Orleans flooding. When these crises occurred, both FEMA and LAPD were in the midst of a deinstitutionalization process. Externally, both organizations had low legitimacy among stakeholders and a shrinking budget. Internally, their old working philosophies were challenged by newly imposed ones. When FEMA found that its rule-based interpretation did not work in coping with the coordination uncertainty, FEMA still rejected the imposed coordination framework, the National Response Plan. At LAPD, when facing unknown consequences of the forming crowds, commanders ordered a retreat. The retreat was inconsistent with LAPD's aggressive policing philosophy, and throughout the night LAPD proved to be unable to cope with the uncertainties resulting from the ongoing riots. The retreat and inaction were the result of criticism by stakeholders of LAPD's aggressive way of working, making LAPD officers fear to cause another King accident. Moreover, LAPD was caught short in terms of its leadership void and weak capacities. After Chief Gates announced his resignation, senior management was competing for the Chief position, and nobody wanted to take charge of the crisis response. As an organization heavily relying on command and control, a lack of leadership paralyzed sensemaking.

Proposition 5: If an organization in the midst of deinstitutionalization experiences sensemaking failures caused by its reliance on its old institutional routines and procedures, it is less likely to trigger a specific-based strategy; the organization will either stick to its rule-based strategy or do nothing to cope with the uncertainty [see [line d and f in Figure 8-1](#)].

The empirical result show that the two organizations in deinstitutionalization (LAPD and FEMA) initiated scattered efforts to engage in specific-based sensemaking after experiencing continuous failures caused by adherence to rule-based sensemaking. For instance, LAPD's strategic management tried to collect information to reduce uncertainties about the riots in the city from available information sources, while the Metropolitan Division set up its own command to cope with the confusion of leadership in the command post. In the New Orleans flooding case, FEMA officials in New Orleans began to plan evacuations when they noticed that the authorities involved did not make an effort to evacuate disaster survivors in the Superdome and the Convention Center

The emergence of scattered specific-based sensemaking efforts at LAPD and FEMA can be seen as the "natural" outcome in a deinstitutionalized organization. Both FEMA and LAPD were in a transition period, moving from an established working philosophy to a new approach imposed by stakeholders. Although their established working philosophy had proved to hinder sensemaking in the initial phase of the crisis, increasing discontinuities or even the collapse of the institutional framework provided more ecological changes to trigger organizational sensemaking. Interpretations of uncertainties proved to be ineffective in both organizations; continuous failures serve as discontinuities in the feedback loops of sensemaking and stimulate sub-groups in the organizations to give a new interpretation to the uncertainty in crises. The deinstitutionalized organization had no powerful "institutional defenders" to readdress these scattered new interpretations. Even institutional defenders address the new interpretation and try to resume institutional order; however, the weak organizational capacities and weak cohesions would not allow it.

Proposition 6: If an organization in deinstitutionalization experiences continuous failures caused by rule-based sensemaking or collapse of sensemaking, its sub-groups are likely to initiate scattered specific-based sensemaking [see [line e in Figure 8-1](#)].

The findings described in this section disconfirm the proposed hypothesis that highly institutionalized organizations tend to rely on rule-based sensemaking. Instead, highly institutionalized organizations demonstrated more flexibility than expected in adopting specific-based sensemaking while organizations with a low level of institutionalization showed more rigidity after failures to interpret uncertainties based on their rule-based strategy. As demonstrated in the empirical research, internally, BP's institutional routines were quickly identified as inappropriate in the novel situation, and specific-based sensemaking became indispensable to interpret the uncertainties. Organizations with a low level of institutionalization (FEMA and LAPD) denied the ineffectiveness of their institutional procedures and frames, and thus maintained rule-based sensemaking. When the organizations tried to maintain its rule-based sensemaking, the organization was caught short in terms of eroding capacities or lack of internal cohesion, which led to chaos or no action to deal with the uncertainty.

Specific-based sensemaking in crises: mission impossible?

In all four cases, a shift to specific-based sensemaking did not necessarily mean success in coping with uncertainties in the crisis response, which might fail consequently. This section compares organizations with different institutionalization levels responding to failures caused by specific-based sensemaking.

Organizations with a low level of institutionalization ran the risk of external intervention after the failure of scattered specific-based sensemaking as shown in the FEMA and LAPD cases. Their specific-based sensemaking efforts failed in the end because of their low level of internal institutionalization, illustrated by their weak capacities and a lack of support by other sub-groups in the organization. FEMA's initiative to evacuate stranded disaster survivors did not gain approval or support from its stakeholders and the initiative to set up the credit card program failed due to the inability to prevent misuse of the assistance, which led to widespread criticism from stakeholders. At LAPD, after the breakdown of existing frames and subsequent inactions, both strategic management and field officers initiated specific-based sensemaking to cope with uncertainties, but failed in the end. The Metropolitan Division at LAPD set up its own command to reduce the uncertainty regarding who was in charge; however, this scattered specific-based sensemaking could not reduce the uncertainty encountered by LAPD. There are similarities with the efforts to reduce uncertainties about the riots in the city. Although management level tried to synthesize different information sources, they could not piece together a full picture of the riot situation due to the breakdown of the communication system. Moreover, when Chief Gates tried to make sense of the uncertain situation after resuming command, the deficient communication system and helicopter problems also hindered his efforts.

After the failure of specific-based sensemaking, both organizations faced intervention by authorities, who had lost trust in the functioning of these existing institutions due to their

inadequate response. Their weak institutional capacities could not support a successful specific-based sensemaking, which led to more criticism from stakeholders. The growing criticism further eroded the weak support from stakeholders, which made external intervention in the response inevitable as shown in the FEMA and LAPD cases. The coordinating role of FEMA was taken over by the Coast Guard chief Vice Admiral Thad W. Allen. In the LA riots, the County became the coordinator of the crisis response.

Proposition 7: Organizations with a low level of institutionalization that experience the failure of specific-based sensemaking are vulnerable to external intervention by authorities [see line g, h and i in Figure 8-1].

In contrast with organizations with a low level of institutionalization, organizations with a high level of institutionalization tended to stick to their specific-based sensemaking, even if they encountered failures as in the NASA and BP cases. Although their coping actions in response to the discontinuities were different, their coping strategies still amounted to specific-based sensemaking. As BP enjoyed an autonomous status, its unique capacities to cope with the oil spill prevented stakeholders from intervening in the response. Although its specific-based sensemaking failed several times during the response process, there was no external intervention, which allowed BP to initiate a new approach to cope with the emerging uncertainties. At NASA, the contradiction between its rule-based sensemaking and specific-based sensemaking was a purely internal affair because the organization could temporarily cope with internal affairs on its own and the consequence of the foam strike was still unclear.

Proposition 8: Organizations with a high level of autonomy that encounter failures of specific-based sensemaking will continue specific-based sensemaking [see line c in Figure 8-1];

Continuous disruptions or discontinuities might trigger external intervention, making insisting on specific-based sensemaking impossible. A crisis can easily become a “focusing event”, which means the organizational response comes under close scrutiny by the media and the public (Birkland 1996; Kingdon 2003). When rule-based procedures or actions are severely interrupted or even collapse, organizations tend to experience a sharp erosion of legitimacy among stakeholders. As a result, these organizations are more likely to experience external interventions (FEMA and LAPD cases).

It is noteworthy that BP as an “arrogant organization” showed its resilience in maintaining specific-based sensemaking. With the erosion of autonomy after experiencing continuous failures of specific-based sensemaking, BP could not prevent that the response was taken over by external actors. Facing an unexpected deepwater oil spill, BP initiated a trial and error process to stop the oil spill because of its unique organizational capacities to cope with deepwater oil spills. However, with the emergence of continuous disruptions, BP and its stakeholders, such as the White House, were increasingly criticized by the public and the media. The stakeholders could not bear the pressure from the public, politicians and the media, and intervened in the response and its specific-based sensemaking.

Proposition 9: Organizations with a high degree of autonomy or a unique organizational capacity necessary for crisis response tend to initiate more cycles of specific-based sensemaking than organizations with a low degree of external institutionalization [see [line c in Figure 8-1](#)].

Proposition 10: Experiencing failures of specific-based sensemaking, organizations with a low level of institutionalization are more vulnerable to intervention by authorities [see [line g in Figure 8-1](#)].

