Information Utilization in Government Decisionmaking

Why and How

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Until recently, information technology was viewed primarily as a means of helping organizations function more efficiently. However, rapid advances in this area are changing the ways in which governments govern, businesses operate, and individuals conduct their daily lives. Increasingly Korean society is moving into an era when all practitioners of public policy will have an IT component. Thus, understanding, directing, and managing information-related activities within government has become critical to the success of government programs and policies. Despite their importance, however, information-related activities have not been systematically examined, not to mention the lack of effort to build a comprehensive theoretical framework. Especially, why and how government officials use information in policymaking still remains open. This study attempts to address a set of issues germane to understanding and improving information utilization in government decisionmaking. First, a so-called knowledge cycle model is briefly presented. This model expects to help readers get a glimpse of how information utilization is related to other activities of information processing. Then, three frequently cited explanations for information use are discussed. In the field of knowledge acquisition, dissemination, and utilization/impact, rational choice theories have been employed as a major tool for understanding activities of information utilization in policymaking. Thus, this study first examines the assumptions dealing with information acquisition and processing in rational actor model. It then puts forward an organizational interest and a communications perspective as alternative explanations for information utilization in government agencies. Finally, a set of policy suggestions for improving information use in government will be drawn from the theoretical explanations. Since this study does not include a rigorous empirical test of the

three theoretical explanations, policy suggestions seem to be hypothetical. However, they expect to show a direction for how to manage information resources, thus to facilitate use of information by government bureaucrats. In this regard, more rigorous studies are needed to improve the current state of art in the field of information utilization.

1. Issues of Agenda

Since we are living in the 'age of information,' information acquisition, dissemination, and utilization have emerged as a major focus for research on bureaucratic behavior (Oh, 1996). Information is now at the core of public administration; information activities became one of the functional domains in organizational research, as are finance, personnel, management, and so forth (Frissen, 1992). As Wenk (1986:95) points out, "In recent decades, the industrial firm has encountered a new challenge. To the concentration of energy and capital, there is now required a concentration of information." He goes on to argue that specialized, proprietary information on product design and manufacturing processes has always been at the heart of successful enterprise in a competitive atmosphere. Here, information is considered property, so companies must develope, expand, and guard their information resources. Insomuch as information plays a critical role in the private sector, broader knowledge is also essential for government management and decision making. Recent efforts of the Korean government to build extensive databases of administrative information is an example for such a trend and organizational need. It is thus important to have a systematic and accurate understanding of information-related activities in government, especially information utilization and its impact.

The idea that information should be used as a basis for govern-
ment action and/or social reform has a longstanding tradition in
the social science. According to Weiss (1978), examples of such
research go back as early as the eighteenth century, for purposes
such as prison reform or social relief for the poor. Although infor-
mation, especially policy research, has different functions over
time, its one timeless and unique feature is that it is expected to
aid directly in the policy-making process. The results of policy
research are meant to provide feedback (or checking points) that
can be used for program development or change as part of a cycle
of policy process (Rich and Oh, 1993). The basic premise of infor-
mation/knowledge utilization literature is that using information for
public policy making is a good thing. Use is good; more use is
better; and increasing use of social research means improving the
quality of government decisions. [1] Thus, whatever the setbacks,
optimism often prevails; social science information should contrib-
ute to sounder and wiser decision making. This optimistic view of
information in the policy process inevitably became the subject of
investigation by government practitioners and by detached schol-
ars, who have produced the beginnings of a research literature on
the production and utilization of information by governments. With
more information available, governments seem to enjoy the luxury
of choice, yet reality tests of that experience do not guarantee
confidence that the quality of government decision making has
kept pace.

Past studies of information utilization in organization and/or in
decision making have generally taken information for granted or
assumed it to be essential and seldom worthy of special attention
(Melody, 1987). If, in some circumstances, information is artifi-

cially restricted, scholars of various stripes generally conclude that it is undesirable. It is also assumed, sometimes naively, that expanded information cannot help but improve the efficiency and effectiveness of any policy-making system mainly on the basis of simple positivism and/or factual efficiency (Jonston, 1983). As Webber (1987:612) points out, "both providers of information and policy makers presume that policy information contributes to a knowledge base that can assist in making sound policies." However, the theoretical rigor and empirical validity of this assumption must be tested. That is, dose the assumption accurately describe the actual behavior of policy makers in government?

Despite the importance of information in the decision making process, recent research generally indicates that governmental policy makers make little use of information (Nelson et al., 1987) ; at best, social science research findings alter policy makers' understandings and/or definitions of policy problems over a long period of time (Rich and Caplan, 1978; Oh, 1996). 2) It seems clear that both practitioners and scholars think that information is not utilized in policy-making as much as it is expected. A recent survey on information sharing and utilization within government agencies and business organizations in Korea shows a similar result. That is, majority of respondents think that information sharing and utilization is not well practiced within their organi- zations (Daily Economy, 1999. 5. 18).

Social scientists have long believed that they can contribute to the pursuit of human welfare (e. g., 'War on Poverty' programs in the Johnson Administration), but they also believe that information is seriously underutilized in important policy decisions. Policy makers, on the other hand, feel that the reports they receive are unintel-

ligible, do not deal with the immediate problems on their agenda, and are not sensitive to the unique pressure for action under which they must perform.

Given the history of information utilization/impact and its importance as well as the tensions between the imperatives of science and those of decision making, the key issues in the development of our knowledge of information utilization and impact must be identified. In that regard, scholars are not simply satisfied with fact-finding about information utilization in policy making. They became more interested in accounting for variations in information utilization and subsequently improving its use in policy making.

