Analysis of Factors Affecting Successful Decision-Making in Government Under Crisis-Emergency Situations: A Comparison Between Survey and AHP Analysis Based on Allison Model

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Ⅰ. Introduction

One of the important elements determining the government's trust is its capability to manage crisis situations(Lee Dong-gyu and Min Yeon-kyung, 2015). In fact, when large-scale accidents or disasters occur, whether the risk is clearly perceived and whether appropriate decisions are made to effectively respond to the crisis can be a critical opportunity to gain trust. In the past, disasters like the Sewol ferry[1], Itaewon[2], and the Osong underpass[3] incidents caused severe human casualties due to the failure of initial situation assessments and appropriate decision-making. How well a crisis is managed reflects the government's capability. If the crisis is not properly managed, public distrust in the government increases, and in severe cases, it can even lead to a change in regime. Especially, the start of the government's crisis management capability is proper situation assessment and decision-making. Almost all tasks in the disaster management process can be considered as the decision-making process of the stakeholders involved(Oh Geum-ho, 2007). Among these, the initial decision-making in response to a crisis is much more critical, and the appropriateness of crisis management is decided at this stage. During a crisis, appropriate decision-making can enable the wise overcoming of perilous situations and transform scenarios that could result in unimaginable human and material damage into safe conditions, thereby protecting the lives and property of citizens.

Crisis management decision-making not only involves simple memory, understanding, and application but also requires higher cognitive levels such as analysis, evaluation, and creation(Ronda, 2017). The situation assessment and decision-making in a crisis situation are dynamic and made under stress, so they require mastery of crisis management decision-making and sometimes creative decisions(Kowalski-Trakofler & Vaught, 2003; Ronda, 2017).

The Sewol, Itaewon, and the Osong underpass disasters seem to have resulted from failures in situation assessment and decision-making by individuals or organizations involved in making decisions in urgent situations, either by missing important variables, misapplying priorities, or due to a rigid

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1) On April 16, 2014, the Sewol ferry, carrying 476 passengers from Incheon to Jeju, sank off the coast near Byeongpung Island in Jodo-myeon, Jindo-gun. This major disaster resulted in 304 people being dead or missing.
2) On October 29, 2022, a major crowd crush incident occurred during the Halloween festival in Itaewon, Yongsan District, Seoul, resulting in 159 deaths.
3) On July 16, 2023, due to the collapse of the Mihocheon embankment, the Gungpyeong 2 Underpass in Osong-eup, Cheongju-city, was flooded, resulting in the death of 14 people.

organizational culture.

This paper aims to identify the factors that should be considered during government decision-making in crisis situations and to examine their priorities. The theoretical basis for extracting these variables was the three models of Allison(Allison, 1971; Allison & Zelikow, 1999) - the Rational Actor Model, the Organizational Behavior Model, and the Governmental Politics Model - from which the key variables are discussed. These variables, particularly those that can aid government decision-making in crisis situations, should be included in future crisis management systems or manuals and acquired through regular training and education.

Ⅱ. Allison Model and Decision-Making Variables in Crisis Situations

1. Overview of the Allison Model

Allison analyzed the decision-making behaviors of participants from both the United States and the Soviet Union during the urgent situation spanning from October 16 to October 28, 1962, when Soviet leader Khrushchev deployed missiles to Cuba and the Kennedy administration in the US responded with a naval blockade. For this analysis, Allison used three conceptual lenses: the Rational Actor Model, the Organizational Behavior Model, and the Governmental Politics Model. The Allison Model illuminates the complex decision-making processes of a nation during a crisis, highlighting how policy decisions are influenced by various factors, and allowing a deep analysis of national interests, organizational goals, and participants' stakes.

- The Rational Actor Model views a nation as a single rational actor, where decision-making involves choosing the most effective means to achieve a goal.
- The Organizational Behavior Model views a nation as a conglomerate of sub-organizations, where decision-making importantly follows the standard operating procedures(SOPs) set by individual organizations.
- The Governmental Politics Model views a nation as an arena for the political actions of individual actors, where decision-making results from interactions such as personal or organizational representatives' political negotiations.

