Information in Organizations as Signal and Symbol

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Formal theories of rational choice suggest that information about the possible consequences of alternative actions will be sought and used only if the precision, relevance, and reliability of the information are compatible with its cost. Empirical studies of information in organizations portray a pattern that is hard to rationalize in such terms. In particular, organizations systematically gather more information than they use, yet continue to ask for more. We suggest that this behavior is a consequence of some ways in which organizational settings for information use differ from those anticipated in a simple decision-theory vision. In particular, the use of information is embedded in social norms that make it highly symbolic. Some of the implications of such a pattern of information use are discussed.•

INTRODUCTION

Organizations are consumers, managers, and purveyors of information. Rules for gathering, storing, communicating, and using information are essential elements of organizational operating procedures. The technologies associated with using and managing information are the bases for several major growth industries, most notably computing and consulting. Reputations for organizational intelligence are built on capabilities for securing, analyzing, and retrieving information in a timely and intelligent manner. This practical consciousness of the importance of information is mirrored by research intended to understand and improve the uses of information by human beings. Information-processing interpretations of cognition, economic theories of information, and cybernetic perspectives on adaptation all build on the idea that the processing of information is a vital aspect of human behavior.

The study of information in organizations, like the study of choice with which it is often closely allied, involves a dialectic between students of information behavior on one hand and information engineers (or economists) on the other. Information engineers hope to design information systems with some clear elements of sensibility in them, or, in the best of all worlds, to design optimal systems (Kanter, 1972; Keen, 1977; Henderson and Nutt, 1978). For students of behavior, the problem is to understand actual human encounters with information. They focus on such things as the ways in which individuals and organizations deal with information on environmental uncertainty and risk (Tversky and Kahneman, 1974; Janis and Mann, 1977; Slovic, Fischhoff, and Lichtenstein, 1977; Nisbett and Ross, 1980), the ways in which individuals and organizations initiate and discontinue search activities (March and Simon, 1958; Cyert and March, 1963; Staw and Szwajkowski, 1975; Sabatier, 1978), and the ways in which organizational biases are reflected in information processing (Cyert, March, and Starbuck, 1961; Wilensky, 1967; Allen, 1969; Adelman, Stewart, and Hammond, 1975).

The dialogue between information engineers and students of information processing is most direct when differences between actual human behavior and apparently optimal information behavior are observed. Engineers characteristically seek to improve behavior, to instruct human actors in techniques for making better use of information. Students of information

behavior characteristically suspect that some strange human behavior may contain a coding of intelligence that is not adequately reflected in engineering models. This paper follows the latter tradition. It recounts some familiar observations about information in organizations that are difficult to make consistent with simple notions of the value of information in making decisions; and it attempts to identify ways in which the behavior might make sense if placed in a somewhat broader frame.

INFORMATION AND ORGANIZATIONAL CHOICE

The classic representation of organizational choice is a simple extension of decision-theory visions of individual choice. In particular, decisions are seen as derived from an estimate of uncertain consequences of possible actions and an estimate of uncertain future preferences for those consequences (Luce and Raiffa, 1957; Taylor, 1975). Both estimates are problematic. They depend on information that is imperfect in a number of obvious ways. Organizations make explicit and implicit decisions about seeking and using information that might improve estimates of future consequences and future preferences. These decisions are, of course, also presumed to be based on estimates of the expected benefits and costs of particular information, information strategies, or information structures.

Within this basic framework, search behavior, investments in information, and the management of information are driven by the desire to improve decisions. The value of information depends in a well-defined way on the information's relevance to the decision to be made, and on its precision, cost, and reliability. Information has value if it can be expected to affect choice. It is a good investment if its marginal expected return in improving decisions exceeds its marginal cost. The calculation of information value in a particular case is likely to be quite difficult. The framework, however, is simple and the idea is appealing (Raiffa, 1968; Marschak and Radner, 1972). This perspective on decision making leads to some simple expectations for information utilization. For example, relevant information will be gathered and analyzed prior to decision making; information gathered for use in a decision will be used in making that decision; available information will be examined before more information is requested or gathered; needs for information will be determined prior to requesting information; information that is irrelevant to a decision will not be gathered.

Studies of the uses of information in organizations, however, reveal a somewhat different picture. Organizations seem to deal with information in a different way from that anticipated from a simple reading of decision theory. The following three stories of decision making in organizations illustrate the contrasts. These stories provide a contextual description of the relation between information and decision making. The three episodes are not exceptional. They are taken from studies by Merewitz and Sosnick (1971), Bower (1970), and Hägg (1977). Others could easily have been used. They include examples taken from private and public, profit and non-profit, American and foreign, and large and small organizations. None of the studies was primarily concerned with the information focus of the present paper. Rather, each study portrays a typical, minor example of the process of problem solving and decision making

in an undramatic situation. The descriptions here are brief and incomplete, but we have tried to retain the flavor of the use of information reported in the original studies.