By employing a single perspective (e. g., rational action, organizational interest, or communications) and not considering a variety of important variables and their relationships, most past studies, however, provide only a partial explanation of information utilization and processing in policy making. Studies generally account for the phenomena of utilization activities from one of the following three perspectives: [3] (1) the actions of rational decision makers (or rational choice); (2) communication or linkages (e. g., the two communities metaphor); and (3) the product of bureaucratic procedures. Looking at this body of literature, we can easily find that there appears to be rationalistic bias which has dominated the field. Furthermore, the rational choice perspective has been taken for granted as a relevant analytical tool without serious investigation of its empirical validity. Recently, a few alternative explanations have been suggested. For example, a perspective holds that levels of utilization may be best explained by examining routine bureaucratic or organizational roles, cultures, and/or procedures (so called organizational interest perspective).

As a result of single perspective approaches, this area of research lacks a comprehensive framework for information proce- ssing and utilization. Some scholars warn that this field of inquiry faces a crises of identity(Rich, 1991). The situation is further complicated by the fact that, despite voluminous work on the use of information in policy making, little is known about its impact on policy making(Oh, 1998a). Practitioners and/or scholars simply assume that use of information automatically leads to changes in outcomes of policy making and do not explore the dynamic processes and causal linkages of factors involved in the impact of information. It thus seems appropriate and timely that we need to examine several perspectives together as a first step toward building a comprehen- sive framework for the field. [4]

Under the circumstances, the purpose of this study is, first, to briefly describe the so-called knowledge cycle model to help readers understand how information utilization is related to other activities of information processing; and, secondly, to present three explanations for information utilization. That is, the essential assumptions of rational actor model regarding information proce- ssing and utilization are elaborated. And two, frequently cited, alternative explanations(i.e., organizational interest and communications perspective) will be presented. Finally, a set of policy suggestions will be made for improving use of information in government. Further, some theoretical issues are also discussed for future efforts of theory building in the field of knowledge/information utilization in policy making.

2. A Model of Knowledge Cycle and Information Utilization

Looking at the body of literature which consists of research, testimonials, and think-pieces, Rich and Oh(1996) argue that most past studies lack a comprehensive conceptual framework which addresses critical issues associated with various stages of information utilization. While each stage of information processing can be studied as a distinctive agenda for research, a complete understanding of each stage requires knowledge about other related phases of the process of information utilization.

The framework of the so-called knowledge cycle serves this purpose, that is, it illustrates how the stages are related and what constitutes the critical issues at each stage. The 'cycle' begins with 'demand or need for information'; given a specific or more general need for information, the cycle then moves to 'creation or production of information'; from this stage, the cycle moves to 'transmitting or disseminating information'; once information is transmitted, the next part of the cycle is 'utilization, underutilization, or application'; and the final stage of the cycle is 'impact or influence.' For each stage or component of the cycle there are several theoretical and methodological issues that need to be examined and evaluation questions which need to be addressed. This study just briefly touches upon some of such issues. Schematically, one can think of the cycle as it is presented in the figure below. Since this study very briefly presents each stage of the cycle, readers may refer to Rich and Oh's work(1996) for more detailed discussion. The notion of a 'cycle' has several meanings associated with it which are important in explaining why this conceptualization is relevant and appropriate for information studies:

(1) A cycle means a pattern of regularly recurring event;

(2) The cycle implies that the process or subprocesses within it are recursive in nature;

(3) By depicting the process as a cycle, it is consciously being stated that one is not dealing with a step by step linear process; and

(4) The schematic figure is designed to illustrate that the components do not necessarily follow one logically from the other (Innes, 1990) ; it is possible, for example, to transmit information which was not asked for. It is similarly possible to transmit information which is not used. Moreover, transmitting information may lead directly back to a new request for information.

1) Demand or Need for Information (Information Acquisition)

The knowledge or information cycle begins with or is initiated by a request for information. This request may take several different forms. The cycle begins with demand because information is usually disseminated on the basis of some general or specific, real or perceived need for information. Clearly, the motivation for acquiring information may be different. [5] The nature of demands or needs will vary by the type of potential users one is working with (e. g., engineer or scientist), and their background (e. g., education or experience) (Starbuck, 1982). Quite importantly, the nature of need or demand for information will be also influenced significantly by the cost of the information requested or asked for (Bardach, 1984).

Figure 1 ━━━━━
The Knowledge Cycle
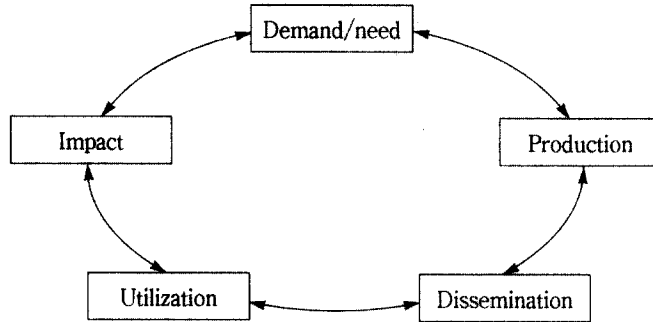
Creation and production of information/knowledge ∶ The creation and production component of the process is important from at least two perspectives∶

(1) When the need which has been defined calls for 'new' research, 'new' analysis, or some 'new' projects, 'new' simply means that the required information cannot be retrieved from a shelf, a database, or someone's files∶ and

(2) When the information is not new, it needs to be synthesized, reanalyzed, or reprocessed in some fashion or form.

