

BELIEFS, EXPECTATIONS, AND BEHAVIOR IN THE TIME OF CORONA

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PREFACE AND DISCLAIMER

In this lecture, I cover several subjects that behavioral economists and psychologists have been mentioning recently as relevant to our topic. I warn in advance that we understand some of them better than we do others. For some we have slightly more persuasive findings than for others, so far. And in other cases, the research is in its infancy or has to date yielded mixed findings.

I do not attempt to be comprehensive; I focus on those subjects closest to my own research interests. I also do not present a laundry list of do's and don'ts; instead, what follows are interesting findings that should give us all food for thought.

The first part of the lecture addresses several important phenomena that have been studied in the world of behavioral economics—and their possible manifestations in the time of corona. It begins with a brief discussion of what behavioral economics is and continues by offering a snapshot discussion of concepts such as reference points, loss aversion, probability weighting, present bias, and social visibility, among others, and of what they may have to do with the coronavirus era.

The second and central part of the lecture is dedicated to expectations. My main message is that expectations, beliefs, confidence, sentiments, fears—all these things that we discuss with our psychologists as we lie on the couch—are objects that have lives of their own. They may even be something we can choose—consciously or not—rather than being merely a passive, mechanical implication of our environment and actions. The seemingly simple link from information to beliefs and expectations is neither self-evident nor, for the time being, well understood. I will also offer a taste of current research on the topic, and conclude with a word for Israel's policymakers about transparency and communication with the public.

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## 1. BEHAVIOR IN THE TIME OF CORONA: BEHAVIORAL ECONOMICS

“Behavioral economics” is a lousy term (and a buzzword I do not like), but I will use it anyway because all the alternatives are worse. Overall, it refers to an attempt by economists to inject psychological, sociological, and other kinds of realism into our models (recommended reading: Rabin, 2002); it replaces simplifying assumptions, such as the rational-expectations assumption, with slightly more empirically grounded assumptions. I say “slightly” because sometimes the surrogates are not much more grounded than are the originals. Sometimes they are simply different, i.e., non-standard.

It is a standard assumption in economics that Homo Economicus makes *decisions* that, given his or her *beliefs*, maximize a utility function that represents his or her *preferences*; behavioral economists study non-standard *beliefs*, non-standard *preferences*, and non-standard *decision-making processes*. It being hard to deal with too many non-standard objects, we often keep two out of the three—*beliefs*, *preferences*, and *decision-making processes*—totally standard, and only modify our assumptions with respect to the third. “Behavioral” economics does not turn “standard” economics on its head, as it is sometimes described in thrillers and adventure books. A behavioral-economics article is, usually, a standard economics article with one modified assumption. This modified assumption is sometimes called a “bias,” even though the exact sense in which modified assumptions represent biases, and do so relative to what, are complex questions not discussed here.

For our purposes, questions about such “biases” might be: Do the public’s beliefs about the pandemic fit the facts on the ground? (And for those who cringe at the problematic expression “facts on the ground”: Do the public’s views comport with the official publications or with the most reliable information that the researcher has—or at least thinks he or she has?) Does the public process these data “correctly”? Does the public use what it remembers after having processed what it considers reliable data as a basis for forecasting the future and, if so, how? Does the public use such forecasts to plan its actions and, if so, how? Does it behave in accordance with such a plan? Below I present some preliminary recent data. But let us start first with several well-known, “classic” phenomena and biases.

### a. Reference points and loss aversion

The idea of loss aversion attained great fame on the heels of the works of Amos Tversky and Daniel Kahneman in the 1970s. In fact, their 1979 article, which combined the idea into a new “theory” of decision under risk, is one of the most-cited papers in economics (Tversky and Kahneman, 1979). Broadly stated, the idea is that a loss of a given size causes more pain than a gain of the same size causes pleasure. Here is a slightly extreme example: earning NIS 1,000 is nice, but losing NIS 1,000 is a catastrophe. One of the hottest questions in this field today is: loss or gain *relative to what?* To what I had before? To what others have? To what I expected to have? In terms of empirical evidence, of course, the various possibilities are hard to tell apart because, in many cases, I probably expected to have what I had before and/or what others have.