Illustration Number 1: Supersonic Transport

Consider decision making within the American national government regarding governmental support for the development of a commercial supersonic aircraft (Merewitz and Sosnick, 1971). In 1961, Congress appropriated funds for exploratory research on supersonic transports. Earlier studies had been commissioned by both the air force and the Federal Aviation Agency. These studies indicated that aircraft manufacturers were unlikely to undertake construction of a supersonic aircraft without government support. The FAA feasibility study commissioned in 1960 was available in 1963. It found "no economic justification for the SST" (Merewitz and Sosnick, 1971: 252). In 1963, after Pan American Airways took options on six Concordes (the British-French SST), President Kennedy committed the United States to developing a supersonic transport in partnership with private industry. By 1966, construction of a prototype was underway. In 1967, the FAA found the supersonic transport to be "viable as a public investment" (Merewitz and Sosnick, 1971: 254). The same year, Congress voted to continue prototype construction. In 1970, Congress rejected a $290 million appropriation for the project, finally approving (in 1971) only $85 million. This meant an end to the development, at least for the near future.

Illustration Number 2: A New Manufacturing Facility

Consider this standard example of corporate planning and capital investment (Bower, 1970). The case involved a project that originally developed as a sideline at one plant of a manufacturing company. As the project expanded, it outgrew existing facilities, and proposals were made either to expand the plant or to build a new facility for the project. Between February 1966 and April 1967, repeated analyses and forecasts about the project were made. In April 1966, the project was losing more than had been forecast. The loss was attributed to low sales and high development costs. By October 1966 the project was showing increasingly poor operating results, lower than predicted by the forecasts. This was interpreted as having been caused by marketing problems; no change in the project was considered. Initial proposals to modify an existing plant by building a new warehouse were expanded to include building a whole new facility as well. As the plans for capital investment went forward, estimates of the projected performance were adjusted downward several times to make the proposal more believable.

Illustration Number 3: New Equipment

Consider the post hoc review of a project involving buying and installing packaging equipment in the manufacturing department of a Swedish firm (Hägg, 1977). The project was seen as a way to reduce personnel and thereby avoid production delays attributable to absenteeism. The investment proposal was submitted and approved in September 1973. By mid-1974, the equipment had been bought and installed and was in operation. In December 1974, a review report was written. The review showed that the project had, in fact, reduced the number of

personnel by two. However, it also showed that the resetting times had been longer than expected and that installation problems had delayed the achievement of normal working conditions beyond the projected date. These problems produced the types of delays that the reduction in the number of personnel was supposed to eliminate. No action was taken as a result of the review. Installation problems were attributed to "the supplier who had given wrong information and who had not supplied the needed expert service" (Hägg, 1977: 81), and the longer resetting times were seen as a result of inadequately trained mechanics. The review was seen as a good idea, nevertheless.

These case studies show a relation between information and decision making that is rather distant from the one anticipated by classical conceptions drawn from decision theory. Considerable information was gathered by the organizations involved in the decisions. Considerable information was sometimes volunteered by other organizations. There was little systematic relation between the time of receiving the results of a study and the time of making a decision. There was no obvious consistent relation between the findings of studies and the decision made. Information was gathered. More information was sought. Information was considered. But the link between decisions and information was weak.

Similar stories are told repeatedly in the research literature. Their number could be increased almost at will.[1] The literature reports phenomena that can be summarized by six observations about the gathering and use of information in organizations. The observations are consistent with the research literature yet close enough to personal experience to be almost self-evident: (1) Much of the information that is gathered and communicated by individuals and organizations has little decision relevance. (2) Much of the information that is used to justify a decision is collected and interpreted after the decision has been made, or substantially made. (3) Much of the information gathered in response to requests for information is not considered in the making of decisions for which it was requested. (4) Regardless of the information available at the time a decision is first considered, more information is requested. (5) Complaints that an organization does not have enough information to make a decision occur while available information is ignored. (6) The relevance of the information provided in the decision-making process to the decision being made is less conspicuous than is the insistence on information. In short, most organizations and individuals often collect more information than they use or can reasonably expect to use in the making of decisions. At the same time, they appear to be constantly needing or requesting more information, or complaining about inadequacies in information.

It is possible, on considering these phenomena, to conclude that organizations are systematically stupid. There is no question that organizational processes are sometimes misguided and that organizational procedures are sometimes incomprehensibly inattentive to relevant information. Nevertheless, it is possible to try to discover why reasonably successful and reasonably adaptive organizations might exhibit the kinds of information behaviors that have been reported. Perhaps the stories of information perversity tell us less about the weak-

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For example, Lindblom (1959); Wohlstetter (1962, 1965); Cyert and March (1963); Wilensky (1967); Olsen (1970); Allison (1971); Beneviste (1972); Cohen and March (1974); Eliasson (1974); Halperin (1974); Lucas and Dawson (1974); Steinbruner (1974); Lynch (1975); Graham (1976); Kreiner (1976); March and Olsen (1976); Meltsner (1976); Tietenberg and Toureille (1976); Weiss (1977); Estler (1978); Sabatier (1978); Sproull, Weiner, and Wolf (1978); Clark and Shrode (1979); Krieger (1979).

nesses of organizations than about the limitations of our ideas about information.

