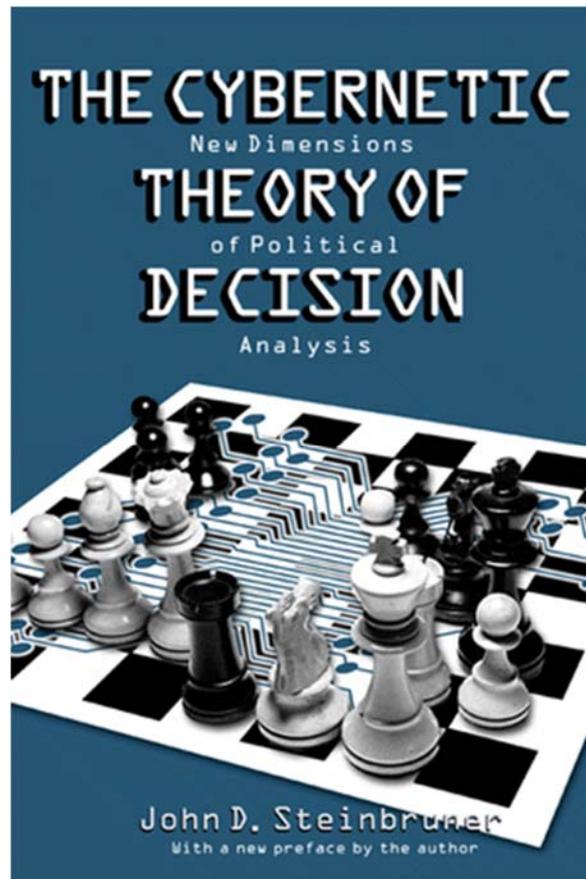


The Cybernetic Theory of Decision: New Dimensions of Political Analysis

(1974)

Reviewed by Lersak Jaturapol



By John D. Steinbruner

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John D. Steinbruner (1941-2015) had a distinguished career as a scholar, policy analyst, and advisor. He graduated from Stanford University in 1963, and received his PhD in political science from the Massachusetts Institute of Technology in 1968. He taught political science at MIT, Yale University and public policy at Harvard University's John F. Kennedy School of Government before joining Brookings. He later became a professor of public policy at the School of Public Policy at the University of Maryland and director of the Center for International and Security. His work focused on issues of international security and related problems of international policy.

Steinbruner wrote a dissertation and books on the “cybernetic theory” of decision-making that have remained references in the field.

The *Cybernetic Theory of Decision: New Dimensions of Political Analysis* has been a well-regarded book about decision-making concepts. Steinbruner presented his decision-making paradigm to challenge the rational model that has been a dominant decision-making concept for decades. Its title appears intriguing, but nevertheless should not be confused with the digital age’s internet terminology. This is a rather difficult book to read and understand, especially for some readers for whom English is not a native language, perhaps due mainly to the author’s extraordinary complicated writing style.

The book is divided into two parts. The first part, titled “Paradigms of the Decision Process”, is about Steinbruner’s three conceptual models of the decision-making process. The second half, titled “The Politics of Nuclear Sharing: 1956-1964”, describes the complicated security relationship and the development of nuclear sharing proposals between the United States and European allies from 1956 to 1964, and the use of multilateral forces mostly under the North Atlantic Treaty Organization (NATO) in post-WWII Europe.

In this book, Steinbruner defined the term “decision” as “a choice made by either an individual or a group of individuals in pursuit of some purpose. The purpose, or value or objective, is included to distinguish decisions from an array of possibilities.” He referred “decision making” as a process which entails a number of “discrete” decisions, some of which actually have the effect or outcome intended while others unintentional happen or are unrecognizable. According to him, the basic ingredients of a decision include options (a set of possible actions from which a choice is made), information (the data and inferential calculations which help determine the choice), and environment (a present or future state of the world which also contributes to the outcome.) (Steinbruner, 1974)

Touching on the topic of public policy decision making, it is inevitable to mention about renowned Graham T. Allison, a former dean of Harvard’s John F. Kennedy School of Government. Allison’s most-recognized book, *Essence of Decision Making: Explaining Cuban Missile Crisis* (Allison, 1971) has continued to be one of the most influential political science works and also one of the most comprehensive analyses of government’s decision-making process. Allison superbly offered post-mortem analyses of US President John F. Kennedy administration’s decision making during the Cuban missile crisis, one of the most challenging crises of the Cold War era, through each of

his three conceptual decision-making models: rational actor, organizational behavior, and governmental politics.