I do not have the relevant data, but here is an anecdote. It was reported one recent day in mid-June 2020 that 177 educational institutions in Israel, out of 5,200 schools and 20,000 preschools and daycares, were closed at that moment. I do not know if the count was accurate; that is one of the problems here and I will address it at the end of the lecture. Let us assume it is accurate. How upset should people be about 177 closed educational institutions? Four months before the present writing, in mid-February 2020, if a hundred educational institutions in Israel had been closed, we would have been much more agitated than we are at the present writing (mid-June). There are many reasons for this, but one of them may be loss aversion. Several months before the present writing, we could not have imagined closing down a whole school, students and all, for days on end. Relative to that state of normality, closing a hundred schools sounds like a disaster. Now that all educational institutions in Israel (and in much of the world) have recently been closed for weeks and weeks, however, the reference point has changed. In the time of corona, the closure of a hundred or two hundred educational institutions—while all the 25,000 others remain open—feels more like a gain than like a loss. The reference point may have changed because expectations changed—we got used to a new normal!—or because our past experience changed—things had previously been much worse—or because, looking around, things are much worse in much of the world.

Here is another anecdote: Donald Trump, one of our generation's greatest persuaders, said more than two and a half months before this writing that if the federal government over which he presides would manage to limit American coronavirus deaths to 100,000, it would be considered a great success ("we altogether have done a very good job"). The president set a new reference point, a very high one, at that time, by international standards (per capita). The actual number of deaths in the U.S. at this writing is around 117,000, that is, we have passed the president's original and lavishly reported estimate (which was subsequently updated). In some sense, however, we so far have passed the president's very-good-job reference point by "only" 17,000.

Below are several other biases and phenomena that behavioral economists and psychologists have mentioned lately:

- **Status quo bias** (e.g., Kahneman, Knetsch, and Thaler, 1991). It is closely associated with loss aversion. Habits are hard to change: "A weekend without the beach, or without the synagogue, isn't a weekend."

**Outcome:** It took people time and pain to get used to the new social-distancing recommendations and restrictions.

- **Probability weighting** (another legacy of Kahneman and Tversky, 1979). A low probability, say 0.001 percent or 0.01 percent, is assigned a higher weight in decision-making, say 5 percent.

**Outcome:** People may be more cautious because they perceive the chances of becoming infected (or dying) as being higher than they really are. The fact that probabilities of 0.001 percent and 0.01 percent are perceived similarly (both, say, as 5 percent), however, may cause people to be less cautious because an action that reduces the likelihood of infection

from low to even lower, like washing one's hands, for example, may be perceived as valueless.

- **Present bias** (see recent survey in O'Donoghue and Rabin, 2015). When we make decisions today, we give greater weight to our situation today, in the present, than to our situation tomorrow, in the future—even though when we made decisions a week earlier, when today's present was also in the future, we weighted them similarly.

**Outcome:** The suffering we endure in order to lower the risk of infection—loss of income due to absence from work or loss of pleasure because of cancellation of leisure activities—is in the *present* and is clear. We overweight it in our decisions relative to the advantage of mitigating the risk to our health, which is in the *future* and is vague. One may liken it to dieting: the sacrifice is immediate and obvious and the gain deferred and uncertain. In the context of the coronavirus, there is an additional element: We may never know whether it was worth it. We might not have become infected anyway, or we might have been infected without knowing it due to being asymptomatic. Perhaps, too, we had already been infected and acquired immunity unknowingly, making the entire present-day sacrifice unnecessary.

- **Optimism bias** (Weinstein, 1980). “It'll be okay; it won't happen to me.”

**Outcome:** Less reason to be cautious.

- **Overconfidence bias** (Fischhoff et al., 1977). “Of course I'm right! Sure I'm sure!”

**Outcome:** As above: less caution (“Of course I know what I'm doing”) and less doubt about my assessment of the situation (“I'm not wrong.”).

- **The power of social norms** (e.g., Posner, 1996). Wearing a face mask in public, for example, is second nature in certain East Asian countries but was considered very strange elsewhere until recently.

**Outcome:** Even in places where information and masks were available, masks were initially not widely used, as people considered the practice strange. Notice how quickly the norm has changed.

- **Social visibility and social status** (e.g., survey in Heffetz and Frank, 2011). Social norms are more easily enforced when they are visible. If I drive a hybrid car, everyone sees that I care about the environment; if I save energy in other, less visible ways, social signaling plays a smaller role.