INFORMATION INCENTIVES, GOSSIP, AND MISREPRE-SENTATION

There are several elementary instrumental reasons why information use in organizations deviates from a standard decision-theory vision. At the outset two relatively conventional explanations should be noted. First, organizations may be unable, because of organizational or human limitations, to process the information they have. They experience an information glut as a shortage. Indeed, it is possible that the overload contributes to the breakdown in processing capabilities (Wohlstetter, 1962; Miller, 1977). The second explanation is that the information available to organizations is systematically the wrong kind of information. Limitations of analytical skill or coordination lead decision makers to collect information that cannot be used. Thus, although there is a great deal of information, there is not enough relevant information (Janis and Mann, 1977). These interpretations certainly have bases in what we know about the uses of information in organizations, but they seem to be limited by their implicit acceptance of the standard formulation of the decision problem in an organization.

There are three other conspicuous features affecting the instrumental use of information in organizations. First, ordinary organizational procedures provide positive incentives for underestimating the costs of information relative to its benefits. Second, much of the information in an organization is gathered in a surveillance mode rather than in a decision mode. Third, much of the information used in organizational life is subject to strategic misrepresentation.

Information Incentives

Organizations provide incentives for gathering more information than is optimal from a strict decision perspective (Bobrow, 1973; Handel, 1977; Chan, 1979). Consider, for example, two simple speculations about systematic bias in estimating the benefits and costs of information. First, the costs and benefits of information are not all incurred at the same place in the organization. Decisions about information are often made in parts of the organization that can transfer the costs to other parts of the organization while retaining the benefits. Suppose having too much information (i.e., having an information overload) increases the risk of being unable either to comprehend the information or to use it effectively in a decision. Since the information-gathering functions are typically separated from the information-using functions of organizations, incentives are modest for gatherers to avoid overloading users. The user of information invites a bias by accepting responsibility for the utilization of information while delegating responsibility for its availability.

Second, post hoc accountability is often required of both individual decision makers and organizations. An intelligent decision maker knows that a decision made in the face of uncertainty will almost always be different from the choice that would have been made if the future had been precisely and accurately predicted. As a consequence, a decision maker must anticipate two post hoc criticisms of information-gathering

behavior: (1) that the likelihoods of events that in fact subsequently occurred were, on the average, underestimated, and thus that less information about these events was secured than should have been; and (2) that the likelihoods of events that in fact subsequently did not occur were, on average, overestimated, and thus that *more* information about them was secured than should have been. If, as seems very likely, the first criticism is more likely to be voiced than the second, it is better from the decision maker's point of view to have information that is not needed than not to have information that might be needed. The asymmetry in post hoc assessment leads directly to an incentive for gathering too much information.

Information as Surveillance

Organizations, as well as individuals, collect gossip (Aguilar, 1967; Mintzberg, 1972). They gather information that has no apparent immediate decision consequences. As a result, the information seems substantially worthless within a decision-theory perspective. The perspective is misleading. Instead of seeing an organization as seeking information in order to choose among given alternatives in terms of prior preferences, we can see an organization as monitoring its environment for surprises (or for reassurances that there are none). The surprises may be new alternatives, new possible preferences, or new significant changes in the world. The processes are more inductive than deductive. The analysis is more exploratory data analysis than estimation of unknown parameters or hypothesis testing.

The surveillance metaphor suggests either a prior calculation of needed information or a kind of thermostatic linkage between observations and actions. In this metaphor, systems for surveillance are justified in terms of the expected decisions and environments to be faced. Systems for surveillance are connected to decision rules in such a way that the relatively long lead times required for information gathering can be linked to relatively short decision times. This vision, however, can easily become overly heroic if it presumes explicit calculations by the organization. Such calculations are made in organizations, but they do not seem to account for much of what we observe. Organizations gather gossip — news that might contain something relevant but usually does not — in situations in which relevance cannot be specified precisely in advance.

Strategic Information

Many studies of human information processing involve situations in which experimental subjects are asked to respond to information known by the experimenter to be reasonable, neutral information. Very few situations in the real world of organizations are of that sort. Most information that is generated and processed in an organization is subject to misrepresentation. Information is gathered and communicated in a context of conflict of interest and with consciousness of potential decision consequences. Often information is produced in order to persuade someone to do something. It is obvious that information can be an instrument of power, and substantial recent efforts to refine the economics of information and the economics of agency focus on managing the problems of strategic unreliability in information (Crozier, 1964; Rothschild and Stiglitz, 1976; Hirschleifer and Riley, 1979).

When strategic misrepresentation is common, the value of information to a decision maker is compromised. Strategic misrepresentation also stimulates the oversupply of information. Competition among contending liars turns persuasion into a contest in (mostly unreliable) information. If most received information is confounded by unknown misrepresentations reflecting a complicated game played under conditions of conflicting interests, a decision maker would be curiously unwise to consider information as though it were innocent. The modest analyses of simplified versions of this problem suggest the difficulty of devising incentive schemes that yield unambiguously usable information (Mirrlees, 1976; Demski and Feltham, 1978). Yet organizations somehow survive and even succeed. Individuals develop rules for dealing with information under conditions of conflict. Decision makers discount much of the information that is generated. Not all information is ignored, however, and inferences are made. Decision makers learn not to trust overly clever people, and smart people learn not to be overly clever (March, 1979).

