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8 Information, Responsibility, and Human Services

Kenneth J. Arrow

8.1 Introduction and Historical Remarks

The recognition of the importance of information has been one of the major achievements of economic analysis in the period since World War II. Of course, the state of knowledge of participants in the economy was long recognized as a major determinant of the state of the economy. Indeed, the idea of the production function, as it was articulated by late-nineteenth-century neoclassical economists (Walras, Stuart Wood, John Bates Clark, Wicksteed), came to be recognized as an expression of the technical knowledge available to the firm (or to the economy, in more aggregate analysis). What was not really analyzed was the idea of information as a *variable,* differing among economic agents or over time.

The formal analyses of economic behavior before World War II implied indeed that information, whether about technology or about tastes, was the same for all participants. There was in fact a curious duality. On the one hand, everyone knew everything relevant. On the other hand, the price system was praised for requiring an economic agent to know virtually nothing about the rest of the economy except as revealed through prices. The Austrians (Menger, Hayek) pursued further than most other economists the personal nature of knowledge.

This duality did not lead to any contradictions because in a competitive economy both viewpoints (that of universal common information and that of completely private information) led to the same outcome, competitive equilibrium. But it must be stressed that this equivalence is valid only under stringent conditions: (1) the economy is in equilibrium (in fact, the process of achieving equilibrium involves an exchange of information, if it is not already universal; the so-called stability problem, how the economy achieves equilibrium, has

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never achieved a satisfactory resolution); (2) the individuals know what the commodities are (or at least are equally ignorant of their properties); (3) the economy is competitive; (4) there are no externalities.

To make a completely explicit study of the role of information was not really possible without an adequate theory of behavior under uncertainty. To summarize inadequately, information amounts to a reduction of uncertainty (the matter is a little more complicated than that) and hence is meaningful only in that context. Although probability theory has been known for three centuries and even the expected-utility theory of behavior under uncertainty dates from Daniel Bernoulli's paper of 1738 (which, among other things, contains a very good explanation of insurance), there were only the most sporadic attempts to give a systematic treatment of even such straightforward matters as portfolio choice (Edgeworth 1888, on bank reserves; Marschak 1938, on portfolios; rather vague remarks of Irving Fisher and Frank Knight; Allais 1943, on the demand for cash balances).

The vigorous revival of expected-utility theory by von Neumann and Morgenstern (1947) and Savage (1954), the latter with an accompanying axiomatization of probability theory, precipitated a vigorous set of applications to economic uncertainty. The general formulation of uncertainty as a system of state-contingent commodities (Arrow 1953; Debreu 1959, chap. 7), the systematic development of portfolio choice by individuals (Tobin 1958; Markowitz 1959), and the incorporation of portfolio theory into general equilibrium theory in the capital-asset-pricing model (Sharpe 1964; Lintner 1965; Mossin 1966) followed rapidly.

These theories were based, however, on the assumption of a given public body of information. The uncertainties were in most models the same for all participants. In some it was possible for individuals to have different probabilities for the same events, but these were purely subjective choices, not based on different observations or other objective and transmittable differences in knowledge.

Mathematical statistics (R. A. Fisher, Neyman and Pearson, Wald) had been developing as a discipline, and it was devoted precisely to the optimal use of information, that is, how best to use a set of observations to modify beliefs. From a somewhat different point of view, communications theory (Shannon) was also concerned with the transmission of information. With the aid particularly of Savage's work, the idea that economic decisions should be thought of as functions of information became widespread. One of the earliest effects was seen in Marschak's work on organization theory (1954). He abstracted from conflicts of interest within the organization but emphasized differences in information. Different members made different observations ("received different signals" in language derived from communications theory) and had to make decisions that were complementary with or substitute for those to be made by other members of the "team," based on different observations. The initial

distribution of information might be modified by communicating some of the signals to other team members.