These cases of production are to be distinguished from those where the analyst or staff member simply needs to retrieve information which can be presented 'as it is'(or with some minimal modification) to the potential user.

2) Transmitting and Disseminating Information

Once the information need has been defined, and the information requested is created/produced, the relevant question becomes∶ how does a potential user acquire the information or how is the

information available to potential users? Another key issue is: within the knowledge cycle, what is the function of the dissemination stage other than transmitting information from point A to point B? At this stage it is worth noting that potential users receive both information they requested and information which is simply being transmitted to them through computer-based network, newsletters, and bulletins, fax machines, friends and acquaintances, and other channels which they do not initiate. In addition to selecting a specific channel for information search, there is also the issue of the form and/or format in which information is being presented (e. g. , an R&D brief, simple charts, a synthesis, or group briefing).

3) Knowledge/Information Utilization

Although much empirical work has been done in the area of knowledge utilization, there appears to be serious conceptual and methodological gaps which need to be filled (Oh, 1997). Most importantly, there is a need to extend and specify the generalizations which are currently considered to be the 'state of art' in knowledge utilization. For example, while it is clear that some types of information are preferred over others (e. g. , longitudinal data is preferred over cross-sectional, single indicator), there is a need to specify why these choices are being made (Rich and Oh, 1993; Rich, 1991). Likewise, we need to specify why we choose a specific theoretical construction in accounting for knowledge/information use (e. g. , political factors over rationality). There is also a need to examine the validity of a certain theoretical construct in a variety of contexts (Oh, 1997; Wingens, 1990).

4) Impact of Information

The last component of the cycle is impact. The fact that information is used may simply reflect that it was read and understood. It does not reflect that it has had an influence on a decision or a choice which needs to be made. If we are to accurately understand information processing in policymaking, we should examine the impact stage of the cycle. Consequently, in addition to utilization, impact represents a second important outcome variable in the cycle. Moreover, the factors or variables which are assumed to predict utilization are not necessarily the same ones that predict impact (Oh, 1996; 1998a). For example, information which is disseminated from internal sources (e. g., ones' own agency) is used more frequently than that provided by external sources (e. g., outside research institute). However, information from outside sources, when used, tends to have a greater influence on, say, decisionmaking than information from internal sources.

3. Three Explanations for Information Utilization

With some knowledge about how information utilization can be understood in the context of information processing in organization or in the decisionmaking process, a more germane question to this study is why government decision makers are expected to use information, that is, accounting for government officials' behavior in utilizing information in their daily business. Among others, there are three frequently discussed explanations for information use which address a set of factors affecting use of information and, thus, can help us come up with feasible policy suggestions for improving use of information in government.

1) Rationality Perspective

As Aldrich (1993:247) notes, virtually all scholars agree with what he calls the 'fundamental equation' of political behavior, which is that preferences (or values or goals) determine behavior. Rational choice is about just how those preferences determine behavior. Although there is no universally accepted definition of rationality, rational actor, or rational choice theory, most social scientists agree that rational choice should confirm to certain basic requirements. I do not intend to discuss all variations of rational choice theories; rather, I will examine basic elements of rational choice-'basic' because all rational choice theories agree on it.

All 'rational actor' theories in the social sciences try to explain 'choice' by individuals or organizations. According to theories of rational decision making, [6] a human being is a rational actor in the sense that he or she is engaged in the process of 'optimizing' his or her expected utilities (or simply goals) by selecting the course of action with the highest payoff through a comprehensive analysis. All rational actor theories in the social sciences call for a systematic canvassing of possible alternatives, for a systematic analysis of the consequences of each alternative in terms of the values or goals that one wants to maximize and for possible choices to be guided by such analysis. Consequently, to choose the best alternative among a set of available options, a decision maker is necessarily required to evaluate and analyze the consequences of available alternatives. This is where information becomes central to rational choice theories. As March (1988:386) points out, the main rationale for using information in rational decision making is its role in reducing uncertainty in making a choice among a set of policy alternatives. In models which maximize one's utility func-

tion, the lack of information is often perceived as the determinant of seemingly 'irrational actions'(Cook and Levi, 1990). Despite the psychological and other constraints(e. g, cost) in decision making, the notion of bounded rationality also assumes that information is essential in allowing individuals to compare alternatives(March and Simon, 1958). In a similar vein, Elster(1990) points out that if decision makers have little information, rationality requires them to abstain from forming and acting upon estimating possible conse- quences of alternatives.

Regarding information processing, rational choice theories generally assume that all available information about possible consequences of alternative option will be gathered from a variety of sources so that individual decision makers are 'completely' informed of deci- sion situations(Denhardt, 1933). They also assume that information gathered will be used for making decisions, if it is precise, reli- able, and relevant(Elster, 1989; Feldman and March, 1981). In other words, information is being gathered for making decisions rational within the limits of resources and cognitive abilities. It is the structure of the process which makes the decision making process 'rational.' within this structure, one step leads naturally (and auto- matically) to the next. Thus, the critical role of information is just assumed and not tested.