**Outcome:** If frequent hand-washing and mask-wearing are perceived as socially desirable behavior (positive externalities), then when I drop off my daughter at kindergarten in the morning and am not wearing a mask, the other parents will give me funny looks (or give me the ultimate penalty: call me out on the kindergarten's WhatsApp group). No one, however, will know whether I wash my hands every hour on the hour or have not washed them since December 2019, so I may have less incentive to wash hands. In groups of people who consider wearing a mask an act of contemptible conformism or blind obedience to the government, wearing a mask may endanger one's social status—and furtive hand-washing may save lives.

Many additional biases and phenomena exist. The day is not far off when we will start seeing studies that also replicate them in the contexts of our coronavirus era. Research teams are already on the task. Below I will give an example, in the context of beliefs and expectations, from a study that our group is pursuing at the present.

## 2. BELIEFS AND EXPECTATIONS IN THE TIME OF CORONA

Those who wished to predict the economic implications of the coronavirus crisis before timely macro data began to arrive, looked at expectations. Prices are supposed to reflect expectations. For example, consider stock prices on Wall Street, in London, Hong Kong, and Tel Aviv as well. They may not be stable, grounded, rational expectations; they may reverse direction from one moment to the next; still, they reflect expectations. Internet searches reflect expectations, intentions, and fears. Consumer and business surveys attempt to measure expectations directly. Governmental statistical agencies, central banks, universities, and private entities all over the world are trying to get a grip on this elusive thing called expectations. Expectations, sentiments, emotions, fear, trust, beliefs, anxieties, hopes, and dreams—they are all shaped by the environment in which we act, but they also shape this environment through their impact on the present and future behavior of economic players: households, consumers, workers, employers, business owners, banks, and the government.

In short, the economy marches to the drumbeat of our expectations, concerns, and hopes—things that are hard to measure, quantify, and model, and things that our training as economists is not necessarily ideally suited to investigate.

### **a. Expectations and the lockdown**

Those who think “the lockdown destroyed the economy” may be right but they overlook the important expectations channel. Some studies ask whether places with longer, broader, or tighter lockdowns suffered more economically. But a lockdown, apart from locking things down, also does something else important: It directly affects fears, trust in the system, confidence or despair, and expectations regarding the pace of the economic rebound. This channel, of the impact of different kinds of lockdowns in different economies at different times and in different political situations through their effect on expectations, is much harder to measure empirically. Economists have begun to try to measure all these things, but it is going to take time. In certain places, lockdowns may well have saved the economy, by providing confidence—temporarily or not, justifiably or not, it makes no difference—that the healthcare system would likely not experience a collapse of the type we had seen on TV in other countries. On the other hand, the absence of a lockdown, or an early exit from lockdown, could in some places have harmed confidence so much that it reduced economic activity, at least among those who believed—again, rightly or wrongly—that they were at risk.

I am an economist, not an epidemiologist. I do not know what kind of lockdown, if any, it takes to stop an epidemic. Economists who study expectations, however, have shown us in recent months that it probably does not take a lockdown to ruin an economy. The question, again, is what the lockdown did, not only to economic activity in the present, but also what it did to expectations and trust in the system's stability in the future. This is hard to measure, but we are trying.

This is one of the differences between the social sciences and the natural sciences, between economics and physics: When the elementary particles that make up the system are people, their present actions are affected not only by the obstacles—physical, legal, social—that block their present trajectory; but also by their beliefs and expectations about the future.

### **b. (Ir?)rational expectations**

Economic behavior hinges on beliefs about the current state of the world and expectations about its state in the future. We model beliefs and expectations as probability distributions. The current state of the world is a given; the future state is not yet given, and may also depend on actions taken in the present. Our beliefs and expectations, including *conditional* ones—What should I expect if A happens? What should I expect if I choose B?—dictate our economic choices. However—and this is one of the most important points in my lecture today—our beliefs and expectations may have lives of their own. They themselves are things that have to be studied, separately from the rest (state of the world, information, individual choices, etc.). They may even be themselves subject to choice, conscious or otherwise. They are not necessarily derived automatically from the state of the world and economic actions.

The rational-expectations revolution in economics, identified with economists such as John Muth in the 1960s and Robert Lucas, Jr., in the 1970s, conveniently eliminated this important degree of freedom that economists used to have when making assumptions about the beliefs and expectations of the individuals they attempt to model. According to the rational-expectations hypothesis, expectations are—what else?—“rational”: They coincide with the probability distribution function of the situations that the model allows, given the agent's information. Thus, the rational-expectations hypothesis introduces “discipline” into our models, and in this lies its strength and importance: No more a world of models where “anything goes.”