While team theory has not developed very much, this picture of differential or asymmetric information was applied during the 1960s to the operation of markets. Subsequent work put more emphasis on incentives. The asymmetric information not only existed but could be the basis for profitable actions, and those without the information would take protective steps. Arrow (1963) found differential information important in the field of medical care, both in the supply of medical care itself and in the workings of medical insurance. (Concepts like "adverse selection" and "moral hazard" were already very well known in insurance practice but had little theoretical development.) Recognition of similar issues in the securities markets, product quality, share-cropping, optimal income taxation, and employment contracts followed very rapidly with work of Radner, S. Grossman, Mirrlees, Ross, Spence, and Stiglitz, among others. One side development was the recognition that, under asymmetric information, prices revealed information about the knowledge of others. To my mind, this particular proposition, ingenious as it is, has deflected attention from the great variety of ways in which information is transmitted, to put all emphasis on one.

The formal analyses of the economics of information based on explicit use of probability theory and the updating of probabilities based on new information have been very fruitful in illuminating previous inexplicable economic institutions such as share-cropping and incentive contracts. But they are only part of the story. One quite different insight into the role of information came from attempts to document and explain economic growth. The fact of technological progress was quite evident and has been referred to casually by most economists at least since Adam Smith. Nevertheless, attention to its importance was dramatically increased by the empirical work of Solow (1957), preceded by similar but less influential work by Tinbergen (1942) and Abramovitz (1956). All showed that output rose more rapidly than an index of total conventional inputs; an obvious interpretation is that information about the ability to transform inputs into outputs is growing over time.

Separately, there had already been a literature, as much sociological as economic in origin, that studied the diffusion of technological and other information. The models were very much drawn from the theory of epidemics; informed and uninformed individuals met each other at random, and at each meeting there was a probability of transmission of the information. This led to a logistic curve for the spread of the new knowledge, an observation that had already appeared in A. F. Burns (1934). Though there was little economic basis, somewhat more sophisticated formulations in which costs and benefits of communication appeared were developed by Griliches (1957) and Mansfield (1968). These models have not been much developed, but they draw attention to two important facts about the state of information: (1) it is not uniform in a country and certainly not in the world, so that there is indeed asymmetric

information about technology; but (2) information does migrate; its distribution cannot be taken as given.

Stigler (1961) introduced a new point of view into the implications of differential information for information seeking. He postulated information (in his work, price information) that could indeed be discovered but only at a cost to the searcher. Stigler's theory has been intensely developed, though in spurts, but has had only limited application to technical or other information other than prices.

Apart from transmission, technological progress requires of course the creation of information that is entirely new. In the models of Solow and Tinbergen, information simply appeared exogenously. To some extent, it is indeed the by-product of noneconomic forces such as scientific curiosity. But to a great extent the new information is the result of deliberate inquiry, which means there is a specific investment decision based on the expectation of reward. This decision may be public or private. The incentives for the creation of information needed examination, especially in view of the fact that information could only partially be made into private property. Many interesting papers were presented at a National Bureau of Economic Research conference (1962), and there has been much subsequent literature, particularly on patent races.

It is obvious and important to note that the cost of acquiring information is a fixed cost with respect to production quantities, and this of course has obvious implications for the organization of competitive industries.

8.2 Some Generalizations about Information

The slippery role of information as an economic good is of deep significance to economic behavior, especially in the relatively information-rich modern economy. It is an economic good in the traditional sense; it is valuable, and it is costly. But it has a peculiar algebra. Adding one ton of steel to another permits more to be done; repeating the same item of information does not add anything useful. On the other hand, supplying a ton of steel to another reduces the steel available to the supplier; supplying information to another does not reduce the information available to the supplier.

From these trivial remarks, a whole host of consequences follows, some of which have already been noted. I want to stress some aspects of the role of information especially relevant to the human services that are the subject of this conference. Some are very common knowledge; others are not so widely remarked in the literature.

8.2.1 The Location of Decision: Information versus Utility

Most of our economic theory takes a simple view of decision making; each entity has a natural sphere (household consumption or production decisions). It is assumed that the individual whose interests or utility (benefits or costs of

both) are at stake is the same who has more information about it. But in many cases the information about the consequences of a decision may not be at all in the hands of the "natural" decision maker. This is notoriously the case with medical care and indeed typically with professions (lawyers). Our practice in education is similar. The actual conduct of a school (even of a private school) is not in the hands of the individual parent and not even in the hands of parents collectively. A university faculty, even today with its shaken confidence, considers that it is better able to determine a curriculum and the contents of particular courses than the students or the parents.