Given these underpinnings of rational choice, what assumptions concerning information acquisition and processing would be needed to maintain the consistency and coherence of rational choice theo- ries? Most of the arguments about the relationship between rational decisionmaking and information revolve around the issue of perfect information. [7] However, this notion of perfect information (or amount of information) is just one dimension of information

processing in organizations and individual decision making. The major underlying assumptions of the rational choice theories (or just rational actor models) with respect to information acquisition, dissemination, and use/impact can be summarized as follows:

(1) The human mind is capable of processing all sources of available information (March and Simon, 1958; Denhardt, 1933) ;

(2) All relevant sources of available information will be searched for and should be applied to a given problem (Feldman and March, 1981) ;

(3) Once information is acquired, it will be widely disseminated to all who 'have a need to know' (Rich, 1991) ;

(4) When the information is collected and disseminated, it will be used if it is sensible and scientifically valid (Huberman, 1987; March, 1988; Nelson et al, 1987) ;

(5) Use of information will lead to a choice among a set of competing alternatives (March, 1988) ; hence, the information will have an impact.

Recently, Oh (1998b) systematically examined the empirical validity of rational choice theories as an analytical tool for explaining use of information in policy making.

By examining each stage of information processing, Oh demonstrates that the assumptions of rational choice theories with respect to information processing in individual decision making do not match with real behavior of decision makers. The empirical findings of information acquisition indicate that individual decision makers search for specific sources of information rather than conduct a wide search of available information. Likewise, at the

dissemination stage of information processing, decision makers share information more with those in their own agencies rather than disseminating it to other actors outside of their agencies. In a similar vein, at the stage of utilization and impact, Oh found that there is no automatic linkage between information acquisition and its use. Further, the relationship between information acquisition and use of it is not linear as assumed in rational choice theories, suggesting that the amount of information acquired does not necessarily get decision makers to use information in decision making. Although there is a positive relationship between use of information and its impact, use of information explains only a very small portion of the variance in the impact of information, and the relationship between the two variables are not linear. This implies that use of information does not necessarily entail simultaneous effects after a certain point of utilization. Even when there is an impact, it is not proportional to use of information. Overall, the findings of Oh's study indicate that individual decision makers do not necessarily process information as assumed in rational choice theories, and that at each stage of information processing, different motives and/or factors may be involved.

2) Organizational Interest Perspective

This perspective derived from the literature on organizations begins with the assumption that organizational rules, structures, tasks, and cultures are essential for understanding information acquisition, dissemination, and utilization. It also assumes that choices with respect to acquiring and using information are predictable: from this assumption, actors make choices which maximize organizational interests (e.g., budget, personnel, or mission) (Halperin,

1974). The bureaucratic literature of the Weberian tradition notes that once bureaucracies began to develop a position of independent power and authority, they devote much of their attention to securing and maintaining their own autonomy, which is often called as 'organizational interest'(Henry, 1995; Rich, 1991). This notion of organizational interest is especially important for our analysis of information acquisition, dissemination, and utilization in governmental bureaucracies because it lies at the foundation of bureaucratic power. Concerned over bureaucratic secrecy and fear of how others might use information, if it were to be shared with them, bureaucrats tend to seek monopolies over control of information. This tendency toward monopolistic control over acquisition, dissemination, and utilization of information is consistent with bureaucratic decision makers' reliance on their own information and rejection of information from external sources. Consequently, in the case of bureaucratic theories, it seems clear that:

(1) Information is essential to the power and prestige of bureaucratic organizations. As a result, use of information is basically instrumental for aintaining or increasing bureaucratic power;

(2) The desire to protect organizational interest affects information produced in bureaucracies and types of information disseminated to other bureaucratic agencies and the public;

(3) Through incentive systems, organizations can control or facilitate use of specific information;

(4) There is thus a tendency to search for a very limited information and to rely on the inventory of information already developed within the bureaucracy. Therefore, information

from external sources (i. e., outside the organization) will rarely
be consulted;

(5) The 'trustworthiness' and the 'credibility' of information
source is essential for use of information. Therefore, selec-
tion of information and consequent use of it will happen
when the information confirms a policy position or interest
already held by a policy maker.

From this perspective, we can now understand the findings of
Oh's study (1998b) presented above. For example, in the case of
information acquisition, decision makers search for information
more from their own agencies rather than touching their decision
base with a variety of sources. These results are quite opposite to
the assumptions of information acquisition in rational choice
theories. However, these results make sense from the organiza-
tional interest perspective. As Weiss (1981) aptly points out, deci-
sion makers in bureaucracies do not always search for all possible
sources of information. Instead, they seek particular types of facts
or opinions from particular types of sources in selective and
strategic ways, ways which might not correspond to what the
rational model predicts. This is because decision makers can trust
information from internal sources and because information from
internal source is believed to support their positions on policy
issues or interests of agencies. Likewise, bureaucratic secrecy and
monopolistic control of information may make decision makers less
likely to share information with other decision makers outside their
agencies. It is to a large extent because they do not want to share
sources of potential power with others. Further, at the stage of
information utilization, even the valid and reliable information finds

little use by decision makers. This is because the content of information may be, though scientifically valid, against interests or goals of decision makers' agencies or because it may not be simply useful to decision makers(MacRae and Wilde, 1985; Innes, 1990).

3) Communications Perspective

Communication-related studies of information utilization often begin with the assumption that there is a 'great divide' between the community of science and that of government or politics and that the linkage problem between both communities serves to explain low levels of information utilization(Caplan, 1979; Dunn, 1980; Nelson, et al., 1987; Rich and Oh, 1993; Oh and Rich, 1996; Oh, 1996; 1997). Most communication-related studies take the so called 'two communities metaphor'(Dunn, 1980) as the underlying conceptual framework for their work. Typically, the gap between two communities is expressed in terms of a few factors:

(1) There is great distrust and even antagonism between the two communities(Caplan, 1979; Weiss and Bucuvalas, 1981; Dunn, 1980). It is often observed that considerable tension exists between program officials and researchers. Program officials feel that they have received little help from research. Likewise, researchers are weary of anti-intellectual program managers and their demands for how-to-do-it manuals.