Allison's first model, the rational policy model (Model I), is based on rational choice theory and conceives of states as unitary, purposive actors (monoliths) who make consistent, value-maximizing choices within constraints. A rational decision maker clarifies and prioritizes his or her values, goals, and objectives. Then, all possible ways (alternatives) for achieving those goals are thoroughly investigated with all consequences compared and evaluated. Finally, the policy alternative with the consequences that most closely answer to the goals is chosen.

The second model, the organizational processes model (Model II), conceives a government as a conglomerate of loosely-allied organizations. Consequently, governmental behavior is constrained by the routines or standard operating procedures of these organizations that effectively limit choices to be chosen.

Allison's third model, the bureaucratic politics model (Model III), portrays a government leader being surrounded by many players in a competitive game. These players bargain with other players and government behavior or decisions can be understood as the outcomes of bargaining game or "political pulling and hauling".

Similar to Allison, Steinbruner presented his three decision-making models: the analytic paradigm, the cybernetic paradigm and the cognitive processes. The title of the book "The Cybernetic Theory of Decision: New Dimensions of Political Analysis", appears to suggest the author's preference of the cybernetic paradigm, which he described as potentially useful in understanding how men and organizations comprised of men actually operate in complex environments (Steinbruner, 1974). Nevertheless, it is surprising when he later pointed out that there are shortfalls with cybernetic logic and that it needs to be supplemented with cognitive theory, which explains the operations of the human mind (Steinbruner, 1974). Thus, it is fair to conclude that Steinbruner's preferred model to analyze decisions under uncertainties and complex environments is in fact a combination of the cybernetic paradigm and the cognitive processes.

In the latter part of the book, Steinbruner selected two issues, the politics of nuclear sharing in the post WWII period and the use of multilateral forces in Europe, for analyzing by his conceptual models. Steinbruner used the cybernetic paradigm of decision, combined with the basic understanding of human mental operations developed in cognitive psychology, to analyze the issue of sharing nuclear weapons among the NATO allies in order to present a picture of how decision

makers deal with the intense uncertainty and fundamental value conflicts that arise in bureaucratic politics.

These two study cases, which were on-going complex development and highly technical issues, appear to be less interesting and less exciting than Allison's choice of the Cuban Missile Crisis, which revolved around the Soviet Union's stockpiling of missiles in Cuba and the subsequent naval blockade mounted by the US Navy to prevent further movements of missiles to the island. The two-week crisis was evidently a dynamic and decisive event that caused a direct political confrontation and a military showdown of the two superpowers bringing the world closest to the brink of a full-scale nuclear war.

On the surface, Steinbruner's analytic paradigm may be roughly comparable to Allison's rational policy model or Model I, but they are considerably different in details. The analytic paradigm, according to Steinbruner, is defined as a set of assumptions about how the decision process operates in relation to the complex decision problem. In this process, there must be some kind of value integration, in which the range of possible outcomes for any courses of action are analyzed and evaluated. Each option is usually accompanied with reward benefits and the costs of acting (or not acting) that characterize its value.

In order to reach a decision, the decision maker must make direct calculations by integrating advantages (positive values) and disadvantages (negative values) into an overall subjective value in order to make subjective estimates of occurrence probability of critical events that may involve the trade-offs. It is an attempt to utilize available information to predict the consequences of a given course of action. And with new incoming information, the decision maker makes adjustments to changing conditions or to fine-tune his or her judgments. Steinbruner called this process a "causal learning process" which proceeds by using new information to get a better estimation of critical circumstances and better analysis of the decision problem to enable an integration of more decision objectives and new alternatives. Steinbruner pointed out that casual learning and dynamism of the environment which generates outcome estimates are the hallmarks of the analytic decision process (Steinbruner, 1974).

Steinerbruner held a different view from Allison's monolithic nature of rational decision making. He pointed out that through a sequence of decision points, the analytic decision-making process may shift from an individual level of analysis to a collective level which, however, is done within the framework of the analytic criteria put forward by the individual level. Continuous information

processing enables the decision maker(s) to shape up and improve the process until the optimal choice emerges. A decision is therefore made with degrees of rationality within feasible ranges. Steinbruner evidently rejected the analytic paradigm saying it requires that decision makers have constant and nearly perfect information, which they rarely have, in order to make their decisions. In his view, this paradigm stipulates conditions which can hardly be met and consequently creates unreasonable load requirements on decision makers. He also pointed out that a great challenge to the analytic decision paradigm is an uphill task to integrate its theory into the realities of political life or the sophisticated dimensions of government.

Steinburner argued that the rational approach did not cover all aspects of decision making, especially regarding complex decision problems. He put a lot of emphasis on complexity which fall into one of following conditions: the decision always affects at least two values that have trade-off relations, meaning that realizing one value comes at the expense of the other; the decision is made under conditions of uncertainty, or a state of imperfect correlation between knowledge and the environment; and, lastly, the power to take the decision is scattered among several individual players or organizational units (Steinbruner, 1974).