One principle that is clearly valuable in many situations is that of colocating information and decision. *Responsibility* can be based on knowledge. This is the sterling contribution of Calabresi in his classic analysis of liability for accidents (1970).

Health and education are indeed examples of asymmetric information, but in a way different from that posed in the usual analyses. The ordinary cases are those in which an individual has private information about himself or herself, for example, his or her capabilities or willingness to perform, and this information is not available to others, for example, an employer. The examples I have in mind here are ones where another individual may have better information. This viewpoint would lead to paternalism, and indeed, in spite of all ideological opposition, we do accept paternalism in many spheres.

It must be emphasized that asymmetric information, even in this case, does not necessarily lead to shifting the locus of decision making. The individual less informed about his or her own well-being may nevertheless have enough information to permit monitoring the choices. Further, the responsibility need not be all or none. The asymmetric information I described may be equally applicable to complex machines, such as automobiles. The producer in general has much better knowledge of the performance characteristics than the buyer. We do not feel it necessary to remove choice from the individiual. But we do have a principle of product liability. The more informed party does not make the decision but bears a responsibility concomitant with its superior knowledge.

There are a number of modes of information transfer that are sufficient to permit the less informed but concerned party to make adequate choices. One is *experience;* the repeated use of objects from the same source may give a reliable measure of usefulness even to the buyer who could not begin to design or build an automobile. A second is *reputation;* this does depend on inexpensive non-market-based transmission of information from others. A third is the use of *signals;* warranties or prices may be used to signal quality, though these have to be validated through experience and reputation.

These devices permit the creation of markets in which principals employ agents who are better informed than they are. Current principal-agent theory takes the relation as given and proposes contracts to reconcile the interests

of the two parties. The usual theoretical contracts are in general much more complicated than those observed in practice. The published literature neglects the market in which principals and agents come together.

These three modes of information transfer are market-based or at least noncoercive forms of information transmission to mitigate the effects of not colocating information and decision. Another tool is *government regulation.* The government licenses physicians (and lawyers), thereby guaranteeing some minimum standards. In a similar vein, we have government regulation of securities issues, which set standards for information disclosure. These provide at least part of the information, so that the decision maker is closer to being adequately informed.

8.2.2 Incentive Problems

Obviously, when decisions are shifted from the person most concerned to the one most informed, there are incentive issues. As noted, much literature addresses incentive contracts, which have little relation to actual contract practices. What is noteworthy in the case of medical care is the extent to which professional standards rather than incentive contracts are still the main source of control.

Obviously, in the medical field, as noted from the beginning, the presence of third-party payers has weakened the incentive to economize. This has shifted the incentives to the insurance carriers, and they are certainly beginning to accept this responsibility. But they have of course their own incentives, which are not those of the patients. It is remarkable therefore that the system has worked as well as it has.

The clearest incentive failures in medical insurance have been the increasing exclusion of preexisting conditions and the constant threat to exclude those who have become ill. Any true insurance would have to take a lifetime viewpoint. Many apparent ethical dilemmas (such as making genetic diagnostic tests) would disappear if this were understood. The problem here is a conflict between the possibility of acquiring information about a patient's health, which may well have other useful purposes in diagnosis and treatment, and the competitive nature of the insurance market.

8.2.3 Economies of Scale in the Production of Information

From the fact that information can be reused at the cost of transmission, it follows that there is considerable economy of scale in the accumulation of information. Economies of scale in turn imply specialization. That is why it pays to have a relatively small number of individuals specialized as physicians. In short, it is precisely Adam Smith's explanation of specialization that explains why the problem of asymmetric information arises in the first place. (Of course, there can also be specialization based on differential abilities and interests, analogous to comparative advantage in international trade. For the

contrast between Smithian and Ricardian specialization, see Houthakker [1956].)