(2) There is a preference for and use of alternative jargon and language in each community(Caplan, 1979; Dunn, 1980; Rich and Oh, 1993). Researchers communicate to their peers in language designed for scholarly journals. Brief, clearly written reports free of terms familiar to those who are

members of particular guild will increase the probability of utilization.

(3) Researchers and bureaucrats operate under substantially different conceptions of time and worldview (Nelson et al, 1987; Rich, 1991). Government officials are accustomed to working on immediate problems and to meeting deadlines; researchers who are rewarded for producing high-quality research see no harm done in delivering a 'better product' a week or even a month after the original delivery date.

(4) It is asserted that researchers need to be more concerned with the needs of government officials and the relevance of research to these needs (Caplan, 1979; MacRae and Wilde, 1985). Relevance may be expressed in terms of the questions being investigated; is it one of interest to the potential users?

One of rational actor model's assumptions is that decision makers use little information when they are provided with little information. However, Oh's study (1998b) shows that the assumption between acquiring information and use of it is not accurate. Unlike rational choice theories, the communications perspective, for example, explains little use of information in decision making in terms of the lack of interaction between decision makers and researchers. The lack of interaction between the two actors may produce information, which does not meet the needs of decision makers and is thus less useful, though scientifically valid and reliable. Interestingly, more than half of the respondents in Oh and Rich's (1996) sample also pointed out that social science information is abstruse and unrelated to the day-to-day problems of

administering mental health policy. They went on to answer that they were thus less likely to use information in the formation of policy. Therefore, information utilization is increased in cases where policy makers has the opportunity to clarify their concerns, results and implications of research through feedback to social scientists.

4. A Comparative Analysis : An Example

At this point, it is appropriate to ask : Which of these three perspectives provides more explanatory power in accounting for different levels of utilization? To examine the relative importance of three different perspectives on use of information, logistic regression is employed because use of information is measured as a dichotomous variable. Based on theoretical underpinnings of each perspective and past studies mentioned earlier, certain variables were chosen for each perspective. Counter-organizational information (i. e., content of information) and organizational incentive systems were chosen for the organizational interest perspective (Weiss and Bucuvalas, 1980; Caplan, 1979; Rainey, 1983). Validity of information and amount of information were selected for the rational choice perspective (Browne and Wildavsky, 1984; MacRae and Wilde, 1985). Interaction between decision makers and researchers, and a composite index of communications (e. g., styles of presentation) were selected for the communications perspective (Nelson et al, 1987; Rich, 1991).[8] Interaction between validity of information and content of information (i. e., counter-organizational information) is also included to see if there actually exists any confounding effects caused by possible interaction between the two variables. As

	B	S. E	Wald	d. f.	sig
Countinfo	-2.830	.959	8.700	1	.003
Comact	4.415	1.766	6.231	1	.012
Interact	-1.424	.458	8.620	1	.003
Incent	-.662	.348	3.606	1	.050
Validinfo	-.094	.532	.031	1	.860
Infofreq	.047	.143	.106	1	.740
Act	.181	.183	.970	1	.324
Constant	-3.831	3.358	1.303	1	.254

Note: Countinfo = information against organizational interest; Comact = composite index for communications; Interact = interaction between counter-organizational information and valid information; Incent = organizational incentive systems for using information. Validinfo = valid information; Infofreq = amount of information; Act = interaction between decision makers and researchers.
-2 Log Likelihood = 126.284, d. f. = 389, sig = .050 (two-tailed test).

illustrated in the table below, use of information at the aggregated level is more affected by factors of the organizational interest and communications perspective than by those of the rational choice theories. Interestingly, the two variables of the rational choice perspective do not have a statistically significant effect on use of information, when they are analyzed together with other variables. This is what Oh's (1998b) study does not elaborate. In assuming 'ceteris paribus,' Oh's study just tested the empirical foundation of the rational choice theory without considering other variables pertinent to use of information in decision making. However, this study examines, even briefly, the explanatory power of the rational choice perspective together with other two perspectives by loosening the ceteris paribus assumption. Interestingly, both factors of the organizational interest have moderate and negative

effects on use of information. 9)

This implies that if the content of information is more against organizational goals or policies, and if there are fewer organizational incentive systems for facilitating use of information, then information is less used by decision makers. Furthermore, the negative effect of the interaction between counter-organizational information and validity of information in the table below indicates that even scientifically valid and reliable information is less likely to be used by decision makers, if the content of information is against the organizational interest. In a similar vein, the composite indicators representing styles/formats of presentation of the communications perspective also has a moderate effect on use of information. This indicates that a proper and easily understandable format of reports facilitates greater use of information. As Nelson and his colleagues(1987) note, policy makers have neither time nor the inclination to read lengthy and complex research report. This points to the importance of short and readable executive summaries that synthesize the research and indicate the implication for policy. Overall, these findings indicate, though brief and exploratory in nature, that use of information is not necessarily determined by decision makers' rational behavior; rather, various factors can influence it.