The significant organizational incentives for gathering information, the gathering of information in a surveillance mode rather than a decision mode, and the strategic misrepresentation of information in organizations all contribute to the information phenomena that have been noted in organizations and provide reasons for decoupling information from decisions. Rational, sensible individuals in organizations, pursuing intelligent behavior, will often gather more information than would be expected in the absence of such considerations and will attend to information less. Such instrumental complications affecting information behavior in organizations are, however, not the only explanations for the anomalies we observe. In fact, they are probably less important than a more profound linkage between decision behavior and the normative context within which it occurs. Information is a symbol and a signal.

INFORMATION AS SYMBOL AND SIGNAL

Information as Symbol

Organizational decisions allocate scarce resources and are thereby of considerable social and individual importance. But decision making in organizations is more important than the outcomes it produces. It is an arena for exercising social values, for displaying authority, and for exhibiting proper behavior and attitudes with respect to a central ideological construct of modern western civilization: the concept of intelligent choice.[2] Bureaucratic organizations are edifices built on ideas of rationality. The cornerstones of rationality are values regarding decision making (Weber, 1947). There are no values closer to the core of western ideology than these ideas of intelligent choice, and there is no institution more prototypically committed to the systematic application of information to decisions than the modern bureaucratic organization.

The gathering of information provides a ritualistic assurance that appropriate attitudes about decision making exist. Within such a scenario of performance, information is not simply a basis for action. It is a representation of competence and a reaffirmation of social virtue. Command of information and information sources enhances perceived competence and in-

spires confidence. The belief that more information characterizes better decisions engenders a belief that having information, in itself, is good and that a person or organization with more information is better than a person or organization with less. Thus the gathering and use of information in an organization is part of the performance of a decision maker or an organization trying to make decisions intelligently in a situation in which the verification of intelligence is heavily procedural and normative. A good decision maker is one who makes decisions in the way a good decision maker does, and decision makers and organizations establish their legitimacy by their use of information.

Observable features of information use become particularly important in this scenario. When there is no reliable alternative for assessing a decision maker's knowledge, visible aspects of information gathering and storage are used as implicit measures of the quality and quantity of information possessed and used. For example, being the first to have information and having more and different information indicate the proximity of an individual or organization to important information sources. Similarly, the resources expended on gathering, processing, and displaying information indicate the quantity and quality of information an individual or organization is likely to have. Displaying information and being able to explain decisions or ideas in terms of information indicate an ability to use information easily and appropriately.

These symbols of competence are simultaneously symbols of social efficacy, and they secure part of their justification there. Belief in the appropriateness of decisions, the process by which they are made, and the roles played by the various actors involved is a key part of a social structure. It is important not only to decision makers that they be viewed as legitimate; it is also vital to society. Ritual acknowledgement of important values celebrates a shared interpretation of reality (Berger and Luckman, 1966). Thus, requesting information and assembling it are ways of making social life meaningful and acceptable.

Standard decision-theory views of choice seem to underestimate these symbolic importances of information and the use of information in decision making. Because the acts of seeking and using information in decisions have important symbolic value to the actors and to the society, individuals and organizations will consistently gather more information than can be justified in conventional decision theory terms. Decisions are orchestrated so as to ensure that decision makers and observers come to believe that the decisions are reasonable — or even intelligent. Using information, asking for information, and justifying decisions in terms of information have all come to be significant ways in which we symbolize that the process is legitimate, that we are good decision makers, and that our organizations are well managed.

Information as Signal

When legitimacy is a necessary property of effective decisions, conspicuous consumption of information is a sensible strategy for decision makers. The strategy need not be chosen deliberately. It will accompany processes that work. Decisions that are viewed as legitimate will tend to be information-intensive. Decision makers who are persuasive in securing acceptance of

decisions will request information, gather information, and cite information. The behavior is a representation of appropriate decision making.

From this point of view, we can examine information gathering and requesting as the kind of signal familiar to the economics of information (Spence, 1974; Nelson, 1974; Meyer, 1979). It is possible that the signal is a valid one. This would be true if organizations that generally produce better decisions are also able to gather and exhibit information at lower cost than those who produce poorer decisions. Even if information contributes nothing directly to the quality of decisions, better decision makers would invest more in information, and decision-maker quality could be estimated accurately by monitoring information practice.

A strategy of legitimation through the use of information cannot, however, be chosen at will. The arbitrary symbolic use of information is subject to limits imposed by competition for legitimacy and variations in the costs of exhibiting information consumption. Since organizations compete for legitimacy, no single organization can control its own relative reputation by its own actions, and the comparative positions of different organizations depend critically on differences in the costs to organizations of maintaining an information posture.

The price of securing information is the value of foregone opportunities. The cost calculation depends not only on the usual considerations of efficiency but also on the kinds of alternative investments that are available. If, for example, the quality of decisions is automatically reflected in costless performance measures, the net returns from further signaling would be negatively correlated with decision quality. As a result, the signal would not be a valid one. By this analysis, information use is more likely to be a valid signal when performance criteria are obscure than when they are clear. Indeed, when the intrinsic quality of decisions is exceptionally difficult to assess, the signaling process may itself affect quality. Suppose, for example, that belief in the legitimacy of a decision is encouraged by the conspicuous utilization of information, and that the legitimacy of a decision, in turn, affects its implementation (an element of quality). Then those organizations that have relatively low signaling costs (or that for other reasons invest in information) will ultimately become better decision makers. The signal will, by this mechanism, become a valid one.