Economies of scale arise in another way, which may be called *statistical economies*. Much information is essentially statistical in character; it finds regularities in large bodies of data. This process by definition requires large scale. If we are discussing the reliability of equipment or the principles of good education, there needs to be a large sample to get some reliability. The experience of a single individual does not offer enough opportunities to get reliable results. Hence, there is value in central data collection, and correspondingly an automatic degree of specialization.

8.2.4 Information Dissemination versus Paternalism

The presence of economies of scale in information explains the mismatch between the location of information and that of concerns. The colocation of information and decision may not accord well with the individual who undergoes the benefits and costs. The physician knows more than the patient, but it is the latter's welfare that is at stake.

This raises the possibility of replacing regulation or proxy decision making by dissemination of information. In the medical field, this can take a number of forms. (1) Instead of licensing physicians, simply inform a potential patient of their training and their record of accomplishment. (But who would provide this information?) (2) Confine the physician's role to giving information, and let the decisions be made by the patient. (3) Make it easier to get alternative opinions.

8.2.5 The Inevitability of Information Diffusion

To some extent, the spread of information will occur in any case, though its reliability may be in doubt. Knowledge about new medical developments and treatments becomes known through a variety of means, in which both personal contacts and media play roles. Medical decisions are made against a background of social knowledge, though undoubtedly very unequally diffused. This is even truer of educational decisions. The professional insulation is much weaker, and lay boards have even more authority.

In both cases, the word "information" may not be quite accurate. What is diffused is opinion, and, as we well know, this may be in some cases far from the most relevant observations. Cognitive biases are well known, but perhaps even more important is the bias toward ease of an interest in communication. In both fields, faddishness is not at all uncommon.

8.2.6 Information and Organization

The way decisions are made and information is used depends heavily upon the organizational environment for decisions. The medical field is in many ways very decentralized. The ultimate unit is the patient-physician encounter, so that knowledge is used on an individual basis. Education is almost invari-

ably carried out in classes; for the sake of continuity and coordination, the classes themselves fit into larger entities, schools. This means that the knowledge is partly embodied in bureaucratic rules of procedure. These may change from time to time under evolving information or opinions, but they have to change in a coordinated manner. This makes each change much costlier. It also gives less room for learning from experience to feed back into the decisions about curriculum and teaching methods.

8.3 Responsibility for Medical Decisions

There is a whole hierarchy of decisions that have to be made to determine the course of medical practice. Physicians make individual decisions about care of their patients, subject of course in the first place to the patients' consent, but in a context where their decisions are constrained by the prospects for reimbursement and by the availability of resources to carry out the diagnoses and therapies.

The conflict of incentives and information is increasingly leading to a diffusion of responsibility for medical decisions. The simple picture of the physician making decisions for the patient has certainly become more complicated. Patients always had a role in choosing to seek medical advice and from whom. Their choices are becoming increasingly restricted as medical practice becomes more organized. The problems of cost control in an insured world are partly met by the increasing use of control of medical services through review by health maintenance organizations and insurance carriers.

A particularly important issue in assigning responsibility for medical choice is the control of decisions about the provision of diagnostic facilities and hospital facilities. These decisions are central not only because they affect an important area of costs directly but also because they indirectly limit the possibilities for medical procedures. To exercise control over facility decisions requires knowing not only the technological usefulness of the facilities but also the alternative sources of supply in the relevant marketplace. The forces of competition, which might otherwise serve as a control, are dulled by third-party reimbursement and may be made less effective by competition among insurance carriers. There seems to be no major informational reason why a central authority cannot set limits (for example, by preventing reimbursement of unnecessary overhead costs), but since such an attempt was made to regulate the introduction of CAT scanners, my impression is that there has been no effective control.

8.4 Responsibility for Educational Decisions

As already suggested, education differs from medicine in its more strongly organized form, although modern developments in the structure of medical practice may be reducing the difference. Within the school, education is essen-

tially a public good; because of economies of scale in coordination, any decision on education cannot be finely differentiated according to the individual.

Education may also differ from medicine in that the degree of knowledge behind it is less. It is harder to understand social processes, in which genuine experimentation is lacking, than biological processes. As a result, professional status, though not entirely lacking, is much less strong, and lay control is much less inhibited.