This example demonstrates that the organizational interest perspective has more relevance in understanding decision makers' behavior of using information than other perspectives do. This finding empirically supports the argument that use of information is a complex political activity within an organization rather than individual rational behavior. As Nachmias(1980) points out, findings of social science research are evaluated within the framework of an

adversary political process in which policy decisions are reached through bargaining, compromise, and trade-offs. Policy makers thus tend to consult the information that is trust-worthy and supports their policy positions or interests of organization(Knott and Wildavsky, 1981; Rich, 1981; Weiss and Bucuvalas, 1980). This study also supports Patton and his associates'(1978) findings that the 'personal' factor(similar to the communications perspective) and the 'political' factor(similar to the organizational interest perspective) have the greatest effect in explaining the utilization phenomena. In general, this result indicates that a closed cycle may exist in information processing. That is, the search process is limited, and when information comes from internal sources, it is more likely to be used. [10]

5. Conclusion : Policy Suggestions and Theoretical Issues

By examining the process of information utilization and discussing three explanations for information use, this study has provided some valuable theoretical and practical insights into the question of whether, when, and under what conditions information is more likely to be used and thus influence government decisionmaking. A cursory empirical test of such explanations illustrates that the so-called rationality model is not a dominant analytical tool for accounting for government officials' use of information; rather information use can be affected by many different factors. Thus, it is naive to simply assume that information, whatever it may be, will be utilized by government officials, should government agencies establish a database. It is because the availability of information is just one of the factors which can affect decision makers to

use information.

One of the challenging tasks in the studies of information utiliza-
tion is, according to van de Vall(1987), to translate research
findings into action, that is, to recommend a set of feasible or
manipulatable measures to increase use of information. This prac-
tice may be an inevitable aspect of applied social science. While
academic researchers are primarily interested in the level of
abstraction of their findings — thus, advancing theory-building,
practitioners or potential users of information in government seem
to be more concerned with the manipulability of their variables.
Maybe, a more interesting and critical question to government
officials is "so what?" or "how information can help them resolve
policy problems?" rather than "do the findings of research con-
tribute to the development of knowledge in a discipline?" In this
regard, the three explanations discussed in the study may enable
us to conjecture some ideas about the factors or conditions which
facilitate use of information by government officials, though the
empirical validity of the factors as well as their relationship is not
sufficiently and rigorously tested here. So the following policy
recommendations may be considered a set of hypothesis, of which
empirical test can be an interesting topic for future study. Further,
the implications of the study partially based on the data about the
mental health area of U. S. A. can be limited in the case of Korea.
Overall, some of the variables in the three explanations have
primarily theoretical consequences, while other are more useful for
practical action. Only some of them, which I think to be manipu-
latable and practically relevant, will be presented below.

1) Identifying Potential Users' Needs and Negotiating an Acceptable Research Plan

When policy makers are directly involved in, say, the formulation of survey questions as part of research, utilization is primarily instrumental; and when involvement is indirect, use seems to be more conceptual. As the organizational interest perspective suggests, negotiation between potential users and providers of information (e. g., researchers) helps ensure that the research under consideration is responsive to needs of potential users, and that the resources for the research will be used to its maximum effect. Representatives of a government agency or department can bring knowledge of the government process to the negotiations. Likewise, researchers as an information provider can bring awareness that their technical expertise is invaluable in finalizing a decision. At this initial stage of information utilization activity in government, it is particularly important to identify and understand potential users' needs for information (Oh, 1998a). Clearly the motivation or need for acquiring or utilizing information may vary, taking on several different forms (e. g., just collecting information, informing himself or herself of a problem, or organizational learning). Further, Costs of information are often higher than assumed and are not limited to financial burden (e. g., time). Potential users thus need to consider how to allocate costs, or which sources (e. g., their own agency or outside sources) to focus on in order to reduce the cost burden.

2) Using Interactive and Timely Reporting Techniques

As illustrated in the communications perspective, the form in which information is passed through the decisionmaking channels is often of greater importance than its content. Forms refers to the length

of a memo, its precision in defining terms, and its ability of relate data to the policy agenda or problem conceptualization of the policy maker. Traditionally, information providers have relied heavily on the development and dissemination of written reports. However, strategies other than written reports can help potential users of information. The development of information and telecommunications technology has made it possible for researchers to use alternatives to written reports. Especially, the use of interactive reporting technique (e. g., teleconference via internet) attracts many decision makers because they may have neither time nor inclination to read reports or documents, even if they are presented in simplified forms free of technical jargon (Chelimsky, 1987).

3) Establishing Ongoing Personal Level Support/Contact

It is well documented, according to the communications perspective, that to improve use of information in government, policy makers should pay a good deal of attention to, and make more investment in, person-to-person communication between potential users of information (e. g., government officials) and information providers (e. g., researchers). Government agencies need to establish effective mechanisms through which regular contacts take place between them and researchers (e. g., participatory actional research in Whyte, 1984). Likewise, good researchers also need to have skills in negotiation, data management, and reporting. Further, researchers especially engaged in monitoring program evaluation should possess knowledge about organizational change and implementation theory, and skills in working with practitioners to implement changes within and/or outside government. As Chelimsky (1991:230) points out, both decision makers and researchers together need to

determine whether the study design proposed will generate information useful enough to make a costly effort worthwhile. More interesting is, however, that personal contacts and support can vary in effectiveness depending on the contexts of application or policy areas. Generally speaking, when decisions are made mainly through bargaining and negotiation among participants, establishing contacts — formal or informal — between information providers and decision makers is critical in getting information accepted and thus utilized. This is because decision makers in such a situation would be interested in certain types of information by which they can justify their policy positions or even neutralize their opponents.

