

# Respecting autonomy: “Information first, then opinion” is more effective than “opinion first, then information”

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## Abstract

As the information gap between experts and non-experts narrows, it is increasingly important for experts to give advice to non-experts in a way that is both effective and respectful of their autonomy. We surveyed 508 participants using a hypothetical medical scenario in which participants were counselled on the risks and benefits of taking antibiotics for a sore throat in circumstances in which antibiotics were inappropriate. We asked participants whether they preferred (1) to make their own decision based on the information or (2) to make their decision based on the doctor's opinion, and then randomized participants to receive “information only”, “opinion only”, “information first, then opinion”, or “opinion first, then information.” Participants whose stated preference was to follow the doctor's opinion had significantly lower rates of antibiotic requests when given “information first, then opinion” compared to “opinion first, then information.” Our evidence suggests that in some important contexts, “information first, then opinion” is the most effective approach. We hypothesize that this is because it is seen by non-experts as more trustworthy and more respectful of their autonomy. Our finding might have general implications for expert communications.

**JEL Classification:** I12, I18, D91.

## Keywords

behavioural economics — health — expert communication

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## Introduction

Suppose that experts are seeking to advise nonexperts about the best course of action. Our central question is simple: should experts begin with their judgment, and then offer information, or should they begin with information, and then offer their judgment?

That question is motivated by the fact in a variety of fields, experts face new challenges in deciding how best to give advice to non-experts. In the field of medicine, these challenges have led to the concept of “shared decision making.” Shared decision making is a movement away from the classic decision making process of medicine, where the expert (the doctor) tells the non-expert (the patient) what tests they should receive, what medications to take, and whether or not to be admitted to hospital or discharged home. Instead, the goal of expert advice in shared decision making is to respect patient autonomy and agency. It involves three main steps: 1) introducing choice; 2) describing options; and 3) helping patients explore preferences and make decisions (Elwyn et al., 2012).

This approach raises a dilemma that faces experts across fields: how can one convey information to non-experts in

a way that truly respects their autonomy? A great deal of work in behavioral science shows that framing greatly matters, which means that formally identical information can be framed in multiple ways, and that people's actions will vary depending on the frame (Keren, 2011). In the context at hand, Peng et al. found that patients have a different evaluation of a drug treatment if the same information is presented to them with a gain frame compared to a loss frame (Peng et al., 2013). No one doubts that how information is presented can have a significant impact on how it is perceived, and therefore on the ultimate decisions made by non-experts. The difference between gain frames and loss frames has been studied in multiple contexts, but much remains to be learned about the effects of different kinds of expert frames.

To many people, the goal of respecting patient autonomy is self-evidently appealing. But endorsing that goal leaves open many questions. What kind of recommendations should doctors provide? And how might recommendations best respect patient autonomy? How should experts convey information and opinions to non-experts? In this survey, we examined individuals' preferences for how they would like to make decisions that require expert medical advice, and the impact of the order of information and opinion on the decisions that they

ultimately make. Our principal finding has major implications for expert advice in the field of medicine, and likely extends to many other fields of expertise.

## A survey to evaluate shared decision making

We surveyed 508 participants using Amazon’s Mechanical Turk to evaluate individuals’ stated preference for how they would like to make medical decisions. We also evaluated the impact of how information was presented on the participants’ decision to request an antibiotic prescription in a hypothetical clinical scenario. The literature on these issues is exceedingly sparse; aside from work on loss frame and gain frames, we have been unable to find any work bearing directly on the issues we examine here.

All participants were given the following scenario:

You have been suffering with a sore throat for 3 days. It is very painful to swallow and you have come to the emergency department for further assessment. The doctor tells you there is a 50% chance that you have “strep throat”, a bacterial infection of the throat.

Participants were then asked how they would like to make the decision about whether or not to receive antibiotics:

To make the decision about whether or not to take antibiotics, would you rather:

- A. I would like to follow the doctor’s opinion on whether or not I should take antibiotics
- B. I would like the doctor to explain to me the risks and benefits of taking antibiotics so that I can make a decision about whether or not I should take antibiotics

Participants were then randomized to receive the information from the doctor in one of four ways: 1) “opinion only”; 2) “information only”; 3) “information first, then opinion”; or 4) “opinion first, then information.” The third and fourth categories were identical to the combination of the first and second categories, with the only difference being the order of the paragraphs.

Participants in the “opinion only” category received the following information:

The doctor tells you that they strongly recommend against taking antibiotics in this situation. She recommends taking ibuprofen, an anti-inflammatory, to help with the pain, and returning to the emergency department if you develop more difficulty swallowing, difficulty opening your mouth, or a high fever.