Society has largely retained the premise that primary and secondary education is primarily a state responsibility, as to both financing and supply. Objections have been made to both kinds of state responsibility, though more usually to the central role of the state in supply. The many versions of voucher schemes seek to achieve private competition for the supply of education. I am certainly no expert in these matters. Decisions have to be made as to the degree of resource support, the particulars of the curriculum, the qualifications of teachers, and the standards to be imposed on the students. Within the framework set by these overall decisions, the teachers still have all the decisions inherent in running a class.

There are additional complications in analyzing the allocation of responsibility in education. The needs and abilities of students differ very much among themselves, so that the aims of the system are not as clear as they are in medicine.

As with medicine, the decision making has become increasingly complicated as the sources of finance become more varied. In particular, the state and even the federal government have become larger participants as compared with the traditional (in the United States) control by local authorities.

By definition, the students are not a very useful set of decision makers; if they were, there would be no need for education. Can the parents play a role? Obviously, some parents are well informed, but many others are not, for all sorts of reasons, rational and otherwise. As Hirschman pointed out long ago (1970), there is an instability associated with parental influence. If a public school system starts deteriorating, it is precisely the most aware and knowledgeable parents who will put their children in private schools and therefore cease to influence the public schools; in his terminology, they choose "exit," not "voice." Now, "exit" is the consumer's decision-making mode in the private competitive sector. This has suggested to many that competition through voucher systems will serve the same function in education. But Hirschman's argument should give pause.

For the voucher system to work, it would be necessary to have informed parents. One cannot be dogmatic without empirical evidence, but I would be surprised if the average parent has the time or patience or competence to digest the relevant information. Indeed, one wonders where the information is to come from and in what form it should exist. Do we use test scores, themselves affected by the selection processes of the students? Impressions of individual teachers or of the physical appearance of the school will tend to dominate.

8.5 Decisions on Child Care

Child care has grown up under different circumstances than education and probably for a mixture of reasons, good and bad. There are many systems of child care, some private, some public. As compared with primary and secondary education, there is clearly less need for coordination. The sequencing of classes is much less important. It would appear that the ability of parents to monitor the conduct of the child care activity is much greater because the activity is much closer to everyday experience and knowledge. Most of the informational and structural arguments for the public supply of education are absent in the case of child care. Reputation and experience may suffice for adequate monitoring.

It is also true that the utility of child care to parents is probably more determined by local considerations than is the case with primary education. In particular, questions of convenience of locality play an important role. On matters such as these, the parents have a natural informational advantage. There are some advantages to specialization based on noninformational scale economies, but these operate at a level well below the smallest local government. There may, for example, be room for initiatives to base a school on the employees of a moderate- or large-size firm. But there seems no reason not to believe that the market will take advantage of those economies.

Hence, there seems to be much less reason for government supply or at any rate for government monopoly of child care than there is for government near-monopoly of primary education.

Are there grounds for government *financing?* A case could easily be made against it. Working mothers should buy child care if and only if the value of the additional income plus whatever gain there may be in being relieved of child care activity covers the cost of child care plus compensation for forgone leisure. However, this argument is complicated by the taxes on income (and possible loss of other benefits) and by redistributionist arguments that take us beyond the scope of this paper.

In the absence of government financing, it is not very clear that the government has any advantage in regulating the quality of child care. If the government does finance child care, at least to some extent, then it begins to have a stake in the quality of care. The most natural manifestation of this concern is regulation, especially in the form of setting minimum standards and possibly licensing personnel.

I have tried to show how informational considerations play an important part in organizing decision making in social services. The crucial point is that information is frequently found in the hands of those with less personal interest. A social system works best when decision, information, and interest are located together. The practical problems of medical care, education, and, to a lesser extent, child care arise because these three variables are possessed by different groups.

References

Abramovitz, Moses. 1956. Resource-output trends in the U.S. since 1870. *American Economic Review Papers Proceedings* 46 (May): 97–103.

Allais, Maurice. 1943. *Économie et interêt.* Paris: Imprimerie Nationale.