4) Providing Incentives and Rewards for Using Information

As both the organizational interest and communications perspective implicitly suggest, incentives and rewards within government contribute to increasing use of information in the government problem-solving process. Of course, the effect varies depending on the area of application. I feel that there are certain types of behavior that should be rewarded. First is the sharing of information at the inter- and intra-organizational levels. Second is information gathering and utilization activities that can develop and expand the overall knowledge base of government. Third is bureaucrats who are instrumental in rejecting information requests that will burden their agency too much.

5) Establishing an Interface (or Delivery Systems) between Internal and External Sources of Information

As the rationality perspective suggests, government officials may

refer to information acquired and disseminated through a variety of channels, but internal channels (e. g., in-house research agency) is often considered the major source of information. Thus it is important to establish an interface among many sources of information to make the best of it in the policymaking process. Thus, if an organization or a government agency is to involve the development of linkage agents (or knowledge broker) who can couple information to the policy process, these agents have the primary responsibility of delivering specific types of information that policy makers seek. If networks connecting information sources exist, so that these agents can retrieve and disseminate specific information, then they can provide policy makers with such information more quickly and at reasonable costs.

The area of information transmission/dissemination is particularly interesting within the context of the 'knowledge cycle' because transmission can and does occur independent of an identified need and of whether there is a direct request for it. Indeed, in some agencies, many users seem to advocate the theory: if enough information is sent, some of it will be used. In this sense, the delivery system of information is important for both expanding the knowledge base of government and understanding information sharing and exchange behavior. Developing or expanding the government knowledge base is particularly important to prepare for the changing environment of government decisionmaking. The policymaking agenda changes daily; information is thus collected to meet the immediate short-term needs and is stored for possible use in addressing new problems as they arise. I have already noted that researchers and policy makers have different conceptions of time (recall the two communities metaphor). Policy makers

prefer to have limited information while they can use it rather than a completed study after the deadline has already passed for a decision. Therefore, getting information ready is a necessary condition for government officials to use information. In this regard, building an interface between internal and external sources of information can assist government agencies to ensure that more policy research is done which can provide possible solutions as well as early warning messages, especially in the topical areas highest on their own agenda, and that a variety of information can be ready for retrieval. In this sense, the current effort of the Korean government to establish so-called databases of administrative information for common use by a broad range of agencies is of great importance as an indicator of monitoring the effect of programs on administrative informatization so far. Since how to build such an interface and what type of it is more effective is not the scope of this study, a follow-up study needs to focus more on specific strategies.

In addition to practical measures for improving use of information by government officials, there are important theoretical issues too. An important task commands our attention to developing a comprehensive and appropriate theory of information utilization. A first step toward building such a theory may be to integrate these three perspectives. This should not be viewed, however, to mean that rational choice theories be rejected out of the main stream of social science (Moe, 1979). Rather, in order to build 'more realistic' models of information acquisition and processing in decision making as a potential contributor to scientific progress in social sciences, each stream of past studies should be understood as a complementary explanation for information processing in decision

making(Cook and Levi, 1990; Ostrom, 1991). A more interesting question would then be: under what circumstances can these perspectives be combined together? And how? Or which perspective is more appropriate? And why? Use of information seems to be hard to be explained by any single perspective; rather, by a variety of factors. Further, the causality among the variables assumed may depend on certain factors such as policy areas, policy types, the nature of problems facing decision makers and/or different stages of the policy making process(Oh, 1996; 1998a). More importantly, there is a need to extend the generalizations which are currently considered the 'state of art' in information acquisition and processing. For example, some studies suggest that bureaucratic political factors may be more important in explaining and/or predicting information utilization than communication-related factors, factors associated with the quality of information being presented, or the rationality of decision makers. Then, do bureaucratic processes represent the 'sufficient condition'? Or is quality a necessary condition but not a sufficient condition for information utilization? These questions need to be answered before it is possible to test a framework which integrates the explanatory variables represented by each perspective.

Appendix : Summary of Variables

Data about knowledge utilization and policy change in the area of mental health(USA) provide the empirical basis for this study. Data collection at the federal and state levels has been organized into two waves. Wave I interviews, which were open-ended in nature, were used to obtain basic background information about the policy making process in the area of mental health in each

state. Wave II interviews — the data set for this study — built on the information derived from the first set of interviews. The questionnaires for the Wave II were highly structured; they were designed to yield data which would systematically allow us to compare the determinants of knowledge and information utilization in the formulation of mental health policy. To determine face validity or content homogeneity, the open-ended questions in Wave I were coded by trained graduate students in consultation with organizational communication researchers.

1. "Organizational incentive/reward systems for information utilization" was measured by a question: how much respondents agree that institution's provision of professional reward/incentives for using and/or conducting researches influence the application of research findings in policy making (on a 5 point scale; 1 for not at all and 5 for very much).

2. "Amount of information" is measured by asking how often policy makers receive policy-related information from different organizations and agencies (on a 4 point scale; 1 for never and 4 for frequently). It is a combined index of averaging out the amount of information received from twelve groups/organizations (Cronbach's alpha = .85). The twelve sources for each policy area are: The Legislature, Advocacy Groups, Governor, Umbrella Agency, Media, Friends and Colleagues, Your Staff, Mental Health Professional, National Institute of Mental Health, Mental Health Bureaucracy, County Boards of Directors, and Health Science Association.

3. "Interaction between researchers and decision makers" is measured by combining two related question: (1) how much respondents think that the interaction between researchers and policy makers affects an accurate and balanced study (on a 5 point scale); and (2) in the recent and/or last planning cycle, how often respondents contacted researchers to discuss the information they

would have or the design of the research (on a 4 point scale: Cronbach's alpha = .69).