Following the publication of the Allison Model, these three models have been internationally recognized and validated through case studies in various research fields and have been continuously reevaluated(Bendor & Hammond, 1991; Rosati, 2000; Kuklick, 2001). In Korea, these models have also been used to analyze military, political, and policy decision-making processes at both the national and local levels, proving the utility of this analytical framework(Bae Jong-yoon 2002; Heo Chul 2004; Min Gwan-sik 2006; Park Chang-won & Kim Bong-seok 2016; Jang Ik-hyeon 2021).

2. Extraction of Variables from the Allison Model

Studies based on the Allison Model have taken various approaches, from directly applying the model to suggesting applications and improvements for specific models. Most preceding research has employed a methodology that applies the analytical framework proposed by Allison’s models directly to policy phenomena, using comparative variables such as perspective on organization, locus of power, actor's goals, goal sharing, decision modality, and consistency of decisions as basic analytical units(Jung

Jung-gil et al. 2023). In domestic research, most studies have adopted a methodology that involves analyzing specific policy decisions by applying structural variables such as the basic unit of analysis, constituent concepts, dominant reasoning tendencies, general propositions, and evidence, which are the framework taken by the Allison model(Heo Chul 2004; Han Ki-beom 2009; Noh Jin-guk & Lee Keun-wook 2014; Lee Woo-seung 2015; Han Se-eok 2011; Jung Yong-il 2015; Kim Tak 2021). Meanwhile, Lee Sun-hee (2005) constructed question frameworks for each model and proceeded with the analysis. Model I dealt with questions about problems, alternatives, strategic costs and benefits, governmental values, observed patterns of shared principles, and international pressures. Model II focused on organizational structure, behavior, and programs, while Model III dealt with action channels, actors, central actors, deadlines, and confusion.

In this paper, we aim to identify the factors to consider in government decision-making during crisis situations and assess their priorities. The variables derived from the basic assumptions in Allison's three models are presented in Table 1, categorized into those extracted from the basic structure/assumptions and those from behavioral factors.

<Table 1: Variables extracted from the Allison Model>

Category	**Rational Actor Model**	**Organizational Behavior Model**	**Governmental Politics Model**
Variables from Basic Structure/Assumptions	Clarity of Objectives	Standard Operating Procedures	Political Negotiation Capability
	Accuracy of Information	Sub-organizational Goals	Political Power Balance
Behavioral Factors	Consideration of All Alternatives	Effective Communication Between Hierarchies	Organizational Interest Advancement
	Rapid Judgment	Strong Leadership	Top-down Command System
	Practical Implementation	Adherence to Existing Regulations and Procedures	Expert Participation

A general description of the extracted variables is shown in Table 2 below.

<Table 2: Description of Variables in the Allison Model>

Model	Variable	Description
Rational Actor Model	Clarity of Objectives	Clearly setting the objective of national safety
	Accuracy of Information	Acquiring accurate information
	Consideration of All Alternatives	Considering all necessary alternatives
	Rapid Judgment	Making quick decisions in crisis situations
	Practical Implementation	Feasibility of executing decisions according to plan
Organizational Behavior Model	Standard Operating Procedures	Adhering to standardized procedures such as manuals
	Sub-organizational Goals	Prioritizing the goals of individual departments or sub-organizations within the government
	Effective Communication Between Hierarchies	Ensuring sufficient communication between superiors and operational staff
	Strong Leadership	Demonstrating strong leadership
	Adherence to Existing Regulations and Procedures	Operating according to regulations and existing procedures, rather than directives from organizational leaders
Governmental Politics Model	Political Negotiation Capability	Ability of decision-making participants to negotiate politically
	Political Power Balance	Balance among various political forces
	Organizational Interest Advancement	Advancing the interests of specific organizations as represented by decision-makers
	Top-down Command System	A hierarchical command system (Top-Down)
	Expert Participation	Participation of crisis management experts in situation assessment meetings

Ⅲ. Survey Analysis

1. Overview of the Survey

The survey consisted of 15 individual variables questioning, "Do you think this will have a positive impact on the government's successful decision-making in crisis situations?" For example, respondents were asked, "Do you think acquiring accurate information will positively impact successful decision-making in government crisis situations?" Respondents were given five options on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), making it easy to evaluate.