Arrow, Kenneth J. 1953. Le role des valeurs boursières dans la répartition la meilleure des risques. *Économétrie: Colloques Internationaux du Centre Nationale de la Recherche Scientifique* 11:41–47. English version, The role of securities in the optimal allocation of resources. *Review of Economic Studies* 31 (1964):91–96.

———. 1963. Uncertainty and the welfare economics of medical care. *American Economic Review* 53:941–73.

Bernoulli, Daniel. 1738. Specimen theoriae novae de mensura sortis. *Commentarii Academiae Imperiales Petropolitanae* 5:175–92.

Burns, Arthur F. 1934. *Production trends in the United States since 1870.* New York: National Bureau of Economic Research.

Calabresi, Guido. 1970. *The costs of accidents: A legal and economic analysis.* New Haven: Yale University Press.

Debreu, Gerard. 1959. *Theory of values.* New York: Wiley.

Griliches, Zvi. 1957. Hybrid corn: An exploration in the economics of technological change. *Econometrica* 25:501–20.

Hirschman, Albert. 1970. *Exit, voice, and loyalty.* Cambridge: Harvard University Press.

Houthakker, Hendrik S. 1956. Economics and biology: Specialization and speciation. *Kyklos* 9:181–87.

Lintner, John. 1965. The valuation of risky assets and the selection of risky investments in stock portfolios. *Review of Economics and Statistics* 47:13–37.

Mansfield, Edwin. 1968. *Industrial research and technological innovation.* New York: Norton.

Markowitz, Harry. 1959. *Portfolio selection: Efficient diversification of investment.* New York: Wiley.

Marschak, Jacob. 1938. Money and the theory of assets. *Econometrica* 6:311–25.

———. 1954. Towards an economic theory of organization and information. In *Decision processes,* ed. Robert M. Thrall, Clyde Coombs, and Robert L. Davis, 187–220. New York: Wiley.

Mossin, Jan. 1966. Equilibrium in a capital asset model. *Econometrica* 35:768–83.

National Bureau of Economic Research. 1962. *The rate and direction of economic activity: Economic and social factors.* Princeton, NJ: Princeton University Press.

Savage, Leonard J. 1954. *The foundations of statistics.* New York: Wiley.

Sharpe, William. 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance* 19:425–42.

Solow, Robert M. 1957. Technical change and the aggregate production function. *Review of Economic Statistics* 39:312–20.

Stigler, George J. 1961. The economics of information. *Journal of Political Economy* 69:213–25.

Tinbergen, Jan. 1942. Zur Theorie langfristigen Wirtschaftsentwicklung. *Weltwirtschaftliches Archiv* 55 (Heft 3): 511–49.

Tobin, James. 1958. Liquidity preference as behavior towards risk. *Review of Economic Studies* 25:65–86.

von Neumann, John, and Oskar Morgenstern. 1947. *Theory of games and economic behavior.* 2d ed. Princeton, NJ: Princeton University Press.

Comment

Glenn C. Loury

Four policy areas have been the main concern of this conference: child care, health care, education, and long-term care. Within each area two central questions have been explored: What are the *social responsibilities* for provision of assistance in these areas? And, how can programs be designed to deal with *implementation problems* likely to arise when trying to meet these social responsibilities? Kenneth Arrow's paper addresses these matters at a conceptual level by considering the role that *limited information* plays in helping economists distinguish individual from social responsibilities, and in thinking about the issue of program design.

There are three perspectives from which to view these questions. One concerns how individuals perceive risks and take decisions in the presence of uncertainty and/or ignorance. Another relates to contracting between private parties and the functioning of markets in the face of informational asymmetries. The third perspective considers the functioning of government regulatory and service-providing institutions under conditions of imperfect information. All three perspectives are involved when asking about the *what* and the *how* of social policy.

