

THINKING STRATEGICALLY ABOUT INFORMING **THE PUBLIC ON COMPLEX ISSUES**

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Information is everywhere. Citizens are inundated with it, and sorting through the sheer volume of information (let alone identifying quality information) on any given topic can be overwhelming. As if information overload were not challenging enough, partisan bickering over which facts are important and even which facts are accurate makes the task even more difficult. In this polarized and politicized environment, some people hunker down into ideological camps, engaging with information in ways that confirm

or reinforce their existing point of view. Others attempt to sort through the messages to find facts amid the opinion and false information. And some simply opt out of engaging with news and information altogether.

That some avoid information and others have trouble locating it is especially concerning when facts do exist. There are facts about the nature of climate change, for example, and the effect of a congressional bill on taxes. Knowing these facts can help us make more informed choices. Scientific evidence – frequently the basis of facts – can provide information on the likely consequences of policy proposals and help us weigh tradeoffs between competing alternatives.

Of course, scientific information is only valuable to the extent that it is used. As we enter an era where social media and fragmented news attention increasingly bring quality information and alternative messages into competition, the challenge becomes how to identify and improve our collective capacity to communicate high-value information that will be most beneficial to society and our democracy.

In this paper, we discuss why high-quality evidence is sometimes underutilized or ignored and what we can do about it. The paper is divided into three parts.

PART I highlights that the type of information citizens should have in a democracy is a matter of philosophical debate. We provide a brief overview of several leading models, with an eye toward what they have in common. All see a role for information, and all could benefit from the clear communication of scientific evidence, but they differ on which citizens need what type of information and when.

PART II identifies some of the challenges in communicating facts. Specifically, we discuss how hard it is to pay attention, how our environment affects our ability to be informed and the opportunities that we have to encounter information, and how the complex nature of scientific and policy-related information makes communication even more challenging. We also note that the contemporary media environment may not always be conducive to communicating facts in the best ways possible.

PART III concludes our paper by presenting possible solutions to communicating complex facts effectively. We see promise in discovering ways of creating engaging and accurate coverage of scientific and social scientific information through collaborations among news organizations, platforms, scientific organizations, academics, and foundations.

PART I. The public's Information needs

What are the information needs of a democracy? Although the question may seem more urgent in a year when "fake news" has become common vocabulary, it is a question that has long been debated by political philosophers. We will not resolve this long-standing debate in this paper. Instead, we highlight that different ideal models of citizenship have different end goals, which require different types of information. As shown in Table 1, various models prioritize different outcomes, pose different problems in practice, and are not always compatible with each other.

MODEL	END GOAL	INFORMATION NEEDED	PROBLEMS/CHALLENGES
Full information	Fully informed citizens.	Complete, in-depth information on all issues.	Not possible due to human capacity/attention.
Cues and shortcuts	Find and follow trusted sources/leaders.	Cues like partisanship and/or endorsements.	Cues are better used by highly- informed individuals; can lead citizens to make mistakes. ¹
Issue publics	Citizen issue-based interest groups alert the public.	Group/issue-based information and alerts.	Groups don't form on all issues;² alerts don't always reach mass public.
Deliberative	Open-minded discussion of issues.	Civil discussion of wide- ranging perspectives.	Challenging to facilitate; can lead to ambivalence and inaction/lack of participation. ³
Participatory	Engaged participation.	Partisan or one-sided media.	Incomplete understanding; unwillingness to compromise.
Experience	Empathy and understanding of others. ⁴	Compassionate representation of others.	Social identities can motivate some and turn off others. ⁵

TABLE 1. MODELS OF CITIZENS' INFORMATION NEEDS IN A DEMOCRACY

As our examples in Table 1 suggest, there is no simple answer to the question of what information democracy requires. Efforts to improve information in a democracy therefore need to use different strategies depending upon which citizen behavior (end goal) we seek to influence. We maintain that regardless of which end goal or information type is chosen, the communication of scientific, evidence-based information can improve democratic decisionmaking and citizens' quality of life. How facts are presented, however, needn't be in the stale and boring manner of textbooks and scholarly journal articles. Similarly, news organizations struggling to maintain audiences in the face of declining profits needn't resort to click bait headlines or sensational stories either. Rather, the challenge is to figure out ways of attracting attention and conveying complex information in an information environment where news organizations are struggling with their business model. We turn to each of these challenges in the following sections.

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PART II. THE CHALLENGES OF FACILITATING AN INFORMED PUBLIC

There are at least three specific challenges to improving the communication of evidence-based information: the nature of citizen attention, the nature of complex evidence-based information, and the nature of news as a for-profit business.

