



*Econ Journal Watch,
Volume 2, Number 1,
April 2005, pp 47-55.*

SYMPOSIUM ON INFORMATION AND KNOWLEDGE IN ECONOMICS

Information-Knowledge Symposium: Introduction

THE TOPIC OF THE SYMPOSIUM IS THE DISTINCTION BETWEEN information and knowledge. Economists who work on information and knowledge were invited to write a brief reflection on whether there is a distinction between information and knowledge, and, if so, what the distinction is and what its significance in economics is.

The invitation posed the following questions:

1. Is there an important distinction between information and knowledge?
2. How would you formulate the distinction?
3. Is the distinction important to economic understanding, explanation, and policy?
4. Why is it important? (Or, why is it not important?)
5. What is the relationship between knowledge and incentives?
6. How well does academic economics appreciate and make use of the distinction between information and knowledge? You may wish to think of different settings of economists' discourse (e.g., the textbooks, the top journals, the lunchroom, etc.)
7. If you believe that the situation in economics is unsatisfactory, what directions would you suggest to improve matters?

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8. What other thoughts do you have on knowledge and information in economics?

Also provided was a compendium of quotations about information and knowledge, which follows here. The quotations were selected to provide possible touchstones of wisdom and of error.

Seven economists—Brian Loasby, Thomas Mayer, Bruce Caldwell, Israel Kirzner, Leland Yeager, Ken Binmore, and Robert Aumann—returned essays, and one—Kenneth Arrow—provided a letter with permission to publish the letter as correspondence regarding the symposium.

Econ Journal Watch is grateful to the contributors for addressing the issue and advancing our thinking about the distinction between information and knowledge. If there is one conclusion to be drawn from the group of essays, it might be that thinking about the relationship between information and knowledge does not satisfy common-knowledge assumptions.

—Daniel Klein
March 2005

**COMPENDIUM:
ECON JOURNAL WATCH SYMPOSIUM ON THE
DISTINCTION BETWEEN KNOWLEDGE AND
INFORMATION**

Quotations regarding the distinction between knowledge and information

Adam Smith, *The Wealth of Nations*. NY: Modern Library, 1937, p. 249:

But though the interest of the labourers is strictly connected with that of the society, he is incapable either of comprehending that interest, or of understanding its connexion with his own. His condition leaves him no time to receive the necessary information, and his education and habits are

commonly such as to render him unfit to judge even though he was fully informed.

Arthur Schopenhauer, *Essays and Aphorisms*, selected and trans. R. J. Hollingdale. NY: Penguin Books, 1970, pp. 226-227:

Students and learned men of every kind and every age go as a rule in search of *information*, not *insight*. They make it a point of honour to have information about everything: it does not occur to them that information is merely a *means* towards insight and possesses little or no value in itself. When I see how much these well-informed people know, I sometimes say to myself: Oh, how little such a one must have had to think about, since he has had so much time for reading!

Friedrich A. Hayek, *The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology*. Chicago: University of Chicago Press, 1952, p. 42:

It might be said that the whole theory of the formation of sensory qualities to be developed in the following pages is no more than an extension and systematic development of the widely held view that every sensation contains an element of interpretation based on learning, an extension by the *whole* of the sensory qualities is accounted for as such an interpretation.

E. H. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation*. New York: Pantheon Books, 1960.

Duck-rabbit illustration (after Wittgenstein's discussion of a duck-rabbit image in *Philosophical Investigations*, p. 195).



Paul Weiss [a biologist], “Knowledge: A Growth Process,” *Science* 131 (June 10, 1960), p. 1717:

Information is but the raw material, the precursor of knowledge. Knowledge emerges from the distilling, shaping, and integrating of the raw material into concepts and rules, and in the process of condensation and generalization, the number of bits of detailed information dwindles, rather than mounts.