One way to look at the issue of individual versus social responsibility, natural for an economist, is through the "market failure" paradigm. There one posits an idealized world of complete markets, on which every commodity can be traded, at every date and under every contingency, through costlessly enforced contracts under competitive conditions. Under such ideal circumstances private contracting and the individual pursuit of self-interest lead to efficient resources allocation. Under this paradigm the presumption is that social responsibilities (beyond the simple redistribution of income) arise only when the efficiency of private contracting cannot be presumed. To the extent that real-world trading possibilities depart from the idealization, one identifies a *market failure;* it is to remedy such a breakdown that the people, through their governments, undertake social actions of various kinds.

Information figures importantly in this paradigm. For example, the fact that a buyer of goods and services may not be as well informed as the seller about the quality of what is being sold leads to market failure when it is impossible to write and enforce contracts contingent on the resolution of this qualitative uncertainty. Insurance markets and markets for professional services are plagued by this problem. Thus, the social provision of insurance and the public regulation or certification of professional competencies are collective responses that can be rationalized as necessary in the face of the inadequacy of markets.

Yet this market failure paradigm is not totally adequate for two reasons. First, people need not be competent to define and effectively pursue their self-

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interest. If they are not, even in the absence of market failure, reliance on individual responsibility alone may not be appropriate. Second, the institutions of government are not exempt from the same performance failures that plague markets under conditions of limited information. The possibility of *government failure* militates against the presumption that matters will necessarily be improved when social responsibility is assumed in areas where markets function imperfectly. The difficulty of making large, bureaucratic organizations responsive to the interests and needs of their clients, and the susceptibility of public agencies to political influence by interested parties, illustrate some of the possible pitfalls.

It is for these reasons that I stress the three distinct perspectives mentioned earlier—individuals' (possibly "irrational") behavior, market functioning, and government functioning. I do not believe that there exists any neat theoretical scheme that provides a general answer to the question of what (if any) human services should be provided via social policy. That question inescapably raises philosophical and ethical issues; it also involves matters of culture and politics. It is probable that different societies, equal in economic resources and in the development of market institutions, will and should answer that question differently.

To illustrate, a central theme arising in all four policy areas and raised in Arrow's paper is the matter of *paternalism*—the coerced substitution of a collective or expert judgment for the individual's assessment of his or her self-interest. Use of state power to affect such coercion is practiced to some degree in all four policy areas—education, child care, long-term care, and health care. Some limitation of information or knowledge on the part of the individual subjected to paternalistic governance—her lack of understanding about how best to socialize her children, for example—is the primary rationale for this extraordinary usurpation of individual autonomy. Yet paternalism always involves *values* as well as *information.* Education is not just the provision of facts; it is also the transmission of a set of convictions about how one *should* look at the world. This distinction between values and facts is inherently political. It inevitably involves social judgments, collectively enforced. It is not subsumed in the distinction familiar from decision theory between an agent's assesssment of probabilities and his valuation of outcomes (see, e.g., Savage, *Foundation of Statistics*). It is important to realize, to take one case in point, that behind the conviction that broad benefits to ghetto children will follow from the universal provision of child care lies the social judgment that the values transmitted to children within institutionalized settings are preferable to those likely to be communicated to the child by its parent.

More generally, Arrow's paper calls attention to the fact that, in matters of human service provision, the locus of decision making, the locus of concern, and the locus of information need not coincide with one another. The locus of decision making identifies the agent governing the choice of a course of action; the locus of concern refers to the parties bearing the cost and/or enjoying the

benefits of the action; the locus of information indicates who has the factual knowledge needed to select an efficient (net benefit maximizing) action. Problems arise when these loci are not concentrated in the same party. And while these problems need not require socialized service provision, or even public regulation of private provision, the evocation of public authority can often be seen as a response to some lack of coordination between these three loci. This framework is attractive since it captures situations of market failure, but does not require a strictly economistic view of the problem of distinguishing individual from social responsibilities.