The case studies show that three organizations experienced external interventions by stakeholders after failures of specific-based sensemaking (such as FEMA and LAPD in the early stages of their response, and BP in a later stage of the response). The continuous failure to cope with uncertainties resulted in a quick erosion of organizational legitimacy among stakeholders and a loss of confidence in the organizational capacities to solve internal problems. Following Boin and 't Hart (2000: 13), we might say that organizations encountered a situation in which "its institutional structure experience a relatively strong decline in (followed by unusually low levels of) legitimacy". Boin and 't Hart describe this situation as an institutional crisis.

Sensemaking after intervention by authorities

The intervention by authorities constrained the organizational sensemaking, as organizations had to cope with uncertainties within the boundaries set by stakeholders. After the take-over by authorities, two organizations (BP and LAPD) had to interpret within the boundaries given by authorities. After LAPD Chief Gates was removed from his coordination position, LAPD lost its autonomy. The coordination was transferred to the County office and then to the Joint Taskforce of the military, so LAPD was confronted with an emerging external coordination network and adapted to the new situation. In the Deepwater Horizon oil spill case, after the federal government intervened in BP's response, BP's trial and error approach was constrained by increasing governmental inspections and challenges. Although it could still initiate new response strategies, BP's response had to be approved by experts from the federal government.

Proposition 11: After being taken over by authorities, organizations (whether highly institutionalized or with a low level of institutionalization) must follow semi-rule-based strategies to interpret uncertainties [[line i in Figure 8-1](#)].

8.3 Implications for theory

Sensemaking theory helps to describe the organizational process of coping with uncertainties, from the moment the organization perceives an uncertainty to the selection of an interpretation of the uncertainty embedded in the organization as a retention. However, sensemaking theory does not consider the organizational context. Classic institutional theory fills the gap by introducing the influence of organizational contexts on organizational actions (sensemaking as organizational actions). The empirical research in this dissertation confirms the influence of institutionalization on organizational sensemaking. The development of the institutional sensemaking model presented in this dissertation has implications for sensemaking theory, institutional theory and crisis

management theory. These implications are discussed in this section.

An expansion of sensemaking theory

Sensemaking theory provides two strategies for coping with uncertainties: one is to interpret situations based on existing frames; the other is to create an interpretation based on the situation. This study indicates that these two strategies are indeed used in times of crisis; however, sensemaking theory does not consider two other types of coping strategies found in the case studies. The empirical research demonstrates that organizations adopt semi-rule-based strategies to interpret uncertainties when authorities have taken over the crisis response. In addition, there is a strategy (no actions) that was observed in LAPD's sensemaking when its organizational capacities were overwhelmed and its leadership was in chaos.

Institutionalization has been put forward as an important factor influencing organizational sensemaking (Wicks 2001; Jennings and Greenwood 2003; Weick 2003; Weber and Glynn 2006). However, the influence of institutionalization on organizational sensemaking has not been empirically studied in crisis contexts. This dissertation has done just that. As depicted in [Figure 8-1](#), the institutional sensemaking model provides a dynamic explanation of the selection of each type of sensemaking strategy and identifies under what institutionalization conditions that type of sensemaking strategy is selected. The results of this study disconfirm the hypothesis in [Chapter 2](#), which proposed that *organizations with a high degree of institutionalization tend to rely on existing frames to interpret uncertain information, whereas organizations within institutional void are more likely to generate new interpretations of uncertainty*. The relationships between institutionalization and sensemaking strategies that emerged from the cross-case comparisons are not purely linear as hypothesized.

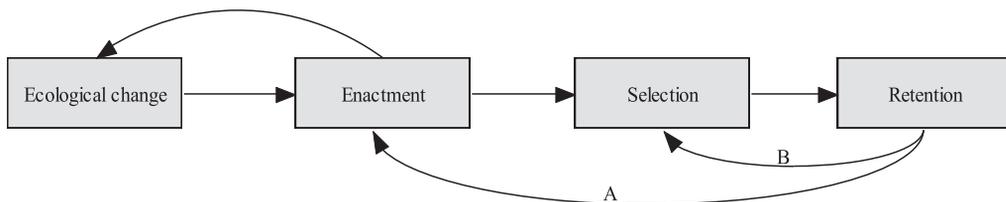


Figure 8-2 Weick's sensemaking theory

The empirical research in this dissertation confirms that feedback loops A and B played an important role in the selection of sensemaking strategies (as depicted in [Figure 8-2](#)). As described in [Proposition 1 and 1-1](#) in the previous section, feedback loops A and B originate mainly from successful interpretations saved in the organizational retention. In other words, we can extend Weick's sensemaking theory: organizations are more likely to select existing frames (if they have) to interpret uncertainties.

The empirical results show three rigidity effects in the selection of sensemaking strategies after organizations had faced the failure of their selected strategies (as depicted in [Proposition 2, 3, 5 and 8](#)).

1. Organizations with low levels of institutionalization stick to rule-based sensemaking after failing to interpret uncertainties based on existing frames. Although experiencing failures, these organizations with low levels of institutionalization attribute the failure of rule-based sensemaking to weak external support instead of the ineffectiveness of existing frames.
2. Highly institutionalized organizations persist in their selected strategies after experiencing the failure of specific-based sensemaking. These organizations rely on their unique organizational capacities to exclude the possibility of external intervention, and insist on a trial-and-error way of working to interpret uncertainties.
3. Highly institutionalized organizations make contradictory interpretations of an uncertainty, creating intra-organizational tensions between different sub-groups (as described in [Proposition 2 and 3](#)). These sub-groups stick to their selected strategies due to the “vicious circle of intra-organization institutional sensemaking”.

This study describes how the discontinuities in the feedback loop of sensemaking trigger a switch of sensemaking strategies. The discontinuities do not necessarily cause the switch of sensemaking strategies, but interact with institutionalization to contribute to the switch of sensemaking strategies (as suggested in [Proposition 4 and 7](#)).

1. This study identifies a condition that reflects Moynihan’s (2012) findings in his recent study on organizational cultural switch in crisis response, and adds another condition contributing to the switch from a rule-based strategy to a specific-based strategy. Moynihan (2012: 864) suggested that “culture switching is likely to occur if a dominant cultural assumption limits the ability of the organization to respond to challenges”. This study finds that the switch from a rule-based strategy to a specific-based strategy occur when the failure of rule-based sensemaking shocks the organization and helps the organization to recognize the failure of existing frames to interpret the uncertainty. The discontinuity provided by failures of existing frames results from existing cultural assumptions limiting organizational response according to Moynihan. Moreover, this study identifies another condition conducive to a switch in sensemaking strategy: an autonomous status resulting from its unique organizational capacities. The autonomous status may prevent intervention from stakeholders, which enables an organizational switch in sensemaking strategies. This would be impossible if the organizational response were taken over by the authorities.
2. Besides an active switch in sensemaking strategies, a second type of switch in sensemaking strategies can be discerned. This occurs after external intervention due to the organizational failure to cope with the crisis. The external intervention signifies the failure of the organizational response to the crisis (at least in the eyes of stakeholders) and reflects a loss of legitimacy among stakeholders, after which organizations have to interpret uncertainties within boundaries imposed by intervening stakeholders.

Contributions to institutional theory

This dissertation fills a gap in the existing literature by exploring how institutionalization influences organizational actions (sensemaking as organizational actions) in times of crisis, when there is a breakdown of organizational routines. The results show that the influence of institutionalization on organizational actions does not follow institutional logic which would suggest that: highly institutionalized organizations rely on routines to cope with problems at hand while organizations with low levels of institutionalization resort to ad hoc analysis to make sense of uncertainty in times of crisis.

It was demonstrated that the level of institutionalization does not make a difference for strategy selection in the initial phase of responding to crises (as forwarded in [Proposition 1](#)). Organizations in the midst of deinstitutionalization still engaged in rule-based actions based on long-sliding procedures. This finding resonates with Oliver's (1992) argument on deinstitutionalization. According to Oliver, organizational inertia embedded in the taken-for-granted institutionalized routines still influences organizational actions even when the organization is in a deinstitutionalization process. This argument can be interpreted in the context of strategy selection: organizations will stick to their routinized strategies in coping with uncertainties even though routinized procedures have become delegitimized among stakeholders.

This study also explored the intra-organizational dynamics of a highly institutionalized organization facing a potential crisis (as depicted in [Proposition 2 and 3](#)). The findings confirm that the effect of the invulnerable mindsets in a highly institutionalized organization makes it hard to tolerate deviation from institutional procedures (Wicks 2001). Even if the deviating sub-group (institutional challenger) resists the routine procedures, the sub-group fails to oppose the institutional procedures publicly. Instead, the sub-group turns to non-institutional channels to prove the inappropriateness of existing rules and procedures.

This study shows that several institutional elements are salient in determining whether organizations act according to institutional procedures.