Thomas C. Schelling, *The Strategy of Conflict*. Cambridge: Harvard University Press, 1960, p. 163-4:

Taking a hint is fundamentally different from deciphering a formal communication or solving a mathematical problem; it involves discovering a message that has been planted within a context by someone who thinks he shares with the recipient certain impressions or associations. One cannot, without empirical evidence, deduce what understandings can be perceived in a nonzero-sum game of maneuver any more than one can prove, by purely formal deduction, that a particular joke is bound to be funny.

George J. Stigler, “Imperfections in the Capital Market,” *Journal of Political Economy* (June 1967): 287-92, p. 291:

Transportation costs are the prototype of all trading costs: costs of acquiring knowledge of products and other traders, inspecting quality, collecting funds, etc. There is no “imperfection” in a market possessing incomplete knowledge if it would not be remunerative to acquire (produce) complete knowledge: information costs are the costs of transportation from ignorance to omniscience, and seldom can a trader afford to take the entire trip.

Fritz Machlup, *The Production and Distribution of Knowledge in the United States*. Princeton, NJ: Princeton University Press, 1962, p. 15:

If our stock of knowledge includes, say, the multiplication table one may object to calling it “information.” Or, if we know the law of supply and

demand and also know that certain prices have just gone down, it may be preferable to speak of price change as a piece of information, and of the usual consequences of price change as a piece of knowledge. One may object to referring to the law of supply and demand as a piece of information, but there should be no serious difficulty in referring to the report of the price change as having become part of our knowledge. Again we conclude that all information in the ordinary sense of the word is knowledge, though not all knowledge may be called information.

Michael Polanyi, *The Study of Man*. Chicago: University of Chicago Press, 1963, p. 15:

The peculiar risk that we take in relying on any explicitly formulated knowledge is matched by a peculiar opportunity offered by explicit knowledge for reflecting on it critically.

Kenneth E. Boulding, *The Meaning of the Twentieth-Century: The Great Transition*. NY: Harper & Row, 1964, p. 71.

It is fundamental to all knowledge processes that we gain knowledge by the orderly loss of information.

Kenneth E. Boulding, *Beyond Economics: Essays on Society, Religion and Ethics*. Ann Arbor, MI: University of Michigan Press, 1968, p. 142:

Knowledge, however, has a dimension which goes beyond that of mere information or improbability. This is a dimension of significance which is very hard to reduce to quantitative form. Two knowledge structures might be equally improbable but one might be much more significant than the other.

William S. Comanor and **Thomas A. Wilson**, *Advertising and Market Power*. Cambridge, MA: Harvard University Press, 1974, p.

If we could be assured that advertising provides no misinformation and thereby promotes consumer choices that are more in accord with those that

would be made with full information, then we could argue that there is a positive gain to the consumer associated with his revised preferences. Although this may be the case in many circumstances, we cannot rule out the prospect that some forms of advertising lead consumers further away from choices based on full information. Indeed, prospects for the provision of misinformation are surely increased by the manner in which advertising messages are supplied, since the dominant concern of the advertiser is to sell the product, not to provide objective information on products in the market.

Paul Simon, Train in the Distance, *Hearts and Bones*, Warner Bros. Records, 1983:

Negotiations and love songs
Are often mistaken for one and the same

James W. Friedman, Game Theory with Applications to Economics. NY: Oxford University Press, 1986, p. 11:

Common knowledge refers to those things that are known by all players, and known by each to be known to all of them, and so forth. See Aumann (1976) and Milgrom (1981). Usually, and always throughout this book, games of complete information [note from D.K: complete information does not imply perfect or symmetric information] are characterized by each player knowing the entire structure of payoffs of the game, by each player knowing that all players possess this information, and by all players knowing that all players have this information. There is, for example, an important conceptual distinction to be made between (a) a complete information game in which complete information is common knowledge and (b) a complete information game in which each player does not actually know whether the other players also have complete information. In general, there is no reason to suppose that intelligent behavior and equilibrium will be the same in both cases. To repeat, in this book, complete information games are restricted to games in which complete information is common knowledge.