The Nature of Attention: We Don't Always Pay Attention to Facts

Each day, we are bombarded with information – emails, grocery lists, bills, work meetings, Twitter messages; the list could go on indefinitely. It is understandable that some may leave the task of keeping up with political news and scientific affairs to others. The purpose of this section is to review the factors that motivate attention to information. We note that attention can be defined in various ways. Is it where one's gaze gravitates? The information one elects to read, listen to, or watch? What one remembers? What one shares with others to command their attention? Although there are important distinctions between these various definitions, we jump among them to highlight the variety of factors that prompt some form of attention.

All day long we constantly filter out information. While you are focusing on reading this white paper there are things that can pull your attention away. You may be filtering out the hum of electronics, the sounds of people chatting in the distance, the ticking of a clock, or any of a variety of stimuli that could grab or divert your attention. We distinguish between two ways in which our attention is drawn: Automatic attention triggers, such as loud noises that are difficult for a person to ignore, and deliberative attention triggers, such as our preferences for news or entertainment that are more purposeful and consciously controlled.

Automatic Attention Triggers

Automatic attentional triggers direct our attention without us even realizing it. Images can direct us to look in some places and not others. Emotional

content can motivate us to click on some stories and not others. Automatic attention triggers connect to biological drives. Looking in the direction of a loud noise has a biological basis – hearing a loud noise allows one to determine whether it is a threat and react accordingly. Attending to images of children has a biological basis in caring for the young.

Automatic attention triggers can be used to direct attention, whether it is to an important piece of news (e.g., "Breaking News" flashing across the television screen) or to a piece of misinformation (e.g., a visually and emotionally evocative political advertisement aiming to depress voter turnout). Those using techniques to draw our attention automatically can attract the public's limited attention, whether for admirable or nefarious ends. We outline several examples of these automatic attention triggers that pull our attention in Table 2.

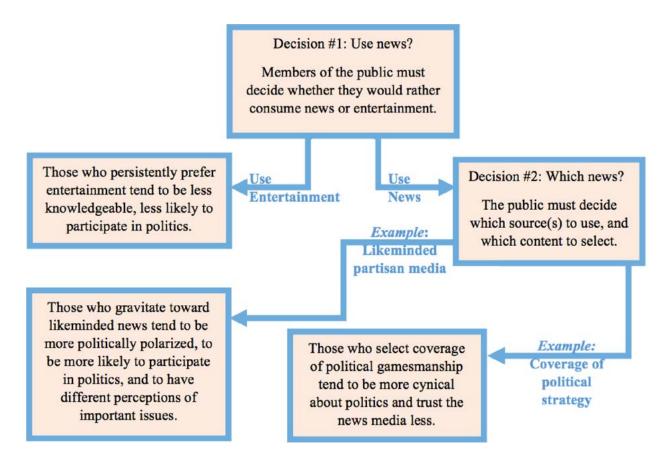
TABLE 2. EXAMPLES OF CONTENT THAT PULLS OUR ATTENTION WITHOUT CONSCIOUS THOUGHT

CONTENT THAT DRAWS ATTENTION	EXAMPLES IN MEDIA	
Loud noises	 Federal Communications Commission rules require that television commercials have the same average volume as the programs they accompany (rule as of December 13, 2012). This prevents volume from being used as a distraction. 	
Images	• Images next to news can increase click-through rates ⁶	
	 "Motion, color, critters of every kind, sexualized men and women, babies and monsters" draw attention.⁷ 	
Prominently displayed	• The "right-rail problem" – content appearing on the rightmost side of a website receives less attention than content appearing in the left column.	
Emotionally arousing	motionally arousing • News that makes people angry, makes people fearful, or inspires awe is more likely to be sha	

Deliberative Attentional Triggers

We also can think about instances in which we intentionally allocate our attention. Here, we pay attention more to fulfilling psychological desires than to responding to biological impulses. Allocating attention deliberately requires us to think about whether some content is of interest. Do we want to pay attention to news or not? These decisions have profound implications for whether citizens are informed in the ways outlined in Part I. Figure 1 provides a flowchart of the attention decisions that people make with respect to news and information. It also outlines the consequences of our choices in allocating attention.

FIGURE 1. A FLOWCHART OF ATTENTION DECISIONS



DECISION #1: PAYING ATTENTION TO NEWS OR ENTERTAINMENT.