Participants in the “information only” category received the following information:

The doctor tells you that based on your symptoms, there is a 50% chance that you have strep throat. Strep throat is a bacterial infection of the back of the throat. There is also a 50% chance that the infection is from a virus, for which antibiotics will be of no help. Most cases of strep throat are self-limiting, meaning they get better on their own without antibiotics within 7 days. If you do have strep throat, taking antibiotics would, on average, reduce the duration of your symptoms by about 12–16 hours. About 1 in 10 people who take antibiotics will develop antibiotic associated diarrhea, and a severe allergic reaction to antibiotics occurs in 1 in 400 people.

Participants were then asked:

What would you like to do in this situation?

- A. I would like to request a prescription for antibiotics from the doctor
- B. I would not like a prescription for antibiotics

The order of the options in each of the above scenarios was randomized to eliminate order effects as an explanation for participants’ selection. Notably, the clinical scenario presented is one in which almost every physician would strongly recommend against taking antibiotics. At the same time, the question was devised in such a way as to make it possible for reasonable people to reach differing conclusions. If one has a 50% chance of having one’s symptoms reduced by 12–16 hours, is it worthwhile to run a 10% risk of diarrhea, and a very small chance of a severe allergic reaction? For many patients, the answer is not self-evident.

## “Information first, then opinion” is more persuasive than “opinion first, then information”

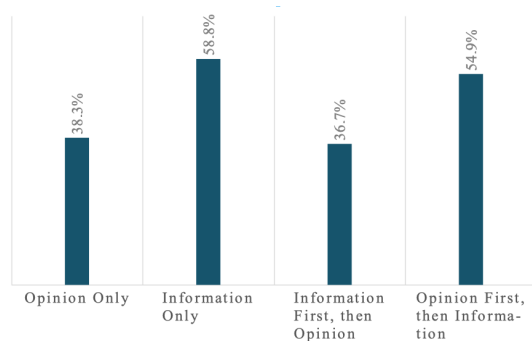
Table 1 shows a breakdown of the 508 participants’ preferences. Slightly less than half of the participants (47%) requested an antibiotic prescription. That might seem a high number, given the likely consensus among doctors that such a prescription would not be a good idea. Recall, however, that the question was devised so as to allow reasonable answers both ways, depending on what subjects most cared about.

Approximately 56% of participants stated that they would prefer to follow the doctor’s opinion on whether or not to take antibiotics, compared to 43% who said that they would prefer to make their own decision about whether or not to take antibiotics. Participants who stated that their preference was to follow the doctor’s opinion actually requested antibiotic prescriptions more frequently (51%) as compared to participants who stated their preference was to make their own decision (40%).

Category	Number (%) of Participants	Number (%) Requesting Antibiotics	P-value
<b>Decision Regarding Antibiotics</b>			
Did not request antibiotic prescription	267 (53.0%)	0 (0%)	
Requested antibiotic prescription	241 (47.0%)	241 (100%)	
<b>Stated Preference</b>			
Follow doctor’s opinion	283 (55.7%)	145 (51.2%)	$p = 0.02$
Make own decision	216 (42.5%)	88 (40.1%)	
Did not answer	9 (1.8%)	8 (89.0%)	
<b>How Information was Presented to Participants</b>			
Opinion only	128 (25.2%)	49 (38.3%)	$p = 0.0006$
Information only	136 (26.8%)	80 (58.5%)	
Information then Opinion	122 (24.0%)	45 (36.9%)	$p = 0.0041$
Opinion then Information	122 (24.0%)	67 (54.9%)	

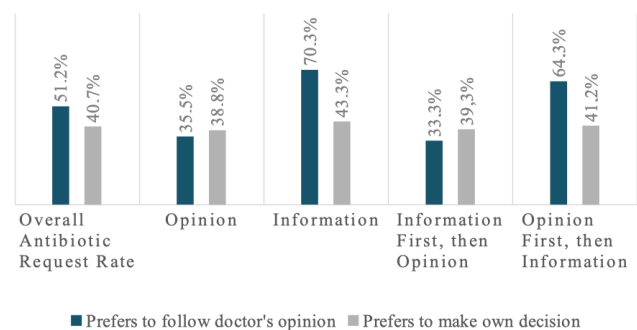
**Table 1.** Number and percentage of 508 participants requesting antibiotics, based on their stated preference for how they would like to make medical decisions and how the information was presented to them.