From May 9 to May 22, 2024, responses were collected from 172 employees in the disaster

management sector of the Ministry of Public Administration and Safety.

2. Results of the Survey Analysis

1) Rational Actor Model

For the Rational Actor Model, the sum and average of the responses from 1 to 5 for each variable are as shown in Table 3. The averages for all individual variables exceeded 4 points, indicating that respondents generally perceive them as having a positive impact on successful decision-making in government crisis situations. Among these, the accuracy of information was rated as the highest priority.

<Table 3: Descriptive Statistics of the Rational Actor Model>

Variable	Total	Average	Rank
Clarity of Objectives	808	4.70	2
Accuracy of Information	825	4.80	1
Consideration of All Alternatives	703	4.09	5
Rapid Judgment	715	4.16	4
Practical Implementation	759	4.41	3

2) Organizational Behavior Model

The responses to the variables of the Organizational Behavior Model are summarized in Table 4. Only the variable of effective communication between hierarchies scored above average. It is not easy to determine that the variables of the Organizational Behavior Model have a positive impact on successful decision-making in government crisis situations without further analysis. Respondents rated effective communication as the highest priority, followed by strong leadership and standard operating procedures.

<Table 4: Descriptive Statistics of the Organizational Behavior Model>

Variable	Total	Average	Rank
Standard Operating Procedures	671	3.90	3
Sub-organizational Goals	470	2.73	5
Effective Communication Between Hierarchies	769	4.47	1
Strong Leadership	671	3.90	2
Adherence to Existing Regulations and Procedures	577	3.35	4

3) Governmental Politics Model

The results of the responses to the variables of the Governmental Politics Model are shown in Table 5. None of the individual variables in the Governmental Politics Model had an average score above 4. It appears that respondents relatively do not see these variables as having a positive impact on successful decision-making in government crisis situations. However, the participation of experts was rated relatively high with a score of 3.91. Upon examining the rankings, respondents rated the participation of experts and the capability for political negotiation relatively highly within the Governmental Politics Model.

<Table 5: Descriptive Statistics of the Governmental Politics Model>

Variable	Total	Average	Rank
Political Negotiation Capability	597	3.47	2
Political Power Balance	520	3.02	4
Organizational Interest Advancement	535	3.11	3
Top-Down Command System	519	3.02	5
Expert Participation	672	3.91	1

4) Overall Statistics of Variables

Table 6 presents the overall statistics of all 15 variables, ranked according to their scores. The variables with the highest rankings were the accuracy of information, clarity of objectives, and effective communication between hierarchies. On the other hand, political power balance, top-down command system, and sub-organizational goals recorded the lowest ranks.

<Table 6: Overall Descriptive Statistics (Rankings) of Variables>

Rank	Variable	Total	Average
1	Accuracy of Information	825	4.80
2	Clarity of Objectives	808	4.70
3	Effective Communication Between Hierarchies	769	4.47
4	Practical Implementation	759	4.41
5	Rapid Judgment	715	4.16
6	Consideration of All Alternatives	703	4.09
7	Expert Participation	672	3.91
8	Strong Leadership	671	3.90
9	Standard Operating Procedures	671	3.90

10	Political Negotiation Capability	597	3.47
11	Adherence to Existing Regulations and Procedures	577	3.35
12	Organizational Interest Advancement	535	3.11
13	Political Power Balance	520	3.02
14	Top-Down Command System	519	3.02
15	Sub-organizational Goals	470	2.73

Ⅳ. AHP Analysis

1. Significance and Survey Method of AHP Analysis

1) Significance of AHP Analysis

The Analytic Hierarchy Process(AHP) analysis assesses the relative importance of items being measured. If a decision-making process leads to a successful outcome, it implies that proper attention was given to items deemed important. Conversely, if a decision proves to be flawed, it can be inferred that insufficient attention was given to critical items or that excessive focus was placed on less important items.