As a pioneer of the cybernetic approach, Steinbruner claimed that decision makers in complex environments put their efforts to reduce the levels of complexity and uncertainties they are facing. The word "cybernetics" is rooted from Greek κυβερνητική (kybernetike), meaning "governance " (Wikipedia, 2016). Cybernetics as a discipline was introduced in late 1940s by Norbert Wiener who investigated communication and control in all types of organizations. Wiener refers "cybernetics" as self-regulating mechanisms. It is widely known as the theory of communication and control based on regulatory feedback in order to provide a means for examining the design and function of any system, including social systems such as business management and organizational learning, for the purpose of making them more efficient and effective. (Weiner, 1961)

Steinbruner's cybernetic paradigm is based on the assumption of uncertainty control. It also views the decision maker's primary concern is to try to avoid the complexity of external constraints by eluding direct outcome calculations. Simple cybernetic mechanisms, he said, provide solutions to complex and difficult problems without imposing a heavy burden on the decision maker. The decision maker utilizes information selectively, thus avoiding the need to have perfect information.

In summary, cybernetic paradigm, which has been designed to handle uncertainty under complexity and increasingly applicable for examining group decision approach, is based on the following concepts:

1. Cybernetic paradigm explains how simple decision mechanisms produce highly adaptive outcomes under the highly structured hierarchical environment of large organizations with multiple actors.
2. In dealing with complexity and uncertainty, the decision maker employs a central cybernetic idea of “servomechanism” to avoid being overloaded by incoming information by selectively paying attention only to the information that enters through the established and highly-focused feedback channels.
3. In order to simplify complex problems, these problems are dissected, segmented and factored into smaller components. After being fragmented into a large number of very specific problems, they are assigned to be handled by separated decision makers. These decision makers, working in groups, acquire the skills and ability to handle complex problems under very complex environments by using “intuitive approaches” based on the accumulation of past experience.
4. The decision makers avoid the preference ordering of objectives and do not explicitly calculate alternatives and outcomes. They also avoid assessment of non-preferred or irrelevant alternatives and the optimizing process. With their extensive experience, the emphasis is placed on reflexive responses based on previous learning processes. Stored knowledge of experts readily available provides a more flexible tool for supporting quicker decision making, especially in crisis.
5. Senior decision makers focus on providing a response to a sequence of problems that arise from below, and that are defined from the perspective of the subunits, making up an organization. A reasonable adaptive outcome is produced as a result of the collective decision process operated within the long-established organizational routines (which is somewhat similar to standard operating procedures in Allison’s Model II.) (Steinbruner, 1974)

Steinbruner, however, believed that cybernetic process alone does not provide proper explanation for decision making under the complex organizational environment because it appears to overlook the relevant human aspects, involving the human mind and the ability to make inductive

inferences. Consequently, Steinbruner saw that there is a need to supplement cybernetic paradigm with cognitive theory.

In order to perfect the cybernetic model, Steinbruner stressed that cognitive theory, which looks into the human brain performing unconscious nature of information processing, allows cybernetic adjustments to explain decisions that are made under uncertainty. It is based on the assumption that a policy is made by people and that individuals can have an impact on the policy. The cognitive approach emphasizes the importance of examining the actual contents of the beliefs and images held by individuals involving in the policy making process. Consequently, the way in which these people see the world or the so-called cognitive processes (human information processing and learning) should not be underestimated because they are believed to affect their decision making and behavior. In short, one fundamental assumption of this thinking is that beliefs are major sources of behavior and, therefore, help explain or predict human action.

As he put it, “Decision processes based on fundamental operations of the human mind are critical to understanding the behavior of governments and consequently the determination of political events. (Steinbruner, 1974)”

An individual’s cognitive system is made up values, personality, style, preference, intellect, and past experience. They work together to create a belief system which is the individual’s set of images or a collection of beliefs about the world. The belief system influences the perception in which a person selects, organizes, and assesses incoming information concerning the surrounding world. It also impacts the interpretation of incoming information. The belief system helps orient a decision maker to the environment, organizes perceptions as a guide to behavior, helps establish goals, and also acts as a filter to select relevant information in a given situation.

Under the cognitive processes model, a complex decision problem is handled through the following mechanisms:

1. Inferential memory is a memory resulted from a mixture of background knowledge and fresh evidence. Once the relationships of these related components of memory are established, they influence the mental process of drawing inferences to form current conscious knowledge.
2. Consistency means that the mind operates in such a way as to keep internal belief relationships consistent with one another. It also works as a constraint affecting the

organization of memory and the processing of new information. Steinbruner gave a special attention to the question of inconsistency management to handle the conflicts between the incoming information and the internal beliefs.