When benefits from information use are approximately equal among organizations, and costs of maintaining an information system are less for good decision makers than for others, conspicuous consumption of information is neither organizationally nor socially foolish. The behavior is an effective signal. It is, of course, possible that an alternative signaling system might be devised that would be less costly for organizations and for society and would still provide equally reliable information. In particular, a system that dampened the competition for legitimacy homogeneously across organizations might be preferred. But the signal that exists appears to have some of the properties associated with signaling validity and cannot be casually discarded.

The information economics perspective is instructive, particularly in its focus on conditions for signal validity and stability in a

signaling system. But that perspective is not essential to an appreciation of the symbolic significance of information posturing. Reason, rationality, and intelligence are central values in modern industrial societies. Within such societies, life is choice; choice is appropriately informed when the best available information about possible future consequences of present actions is sought. In a society committed to intelligent choice, requests for information and the gathering of information will generally be rewarded by observers; less systematic procedures are common, but they tend to be less reliably rewarded. Whether we think of simple learning, of some ideas about role-taking, or of socialization into basic values, we develop a similar conclusion. The pattern of information gathering and utilization that characterizes such a society must be as much a part of ordinary experience as the most elementary social values of honesty, autonomy, and self-reliance.

THE DYNAMICS OF SYMBOLS

This paper has presented some possible reasons for certain apparently peculiar information behavior in organizations. The reasons suggested above emphasize the strategic and symbolic incentives for gathering information. Such reasons are, however, only an introduction to understanding the process. In particular, there is no reason to assume that organizational behavior with respect to information is stable, that the process is in equilibrium. Consider, for example, the classic dynamics of symbolic life: I learn French to symbolize my commitment to a cultured life, but having learned French I discover ways in which it is useful; I buy a car to symbolize my affluence, but having the car leads me to discover the pleasures of automobile travel; I work for a political candidate to symbolize civic duty and solidarity, but in the process I discover opportunities for political power. When organizations establish information systems, however symbolic or strategic the initial reasons may be, they create a dynamic that reveals new justifications as the organizational process unfolds.

The analytical problem is similar to the problem of understanding hypocrisy in individual behavior. The hypocrite presumably adopts the assertion of a value as a symbolic substitute for action. In the short run, hypocrisy is both a social acknowledgement of the importance of a value and an evasion of the value. In the long run, however, proclamation of social values, particularly when associated with opportunities for social approbation, changes the action. The changes are not necessarily intentional. It is not easy to be a stable hypocrite. Similarly, it is hard to find stable symbols or tactics in organizations. Each creates a dynamic by which it is transformed.

At the individual level, symbols produce belief and belief stimulates the discovery of new realities. For example, suppose that individuals in organizations are inclined to attribute successes, but not failures, to factors they control (Davis and Davis, 1972; Miller and Ross, 1975) and suppose that information-gathering decisions are something that successful decision makers feel they control. Then successful decision makers would come to believe that the information rituals they control are, in fact, important to decision making. If they then act to make information important to decision making, and discover new ways of making these tools indispensible, the circle is

complete. Tactical uses of information are transformed into belief, and thence into functional necessity.

The process at the organizational level is similar, though the mechanisms are slightly different. An example is the creation of a special office symbolizing a newly important value (e.g., environmental protection, affirmative action). The office may have been established as a symbolic alternative to more substantial action (Edelman, 1964, 1977). New offices, however, are not passive. They affect their own functions. Consider the dynamics of flak-catching (Wolfe, 1970). Organizations create flak-catching offices — special offices to display their concern for outside complaints, pressures, and the like. But flak-catchers, who are commissioned to protect an organization from flak and to symbolize a commitment to deal appropriately with flak, quickly learn to enhance the importance of flak. The mechanisms are familiar. Partly, flak-catchers are chosen because of some willingness to deal with outsiders, perhaps because of prior affinity to them. Partly, they learn from their association with outsiders to identify with them. Partly, they discover that their importance in the organizations depends on the existence of flak (Taylor, 1980).

These dynamics apply to almost any specialized function in an organization. Individuals and organizations gathering, storing, and analyzing information are likely to behave in this way. Organizational departments assigned information-processing responsibilities are unlikely to remain neutral with respect to the uses of information. Partly, people who gather and use information will tend to be people who believe that information gathering is important. Individuals who discover they are good at solving problems using information will discover more ways for making it sensible to do so. Partly, people who gather and use information will associate with other information gatherers and users and will come to identify with them. As a class, they will generate belief in their importance. Partly, people who gather and use information will try to convince others of its importance as a natural way of ensuring their own importance. People who prepare reports are likely to try to persuade others to read them. Individuals who use information because it serves a particular purpose are likely to come to believe information is useful in a more general way. Individuals who request information are likely occasionally to find it useful, even to come to believe in the general utility of information gathering.