Surveying experts ensures that respondents easily comprehend the content of the survey and provide consistent answers in a complex survey structure because of their in-depth understanding of the specialized issues involved. Answers that maintain consistency in pairwise comparisons of variables enable valid identification of priorities, thereby lending credibility to the analysis results. This paper aims to provide meaningful analysis results to disaster management personnel by highlighting the issues that should be prioritized in government decision-making during crisis situations.

2) Survey Method

(1) Design of Evaluation Structure

For the AHP analysis, variables from each of Allison's three models were selected, with five from each model. These variables were designated as the third tier, the three individual models of Allison as the second tier, and the successful decision-making in government crisis situations as the first tier. The aim was to identify which items among the 15 variables are more crucial in final government decision-making. The structure of each tier and the content of items in the third tier are shown in the table 7 below.

<Table 7: AHP Evaluation Structure>

First Tier	Second Tier	Third Tier
Successful Decision-Making in Government Crisis Situations	Rational Actor Model	Clarity of Objectives
		Accuracy of Information

		Consideration of All Alternatives
		Rapid Judgment
		Practical Implementation
	Organizational Behavior Model	Standard Operating Procedures
		Sub-organizational Goals
		Effective Communication Between Hierarchies
		Strong Leadership
		Adherence to Existing Regulations and Procedures
	Governmental Politics Model	Political Negotiation Capability
		Political Power Balance
		Organizational Interest Advancement
		Top-Down Command System
		Expert Participation

(2) Identification of Importance

For the analysis, disaster and crisis management experts were selected. From May 13 to May 21, 2024, surveys were conducted among 11 individuals currently employed in academia and as executives in disaster management departments. The analysis involved, firstly, assessing the primary level of importance among the Rational Actor Model, Organizational Behavior Model, and Governmental Politics Model by comparing two items from each model for relative importance. Secondly, the secondary level of importance was assessed by comparing pairs of the five items from each of Allison's three models. In pairwise comparisons, a score of 1 indicates no difference, and the highest relative importance is scored as 9.

2. Survey Results(Relative Importance)

1) Priority Analysis by Measurement Area

The relative importance and priorities for each measurement area are organized as shown in Table 8. The consistency index(CR) calculated from the responses of the survey participants was 0.05, which indicates a significant level of consistency.

<Table 8: Relative Importance and Priority by Measurement Area>

Measurement Area	Relative Importance	Priority
Rational Actor Model	0.562	1st
Organizational Behavior Model	0.364	2nd
Governmental Politics Model	0.074	3rd

*Consistency Ratio(CR): 0.05, CR < 0.1 is significant

The relative importance measured shows that the Rational Actor Model is considered the most crucial at 0.562, indicating that it is thought to be highly significant for successful crisis management. The Organizational Behavior Model was also deemed somewhat important with a score of 0.364, while the Governmental Politics Model received a much lower evaluation at 0.074.

2) Priority Analysis by Measurement Elements

The analysis of priorities within each model based on the measurement elements is as follows: For the Rational Actor Model, the details are organized in Table 9. The consistency index is 0.08, which is considered significant. The relative importance shows that the clarity of objectives > accuracy of information > rapid judgment > practical implementation > consideration of all alternatives.

<Table 9: Relative Importance and Priority in the Rational Actor Model>

Measurement Element	Relative Importance	Priority
Clarity of Objectives	0.272	1st
Accuracy of Information	0.227	2nd
Rapid Judgment	0.123	3rd
Practical Implementation	0.100	4th
Consideration of All Alternatives	0.079	5th

***CR = 0.08, Significant**

For the Organizational Behavior Model, details are provided in Table 10. The consistency index is 0.09, indicating a significant level. The relative importance is ordered as standard operating procedures > effective communication between hierarchies > strong leadership > adherence to existing regulations and procedures > sub-organizational goals.