4. "A composite index for communications (or format of report)" is constructed by combining three related indicators: how much respondents think that the following factors affect use of information — (1) the presentation of results makes extensive use of graphics such as bars, pie charts, flow diagrams, etc. ; (2) the study is presented in a series of small, carefully focused modules; and (3) the entire study is presented in a single comprehensive report (on a 5 point scale: Cronbach's alpha = .89).

5. "Counter-organizational information (or content of information)" is measured by combining three questions (each on a 5 point scale) : how much do you think that the following factors increase or decrease the likelihood that policy-related information will be used? — (1) the findings challenge existing organizational policies/ programs; (2) government agencies tend to ignore research findings that are not in line with agency's assumption and philosophy; and (3) the findings of research do not agree with potential user's intuition (Cronbach's alpha = .56). These indicators were developed from the findings of past studies about the organizational interest perspective (Nelson, et. al., 1987).

6. "Validity of information" is measured by combining two related questions: how much respondents' evaluation or assessment of the results of research is related to validity and/or reliability of the methodology employed: and (2) how much respondents agree that the validity of methodology and research designs used must be evaluated to make adequate use of the results of research in policy making (on a 5 point scale: Cronbach's alpha = .701). To make adequate use of the results of research in policy making (on a 5 point scale; Cronbach's alpha = .701).

7. In measuring "information use," this study attempts to ask respondents to respond to specific questions within the context of real or actual decision making rather than in an artificial context specified by researchers (Weiss and Bucuvalas, 1980), that is, not by potential possibility of utilization. This assumption is based on the argument that the last experience is representative of overall utilization experience (Tversky and Kahneman, 1974). Thus, use of information is measured by asking the question: in the past year have you/your agency referred to policy-related information to help you make decisions about mental health areas? (1 for yes, 0 for no). The utilization measure employed in this study is a composite variable which combined the "yes-or-no" use of different types of information (e. g., policy analysis, statistical data, or program evaluation).

■ Notes

1) For the so-called idealized model of utilization, see Nachmias (1980) and Weiss (1977).
2) For the "conceptual use," see Weiss (1977; 1980).
3) For more detail, see Oh (1996).
4) For more detail on such a multi theories-related research strategy, see Hill (1997) and Sabatier (1997).
5) For more detail, see Oh (1996).
6) For more detail on rational choice and its limitations, see Allison (1972), Braybrook and Lindbloom (1972), Majone (1989), March (1988) and March and Simon (1958).
7) Whether an actor has perfect or incomplete information under constraints of time and resources, for example, perfect information about candidates in election, see Calvert (1985), Mckelvey and Ordeshook (1985) and Riker (1962).
8) For more detail on measuring these variables, see Appendix.
9) The interpretation of the effect that an independent variable (e. g., interact) may have on dependent variable (i. e., information use) is based on odds ratio. In the table above, B

(i. e., logistic coefficient) indicates the log-odds associated with a one-unit change in the independent variable. It's easier to think of odds rather than log-odds in interpreting logistic coefficients. SPSS automatically estimates Exp(B) which can be used for calculating odds ratios. For more detail, see Liao, 1994.

10) For more detail, see Dunn(1980) and Rich and Oh(1993).

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cation, that is not distorted, should be promoted on the basis of information sovereignty and independence. Third, reflexivity on human and nature should be heightened through deepening the existential communication. And this kinds of informatization efforts should be fortified by a social reform that is aiming at *autonomy and originality, trust and empowerment, and coexistence and coprosperity*. Finally, to achieve a reflexive informatization, endowed with the above-mentioned attributes, a new approach and perspective should be required. Above all, government, free from a bureaucratic eliticism, should more focus on social value that emphasizes individual freedom, independence, and subjectivity. On a policy matter, the perspectives on individual information should be drastically changed, and in this vein, *information sovereignty and privacy* issue needs to be reemphasized. In addition, government should promote NGO activities by empowering them, particularly in the sphere of information and *civic culture*.

2. Information Utilization in Government Decisionmaking : Why and How

Cheol-Ho Oh

Until recently, information technology was viewed primarily as a means of helping organizations function more efficiently. However, rapid advances in this area are changing the ways in which government governs, business operates, and individuals conduct their daily lives. Increasingly Korean society is moving into an era when all practitioners of public policy will have an IT component. Thus, understanding, directing, and managing information-related activi-

ties within government has become critical to the success of government programs and policies. Despite the importance of information-related activities, such activities have not been systematically examined, not to mention the lack of effort to build a comprehensive theoretical framework. Especially, why and how government officials use information in policymaking still remains open. This study attempts to address a set of issues germane to understanding and improving information utilization in government decisionmaking. First, so-called knowledge cycle model is briefly presented. This model expects to help readers get a glimpse of how information utilization is related to other activities of information processing (e. g., information dissemination). Then, three frequently cited explanations for information use are discussed. In the field of knowledge acquisition, dissemination, and utilization/impact, rational choice theories or rational actor model have been employed as a major tool for understanding activities of information utilization in policymaking. Thus, this study first examines the assumptions dealing with information acquisition and processing in rational actor model. It then puts forward an organizational interest and a communications perspective as alternative explanations for information utilization in government agencies. Finally, a set of policy suggestions for improving information use in government will be drawn from the theoretical explanations. Since this study does not include a rigorous empirical test of the three theoretical explanations, policy suggestions seem to be hypothetical. However, they expect to show a direction for how to manage information resources, thus to facilitate use of information by government bureaucrats. In this regard more rigorous studies are needed to improve the current state of art in the field of information utilization.