1. A unique organizational capacity helps organizations maintain their autonomy, even if the crisis has already caused the erosion of external legitimacy (as depicted in [Propositions 4 and 8](#)).
2. In an organization in deinstitutionalization, the way of working imposed by the organizational environment is no longer adequate when a crisis breaks out, and the organization tends to return to its way of working before deinstitutionalization. The organization shows rigidity in its adherence to the way of working before deinstitutionalization (as forwarded in [Propositions 1 and 5](#)).
3. The vulnerability to intervention by stakeholders depends on the level of institutionalization. During a crisis, organizations are vulnerable to criticism by stakeholders, and continuous failures easily trigger intervention by the authorities. Organizations with a high degree of external institutionalization can maintain operations without external intervention longer than organizations with a low level of external institutionalization. However, continuous failures make intervention by authorities inevitable (as described in [Propositions 7, 8 and 9](#)).

Contributions to crisis management theory

This study is about sensemaking in crises, and the findings of the empirical research contribute to research on improvisation and leadership in crisis management.

This study -at least partially- confirms the improvisation paradox proposed by Boin, 't Hart et al.(2005: 56): “when employees realize that a crisis demands the services of their organization, the accompanying uncertainty nurtures a reliance on institutionalized response modes. However, these modes were never designed or tested with the crisis at hand in mind”. All four cases show that organizations start with institutionalized response modes to cope with uncertainties. However, they also show that organizations with different degrees of institutionalization perform differently in terms of enabling or constraining improvisation in such a highly volatile condition.

The empirical findings show that two types of institutional conditions trigger the paradox of improvisation, thus constraining the improvisation:

1. In a highly institutionalized organization, leaders tend to rely on routine procedures in crisis response, even if operators demand improvisation to cope with an emerging uncertainty. These leaders show low tolerance for improvisation to cope with an emerging uncertainty, and rely on their institutionalized response mode (as depicted in [Propositions 2 and 3](#)).
2. Although the routine way of working has resulted in failure, leaders in organizations with a low level of institutionalization still try to maintain the institutionalized response mode. The operators might improvise; however, these improvisations are likely to fail in the end due to a lack of support by stakeholders or weak organizational capacities (as depicted in [Propositions 6 and 10](#)).

The empirical research identifies an institutional condition enabling improvisation when responding to a crisis. A unique organizational capacity that others do not have can help an organization with a high level of internal institutionalization to keep its autonomy in responding to the crisis; meanwhile, the organization has to realize that its plans may have become “fantasy documents” (as depicted in [Proposition 4](#)).

As described by Thompson (1967), organizations typically rely on institutionalized procedures to reduce uncertainties in organizational operations. This study indicates that planned or institutionalized procedures are never perfect to cope with uncertainties encountered in crises, and failures are “normal accidents” when relying on these institutionalized procedures in the crisis response. Organizing feedback loops after using these institutionalized procedures, and learning from failures or discontinuities becomes extremely important. A simple denial of the institutionalized way of working cannot guarantee success; organizational capacities and support from stakeholders are both necessary conditions.

8.4 Policy implications

One of the aims of the present research is to help crisis managers open the “black box” of sensemaking in crises. The findings from this study are relevant for crisis managers. This section will recapture lessons learned from the inquiry that may be helpful for crisis managers.

Organizing sensemaking feedback loops

As demonstrated in all four cases, it is unlikely that an organization will adopt the right strategy to cope with crisis uncertainties straight away; crisis managers should realize that failures and discontinuities occurring in the feedback loops are normal parts of the sensemaking process in crises. Therefore, organizing information received in the feedback loops of sensemaking is an essential task for crisis managers. This section provides suggestions for crisis managers to handle feedback loops in sensemaking:

Crisis managers should consider discontinuities in the feedback loops as an important source of information regarding the appropriateness of their adopted strategy. The sensemaking feedback loops provide information whether a selected strategy works to cope with uncertainties, or whether stakeholders support the strategy.

Crisis managers should not simply deny emergent interpretations of uncertainties made by organizational members if these interpretations are at odds with existing routine procedures. This study shows that sub-groups within an organization might offer interpretations of uncertainties that are at odds with prevalent ones, which will likely cause tensions between organizational units supporting emergent or existing interpretations. Organizations get used to working under existing rules and procedures, and usually pay little attention to emergent interpretations. As a result, organizations (especially those organizations heavily relying on rules and procedures) tend to terminate “unorthodox” interpretations of uncertainties. Organizations should remain sensitive sensitivity to emerging interpretations of uncertainties.

Overcoming organizational routines that do not work

This research indicates that organizations have a tendency to rely on existing frames to interpret uncertainties (actually most organizations require their members to deal with problems based on existing procedures and routines). Crisis managers should realize that organizations naturally maintain a low sensitivity to emerging uncertainties, which can easily nurture blind spots in sensemaking. Acknowledging the organizational tendency towards certainty and reinforcing of existing institutional routines, crisis managers should:

1. seek regular advice from external advisors with different backgrounds, which helps to create alternative frames to interpret uncertainty;
2. encourage continuous learning through exploring the deficiency of existing institutional routines (if this is not possible in actual practice because the stakes are too high, then extensive use of simulations and role play becomes more important).
3. encourage organizational members to report deviations during the crisis response to speed up the error detection process.

Build a unique organizational capacity: instant/emergent institutionalization

Crises present uncertainties and surprises to organizations. It is impossible to prepare for each and every unknown situation and mitigate the disruption to organizational operations. In the dynamic evolution of a crisis, disruptions to or the collapse of organizational routines might be considered normal for an organization. Disruptions or collapses demand a temporary organization or temporary institutional arrangement to cope with the unknown situation (Lanzara 1983; Schneider

1995). A unique organizational capacity—an instant/emergent institutionalization – fills the gap to help crisis managers better recapture crisis dynamics after disruptions (Boin, ‘t Hart et al. 2005: 62; Ansell and Gingrich 2007).

Instant/emergent institutionalizations require a temporary and quick mobilization of knowledge and resources from various subgroups in the organization and even stakeholders. Organizations should maintain flexibility to switch between existing frames and adopt advice from important stakeholders who might reverse normal routines. They also should encourage cooperation between different sub-groups in the organization and coordinate actively with external organizations to increase the availability of information and enrich alternative interpretations of uncertainties. The mobilization of knowledge and resources might require crisis managers to be “smart” and make alliances with political “enemies” or “opponents” to manage crises jointly (Rosenthal, ‘t Hart et al. 1991).

8.5 Reflections on sensemaking and crisis management in China

Limited availability of data is a barrier to studying crises in China

I became interested in studying managing uncertainties in crisis during my master study, because I personally experienced a crisis in China, the Songhua River pollution crisis. In 2005, an explosion of a chemical factory in Jilin Province caused a spill of poisonous materials into the Songhua River, which led to a shutdown of the water pipe system in Harbin city in Heilongjiang Province (where I studied), with a population of 10 million. The water pollution evolved into an international crisis when the Russian city downstream of the river began to protest against this pollution to their quality of life. The uncertainties regarding the impacts of the pollution and the social panic caused by uncertainties of the crisis in Harbin shocked me and inspired me to explore this topic. This dissertation continued to study uncertainties confronted by response organizations and the way response organizations coped with these uncertainties. However, the limited access to data hindered a further exploration of coping with uncertainties during crises in the Chinese context.

In China, there is a lack of available/accessible records (while official reports, public hearings, media reports and selected monographs used in this dissertation contained a wealth of in-depth information about the response of major crisis responders in the United States). A pilot field research project in 2008 in Wenzhou, a city in Southern China frequently influenced by typhoons, revealed that the Chinese government simply did not have detailed official reports to document the crisis response process. In recent years, the Work Safety Committee of the State Council, an inter-agency committee responsible for managing industrial accidents, has begun to release official reports of only twenty or thirty pages in all without detailed records about the response process. Moreover, the public organizations in China are not as open to researchers as those in the US or in Europe, which makes collecting data relatively time consuming for a four-year Ph.D. study.¹⁹² Crisis research is still in its infancy in China and there are no in-depth monographs documenting the crisis response (Lu, Zhang et al. 2012). The exception might be Qian’s (2005) *The Great Tangshan*

192 The argument is based on lectures given by Stafford sociology professor Zhou Xueguang in the 2013 summer course *Bureaucracy studies* at Peking University, Beijing.