<Table 10: Relative Importance and Priority in the Organizational Behavior Model>

Measurement Element	Relative Importance	Priority
Standard Operating Procedures	0.288	1st
Effective Communication Between Hierarchies	0.217	2nd
Strong Leadership	0.127	3rd
Adherence to Existing Regulations and Procedures	0.109	4th
Sub-organizational Goals	0.059	5th

***CR = 0.09, Significant**

For the Governmental Politics Model, the consistency index is 0.02, indicating a very significant level. The relative importance and priorities are listed in Table 11, showing that expert participation > political negotiation capability > top-down command system > political power balance > organizational interest advancement are ranked from highest to lowest importance.

<Table 11: Relative Importance and Priority in the Governmental Politics Model>

Measurement Element	Relative Importance	Priority
Expert Participation	0.293	1st
Political Negotiation Capability	0.190	2nd
Top-Down Command System	0.161	3rd
Political Power Balance	0.111	4th
Organizational Interest Advancement	0.046	5th

*** CR = 0.02, Significant**

3) Analysis of Composite Weights and Priorities

By calculating the weights through the relative importance of each model and the internal elements, the overall importance of all items was determined. The items were ranked based on their importance as shown in Table 12, where the priorities are ordered from highest to lowest based on composite weights.

<Table 12: Measurement Element AHP Composite Weights and Priority>

Measurement Element	Composite Weight	Overall Priority
Clarity of Objectives	0.2721654	1st
Accuracy of Information	0.2265822	2nd
Standard Operating Procedures	0.2881606	3rd
Effective Communication Between Hierarchies	0.2170552	4th
Rapid Judgment	0.1226965	5th
Practical Implementation	0.0996645	6th
Strong Leadership	0.1269368	7th
Consideration of All Alternatives	0.0788914	8th
Adherence to Existing Regulations and Procedures	0.1091444	9th
Expert Participation	0.2928161	10th
Sub-organizational Goals	0.058703	11th
Political Negotiation Capability	0.1895382	12th
Top-Down Command System	0.160978	13th
Political Power Balance	0.1111466	14th
Organizational Interest Advancement	0.0455211	15th

This table summarizes the combined weights derived from the AHP analysis, reflecting how each element stands in terms of importance when making decisions in governmental crisis situations.

Ⅴ. Comparison Between Survey Analysis and AHP Analysis

1. Comparison of Survey Average Values and Expert AHP Analysis Composite Weight Rankings

Comparing the survey analysis and the AHP analysis, it is evident that there are differences between

the two. As shown in Table 13, the only variable that shares the same ranking in both analyses is 'Rapid Judgment', which is ranked fifth in both cases. For the variable considered most important, 'Accuracy of Information' was prioritized in the survey, whereas the expert analysis via AHP ranked 'Clarity of Objectives' as the most important. In cases where the rank difference is two or less, the evaluations can be considered similar, but differences of three ranks or more suggest differing priorities for the same variables.

<Table 13: Comparison of Survey Average Values and AHP Composite Weight Rankings>

Model	Measurement Element	Survey Average Value Rank	AHP Rank
Rational Actor Model	Clarity of Objectives	2	1
	Accuracy of Information	1	2
	Consideration of All Alternatives	6	8
	Rapid Judgment	5	5
	Practical Implementation	4	6
Organizational Behavior Model	Standard Operating Procedures	9	3
	Sub-organizational Goals	15	11
	Effective Communication Between Hierarchies	3	4
	Strong Leadership	8	7
Governmental Politics Model	Adherence to Existing Regulations and Procedures	11	9
	Political Negotiation Capability	10	12
	Political Power Balance	13	14
	Organizational Interest Advancement	12	15
	Top-Down Command System	14	13
	Expert Participation	7	10