Although it is easy to observe that arbitrary actions induce instrumental interpretations and become effective practical instruments under fairly general conditions, it is clear that the process does not always proceed rapidly and rarely goes to the limit. Exploring such dynamics significantly is beyond the scope of the present paper. These dynamics are, however, important to its spirit. We have tried to describe some ways in which apparently anomalous behavior is sensible and have explored particularly the symbolic significance of information use. In the process, we have suggested that simple decision-theory visions of information and its value do not match the ways in which information is used in organizations as we observe them. The argument has been made in a form that might suggest a stable separation of symbolic and instrumental action. But organizations as we observe them are not stable. They change, and they change in a way that weaves the symbolic and

instrumental aspects of life together, not in the sense that everything is both (though that is true enough) but in the sense that interpretations of life affect life. If there is substantial decision value in information, the present pattern of investment in information may be a good strategy for discovering that value. Symbolic investments in information are likely to convert to more instrumental investments.

A strategy of using symbolic investments in information as an instrument of change is dependent on a corresponding ideology. The symbolic value of information is a function of the social norms of a society and of a belief in rational decision processes of a particular kind. It is not hard to imagine a society in which requests for information, and insistence on reports and analyses, would be signs of indecisiveness or lack of faith. Even within the rational traditions of the enlightenment, decision-theory perspectives on intelligence have competitors. Suppose that interpretations of decision making that emphasize loose coupling rather than organizational structure, ambiguity rather than precision, and limited rather than complete rationality succeed in changing the normal conception of organizational life. Then the symbolic value of information will be compromised. Organizations will be less inclined to treat information gathering as a precious manifestation of their virtue. Information will be a less effective signal of their competence.

CONCLUSION

From a classical decision-theory point of view, information is gathered and used because it helps make a choice. Investments in information are made up to the point at which marginal expected cost equals marginal expected return. Observations of organizations are not easy to reconcile with such a picture. Individuals and organizations invest in information and information systems, but their investments do not seem to make decision-theory sense. Organizational participants seem to find value in information that has no great decision relevance. They gather information and do not use it. They ask for reports and do not read them. They act first and receive requested information later.

It is possible, on considering these phenomena, to conclude that organizations and the people in them lack intelligence. We prefer to be somewhat more cautious. We have argued that the information behavior observed in organizations is not, in general, perverse. We have suggested four broad explanations for the conspicuous over-consumption of information. First, organizations provide incentives for gathering extra information. These incentives are buried in conventional rules for organizing (e.g., the division of labor between information gathering and information using) and for evaluating decisions. Second, much of the information in organizations is gathered and treated in a surveillance mode rather than a decision mode. Organizations scan the environment for surprises as much as they try to clarify uncertainties. Third, much of the information in organizations is subject to strategic misrepresentation. It is collected and used in a context that makes the innocence of information problematic. Fourth, information use symbolizes a commitment to rational choice. Displaying the symbol reaffirms the importance of this social value and signals personal and organizational competence.

Information as Signal and Symbol

These factors seem important enough to affect organizational information behavior significantly. They can influence organizational behavior through any of the usual mechanisms of adaptation. To some extent, individuals and organizations calculate the alternatives and decide to buy information (or use information). Such conscious decisions, if taken sensibly with knowledge of the factors we have discussed, will lead to an information strategy that is more like what is observed than what is expected from a simple model of information investment. Even without conscious calculation, organizations will learn from experience to follow strategies that generate information without using it. Strategies developed from calculation or learning could spread through a population of organizations by imitation. Alternatively, some process of natural selection among procedural rules can be seen as selecting rules that encourage considerable investment in information. In such cases, the intelligence of the behavior is buried in the rules and is not easily retrieved (or expressed) by individuals within the organization. Learning, imitation, and selection tend to hide the intelligence of behavior within rules and rule-following. Understanding fully the ways in which particular kinds of experience are coded into particular kinds of rules requires a precise specification of the adaptive mechanisms. For present purposes, however, all that is needed is to note that the factors identified here need not necessarily affect behavior by inducing incentives, conscious calculation, and intentionally strategic action. The mechanisms may be considerably more indirect than that, yet retain the same essential effect.

These general ideas have some obvious research implications. The factors we have identified are not homogeneously relevant across organizations, decision situations, and time. We should observe some systematic variation in the information behavior of organizations and the individuals in them. That is not to say that the phenomena are limited to a small number of organizations. On the contrary, they are very general. Nevertheless, we might expect investment in information to be particularly sensitive to variations in the symbolic requirements and signaling opportunities of the organization.

The kinds of information behavior noted here should be more common in situations in which decision criteria are ambiguous than in situations in which they are clear, more common where performance measures are vague than where they are precise, more common when decision quality requires a long period to establish than when there is quick feedback, more common where the success of a decision depends on other decisions that cannot be predicted or controlled than where a decision can be evaluated autonomously, more common where other legitimating myths (e.g., tradition or faith) are not important than where they are, more common in institutions and occasions closely linked to rational ideologies than in those that are distant from such ideologies. Thus, we might reasonably predict that the phenomena are more conspicuous in policy making than in engineering, more conspicuous in the public sector than in the private, more conspicuous at the top of an organization than at the bottom, more conspicuous in business than in the church or family, more conspicuous in universities than in football teams. To list such speculations is not to claim their correctness. Indeed, casual evidence seems unsupportive

of one or two of them. Nor is the present essay a good occasion for attempting to assess the ideas empirically. Such pleasures are left, in the grand tradition of such things, to the reader.