Earthquake. Qian spent ten years to collect data about the governmental response to the 1976 Tangshan earthquake.¹⁹³

Testing western theories in the Chinese context and adapting them

Before using a theory generated in the western context to explain a Chinese phenomenon, testing the appropriateness of the theory in the Chinese context is indispensable. In China, organizational research has been booming in the fields of business administration and sociology. Researchers initiated international dialogues in two ways: testing some general organizational concepts or theories in the Chinese context (such as performance, cross-culture communication, organizational reform and change, and motivation and performance), or interpreting uniquely Chinese phenomena (such as *I-Ching*, *Yin Yang*, *Confucianism*, *guanxi*, *mianzi*, kinship and *danwei*) (Shenkar and Glinow 1994; Peng 2004; Quer, Claver et al. 2007; Fang 2012).¹⁹⁴ Generally speaking, Sensemaking Theory and Classic Institutional Theory, two perspectives that are at the basis of the institutional sensemaking model presented in the thesis, are still novel to most Chinese social scientists.¹⁹⁵ These two theories have not yet been tested or applied in the Chinese context. Chinese researchers have studied Neo-institutionalism, mostly building on Williamson's (2000) and North's (1990) economics perspective. In-depth research focusing on a single public organization in China is still rare, which makes testing and applying Selznick's Classic Institutional Theory nearly impossible based on the available data.

The lack of available research offers grounds for pessimism about the application of the institutional sensemaking model in China. However, the data and knowledge gap provides opportunities for the young generation of researchers in public administration and crisis management. The following section offers reflections about the "Chinese characteristics" of crisis response and sensemaking in crisis.

The recent response to crises in China has demonstrated a powerful mobilization and response capacity in catastrophic situations, such as after the 2008 Wenchuan earthquake. Zhou (2012) described this temporary and quick mobilization and crisis response as "campaign-styled governance" (CSG), which terminates the normal routines of bureaucratic operations during a crisis.¹⁹⁶ CSG can be traced back to the traditional bureaucratic operations of the Qing dynasty (1636-1912). *Emperor Qianlong* relied on CSG to cope with natural disasters and widespread social panic caused by sorcery, that were threatening its regime (Kuhn 1990).

193 In a recent talk with a crisis manager in Ya'an city which was hit by a M7.0 earthquake in April of 2013, I offered my idea about setting up a third-party committee to evaluate their crisis response. The crisis manager showed interests in this idea. Such an evaluation might offer invaluable data for crisis researchers in China in the near future.

194 The English journal *Management and Organizational Review* has become an important medium to facilitate organizational research about China.

195 This is according to my presentation in Chinese academic conferences and personal discussions with colleagues in China.

196 Zhou (2012) only mentioned crisis response in his definition of CSG, and he mostly concentrated on general social movements, such as the Culture Revolution.

CSG has become a governing style in which political resources are mobilized to cope with a situation that is perceived to be beyond the capacities of normal bureaucratic routines by the central government in contemporary China. CSG breaks through the boundaries of organizations and drops normal organizational routines, and concentrates on a temporary central task. CSG is normally initiated by the highest level of authority, such as the emperor or the central government. Relying on centralized authority and the hierarchy in the governing system (which is different from the federal system in the US) and Communist Party line, the highest authority can mobilize every level of bureaucracy, from provinces, prefectures, counties, townships to villages. Often, CSG is initiated by the central government when the perceived impact of a crisis on society is enormous or the catastrophic damage caused by a crisis has become visible to society.¹⁹⁷

Whether CSG will be initiated depends on the sensemaking of the central government. It seems that sensemaking of the central government is influenced by the multiple hierarchies in the Chinese bureaucracy system, which has been demonstrated in the following ways:

Firstly, if a crisis does not come as a shock causing catastrophic damages, the central government still relies on information reported via hierarchies in the bureaucracy system. Local governments generally prefer not to report bad information which might show its in-capacity and erode promotion opportunities for local officials, especially in manmade disasters (Zhong 2007; Peng 2008). The cover-up of crisis situations by local governments slows down or paralyzes the sensemaking of the central government. Sometimes, the central government does not learn of the catastrophic situation until the crisis escalates.

Secondly, the central government's efforts to implement a new policy of reporting crisis information have only had limited success in recent years, and have not enhanced its weak sensemaking capacities. In recent years, the central government has made efforts to prescribe an up-flow information reporting mechanism in different policy domains, such as responding to a pandemic or communicable diseases. However, these policies could not cover every instance requiring a report to central government, especially in case of "unknown unknowns". Thirdly, the government has set up an accountability system to punish those officials who intentionally cover-up information in crisis management. In 2009, the Central Committee of the Chinese Communist Party and the State Council issued the Interim Provisions on the Implementation of the Accountability System for the Leaders of the Party and Government to specify occasions of individual leadership accountability (General Office of the CPC Central Committee and General Office of the State Council 2009). Before the release of this national provisions, local governments had already created their own individual leadership accountability systems. The accountability system assigned too many responsibilities to individual leaders but failed to investigate the "real" causes of crises, which seemed not to work well in preventing the food crisis or the social riots (Lu 2011). For instance, in 2008, the Sanlu milk scandal ended with the resignation of the Mayor of Sijiazhuang and the Director of the General Administration of Quality

197 CSG has not always been successful in crisis response in China. For instance, the central government initiated CSG to restore the food market and reduce social unrest, but it failed to manage the food crisis and social unrest.

Supervision, Inspection and Quarantine. Nevertheless, the milk crisis has persisted until today, becoming a trans-boundary crisis.¹⁹⁸

8.6 Limitations of the study and recommendations for future research

This study has generated a series of propositions based on rich descriptions of four in-depth case studies and a comparative analysis of these four cases. Notwithstanding the richness and accuracy of in-depth case studies, the generalizability of this research is understandably limited. The generalizability of the generated propositions needs to be tested on the basis of more cases and carefully designed quantitative research. However, it is not easy to conduct a large-N test, because it is difficult to find datasets containing information about the institutionalization level of organizations responding to crises and the process of managing crises. Most current research on crisis response is still qualitative, with the Moynihan Institute Transboundary Crisis Research and Analysis Project as an exception, which has collected data on crises and the crisis management process (Svedin 2008). Hopefully, the dataset collected by the Moynihan Institute will become a pillar for future crisis research, and may help to test the generalizability of these propositions.

This research did not distinguish between different phases in the cycle of a crisis. These phases might contribute to the variety in strategies selected to cope with uncertainties. The NASA case illustrates an organization coping with uncertainties in the unfolding phase of a crisis, while the other three cases focus on the response phase. The unfolding phase and response phase after a crisis has broken out involve different levels of pressure for a response organization, which might influence strategy selection. The occurrence of a crisis usually marks a focus of stakeholders' attention on response organizations; even small deficiencies during the response might be amplified by the media and the political opposition, causing external intervention. In other words, organizations might feel more pressure in the response phase than in the unfolding phase. The present research did not consider the impact of crisis phase on strategy selection. Future research in the first place should focus on sensemaking of different organizations in the same crisis phase to exclude the influence of crisis phase and secondly conduct a longitudinal study of an organization responding to a crisis in both phases.

This study did not explore the influence of different types of crisis on sensemaking. In order to accumulate evidence, uncertainty was treated as a broad construct that included any unknown situation for an organization. An organizational response to a manmade crisis might trigger different sensemaking actions than a response to a natural disaster. For instance, BP and LAPD, as the "responsible parties" in manmade crises, rapidly lost legitimacy in the eyes of their stakeholders. During the crisis response, organizations come under close scrutiny by stakeholders, which makes them more vulnerable to external intervention. Future research might further explore whether the type of threatening agents makes a difference for selecting strategies in crisis

198 Due to a lack of confidence in local suppliers of baby milk powder, Chinese customers purchased large amount of milk powder from the Netherlands and Hongkong via personal friends or online shops of *Taobao* (which is an e-business platform like Amazon). The purchase caused a shortage of milk powder in the Netherlands and Hongkong, causing protests by local customers.

sensemaking. In order to do this, crisis cases with the same type of threatening agents can be compared.

Proposition 1 suggests that institutional inertia leads to the selection of a rule-based strategy in the initial stages of organizational sensemaking. Staw and his colleagues (1981) provide a competing explanation of the selection of a rule-based strategy in crises (i.e. the threat-rigidity hypothesis). The threat-rigidity hypothesis suggests that organizations tend to rely on habitual actions in a threatening situation. The threat-rigidity hypothesis does not focus on actions related to coping with uncertainties or sensemaking, but a general organizational action (sensemaking is part of that) can still be considered as the effect of a threat. Future research should further investigate the two explanations and explore the reason for selecting a rule-based interpretation of uncertainty in the initial phase of a crisis. To see whether institutionalization really matters, future research could explore sensemaking in organizations with different degrees of institutionalization, but facing the same threats.

