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Expert advice for amateurs☆

Ernest K. Lai*

Department of Economics, Lehigh University, United States

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ABSTRACT

A biased, perfectly informed expert advises a partially and privately informed decision maker using cheap-talk message. The decision maker can tell whether the state is "high" or "low" relative to a private threshold that divides the unit-interval state space into two subintervals. The decision maker's response to the expert's advice becomes less sensitive under the former's own information. In response, the expert provides advice that is considered more biased, relative to the case when decision maker is uninformed. For some types of decision maker, this negative, strategic effect of their own information outweighs its direct, positive effect—being informed makes them worse off. Examples show, however, that evaluated before the realization of her type, the opportunity to access information is always beneficial to the decision maker when the expert has moderate bias.

> "A little Learning is a dang'rous Thing;
> Drink deep, or taste not the Pierian spring."
> —Alexander Pope

1. Introduction

With a great deal of information only a few clicks away, the boundary between experts and novices blurs. Once the privilege of experts, specialized knowledge is now widely available on encyclopedic websites and through search engines. In the medical arena, for example, websites such as www.webmd.com have rendered patients much more informed and sophisticated than their counterparts a decade ago. We can perhaps jump a step ahead by saying that novices no longer exist today, and amateurs—those who know but do not know enough to dispense with the help from experts—have emerged to fill the void.

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* Correspondence to: 621 Taylor Street, Bethlehem, PA 18015, United States. Tel.: +1 610 758 5726.
E-mail address: kwl409@lehigh.edu

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Is evolving from novices to amateurs beneficial to patients and other decision makers? Advocates for consumer education would answer affirmatively; the underlying proposition of consumer education is that more information may help consumers defend against fraud and deception and in general leads to better decision.[1] Yet it is a well-known result in information economics that more information is not necessarily better. In, for instance, the classic lemons model of Akerlof (1970), information, when asymmetrically distributed, can eliminate trades that are otherwise mutually beneficial. In this paper, I examine the effects of decision makers' information in strategic information transmission (Crawford and Sobel, 1982), a setting that captures the interactions between experts and decision makers. Within the confine of the specified environment, two questions are explored: (1) how a biased expert responds to a decision maker who is (partially) informed; and (2) whether and under what circumstances becoming amateur may benefit or hurt the decision maker.

I start with Crawford and Sobel's (1982) model (the "CS model"). An expert (he), after privately observing the state of the world distributed uniformly on [0,1], sends a message (advice) to a decision maker (she). "Talk is cheap"—the message itself has no payoff consequence. After receiving a message, the decision maker takes an action that affects the payoff of both. Interests are misaligned: while the decision maker wants to take an action that matches the state, the expert's most preferred action is higher than the state by a fixed bias parameter.

The novelty of my model—which I call the *amateur model*—lies in the decision maker being an "amateur" who is partially informed. The decision maker does not directly observe the state but can tell whether it is "high" or "low": she is informed about in which interval of a binary partition of [0,1] lies the true state. Her definition of "high" and "low"—the cutoff in the partition or the *threshold*—is a private information constituting her type. The realization of the threshold, uniformly distributed on [0,1], privately determines the *amateur's partitional information structure*.

The way amateurs access and use information, which I attempt to capture with the model, may be illustrated with patient use of online information.[2] Fox (2006) reports that eight out of ten Internet users in the United States, accounting for some 113 million adults, have searched for health information on the Internet. These users may have access to only limited sources of information. Even when they have at their disposal the same information available to the professionals (e.g., by using the *Google Scholar*), as amateurs they typically lack the ability to interpret the information and sort out the relevant from the irrelevant. As one doctor puts it, "There's so much information (as well as misinformation) in medicine—and, yes, a lot of it can be Googled—that one major responsibility of an expert is to know what to ignore."[3] Given these extrinsic and intrinsic constraints, all a patient can get out of the websites may amount only to a rough idea as to whether her condition calls for serious attention ("high") or not ("low"). And with different sources of information and individual interpretations, it is plausible that even for the same underlying condition different individuals may arrive at different conclusions.

Fox (2006) reports that only one-third of the respondents mentioned their online findings during doctor's visits; a doctor facing a "Googler-patient" is likely to offer advice in the midst of some private information on the patient's part. Suppose the doctor reports a diagnosis biased toward inducing more intense and expensive treatments than are necessary.[4] A patient who believes that her condition is serious may consider the biased diagnosis a confirmation of her findings and proceed with an expensive treatment. Otherwise, she may request for other options or even seek a second opinion.[5] Even for the same piece of advice, once decision makers have their own information, it is inevitable that different responses will ensue.

To illustrate how different interpretations of advice arise under the decision maker's partitional information structure, consider, in the context of doctor-patient interaction, two types of patient, *Wimp* and *Stoic*. The diagnosis, observed only by the doctor, is represented by a point in [0,1]. The patients do not observe the exact diagnosis. But from what she learns from the Internet, *Wimp* is able tell that her condition is "not serious" if the underlying diagnosis lies in $[0, \frac{1}{3})$ and "serious" if it lies in $\left[\frac{1}{3}, 1\right]$. *Stoic*, interpreting information differently, considers $[0, \frac{2}{3})$ as "not serious" and $\left[\frac{2}{3}, 1\right]$ as "serious." Suppose the true, exact diagnosis is $\frac{1}{2}$ for both of them. Then, even for the same diagnosis, *Wimp* will consider her condition as "serious" while *Stoic* will deem otherwise.

Suppose the doctor provides a "vague" advice that the true diagnosis lies in $\left[\frac{1}{4}, \frac{7}{12}\right]$; he is not telling the exact truth but is not deceiving either because $\left[\frac{1}{4}, \frac{7}{12}\right]$ contains $\frac{1}{2}$. In light of her knowledge that the diagnosis lies in $\left[\frac{1}{3}, 1\right]$, *Wimp* will

[1] Ben Bernanke was once quoted on the Fed Education website: "In today's complex financial markets, financial education is central to helping consumers make better decisions for themselves and their families." As one of its missions, the Bureau of Consumer Protection "empowers consumers with free information to help them exercise their rights and spot and avoid fraud and deception"; they believe "education is the first line of defense against fraud and deception; it can help you make well-informed decisions before you spend your money."

[2] Cheap talk models have been applied to study the interactions between doctors and patients. For example, Kőszegi (2006) uses one to explore the emotional aspect of doctors' advice, extending on Caplin and Leahy's (2004) emotional model of certifiable information. Applications can also be found in other areas, e.g., political science (Gilligan and Krehbiel, 1989; Krishna and Morgan, 2001b) and finance (Benabou and Laroque, 1992; Morgan and Stocken, 2003). The questions that motivate this paper arise in these areas as well. For instance, with widely available online financial information, investors may no longer rely exclusively on the information provided by investment advisors.

[3] This controversial *Time* magazine article, "When the Patient Is a Googler," is written by an orthopedist Haig (2007) who reports his unpleasant experience with a "Googler-patient" whom he describe as "brainsucker." The doctor eventually decided not to treat the patient.

[4] The supplier-induced demand hypothesis in health economics (Evans, 1974) posits that doctors recommend more health care purchases than patients would buy if they had the same information. This coincides with the bias of the expert in the model.

[5] Thirty percent of the respondents in Fox (2006) indicate that online information led them to ask further questions to their doctors or seek a second opinion. In an article on *salon.com*, "Is There a Doctor in the Mouse?," the pediatrician-author Parikh (2008) mentions that some parents refused to vaccinate their children after being exposed to stories on autism websites about the dangers of vaccinating children.