Not surprisingly, the doctor’s recommendation mattered. Just 38% of participants who were provided only the doctor’s opinion strongly recommending against antibiotics requested antibiotics, while 59% of participants who were given just the information and no recommendation requested antibiotics ( $p = 0.0006$ ). In addition, the way the information was presented to patients significantly affected their decision about whether to request an antibiotic prescription (see figure 1). Most important: when participants were given both the information and the doctor’s opinion, the order in which that information was presented had a significant impact. Only 37% of participants who were given information and then the doctor’s opinion requested antibiotics compared to 55% of participants when the opinion was given before the information ( $p = 0.0041$ ). (Also revealing and somewhat puzzling: there was no statistically significant difference between presenting the participants with the doctor’s opinion only compared to the information and then the opinion.)



**Figure 1.** Percent of participants requesting an antibiotic prescription, based on how they were presented the information.

The driver of this difference was the subset of participants whose stated preference was to follow the opinion of the doctor (see figure 2). There was no statistically significant difference in the rates of antibiotic requests among participants with a stated preference to make their own decisions. Among participants who stated that they preferred to follow the doctor’s opinion, rates of antibiotic prescriptions almost doubled from 33% in the “information first, then opinion” group to 64% in the “opinion first, then information” group.



**Figure 2.** Percent of participants requesting an antibiotic prescription, based on how they were presented the information and their stated preference for medical decision making.

Table 2 shows a breakdown of the 508 participants’ preferences based on various sociodemographic factors. Higher education was associated with higher rates of antibiotic requests, despite the fact that, as previously mentioned, almost all doctors would recommend against taking antibiotics in this scenario. Race/ethnicity, age, household income, and gender did not have a statistically significant impact on the rates of antibiotic requests.

Category	Number (%) of Participants	Number (%) Requesting Antibiotics	P-value
<b>Education</b>			
Did not complete high school	3 (0.6%)	0 (0.0)	
Completed high school	120 (23.6%)	43 (35.8%)	
Completed trade/vocational training	59 (11.6%)	27 (45.8%)	
Completed undergraduate degree	210 (41.3%)	101 (48.1%)	
Completed graduate/professional degree	111 (21.9%)	67 (60.4%)	
Prefer not to say	5 (1.0%)	3 (60.0%)	
<b>Race/Ethnicity</b>			
Asian	42 (8.3%)	17 (40.5%)	$p > 0.05$
Black or African American	56 (11.0%)	28 (50.0%)	
Hispanic or Latin American	28 (5.5%)	13 (46.4%)	
Mixed Race	4 (0.8%)	1 (25.0%)	
Native American	11 (2.2%)	8 (72.7%)	
White	360 (70.9%)	170 (47.2%)	
Prefer not to say	7 (1.4%)	4 (57.1%)	
<b>Age</b>			
< 20	2 (0.4%)	1 (50.0%)	$p > 0.05$
20-29	193 (38%)	96 (49.7%)	
30-39	180 (35.4%)	84 (46.7%)	
40-49	77 (15.2%)	34 (44.2%)	
50-59	32 (6.3%)	17 (53.1%)	
60-69	19 (3.7%)	8 (42.1%)	
70-79	4 (0.8%)	1 (25.0%)	
Prefer not to say	1 (0.2%)	0 (0.0%)	
<b>Household Income</b>			
< \$30,000	87 (17.1%)	43 (49.4%)	$p > 0.05$
\$30,000 – \$59,999	147 (28.9%)	71 (48.3%)	
\$60,000 – \$89,999	90 (17.7%)	39 (43.3%)	
> \$90,000	67 (13.2%)	29 (43.3%)	
Prefer not to say	117 (23%)	59 (50.4%)	
<b>Gender</b>			
Female	224 (44%)	110 (49.1%)	$p > 0.05$
Male	280 (55%)	130 (46.9%)	
Prefer not to say	4 (1%)	1 (25.0%)	

**Table 2.** Number and percentage of 508 participants requesting antibiotics, based on various sociodemographic factors.

### Discussion: The power of “information first, then opinion”

We presented participants with a hypothetical clinical scenario in which they could choose whether or not to receive an antibiotic prescription for a sore throat. In that scenario, both the opinion of the doctor and the objective data presented should have dissuaded most participants from choosing to take an antibiotic (bracketing the public health implications of increased

antibiotic resistance from unnecessary antibiotic use). Despite this, almost half of participants (47.0%) requested an antibiotic prescription, evidently because what to do, on the basis of the data, was not self-evident.

More than half (55.7%) of participants did state that their preference was to follow the doctor’s opinion. A large proportion of patients (42.5%), however, still preferred to make their own decision. Providing only the doctor’s opinion resulted in a lower rate of antibiotic requests compared to providing

the participant with the objective medical information and allowing them to make their own decision.