Organizational sensemaking usually starts with rule-based strategies, and discontinuities in the sensemaking feedback loops might (but do not necessarily) trigger a switch in organizational sensemaking strategies. This dissertation has examined whether institutionalization levels and discontinuities in feedback loops contribute to the strategy switch or to rigidity in adhering to a type of sensemaking strategy. The findings suggest that a unique organizational capacity and the failure of a rule-based strategy causing discontinuities in the sensemaking feedback loops determine the shift of sensemaking strategies. Future research might especially focus on the mechanisms triggering the switch of sensemaking strategies in crises if the data are available.

This dissertation has explored the impact of institutionalization on the selection of organizational sensemaking strategies. The interaction between institutionalization and sensemaking actions might reflect a reciprocal influence instead of a single-loop process as identified in the previous section. In other words, there might be another shaping mechanism being left unexplored in this book: how strategy selection in organizational sensemaking affects the institutionalization level in organizations during the response to crises. Previous research, such as Barley and Tolbert's (1997) study, has identified the influence of organizational actions on the change of institutionalization levels. However, empirical research has not yet studied how sensemaking actions shape institutionalization during a crisis. Future research based on in-depth interviews with leaders and staff in crisis response organizations can explore the sensemaking process during a crisis and measure the institutionalization dynamics in such a high velocity situation.

This research did not distinguish between different phases in Weick's sensemaking theory, but relied on visible organizational actions to objectify strategy selection in sensemaking. The sensemaking phases in Weick's theory, especially enactment and selection, could not be observed in reality. Thus, this part of Weick's theory could not be tested. Future research might collect more data to further investigate whether the four phases exist in reality or whether it is only a theoretical model. If these four phases do exist, future research could determine how each phase of the sensemaking model contributes to the variety of sensemaking strategies and the switch of sensemaking strategies in the evolution of crisis response.

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Appendix 1 A list of web sources relevant to this research

<i>Name of the source</i>	<i>Format of the source</i>	<i>Related cases</i>	<i>Web address</i>
Session on the 2010 Gulf of Mexico Oil Spill from The Times-Picayune in New Orleans	RSS	Recent development on the 2010 Gulf o Mexico oil spill disaster	http://www.nola.com/news/gulf-oil-spill/index.ssf/
BBC News - BP oil disaster	RSS	Recent development on the 2010 Gulf o Mexico oil spill disaster	http://www.bbc.co.uk/go/rss/int/news/-/news/special_reports/oil_disaster/
Daniel P Aldrich's blog	RSS	Updating regarding FEMA and emergency management	http://works.bepress.com/daniel_aldrich
LAPD Blog	RSS	Updating regarding LAPD	http://lapdblog.typepad.com/lapd_blog/
NASA Breaking News	RSS	Updating regarding NASA	http://www.nasa.gov/audience/formedia/features/index.html
Recovery Diva	RSS	Updating regarding FEMA and emergency management	http://recoverydiva.com/
BrownOnDisasters	RSS	Former FEMA director Michael Brown's blog	http://brownondisasters.wordpress.com/
DavisLogic - Blogging on Emergency Management and Existentialism	RSS	Updating regarding FEMA and emergency management	http://davislogic.blogspot.com/
Disaster Planning and Emergency Management	RSS	David Alexander's blog on emergency management	http://emergency-planning.blogspot.com/
Disaster Safety Blog	RSS	blog on emergency management	http://disastersafety.typepad.com/disaster_safety_blog/
Disaster Zone: Emergency Management in the Blogosphere	RSS	blog on emergency management	http://emergencymgmt-disaster-zone.blogspot.com/
Disasters and Society	RSS	blog on emergency management	http://disasterandsociety.blogspot.com/
HAZUS.org	RSS	Updating regarding FEMA and emergency management	http://hazus.blogspot.com/
Hometown Security	RSS	Updating regarding local emergency management	http://hometownsecurity.blogspot.com/
idisaster 2.0	RSS	Updating regarding FEMA and emergency management	http://idisaster.wordpress.com/

<i>Name of the source</i>	<i>Format of the source</i>	<i>Related cases</i>	<i>Web address</i>
In Case Of Emergency, Read Blog	RSS	blog on emergency management	http://incaseofemergencyblog.com/
NYT > Gulf of Mexico Oil Spill (2010)	RSS	Recent development on the 2010 Gulf of Mexico oil spill disaster	http://topics.nytimes.com/top/reference/timestopics/subjects/o/oil_spills/gulf_of_mexico_2010/index.html?
NYT > Hurricane Katrina	RSS	Recent development on Hurricane Katrina	http://topics.nytimes.com/top/reference/timestopics/subjects/h/hurricane_katrina/index.html?
NYT > Space Shuttle	RSS	Recent development on the space shuttle program	http://topics.nytimes.com/top/news/science/topics/space_shuttle/index.html?
The Vacation Lane Blog: cumming former FEMA council attorney	RSS	blog on emergency management	http://vlg338.blogspot.com/
FEMA (Federal Emergency Management Agency) Daily Digest Bulletin	Email list	FEMA	fema@service.govdelivery.com
Homeland Security News Wire	Email list	Recent development on homeland security	hsnewswire@newswirepubs.com
Disaster Research News and Natural Hazards Observer by Natural Hazards Center	Email list	Recent development on emergency management	hazctr@colorado.edu
Partnership for Public Service	Email list	Recent development on public agencies	mail@ourpublicservice.org
Journal of Contingencies and crisis management	Academic journal	Recent development on emergency management	http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1468-5973
Journal of homeland security and emergency management	Academic journal	Recent development on emergency management	http://www.degruyter.com/view/j/jhsem
Space policy	Academic journal	Recent development on NASA and space policy	http://www.sciencedirect.com/science/journal/02659646
International Journal of Mass Emergencies and Disasters	Academic journal	Recent development on emergency management	http://ijmed.org

Appendix 2 Figures and tables indicating the flooding areas in New Orleans



Notes: revised from <http://www.nola.com/katrina/graphics/flashflood.swf>

Figure A2-1 A revising version of screenshot of flooding area in New Orleans during hurricane Katrina



Figure A2-2 the landfall point of Hurricane Katina



Figure A2-3 The flooding situation of St. Tammany Parish

Table A2-1 A summarized table of the flooding process in New Orleans

<i>Nr.</i>	<i>Date</i>	<i>Time</i>	<i>Where</i>	<i>Influence areas</i>	<i>What</i>
A	Aug. 28		Wetlands outside levee system	Wetlands and communities outside levee system	High tides created by hurricane
B	Aug. 29	4:30 am	Industrial canal	Both sides of the I-20 high rise	Leaks through damaged gates; flow is minor
C	Aug. 29	5 am	MR-GO levee	Wetlands, towards St. Bernard Parish	Levee sections crumble
D	Aug. 29	6:10 am	Buras	Plaquemines parish	Katrina landfall, 21 feet water wall cross Mississippi river and its levees
E	Aug. 29	6:30 am	Intracoastal waterway's "funnel" and levees	Eastern New Orleans	Overtopped and breached
F			Sections of the 17 th street canal levee wall	Lakeview	Leak through cracks in the wall
G	Aug. 29	6:50am	Industrial canal	Lower 9 th ward and Bywater	Strom surge from the "funnel", water overtops
H	Aug. 29	7:30am	Industrial canal	Upper 9 th ward, Bywater and Treme	Breach of levee wall panels on western side of industrial canal
I	Aug. 29	7:45 am	Industrial canal	Lower 9 th ward, Arabi, and Chalmette	Fall of two floodwall sections on the eastern side of the industrial canal
J	Aug. 39	8:30 am	40-Arpent Canal levee	Poydras, Violet, Meraux and Chalmette	Lake Borgne advanced to St. Bernard Parish's second line of defense, topping the 40-Arpent Canal levee
K			Floodwall on the south side of Lakefront Airport	Lakefront Airport and Eastern New Orleans parish	Topped by surge from Lake Pontchartrain
L	Aug. 29	9 am	London Avenue Canal and Levee	flow is still minor	Surge rises to 10 feet in the canal and levee, start bending, water leak

<i>Nr.</i>	<i>Date</i>	<i>Time</i>	<i>Where</i>	<i>Influence areas</i>	<i>What</i>
M			Orleans Avenue Canal	City park	6 feet lower than the floodwalls. Water tops the embankment and pour into city park
N	Aug. 29	9:30 am	I-wall panels on the eastern side of London Avenue Canal	Gentilly	Levee failed
O	Aug. 29	9:45 am	17 th Street Canal levee wall panels	Lakeview , midtown New Orleans and parts of Metairie	Levee failed
P			Slidell landfall	St. Tammany Parish neighborhoods: Rigolets, Slidell, Lacombe, Mandeville, and Madisonville	Storm surge is 15 feet at the shoreline of Lake Pontchartrain
Q	Aug. 29	10:30 am	I-wall panels on the western side of London Avenue Canal	Gentilly	Levee fails
R			Unstaffed pumping system	Jefferson parish	Rainwater leaks
S	Until midday of Sep. 1		Lake Pontchartrain		Swollen from the lake

Summary

This dissertation studies the variety in organizational strategy selection when coping with critical uncertainties during a crisis. Dealing with uncertainty is an essential part of any crisis response, and poses enormous challenges to crisis managers and response organizations. In dealing with uncertainties, some organizations rely on organizational routines developed over time, while some others analyze uncertainty in an ad hoc way to provide a workable interpretation of that uncertainty. The research question of this dissertation, therefore, is why some organizations select a rule-based strategy to cope with uncertainties whereas others follow a more ad hoc-based strategy.