In short, we economists took a shortcut some fifty years ago: We adopted an assumption that frees us from struggling with what the economic agents we model may believe and expect. Let's just assume, we said, that given the information they have, our agents believe and expect what we, the modelers, know and expect. This proved an extremely useful shortcut, and led to many achievements (and a few Nobel prizes). The world, however, turns out to be more complex. This of course isn't a critique of economic theory; it's a critique of the world!

### c. Beliefs, expectations, and behavior in the time of corona: an example of empirical data collection

As an empirical economist who uses economic models that attempt to improve, if only slightly, the psychological and sociological realism behind our models, and who uses surveys and experiments, I would like to repeat my earlier disclaimer. There is a tendency sometimes among empirical social-science researchers to get carried away, overinterpret, and overclaim. For example, to blow up findings from context-specific lab experiments involving a small sample of participants—sometimes students or volunteers in an online panel—into grand generalizations. I therefore caution: we have little experience with people’s behaviors during an epidemic, and no experience whatsoever with a pandemic on such a scale as ours.

Conversely, it warms the heart to see our profession mobilize. Indeed, numerous economists from all fields have dropped everything and tackled “the situation” with a mountain of new studies, for which funding suddenly materialized *ex nihilo*. Their efforts have yielded a small but steadily growing pile of new data in recent months. Thus, notwithstanding the disclaimer above, we are indeed learning new things. Here is one example from a study that I am conducting with a doctoral student at the Hebrew University, Guy Ishai (Heffetz and Ishai, 2020).

In one sentence, we asked the public about its beliefs, expectations, and risk perceptions in the context of infection with the novel coronavirus. The study is still in its early stage, but we have already found that some of the reported beliefs, expectations, and risk perceptions do have lives of their own. They are not necessarily rational, in the sense that they do not square with the information that is available and known to the public, and are not even mutually consistent. (We also examine relationships with reported behavior—but I’ll save that for another time.)

The graph below is based on an online daily survey that we are conducting in the United States. Its (nonrepresentative) sample of respondents come from all fifty states. All the lines in the graph show a 7-day moving average of responses (or administrative data) after each response (or datum) is converted into a logarithmic scale. The survey includes the following questions, among others:

- **Give your best estimate: How many people in [your state] will have been infected with the coronavirus since the beginning of the epidemic (including those who have already recovered or died) ... a month from now?**

Respondents choose whether to respond by entering a number or a percent of their state’s population. They are informed of their state’s population and even if they input a number and not a percent (almost all respondents input a number), they immediately see the number they entered also expressed as a percent. See the blue line.

- **Imagine that we picked a person from [your state] who has an average chance to get infected. Give your best estimate: what is the percent chance (0-100) that in the next month this average person will get infected with the coronavirus?**

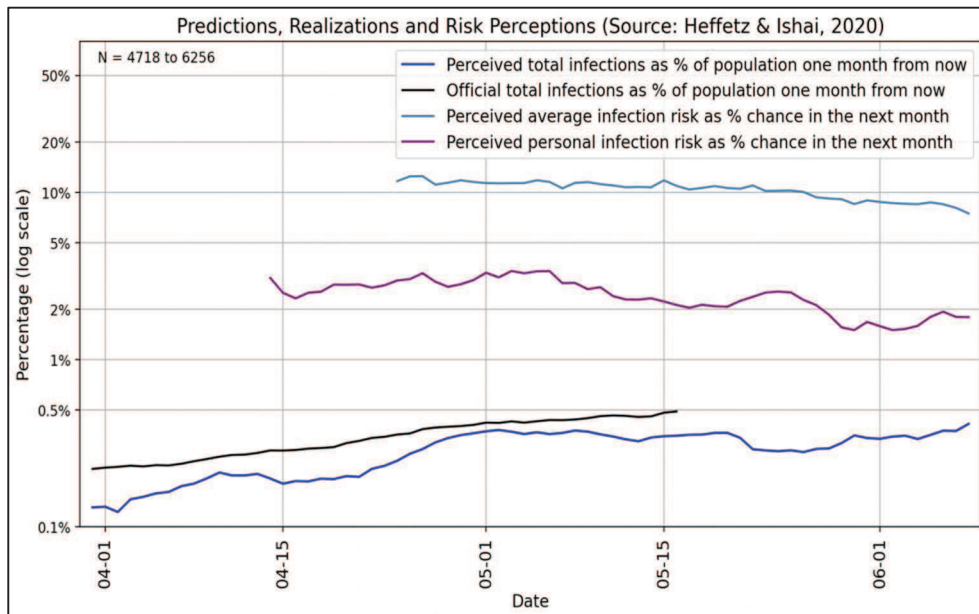
Respondents enter a probability in percent. See the turquoise line.