A static analysis of information use, however, is likely to be misleading. The symbolic significance of any activity depends on the social norms within which it is undertaken. Information is significant symbolically because of a particular set of beliefs in a particular set of cultures. These beliefs include broad commitments to reason and to rational discourse, as well as to the modern variants that are more specifically linked to decision-theory perspectives on the nature of life. As social norms change, the relevance of information as a symbol, or signal, changes with them. At the same time, symbolic actions reveal more instrumental consequences. Like other behavior, symbolic behavior explores possible alternative interpretations of itself and creates its own necessity. Thus, it is possible that norms that are changing will be simultaneously losing symbolic significance and gaining instrumental importance. An elegant manifestation of the process would occur should values shift enough to leave information and information-based analysis as the true basis of organizational action that is legitimized by symbols of ambiguity and intuition.

REFERENCES

Adelman, Leonard, Thomas R. Stewart, and Kenneth R. Hammond
1975 "A case history of the application of social judgment to policy formation." Policy Sciences, 6: 137–159.

Aguilar, Francis Joseph
1967 Scanning the Business Environment. New York: Macmillan.

Allen, Thomas J.
1969 "The differential performance of information channels in the transfer of technology." In W. H. Gruber and D. G. Marquis (eds.), Factors in the Transfer of Technology. Cambridge, MA: MIT Press.

Allison, Graham T.
1971 Essence of Decision: Explaining the Cuban Missile Crisis. Boston: Little, Brown.

Beneviste, Guy
1972 The Politics of Expertise. Berkeley, CA: Glendessary Press.

Berger, Peter L., and Thomas Luckman
1966 The Social Construction of Reality: A Treatise in the Sociology of Knowledge. New York: Doubleday.

Bobrow, David B.
1973 "Analysis and foreign policy choice." Policy Sciences, 4: 437–451.

Bower, Joseph L.
1970 Managing the Resource Allocation Process: A Study of Corporate Planning and Investment. Boston: Harvard School of Business Administration.

Chan, Steve
1979 "The intelligence of stupidity: Understanding failures in strategic warning." American Political Science Review, 73: 171–180.

Clark, Thomas D., Jr., and William A. Shrode
1979 "Public sector decision structures: An empirically based description." Public Administration Review, 39: 343–354.

Cohen, Michael D., and James G. March
1974 Leadership and Ambiguity: The American College President. New York: McGraw-Hill.

Crozier, Michel
1964 The Bureaucratic Phenomenon. Chicago: University of Chicago Press.

Cyert, Richard M., and James G. March
1963 A Behavioral Theory of the Firm. Englewood Cliffs, NJ: Prentice-Hall.

Cyert, Richard M., James G. March, and William H. Starbuck
1961 "Two experiments on bias and conflict in organizational estimation." Management Science, 8: 254–264.

Davis, William L., and D. Elaine Davis
1972 "Internal-external control and attribution of responsibility for success and failure." Journal of Personality, 40: 123–136.

Demski, Joel S., and Gerald A. Feltham
1978 "Economic incentives in budgetary control systems." The Accounting Review, 53: 336–359.

Edelman, Murray
1964 The Symbolic Uses of Politics. Urbana, IL: University of Illinois Press.
1977 Political Language: Words that Succeed and Policies that Fail. New York: Academic Press.

Eliasson, Gunnar
1974 Corporate Planning — Theory, Practice, Comparison. Stockholm: Federation of Swedish Industries.

Estler, Suzanne
1978 Rationality, Politics and Values: Systematic Analysis and the Management of Sexual Equity in the University. Unpublished Ph.D. dissertation, Stanford University.

Graham, Otis L., Jr.
1976 Toward a Planned Society: From Roosevelt to Nixon. New York: Oxford University Press.

Hägg, Ingemund
1977 Review of Capital Investments. Uppsala, Sweden: University of Uppsala, Department of Business Administration.

Halperin, Morton H.
1974 Bureaucratic Politics and Foreign Policy. Washington, DC: Brookings Institution.

Handel, Michael I.
1977 "The Yom Kippur War and the inevitability of surprise." International Studies Quarterly, 21: 461–502.

Henderson, John D., and Paul C. Nutt
1978 "On the design of planning information systems." Academy of Management Review, 3: 774–785

Hirschleifer, J., and John C. Riley
1979 "The analytics of uncertainty and information — an expository survey." Journal of Economic Literature, 17: 1375–1421.

Janis, Irving L., and Leon Mann
1977 Decision Making. New York: Free Press.

Kanter, Jerome
1972 Management-Oriented Management Information Systems. Englewood Cliffs, NJ: Prentice-Hall.

Keen, Peter G. W.
1977 "The evolving concept of optimality." TIMS Studies in the Management Sciences, 6: 31–57.