To answer this question, this study formulated and applied an institutional sensemaking model to explain the selection of strategies to cope with uncertainties during a crisis. The institutional sensemaking model integrates sensemaking theory and institutional theory. Weick's sensemaking theory provides a general explanation of organizational processes of coping with uncertainties, identifying two basic strategies of dealing with uncertainties: a rule-based strategy and a specific-based strategy (Weick 1979; Weick 1995). This study builds on the insight that organizational sensemaking might vary in different organizational contexts, which are defined by different levels of institutionalization (Jepperson 1991; Tolbert and Zucker 1996). This research aims to explore how different levels of institutionalization influence the selection of organizational sensemaking strategies during a crisis, thus explaining the selection of different strategies to cope with uncertainty in crises.

The empirical chapters describe four major crises in the US and the major response organizations in these four major crises. The organizations are selected based on the level of institutionalization. A distinction is made between the internal and external dimensions of institutionalization. This leads to a typology: the *Organization* (with a low level of institutionalization on both the internal and external dimensions), the *Institution* (with a high level of institutionalization on both the internal and external dimensions), the *Mythical Organization* (with a high level of external institutionalization but its internal institutionalization remaining low), and the *Arrogant Organization* (with a high degree of internal institutionalization and a low level of external institutionalization). The *Organization* type is filled by the Federal Emergency Management Agency (FEMA) in the 2005 New Orleans Flood, the *Institution*, *Mythical Organization*, and *Arrogant Organization* are filled by the National Aeronautic Space Administration (NASA) in the 2003 Space Shuttle *Columbia* Disaster, the Los Angeles Police Department (LAPD) in the 1992 Los Angeles riots, and BP in the Deepwater Horizon Oil Spill in 2010 respectively.

The four case-studies concentrated on uncertainties that the organizations encountered during their response to the crisis and on sensemaking actions to cope with these uncertainties. Based on the collected data, the influence of institutionalization on organizational sensemaking strategies during the response to a crisis was analyzed. After synthesizing findings from four case-studies and making a comparison among them, the results show that the influence of institutionalization on organizational actions does not follow institutional logic which would suggest that: highly institutionalized organizations rely on routines to cope with problems at hand while organizations with low levels of institutionalization resort to ad hoc analysis to make sense of uncertainty in

times of crisis. Instead, the dissertation formulates an institutional sensemaking process model.

The model can be translated into the following concrete insights:

Firstly, it was demonstrated that the level of institutionalization does not make a difference for strategy selection in the initial phase of responding to crises. Organizations in the midst of deinstitutionalization still engaged in rule-based actions based on long-sliding procedures. Secondly, the empirical results show three rigidity effects in the selection of sensemaking strategies after organizations had faced the failure of their selected strategies.

- Organizations with low levels of institutionalization stick to rule-based sensemaking after failing to interpret uncertainties based on existing frames. Although experiencing failures, these organizations with low levels of institutionalization attribute the failure of rule-based sensemaking to weak external support instead of the ineffectiveness of existing frames.
- Highly institutionalized organizations persist in their selected strategies after experiencing the failure of specific-based sensemaking. These organizations rely on their unique organizational capacities to exclude the possibility of external intervention, and insist on a trial-and-error way of working to interpret uncertainties.
- Highly institutionalized organizations make contradictory interpretations of an uncertainty, creating intra-organizational tensions between different sub-groups. These sub-groups stick to their selected strategies, and this finding confirms that the effect of the invulnerable mindsets in a highly institutionalized organization makes it hard to tolerate deviation from institutional procedures (Wicks 2001). Even if the deviating sub-group (institutional challenger) resists the routine procedures, the sub-group fails to oppose the institutional procedures publicly. Instead, the sub-group turns to non-institutional channels to prove the inappropriateness of existing rules and procedures.

Third, this study describes how the discontinuities in the feedback loop of sensemaking trigger a switch of sensemaking strategies. The discontinuities do not necessarily cause the switch of sensemaking strategies, but interact with institutionalization to contribute to the switch of sensemaking strategies.

- This study identifies a condition that reflects Moynihan's (2012) findings in his recent study on organizational cultural switch in crisis response, and adds another condition contributing to the switch from a rule-based strategy to a specific-based strategy. Moynihan (2012: 864) suggested that "culture switching is likely to occur if a dominant cultural assumption limits the ability of the organization to respond to challenges". This study finds that the switch from a rule-based strategy to a specific-based strategy occur when the failure of rule-based sensemaking shocks the organization and helps the organization to recognize the failure of existing frames to interpret the uncertainty. The discontinuity provided by failures of existing frames results from existing cultural assumptions limiting organizational response according to Moynihan. Moreover, this study identifies another condition conducive to a switch in sensemaking strategy: an autonomous status resulting from its unique organizational capacities. The autonomous status may prevent intervention from stakeholders, which enables an organizational switch in sensemaking strategies. This would be impossible if the organizational response were taken over by the authorities.
- Besides an active switch in sensemaking strategies, a second type of switch in sensemaking strategies can be discerned. This occurs after external intervention due to the organizational

failure to cope with the crisis. The external intervention signifies the failure of the organizational response to the crisis (at least in the eyes of stakeholders) and reflects a loss of legitimacy among stakeholders, after which organizations have to interpret uncertainties within boundaries imposed by intervening stakeholders.

Fourthly, this study shows that several institutional elements are salient in determining whether organizations act according to institutional procedures.

- A unique organizational capacity helps organizations maintain their autonomy, even if the crisis has already caused the erosion of external legitimacy.
- In an organization in deinstitutionalization, the way of working imposed by the organizational environment is no longer adequate when a crisis breaks out, and the organization tends to return to its way of working before deinstitutionalization. The organization shows rigidity in its adherence to the way of working before deinstitutionalization.

Fifthly, the vulnerability to intervention by stakeholders depends on the level of institutionalization. During a crisis, organizations are vulnerable to criticism by stakeholders, and continuous failures easily trigger intervention by the authorities. Organizations with a high degree of external institutionalization can maintain operations without external intervention longer than organizations with a low level of external institutionalization. However, continuous failures make intervention by authorities inevitable.

Finally, this study -at least partially- confirms the improvisation paradox proposed by Boin, 't Hart et al.(2005: 56): "when employees realize that a crisis demands the services of their organization, the accompanying uncertainty nurtures a reliance on institutionalized response modes. However, these modes were never designed or tested with the crisis at hand in mind". All four cases show that organizations start with institutionalized response modes to cope with uncertainties. However, they also show that organizations with different degrees of institutionalization perform differently in terms of enabling or constraining improvisation in such a highly volatile condition. The empirical findings show that two types of institutional conditions trigger the paradox of improvisation, thus constraining the improvisation:

- In a highly institutionalized organization, leaders tend to rely on routine procedures in crisis response, even if operators demand improvisation to cope with an emerging uncertainty. These leaders show low tolerance for improvisation to cope with an emerging uncertainty, and rely on their institutionalized response mode.
- Although the routine way of working has resulted in failure, leaders in organizations with a low level of institutionalization still try to maintain the institutionalized response mode. The operators might improvise; however, these improvisations are likely to fail in the end due to a lack of support by stakeholders or weak organizational capacities.