- **Give your best estimate: what is the percent chance (0-100) that in the next month you personally will get infected with the coronavirus?**

Respondents enter a probability in percent. See the purple line.

The graph also shows the cumulative number of infections, as a percent of population, in the respondent's state thirty days later, according to official data published about a month after the survey date. See the black line. (That is, the black line on April 1 shows total infections as percent as of May 1.)



So, what have we learned from the data so far?

- **Respondents' expectations (in numbers) are rather close to official outcomes.** Relative to the black line (the official infection rate a month later), the blue line (responses to the question: How many people will have been infected a month from now?) shows that the public predicts fewer infections than the official data will show, but the error is not dramatic. (Responses to additional questions in the survey suggest that the public does not think that the published official figures significantly underestimate the true case count; here it seems that the public is wrong.)
- **Respondents' risk perceptions are disconnected from their numerical expectations.** The turquoise line (What is the average chance to get infected?) runs at around 10 percent, more than twenty times greater than the blue line and, therefore, far above the average infection rate in the coming month as calculated from the respondents' numerical expectations, which comes out to less than 0.5 percent.
- **Optimism?** The purple line (What is your chance to get infected?) is around 2 percent, far below the turquoise line (What is the average chance to get infected?). This is not



necessarily an optimism bias; our respondents may indeed be less likely to be infected than the average. The spread between the responses, however, seems to be large. Either way, the purple line is far above the blue line, which mathematically should be very close to the turquoise line.

So, what are the public's beliefs, expectations, and risk perceptions? The answer depends on how one phrases the question. And on which basis does the public make decisions? On a 0.2 percent risk of infection in the coming month? On a 2 percent risk? A 10 percent risk? Furthermore, how does a single individual simultaneously hold such a broad range of internally inconsistent beliefs, expectations, and perceptions—or at least report to us that she or he does? Is it a conscious choice? And is there an advantage, for example, in perceiving higher risk because it motivates one to take action, or is perceiving lower risk better because it sustains optimism and fends against despair?

These are important questions that researchers in various disciplines have been probing for half a century. Decades ago, psychologists found that the answers to quantitative questions vary with question wording and response scale, and the economist Chuck Manski, for example, is a pioneer in using surveys to measure expectations (Manski, 2004). Recently, many behavioral economists have been working on these questions with renewed vigor in the context of the coronavirus.

#### **d. Beliefs, expectations, and behavior in the time of corona: advice for policymakers in Israel**

And what about Israel? The public discussion of the Israeli government's economic role in the crisis has focused on questions regarding the public health system's capacity and resources, monetary policy, and fiscal policy that prioritizes direct and indirect aid to households and businesses that have been adversely impacted (flattening the economic curve). The government's functioning in each of these respects is vociferously debated, with assessments ranging from dizzying success to ghastly failure, from fiscal largesse to "the tightwads at the Finance Ministry". Time will tell (or it won't). What everyone agrees on, it seems to me, is that transparency is lacking at every step along the way. I do not currently have data and analyses to back this up, but this lack of transparency may have also impaired the public's trust in the government's decisions. The public has asked questions such as, "Why can Ikea reopen in spite of restrictions but cemeteries on Memorial Day cannot?" The lack of transparency may also have interfered with households' and businesses' expectations regarding what policymakers think we are facing, how policymakers have made the decisions that they made, and under what future conditions—which, of course, are unknown at the moment—the decisions will change.

Many Israeli economists—"behavioral" or not—urged the government months ago to tackle the uncertainty directly. Otherwise, we said, this uncertainty—which causes households and businesses to spend and invest less, and thus reduces macroeconomic activity—may become a self-fulfilling prophecy, toppling the economy into a grave crisis (see, for example, Heffetz, 2020, and Hoffman and Heffetz, 2020). This uncertainty may

harm the most economically vulnerable, those most in need. Therefore, we economists and policymakers have a moral duty to mitigate it as much as possible.