2. Interpretation of Differences Between Survey Analysis and AHP Analysis

The differences between the two analyses can be attributed to two main factors. First, the survey sampled 172 disaster department workers, while the AHP analysis was based on evaluations from 11 experts, suggesting potential bias due to the difference in sample sizes. Second, the survey targeted practitioners directly involved in crisis management at disaster management departments, reflecting a more operational perspective, whereas the AHP analysis incorporated views largely from external

experts, thus possibly reflecting a difference in subjectivity and objectivity.
These differences highlight distinct perspectives on the importance of variables such as 'Standard Operating Procedures', where external experts view proper preparedness and response to crisis situations as crucial, whereas practitioners, faced with the diversity and complexity of crisis situations, may find it challenging to fully encapsulate responses in manuals and thus may not rate the importance of such procedures as highly.

If we analyze the content against this backdrop of differences, it can be summarized as follows. Firstly, the differences in 'standard operating procedures' are considered very important when viewed from the perspective of external experts, as they involve adequately preparing manuals and standard operating procedures for predicting and responding to crisis situations, and appropriately responding based on these standards when a crisis occurs. On the other hand, field crisis managers often face the diversity and complexity of crises that challenge the applicability of any single set of procedures, resulting in a lower importance rating from them. Secondly, concerning 'prioritizing the goals of individual departments or sub-organizations over those of the entire government', both civil servants and experts rank this low, but crisis management officials rate it the lowest. From the perspective of the Ministry of Public Administration and Security, which operates the Central Disaster and Safety Countermeasures Headquarters, prioritizing individual policies that do not align with the joint goals of the department leading the crisis response and the entire government can lead to confusion and damage, and thus, this behavior should be most cautiously avoided. Thirdly, 'decision-makers enforcing the interests of their organizational members from the position of representing a specific organization' ranked lowest in expert AHP analysis. Experts believe that decision-makers should prioritize overarching government views and collaboration rather than narrow organizational interests, which they view as not conducive to effective crisis management. Lastly, regarding the participation of 'Expert Participation' in crisis management, disaster management officials see a greater necessity for this compared to the experts. This difference may stem from the operational frontline's growing need for specialized knowledge in increasingly complex crisis scenarios.

Ⅵ. Conclusion

The survey conducted among public servants involved in disaster management at the Ministry of Public Administration and Safety and the AHP analysis among experts show substantial agreement on many items, although there are some differences in the ranking of specific variables. It is crucial that these priority evaluations be considered in decision-making during government crisis situations. The variables identified from the Allison model as important for successful decision-making should be particularly borne in mind during many recent crisis situations.

First, for successful decision-making in crisis situations, it is paramount that the objective of ensuring the safety of the populace is clearly prioritized, which should prevent the intrusion of other conflicting interests. For example, in situations where flooding is predicted or during events that could escalate societal risk, the clarity of prioritizing the safety of citizens' lives and property should guide the operational posture and preparedness of disaster management personnel.

Second, the acquisition of accurate information is identified as a critical factor. Practically, during crisis management meetings or briefings, the most vital element is an accurate understanding of the nature, type, urgency, and progress of the crisis. Lack of accurate information can distort the understanding of the situation and lead to erroneous decisions, potentially causing grave errors in evacuation or rescue operations. Therefore, establishing a management system that ensures the accuracy and rapid dissemination of information is essential.

Third, the survey underscores the importance of effective communication between superiors and operational staff during crises. When a crisis strikes, ensuring that operational staff who may have critical information are able to contribute to situation assessments and decision-making is vital. Often, important insights remain unshared or unutilized because they are not solicited or because the staff feel unable to express them freely.

Lastly, the importance of having strong leadership and clear operational procedures as identified in the Organizational Behavior Model is reaffirmed. During a crisis, decisive leadership and clear guidelines can help navigate through the chaos and contribute to a more systematic and effective crisis response.

The findings of this study underscore the complexity of decision-making in crisis situations and the variety of factors that need to be considered to enhance the effectiveness of government responses.

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