The empirical research identifies an institutional condition enabling improvisation when responding to a crisis. A unique organizational capacity that others do not have can help an organization with a high level of internal institutionalization to keep its autonomy in responding to the crisis; meanwhile, the organization has to realize that its plans may have become "fantasy documents". The dissertation provides implications for crisis managers in coping with uncertainties during

crises. Firstly, crisis managers should realize that an organization is unlikely to adopt the right strategy to cope with crisis uncertainties straight away, and failures and discontinuities occurring in the feedback loops are normal parts of the sensemaking process in crises. Therefore, organizing information received in the feedback loops of sensemaking is an essential task for crisis managers. Secondly, crisis managers should realize that organizations naturally maintain a low sensitivity to emerging uncertainties, which can easily nurture blind spots in sensemaking. Acknowledging the organizational tendency towards certainty and reinforcing of existing institutional routines, crisis managers should actively enrich the source of advice, and encourage continuous learning through exploring the deficiency of existing routines. Thirdly, crisis managers should realize that it is impossible to prepare for each and every unknown situation and mitigate the disruption to organizational operations. Acknowledging the inevitable occurrence of disruptions, a temporary organization or temporary institutional arrangement to cope with the unknown situation becomes extremely important for crisis managers. Instant/emergent institutionalizations require a temporary and quick mobilization of knowledge and resources from various subgroups in the organization and even stakeholders.

Samenvatting

Dit proefschrift gaat over de variëteit in strategieën die gekozen worden als organisaties geconfronteerd worden met kritieke onzekerheden tijdens een crisis. Omgaan met onzekerheid vormt een essentieel onderdeel van het managen van iedere crisis, en stelt crisismanagers en organisaties die betrokken zijn bij de crisisbeheersing voor enorme uitdagingen. Bij het omgaan met onzekerheid gaan sommige organisaties uit van vaste procedures die in de loop van de tijd ontwikkeld zijn, terwijl andere de onzekerheid ad hoc analyseren en interpreteren om tot een werkbare oplossing te komen. De onderzoeksvraag van dit proefschrift is waarom sommige organisaties een op regels gebaseerde strategie kiezen om met onzekerheid om te gaan, terwijl andere meer op ad-hocbasis te werk gaan.

Om deze vraag te beantwoorden is een institutioneel sensemakingmodel ontwikkeld en toegepast. Dit model verklaart de keuze van strategieën om met onzekerheden om te gaan tijdens een crisis. Het institutionele sensemakingmodel integreert elementen van de sensemakingtheorie en de institutionele theorie. De sensemakingtheorie van Weick biedt een algemene verklaring van organisationele processen die een rol spelen bij het omgaan met onzekerheden en onderscheidt twee fundamentele strategieën om met onzekerheden om te gaan: een op regels gebaseerde strategie en een specifiek op de situatie toegesneden strategie (Weick 1979; Weick 1995). Dit onderzoek gaat uit van de gedachte dat sensemaking (het duiden van gebeurtenissen en verschijnselen) in organisaties afhankelijk is van de organisationele context die gedefinieerd wordt door de mate van institutionalisering (Jepperson 1991; Tolbert and Zucker 1996). Het doel van dit proefschrift is om te onderzoeken in hoeverre de mate van institutionalisering van invloed is op de keuze van sensemakingstrategieën in organisaties tijdens een crisis, en daarmee de variëteit in strategieën die gekozen worden bij het omgaan met onzekerheden in crises te verklaren.

De empirische hoofdstukken beschrijven vier grote crises in de VS en de belangrijkste organisaties die bij de crisisbeheersing betrokken waren. De organisaties zijn gekozen op basis van de mate van institutionalisering. Er wordt onderscheid gemaakt tussen de interne en externe institutionalisering en dit vormt de basis voor de volgende typologie: de *Organisatie* (met een laag institutionaliseringeniveau op zowel de interne als externe dimensie), de *Instelling* (met een hoog institutionaliseringeniveau op zowel de interne als externe dimensie), de *Mythische Organisatie* (met een hoog extern institutionaliseringeniveau maar een laag intern institutionaliseringeniveau), en de *Arrogante Organisatie* (met een hoge mate van interne institutionalisering en een lage mate van externe institutionalisering). De Federal Emergency Management Agency (FEMA; het Amerikaanse bureau voor rampenbestrijding) die tijdens de overstromingen in 2005 in New Orleans een belangrijke rol speelde is gekozen als voorbeeld van het type *Organisatie*. De NASA (National Aeronautic Space Administration), hoofdrolspeler ten tijde van de ramp met de Space Shuttle *Columbia* in 2003 representeert de *Instelling*. De politie van Los Angeles (Los Angeles Police Department; LAPD) die de rellen die in 1992 in Los Angeles uitbraken het hoofd moest bieden is gekozen als voorbeeld van de *Mythische Organisatie*, en oliebedrijf BP dat zich geconfronteerd zag met de explosie op boorplatform Deepwater Horizon die een grote olieramp teweegbracht in de Golf van Mexico in 2010, fungeert als voorbeeld van de *Arrogante Organisatie*. De vier casestudy's zijn gericht op onzekerheden waarmee de organisaties te maken kregen bij

het bestrijden van de crisis en op de sensemaking die plaatsvond binnen de organisaties om greep te krijgen op deze onzekerheden. Op basis van de onderzoeksgegevens is de invloed van institutionalisering op sensemakingstrategieën binnen de organisaties tijdens de crisisbeheersing geanalyseerd. De gegevens van de vier casestudy's zijn naast elkaar gelegd en met elkaar vergeleken. Uit de resultaten blijkt dat de invloed van institutionalisering op het handelen van organisaties anders is dan op grond van institutionele logica verwacht kan worden. De verwachting was dat sterk geïnstitutionaliseerde organisaties op basis van vaste procedures omgaan met problemen die zich voordoen, terwijl organisaties met een laag institutionaliseringeniveau op ad-hocbasis de problemen analyseren en proberen greep te krijgen op onzekerheden in een crisis. Op basis van de resultaten is een model van het institutioneel sensemakingproces ontworpen. Het model vormt de weerslag van de volgende concrete inzichten:

Ten eerste is aangetoond dat de mate van institutionalisering geen effect heeft op de keuze van een strategie in de beginfase van de crisisbeheersing. Ook organisaties die in een stadium van deinstitutionalisering verkeerden handelden op basis van regels en vaste procedures.

Ten tweede tonen de resultaten drie vormen van rigiditeit in de keuze van sensemakingstrategieën nadat organisaties geconfronteerd waren met het falen van hun aanvankelijk gekozen strategie.

- Organisaties met een laag institutionaliseringeniveau houden vast aan sensemaking op basis van vaste regels als het niet lukt om onzekerheden te interpreteren op grond van bestaande denkkaders. Deze strategie werkt niet, maar organisaties met een laag institutionaliseringeniveau schrijven het falen van sensemaking op basis van vaste regels toe aan een gebrek aan externe ondersteuning in plaats van aan het feit dat bestaande denkkaders niet effectief zijn.
- Sterk geïnstitutionaliseerde organisaties volharden in de gekozen strategie als een specifiek op de situatie toegesneden sensemakingstrategie niet blijkt te werken. Deze organisaties gaan ervan uit dat hun unieke capaciteiten de mogelijkheid van externe interventie uitsluiten, en interpreteren onzekerheden op basis van trial-and-error.
- In sterk geïnstitutionaliseerde organisaties komen tegenstrijdige interpretaties van onzekerheden voor, wat tot spanningen tussen verschillende subgroepen binnen de organisatie leidt. Deze subgroepen houden vast aan hun gekozen strategieën, en dit resultaat bevestigt dat onkwetsbare mindsets in een sterk geïnstitutionaliseerde organisatie ervoor zorgen dat het moeilijk is om afwijkingen van institutionele procedures toe te staan (Wicks 2001). Als de afwijkende subgroep (de institutionele uitdager) zich al verzet tegen de vaste procedures, zal deze subgroep dat niet openlijk doen. In plaats daarvan maakt de subgroep gebruik van non-institutionele kanalen om de ontoereikendheid van bestaande regels en procedures aan te tonen.

Ten derde beschrijft dit onderzoek hoe de discontinuïteit in het feedbackproces van sensemaking een verandering van sensemakingstrategieën uitlokt. De discontinuïteit leidt niet noodzakelijkerwijs tot een verandering van sensemakingstrategieën, maar interacteert met institutionalisering en draagt zo bij aan de verandering van sensemakingstrategieën.