3. Simplicity and stability which mean that the mind is highly selective about information to which it attends and that which it uses in order to deal with inconsistency. Meantime, cognitive inference mechanisms work to keep the structure of belief as simple as possible by choosing to remember important things and forget insignificant received information. The stability principle asserts that these mechanisms resist change in the well-established core structure of beliefs, frequently resulting in a bias or ignoring contradictory information or selecting only bits and pieces that might be used to support the image already held. The more core structure of a belief is established, the more it resists change.
4. The reality principle enables people to function in a world with boundaries and acceptable behaviors. It works to help people relate to the world through understanding reality and how the world functions that will make them feel good and acceptable by getting things “right”.

Steinbruner’s cognitive processes model helps modify the assumptions of the cybernetic paradigm by taking into consideration of the decision makers’ thinking patterns. He argued that these modifications are necessary because despite operating in conditions of uncertainty most of the time, the minds of the decision makers often operate in a way so as to establish strong beliefs and to act on these beliefs. Decision makers therefore do not construct the careful trade-offs necessary to attain an optimal solution to most policy problems.

Cognitive theory suggests three ways in which uncertainty is subjectively resolved. Firstly, by the reinforcement of information in the memory. In cognitive operations, the general beliefs of a decision maker tend to be strengthened by intermittent success of the prior decisions. Consequently, the beliefs are reinforced and maintain themselves despite weak connections to reality or even contradictions. Secondly, by the operation of inconsistency management utilizing the following mechanisms: drawing simple images and arguments from analogies, wishful thinking, impossibility inferences to block off thorough considerations, and emphasis on negative images or bad consequences. Thirdly, by the effects of small-group interactions with reliance on supportive opinions from a group of peers (Steinbruner, 1974)

According to Steinbruner, there are three concepts connecting cognitive theory to the organization settings of the cybernetic paradigm: grooved thinking, un-committed thinking, and theoretical thinking.

The grooved thinking concept describes the tendency of well-established organizations, having to deal repeatedly with certain situations, eventually take action to develop a set of solutions based on well-founded decision rules. These highly stable patterns of reaction are refined to become ready-made and well-anchored structure to which new problems can be fitted in. The result of this is a fragmentation of a complex decision problem into small pieces to be independently handled by individuals or low-level offices. Consequently, high-level decisions are filtered through the low levels of a policy bureaucracy for implementation. In cognitive terms, encountering repeated decision problems helps cement the experience recorded in memory, thus providing stability and reflecting the reality principle.

The uncommitted thinking concept refers to situations in which decision makers find it difficult to take a clear position regarding the issue at hand. The term also includes cognitive aspects that highlight the uncertainty momentum among decision-makers struggling to manage inconsistency. In these situations, decision makers tend to adopt different positions at different times indicating the reality principle.

The theoretical thinking concept refers to decision makers who are characterized by a high degree of commitment to any faith-based framework clustering around one central value that provides internal consistency and stability over time. High-level commitment to a faith-based framework in the belief system, which has been strengthened and reinforced through subsequent experience, is a useful tool for filtering and processing information, and is a convenient way to cope with uncertainty. (Steinbruner, 1974)

In summary, Steinbruner expressed his confidence that the cybernetic paradigm, which focuses on uncertainty control, together with the cognitive theory, which sees the human brain as the ultimate locus of decision making, can provide an explanation to how decision processes operate for complex policy problems and how public affairs are conducted. However, he cautioned that no theories can perfectly be used to analyze policy problems unless they take into account the political environment in which government is conducted (Steinbruner, 1974). Unfortunately, he did not elaborate this issue. Steinbruner's cybernetic paradigm is non-rational, yet adequately systematic to explain the nature of public policy decisions in the real world of organizational and bureaucratic

politics particularly when combining with the understanding of human mental operations based on cognitive psychology. This book, nonetheless, does offer a realistic and pragmatic framework for examining public policy decision making.

It will be very interesting to apply Steinbruner's preferred decision-making model in analyzing decisions of the White House under President Donald Trump, a controversial real estate tycoon with no experience in running any public office. The first month of his presidency was bumpy, and beset by "sloppiness", bashing tweets, polarization as well as controversies. Trump, branded by many critics as unconventional, unpredictable and arrogant, still has almost four years of his presidency ahead of him, and it will be quite fascinating to see how he makes decisions when he actually runs the US government, which is one of the world's largest and most complicated bureaucratic organizations, and works under the complexity of politics in Washington DC.

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