Our central finding is that providing participants with the doctor’s opinion before the information resulted in higher rates of antibiotic prescription requests than if the doctor’s opinion came after the information – a significant difference notwithstanding the fact that the doctor recommended against taking the antibiotic in both cases, and the further fact that the information was exactly the same. We can understand “information, then opinion” as a kind of nudge – that is, an intervention that allows freedom of choice, but that steers people in a particular direction (Sunstein, 2019). “Opinion, then information” also counts as a nudge, but apparently a less effective one.

Further research would be necessary to explain the difference. We speculate that when information is given first, participants believe that their autonomy is being recognized, that they are being treated with respect, and that they can follow the physician’s reasoning along a kind of track towards a shared conclusion. By contrast, some participants might rebel when a clear opinion is offered first, especially when it is immediately followed by a statistical explanation that undermines that clarity. In that sense, “opinion first, then information” may create psychological reactance (Brehm and Brehm 1981), especially when the question is whether to take an antibiotic, a course of action to which many patients are undoubtedly attracted. Some participants may wonder: am I being dictated to? Aren’t antibiotics a good idea? How can the doctor’s opinion be so emphatic when the data is confusing and complex? “Opinion first, then information” may decrease trust.

By contrast, when the information is presented first, participants are engaged in a process of deliberation, in which there are two participants, not one. They may well be trying to make sense of the data, and the doctor’s eventual opinion may well make sense to them. The opinion is accepted because it logically flows from the information provided. Presenting the information first, and then an opinion follows a familiar process for how we form our own opinions. (Admittedly, this explanation does not explain why “opinion only” has a significantly greater effect than “opinion, then information” and the same effect as “information, then opinion.” It may be that “opinion only”, without the undermining statistical information, has an unquestioned authority that feels like an order.)

If these speculations are correct, we might hypothesize that in some circumstances, “opinion first, then information” will not be less effective. If people have a high degree of trust, and do not have a prior conviction of any kind, an expert opinion might be enough. In highly complex areas in which people feel essentially at sea, “opinion first, then information” might seem simpler and more solid than “information first, then opinion.”

The differences observed in this survey were driven by the subset of participants who explicitly expressed a preference

to follow the doctor’s opinion rather than make their own decisions about their health. In a formal sense, autonomy is preserved in those who want to make their own decisions about their health, regardless of how the information is conveyed. For those whose preference is to follow the doctor’s opinion, however, how information is conveyed is critical. Providing opinion before information leads to worse outcomes and leads to lower rates of compliance with the doctor’s opinion, despite the indicated preference to follow it.

Ours should be taken as a kind of pilot study; much more remains to be done on this topic. But we believe that to respect patient autonomy and to provide expertise in a persuasive way, it would be prudent for physicians to structure their advice to provide information first and then an opinion.

We suspect that our central finding might well extend to other fields in which experts are asked to provide their view, whenever there is information asymmetry and a decision to be made by the non-expert based on the expert’s advice. A lawyer might find that counselling a client not to sue is more effective using the “information first, then opinion” approach, rather than leading with the opinion and then trying to explain one’s self to a suddenly defensive client. This does not mean that “information first, then opinion” will always lead to improved well-being for the non-expert. On the contrary, these results could be used nefariously by experts with poor intentions. For example, a car mechanic might use this strategy to give overly complex information about a client’s car, followed by an opinion to have expensive and unnecessary repairs done. The client may be less critical of the opinion and more likely to be duped if information is given before the opinion.

## Conclusion

In this hypothetical scenario presenting participants with a choice of whether or not to request an antibiotic prescription for a sore throat, “information first, then opinion” is significantly more effective than “opinion first, then information.” The difference is driven by participants who state that their preference is to follow the doctor’s opinion.

The greater effect of “information first, then opinion” might well be taken as surprising. In our own, informal consultations with behavioral experts, including some of the most well-known and well-respected, the majority wrongly expected that “opinion first, then information” would be more effective, because it would anchor subjects on the doctor’s conclusion. But importantly, our data do not isolate the mechanism(s) behind our finding. We have speculated that patients might well feel that they have been treated with respect if the doctor begins by conveying information. It is also possible that in this context, antibiotics seem attractive, and “opinion first, then information” produces a degree of reactance (Brehm & Brehm, 1981), leading patients to resist the recommendation. These speculations suggest possible boundary conditions on our central finding.

Nonetheless, we believe that our results may well reflect a general phenomenon. In the face of information asymme-

try and a decision to be made by the non-expert, the more effective approach may well be to start with information.

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