A principal benefit of socialized human service provision is that it permits the violation of individual rationality constraints. The economic theory of mechanism design with incomplete information proceeds from the observation that no outcome can be implemented that is not consistent with self-interested, privately informed agents' being willing to reveal what they know. Yet, if truthful revelation results in an agent being made worse off than in the status quo ante, that agent would not participate in the endeavor. For example, under conditions of adverse selection in insurance markets, a well-known unraveling phenomenon occurs in which better risks selectively withdraw from pooled insurance contracts that are priced at the cost of providing coverage to the average risk. As the better risks withdraw, the pool worsens, raising costs and thus prices, and inducing further withdrawals. Often the only way around this problem is to compel participation by those who would otherwise opt out. Such use of the coercive power of the state is only possible when the organization of the insurance market, if not the actual provision of coverge, has been socialized. Mandatory education laws, and vouchers for education or child care that cannot be augmented with private funds or that are limited to use in nonsectarian settings, can be viewed in a similar light.

A lack of coincidence between the loci of choice, concern, and expertise is also evident in the class of situations associated with the *principal-agent problem.* In the health care sector the interaction between patient and doctor illustrates the problem. Interests are not coincident; one party knows his preferences among alternative treatment strategies given their likely outcomes; the other party knows better the uncertain relation between treatment strategies and results. Mechanisms of accountability—such as professional licensing, standards of practice enforced within a relevant community of practitioners, threats of ex post legal action, and experience/reputation effects—are imperfect at best.

Another, less obvious, instance of the agency problem is the relationship between society as a whole and the parents responsible for the care of children. The social interest in effective child rearing is obvious, but seldom so compelling as to override the autonomy of the family. Thus, human service provision to children is necessarily mediated by parental choice. As mentioned, to the extent that the instruments available to induce parents to make the "right"

choice are inadequate, the case is strengthened for socialization of some activities that complement child development, to ensure appropriate investments are made.

Another set of issues arises in the classical *moral hazard* conflict between the desire to provide individuals with security and the need to provide them with incentives. This is a central element of the health care debate, but it is important in long-term care as well. Politically, the demand for security has been an important motive behind the growth of welfare states in the industrial societies. Yet the negative implications of inadequate incentive provision for social budgets and health costs have become increasingly evident. While people rally for their governments to provide them with security, we do not observe them in the streets insisting that they be provided with the incentives to make economically rational choices. Therein lies a basic dilemma in the political economy of service provision.

Another moral hazard dilemma arises in the presence of socialized service provision, deriving from the government's inability to credibly threaten to withhold services. All helping relationships are troubled by the following problem: The provider of assistance (P) wants the one in need (N) to act responsibly so as to minimize the need for assistance. At the same time P, being unwilling to tolerate undue suffering by N, is compelled to provide help whenever N's need becomes too great. So N can rely on the fact that, even when N has taken inadequate precautions against the prospect of needing assistance, should disaster occur P will come to the rescue. P's inability to tolerate N's suffering fundamentally limits P's ability to control N's behavior. This is the Samaritan's dilemma. Of course this problem arises in private, consensual relationships as well. But it is exacerbated in the context of public provision by the political dynamics that expose public decision makers inclined toward a "tough-minded" stance to the risks of being portrayed as mean-spirited.

Finally I want to observe, in keeping with a prominent idea in Arrow's paper, that the lack of information creates a circumstance in which learning and innovation become important. Research and development in the drugs industry and exploration of the human genome are instances of this general observation. Public policy—regulatory, antitrust, research support, and patent policies, for example—affect the incentives of private agents to create new information. Moreover, deep problems arise about the ways in which information should be exchanged and disseminated into the marketplace. The issues of "preexisting conditions" in medical insurance and of the identification of genetic markers associated with higher risks of contracting certain ailments have recently focused public attention on this problem. There is also the matter of learning about the most effective methods of organizing and managing socialized human service provision. Here the question of which activities are appropriately undertaken at the federal level, versus at the level of state and local governments, is crucial. Greater devolution permits greater experimentation from

which might arise new knowledge about which methods of public provision are most effective, though this diversity undermines the ability to enforce minimal standards of provision across the various jurisdictions.

Viewing the problem of how to divide responsibility for human service delivery between the private or public sectors through the lens of information economics is no panacea, but it can be extremely helpful. Kenneth Arrow's paper should stimulate useful reflection on a wide range of issues related to this general problem.

Reference

Savage, Leonard J. 1954. *The foundations of statistics.* New York: Wiley.