- Dit onderzoek wijst op een factor die de resultaten van Moynihans (2012) recente onderzoek naar een culturele omslag in organisaties bij crisisbeheersing weerspiegelt, en voegt nog een factor toe die bijdraagt aan de omslag van een op regels gebaseerde strategie naar een specifieke strategie. Moynihan (2012: 864) stelt dat een culturele omslag waarschijnlijk zal

optreden als een dominante aanname binnen de cultuur de mogelijkheden van een organisatie beperkt om te reageren op uitdagingen. Uit dit onderzoek blijkt dat er een omslag van een op regels gebaseerde strategie naar een specifieke strategie optreedt wanneer het falen van sensemaking op basis van regels een schok veroorzaakt in de organisatie en helpt om te erkennen dat bestaande denkkaders niet toereikend zijn om de onzekerheid te interpreteren. Volgens Moynihan is de discontinuïteit die veroorzaakt wordt door de ontoereikendheid van bestaande denkkaders het gevolg van bestaande culturele aannames die de mogelijkheden van organisaties om te reageren beperken. De andere factor die volgens dit onderzoek leidt tot een omslag in de sensemakingstrategie is een autonome status die het gevolg is van unieke capaciteiten van een organisatie. De autonome status kan interventie door belanghebbenden voorkomen, wat een organisatie in staat stelt om een andere sensemakingstrategie te kiezen. Dit zou onmogelijk zijn als de autoriteiten de crisisbeheersing zouden overnemen.

- Naast een actieve verandering van sensemakingstrategie kan er nog een tweede type verandering van sensemakingstrategie onderscheiden worden. Deze verandering treedt op na een externe interventie omdat de organisatie niet in staat is gebleken om de crisis te beheersen. De externe interventie wijst op het falen van de organisatie in de crisisbeheersing (in ieder geval in de ogen van belanghebbenden) en weerspiegelt een verlies aan legitimiteit onder belanghebbenden, waarna organisaties onzekerheden moeten interpreteren binnen de grenzen die gesteld worden door deze belanghebbenden.

Ten vierde blijkt uit dit onderzoek dat verschillende institutionele elementen een rol spelen bij het bepalen of organisaties handelen volgens institutionele procedures.

- Unieke capaciteiten helpen organisaties om hun autonomie te behouden, zelfs als de crisis de externe legitimiteit al heeft aangetast.
- Als een organisatie een deinstitutionaliseringproces doormaakt, voldoet de werkwijze die wordt opgelegd door de omgeving van de organisatie niet meer als er sprake is van een crisis, en dan hervat de organisatie doorgaans de werkwijze van voor de deinstitutionalisering. De organisatie toont rigiditeit door vast te houden aan de werkwijze van voor de deinstitutionalisering.

Ten vijfde is de kwetsbaarheid voor interventie door belanghebbenden afhankelijk van de mate van institutionalisering. Tijdens een crisis kunnen organisaties te maken krijgen met kritiek door belanghebbenden en als ze voortdurend falen is er een grote kans op interventie door de autoriteiten. Organisaties met een hoge mate van externe institutionalisering kunnen langer blijven functioneren zonder externe interventie dan organisaties met een lage mate van externe institutionalisering. Als een organisatie er echter keer op keer niet in slaagt om de crisis te beheersen, wordt interventie door de autoriteiten onvermijdelijk.

Ten slotte bevestigt dit onderzoek – in ieder geval gedeeltelijk – de improvisatieparadox van Boin, 't Hart et al. (2005: 56): “als medewerkers merken dat een crisis de diensten van hun organisatie vereist, zijn ze door de daarmee gepaard gaande onzekerheid geneigd te vertrouwen op een geïnstitutionaliseerde aanpak. Deze aanpak is echter niet ontworpen en nooit getest voor deze crisis”. Uit alle vier de casestudy's blijkt dat organisaties beginnen met een geïnstitutionaliseerde aanpak als ze geconfronteerd worden met onzekerheden. Het blijkt echter ook dat organisaties

die verschillen in institutionaliseringniveau ook verschillen in improvisatievermogen in zulke onvoorspelbare omstandigheden. Uit de onderzoeksresultaten blijkt dat de improvisatieparadox optreedt onder twee typen institutionele voorwaarden die daarmee het improvisatievermogen beperken:

- In een sterk geïnstitutionaliseerde organisatie hebben leiders de neiging om te vertrouwen op vaste procedures bij de crisisbeheersing, ook al vragen medewerkers om improvisatie als ze geconfronteerd worden met onzekerheden. Deze leiders staan niet open voor improvisatie bij het omgaan met onzekerheid, en vertrouwen op de geïnstitutionaliseerde aanpak.
- Hoewel de normale werkwijze niet effectief is gebleken, houden leiders in organisaties met een laag institutionaliseringniveau vast aan de geïnstitutionaliseerde aanpak. De mensen op de werkvloer zullen misschien improviseren, maar deze improvisaties leveren waarschijnlijk niets op wegens een gebrek aan steun van belanghebbenden of tekortschietende capaciteiten van de organisatie.

Het empirisch onderzoek wijst op een institutionele factor die improvisatie mogelijk maakt bij de crisisbeheersing. Een unieke capaciteit die andere organisaties niet hebben kan een organisatie met een hoog intern institutionaliseringniveau helpen om autonoom te blijven bij de crisisbeheersing. Tegelijkertijd moeten zulke organisaties rekening houden met de mogelijkheid dat hun plannen “fantasiedocumenten” geworden zijn.

Dit onderzoek heeft implicaties voor crisismanagers die geconfronteerd worden met onzekerheden tijdens een crisis. Ten eerste moeten crisismanagers beseffen dat een organisatie meestal niet direct de juiste strategie kiest om met onzekerheden om te gaan, en dat mislukkingen en discontinuïteit in het feedbackproces een normaal onderdeel vormen van het sensemakingproces bij crises. Dit betekent dat het ordenen van informatie die naar voren komt in het feedbackproces van sensemaking een essentiële taak voor crisismanagers is. Ten tweede moeten crisismanagers beseffen dat onzekerheden waarmee een organisatie te maken krijgt vaak niet opgemerkt worden in organisaties, wat gemakkelijk kan leiden tot blinde vlekken bij het sensemakingproces. Crisismanagers moeten de neiging tot het zoeken naar zekerheid en het versterken van bestaande institutionele routines erkennen, en actief op zoek gaan naar advies en een continu leerproces stimuleren door de ontoereikendheid van bestaande routines te onderzoeken. Ten derde moeten crisismanagers beseffen dat het onmogelijk is om op elke onbekende situatie voorbereid te zijn en iedere verstoring in het functioneren van de organisatie te verhelpen. Vanuit de gedachte dat verstoringen onvermijdelijk zijn, is een tijdelijke organisatie of een tijdelijke institutionele regeling om met een onbekende situatie om te gaan van groot belang voor crisismanagers. Een instant of zich ontwikkelend institutionaliseringsproces vereist een tijdelijke en snelle mobilisatie van kennis en middelen die aanwezig zijn bij diverse subgroepen in de organisatie en zelfs bij belanghebbenden.

CURRICULUM VITAE

Xiaoli Lu was born on 16 September 1982 in Penglai, China. He completed high school at the Penglai No.1 High School in 2001. He subsequently studied civil engineering management at Harbin Institute of Technology in Heilongjiang province, China. He completed his bachelor and master in 2005 and 2007 respectively. From 2007 to 2011, Xiaoli was a Ph.D. researcher at Leiden University's Institute of Public Administration. During the studies, he was a visiting scholar at Louisiana State University's Stephenson Disaster Management Institute from 2008 to 2009. In the fall of 2011, he continued his Ph.D. research at Utrecht School of Governance, Utrecht University. Since April 2012, Xiaoli has been visiting Tsinghua University's School of Public Policy and Management in Beijing, China, and served as the guest research fellow at the Center for Crisis Management Research.

Xiaoli published in international journals (i.e. *Journal of Contingencies and Crisis Management*, *International Journal of Mass Emergencies and Disasters*, and *Crisis Response Journal*), Chinese journals (i.e. *Journal of Public Management*, *Emergency management in China*, and *Journal of Gansu Institute of Public Administration*) and book chapters. In 2009, he was awarded the 1st Place Winner in the Annual Hazards and Disaster Student Paper Competition for an article for typhoon evacuation in Wenzhou in the 34th Annual Natural Hazards Research and Application Workshop (the first winner from the non-US university). Since 2012, Xiaoli was invited to edit annual sections on crisis management in the *Journal of Public Management*, a premier Chinese journal in public administration.

In 2009, Xiaoli initiated the China Crisis Management Website (www.crisis119.org) as the founding coordinator with 22 other members and volunteers from institutions in six countries. Xiaoli and his colleagues update news, research information, experts' information, conference information and crisis wiki worldwide on a daily basis for the Chinese audience. Based on the network built through the website, Xiaoli co-organized a crisis management conference in January of 2012 in Chongqing, China.