Kreiner, Kristian
1976 The Site Organization. Copenhagen: Technical University of Denmark.

Krieger, Susan
1979 Hip Capitalism. Beverly Hills, CA: Sage Publications.

Lindblom, Charles E.
1959 "The science of muddling through." Public Administration Review, 19: 79–88.

Lucas, William A., and R. H. Dawson
1974 The Organizational Politics of Defense. Washington, DC: The International Studies Association.

Luce, R. Duncan, and Howard Raiffa
1957 Games and Decisions. New York: Wiley.

Lynch, Thomas D.
1975 Policy Analysis in Public Policymaking. Lexington, MA: Lexington Books, D.C. Heath.

March, James G.
1979 "Science, politics, and Mrs. Gruenberg." In the National Research Council in 1979. Washington, D.C.: National Academy of Sciences.

March, James G., and Johan P. Olsen
1976 Ambiguity and Choice in Organizations. Bergen, Norway: Universitetsforlaget.

March, James G., and Herbert A. Simon
1958 Organizations. New York: Wiley.

Marschak, Jacob, and Roy Radner
1972 Economic Theory of Teams. New Haven: Yale University Press.

Meltsner, Arnold J.
1976 Policy Analysis in the Bureaucracy. Berkeley, CA: University of California Press.

Merewitz, Leonard, and Stephen H. Sosnick
1971 The Budget's New Clothes. Chicago: Rand McNally.

Meyer, Marshall W.
1979 "Organizational structure as signaling." Pacific Sociological Review, 22: 481–500.

Miller, Dale T., and Michael Ross
1975 "Self-serving biases in the attribution of causality." Psychological Bulletin, 82: 213–225.

Miller, James G.
1977 Living Systems. New York: McGraw-Hill.

Mintzberg, Henry
1972 "The myth of MIS." California Management Review, 15: 92–97.

Mirrlees, James A.
1976 "The optimal structure of incentives and authority within an organization." Bell Journal of Economics, 7: 105–131.

Nelson, Phillip
1974 "Advertising as information." Journal of Political Economy, 82: 729–754.

Nisbett, Richard, and Lee Ross
1980 Human Inference: Strategies and Shortcomings of Social Judgment. Englewood Cliffs, NJ: Prentice-Hall.

Olsen, Johan
1970 A Study of Choice in an Academic Organization. Bergen, Norway: Institute of Sociology, University of Bergen.

Pfeffer, Jeffrey
1980 "Management as symbolic action: The creation and maintenance of organizational paradigms." Unpublished manuscript, Graduate School of Business Administration, Stanford University.

Raiffa, Howard
1968 Decision Analysis: Introductory Lectures on Choices under Uncertainty. Reading, MA: Addison-Wesley.

Rothschild, Michael, and Joseph Stiglitz
1976 "Equilibrium in competitive insurance markets: An essay on the economics of imperfect information." Quarterly Journal of Economics, 90: 629–649.

Sabatier, Paul
1978 "The acquisition and utilization of technical information by administrative agencies." Administrative Science Quarterly, 23: 396–417.

Slovic, Paul, Baruch Fischhoff, and Sarah Lichtenstein
1977 "Behavioral decision theory." Annual Review of Psychology, 23: 1–39.

Spence, Michael
1974 Market Signaling. Cambridge, MA: Harvard University Press.

Sproull, Lee S., Stephen Weiner, and David Wolf
1978 Organizing an Anarchy. Chicago: University of Chicago Press.

Staw, Barry M., and Eugene Szwajkowski
1975 "The scarcity-munificence acts." Administrative Science Quarterly, 20: 345–354.

Steinbruner, John D.
1974 The Cybernetic Theory of Decision. Princeton: Princeton University Press.

Taylor, J. Serge
1980 "Environmentalists in the bureaucracy." Unpublished manuscript, Graduate School of Business Administration, Stanford University.

Taylor, Michael
1975 "The theory of collective choice." In Fred L. Greenstein and Nelson W. Polsby (eds.), Handbook of Political Science, 3: 413–481. Reading, MA: Addison-Wesley.

Tietenberg, Thomas H., with Pierre Toureille
1976 Energy Planning and Policy: The Political Economy of Project Independence. Lexington, MA: Lexington Books, D. C. Heath.

Tversky, Amos, and Daniel Kahneman
1974 "Judgment under uncertainty: Heuristics and biases." Science, 185: 1124–1131.

Weber, Max
1947 The Theory of Social and Economic Organization. A. M. Henderson and T. Parsons, trans. Oxford: Oxford University Press.

Weiss, Carol H., ed.
1977 Using Social Research in Public Policy Making. Lexington, MA: Lexington Books, D. C. Heath.

Wilensky, Harold L.
1967 Organizational Intelligence. New York: Basic Books.

Wohlstetter, Roberta
1962 Pearl Harbor: Warning and Decision. Stanford, CA: Stanford University Press.
1965 "Cuba and Pearl Harbor: Hindsight and foresight." Foreign Affairs, 43: 691–707.

Wolfe, Tom
1970 Radical Chic and Mau-Mauing the Flak Catchers. New York: Farrar, Straus and Giroux.