The government, of course, could not then, and cannot now, make the uncertainty go away. However, it could then, and still can today, take measures that would alleviate it and create confidence wherever possible by means of *transparency, transparency, and more transparency* in decision-making processes, data, models, and scenarios. The public should know who decides what, why, and when. The public should not be repeatedly surprised by dramatic late-night announcements that are sometimes reversed by morning. Transparency should be reflected in fiscal commitments about who will receive what, how much, when, and under what conditions. The public needs the government's help for making plans. How many businesses know today whether their property tax in the past few months ended up being written off or not? How many jobless people know for sure under what conditions they will remain eligible for relief?\*

Of course, this all is easier said than done. However, economists in Israel have been saying this for months now, but confusion still reigns. It is a communications crisis that

\* In early April 2020, for example, Eran Hoffman and I gave several practical proposals, of which the simplest and the most immediately applicable were:

First, **the state should clarify, by means of fiscal commitments, that it intends to prolong eligibility for unemployment benefits and other relief transfers and benefits as long as necessary...**A clear government commitment in the present to extend eligibility to the end of the crisis would mitigate the economic anxiety of households that are afraid of exhausting their eligibility and would allow them to concentrate on staying healthy and supporting those going through hard times. Similarly, an explicit commitment to maintain relief for businesses would prevent unnecessary uncertainty that seriously impedes businesses in planning their strategy for the crisis. To avoid unnecessary fiscal commitments, it is important for such announcements to be conditioned explicitly on continued restrictions that prevent the public from going to work and keep businesses from opening. The government should state immediately, and explicitly, that from the moment the restrictions are lifted—but not before—the relief program will enter an automatic and foreknown process of phaseout.

Second, the state should increase transparency and visibility regarding its policy measures and the progress made in executing them. In ordinary times, there is a considerable time lag between deciding on and carrying out a public policy. This interval, which gives the public time to ask questions, learn, and prepare, abets policy success. Such a lag, however, does not exist today due to the need to act quickly. At the present writing, the public and the business community, and even Israeli policymakers and economists, are terribly confused about the details of the relief program: Who gets what, how much, and when? The more transparently the policy measures decided upon are presented to the public, and the more promptly they are implemented, the more effective they will be in reducing uncertainty. **Therefore, the government should, with alacrity, apprise the public of the details behind the headlines of its decisions, and carry out these decisions rapidly.**

We signed off on the article with a recommendation that really says it all: “Thoroughly and transparently preparing for possible scenarios regarding the various restrictions, and sharing the relevant details with the public, will make coping with the crisis easier by mitigating economic uncertainty.”

These are only examples, of course. Many other writers have written similar things.

troubles us as economists—after all, we are not politicians—because it is directly linked to the important topic of beliefs and expectations.

In this call for transparency and information, behavioral economists join the rest of the economic community; we all agree. These issues are also neither new nor unique to Israel or to the time of corona. Self-fulfilling prophecies, economic damage due to uncertainty, and the importance of reliable information and of the expectations channel are familiar topics in models of rational expectations, too. As behavioral economists, we try to contribute to the discussion by reminding officials that the public's beliefs and expectations have additional degrees of freedom even in ordinary times and, *a fortiori*, in these frenzied days of Covid-19. In a situation where the public lacks experience and understanding of the new reality, lacks transparency, lacks reliable information, and lacks understanding of the government's decision-making processes, expectations may wander even further afield. Because under such circumstances (even more than ever), when it comes to expectations, anything goes.

In the meantime, as I have tried to briefly illustrate, we behavioral economists are attempting to study and understand also *how* to mitigate perceived uncertainty, *how* to provide confidence, and *how* to help the public to remember, to take action, and to sleep well at night. For example: how should one communicate and share information with the public—in numbers or in percentages? In contrast to the standard assumptions, according to which it does not matter—because from the standpoint of the model, numbers and percentages are the same thing—our studies find a major difference between the two. For our survey respondents, at least, they are not the same thing. More generally, how should information be framed? How is the information that we communicate and frame perceived? Does it influence the public's behavior, and if so, how?

We do not yet have all the answers to these difficult questions, but we are definitely working on it.

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