Eric Rasmusen, *Games and Information: An Introduction to Game Theory*. New York: Basil Blackwell, 1989, p.51.

For clarity, models are set up so that information partitions are common knowledge. Every player knows how precise the other players' information is, however ignorant he himself may be of which node the game has reached. Modelled this way, the information partitions are independent of the equilibrium concept. Making the information partitions common knowledge is important for clear modeling . . .

Donald Wittman, "Why Democracies Produce Efficient Results," *Journal of Political Economy* 97 (6) (1989): 1395-1424, pp. 1400-01:

It would be foolish to argue that voters are perfectly informed about political markets. However, efficiency does not require perfectly informed voters any more than efficient economic markets require all stockholders to know the intimate workings of the firms in which they hold stock or all principals to perfectly monitor their agents. A voter needs to know little about the actions of his congressman in order to make intelligent choices in the election. It is sufficient for the voter to find a person or organization(s) with similar preferences and then ask advice on how to vote. For example, people who like to hunt are more likely to read the literature from the National Rifle Association than from an organization attempting to ban guns, and one can always ask advice from a more politically knowledgeable friend with similar tastes. Voters can also look at the list of campaign contributors (who typically make their campaign endorsements public) and infer the characteristics of the candidates' policies (pro or con). That is, interest group endorsements are like signals in the market and provide strong cues about candidates' preferences. Furthermore, competitors for public office need provide only the information when there are discrepancies between the voters' preferences and the political outcome, not all the unnecessary detail.

Ken Binmore, *Fun and Games: A Text on Game Theory*. Lexington, MA: D. C. Heath and Co., 1992, p.150.

In game theory, something is common knowledge if everybody knows it; everybody know that everybody knows it; everybody knows that everybody

knows that everybody knows it; and so on. Game theorists usually assume that the rules of the game and the preferences of the players are common knowledge. In analyzing a game, they typically need also to assume that the fact that all the players subscribe to appropriate rationality principles is also common knowledge, although they are seldom explicit on this point.

Louis Putterman, John E. Roemer, and Joaquim Silvestre, “Does Egalitarianism Have a Future?,” *Journal of Economic Literature* 36 (June 1998): 861-902, p. 861:

This view [that unfettered markets are the optimal institution for promoting human welfare], traced to what are now considered to be the prescient writings of Friedrich Hayek, is based on problems of uncertainty and asymmetric information, from which flow agency problems of myriad kinds.

Eric Raymond (a pioneer of open-source software), “The Cathedral and the Bazaar,” *Knowledge, Technology & Policy* 12(3), Fall 1999, pp. 23-49, quotation at pp. 30, 33:

More users find more bugs because adding more users adds more different ways of stressing the program. This effect is amplified when the users are co-developers. Each one approaches the task of bug characterization with a slightly different perceptual set and analytical toolkit, a different angle on the problem. . . . *Often, the most striking and innovative solutions come from realizing that your concept of the problem was wrong.*

Unidentified author.

Sherlock Holmes and Dr Watson go on a camping trip. After a good dinner and a bottle of wine, they retire for the night, and go to sleep.

Some hours later, Holmes wakes up and nudges his faithful friend. "Watson, look up at the sky and tell me what you see."

"I see millions and millions of stars, Holmes" replies Watson.

"And what do you deduce from that?"

Watson ponders for a minute.

"Well, astronomically, it tells me that there are millions of galaxies and potentially billions of planets. Astrologically, I observe that Saturn is in Leo. Horologically, I deduce that the time is approximately a quarter past three. Meteorologically, I suspect that we will have a beautiful day tomorrow. Theologically, I can see that God is all powerful, and that we are a small and insignificant part of the universe. What does it tell you, Holmes?"

Holmes is silent for a moment. "Watson, you idiot!" he says. "Someone has stolen our tent!"

Cartoon by Mueller.



Author Unidentified:

Computers are stupid: They do what you say, not what you mean.

[RETURN TO SYMPOSIUM HOMEPAGE](#)