Not surprisingly, people dedicate attention to media content that they like, whether that is news or reality television or scripted comedies. Once the choice was simply between watching the news on television or doing something other than watching television. Today there are innumerable options from which to choose. Research repeatedly shows that when given a choice between news and entertainment, a significant share of the public will opt for entertainment. For example, soft news stories are more likely to make it into the Most Popular lists (content selected most frequently by audiences) on news websites than they are to be among the top stories selected for prominent placement on by news editors. The choice of news versus entertainment has implications for the information that citizens receive. If they have access to entertainment and news options, those preferring entertainment programming know less and participate less in democratic politics than those opting for news.

DECISION #2A: PAYING ATTENTION TO LIKE-MINDED NEWS.

Those interested in news are more likely to select news that expresses views in line with the beliefs they already hold rather than news articulating an opposing point of view. The most basic example is that more Republicans watch Fox News and more Democrats tune in to MSNBC. The same pattern applies whether looking at political news or news about science. Those gravitating toward like-minded news tend to have more polarized attitudes and higher levels of political participation. When those on the political left and right look at different news sources, they can come away with different ideas about which issues are most important.

DECISION #2B: PAYING ATTENTION TO NEWS ABOUT POLITICAL STRATEGY AND GAMESMANSHIP.

Some types of news earn more attention than others. Two types of campaign and policy news are common, for instance: Strategy news, which focuses on which candidate or proposal is likely to win, and issue news, which emphasizes candidate positions on issues or policy alternatives. Some research suggests that the public prefers and is more likely to click on strategy information than on issue information. Although more research is needed, the finding suggests that particular ways of writing about a topic may garner more audience interest than others. The consequences of paying attention to strategy news are heightened levels of political cynicism and lower trust in the news media.

Availability, Ability, and Motivation to Pay Attention to News and Information

If paying attention to news and information is a deliberate decision, what leads us to choose to pay attention in the first place? In this section, we underscore three factors: The availability of information, our ability to engage with the information, and our motivation to do so.

AVAILABILITY

It's easy to believe that information is easily and quickly available to anyone who wants it. If only it were so easy. Just because information exists does not mean that people have access to it.

Access to facts is required for people to take advantage of them. And access to quality information is limited in innumerable ways. Access to cable television, the internet, and hard copy newspapers all require financial investment. Those without the ability to pay are unable to access information via these channels unless they have access through another source, such as a library. Even if one has access to the internet, however, there are additional barriers. For example, paywalls limit access to online information; some newspaper websites use paywalls that allow access to a limited number of free news articles before requiring a payment (per access or subscription). Online academic journals are typically behind paywalls as well. The increasing use of mobile devices also affects news availability as there are costs for some news apps, and data plans require spending money to get news.

ABILITY

Another factor that influences the ability to engage with news is whether people have adequate education and skills to obtain information. We can think of this in terms of education; some newspapers are written at levels that are inaccessible to those with lower levels of education. Beyond education, having basic internet abilities can affect the information that people access. If you don't know how to use a search engine or social media, it's difficult to find information.

MOTIVATION

Our personality traits and background undoubtedly factor in when we form our preferences for news. Our social situation also influences whether we are motivated to look for news. If our workplace, friends, social media feeds, and casual encounters are filled with discussions of politics or science, this is not only going to be a source of information, it also can motivate us to seek out information in order to contribute to the conversation. The people with whom we surround ourselves can act as deliberative triggers motivating news seeking.

Trust is another important motivational factor. We're unlikely to attend to information that we don't trust. And in the event we encounter distrusted information, we are unlikely to change our beliefs, attitudes, or behaviors in response to it.

There is no shortage of distrust. Confidence in the mass media to report the news "fully, accurately and fairly" peaked at 72 percent in 1976 and dipped to 32 percent in 2016, according to Gallup. Trust in Congress, banks, and the medical system, institutions that have factual information that could benefit the public, fare just as poorly over time. One notable exception to this pattern is trust in science, which has remained relatively stable in the United States. Yet contentious scientific topics, such as stem-cell research and climate change, can inspire distrust in the scientific enterprise. Even though over-arching institutions are not trusted, more specific and immediate sources are. The news media that one uses is rated far more favorably than the media writ large. Although many government agencies are not well trusted, the Centers for Disease Control and Prevention, for example, remains highly trusted with 70 percent expressing favorable views.

Interpersonal sources of information also remain trusted. For example, one's family doctor remains an important source of information about topics like immunization and is trusted more than other sources.⁹ Social recommendations, now made highly visible through social media, also allow for interpersonal recommendations of news and information. In fact there are circumstances in which a friend's social media recommendation can prompt people to read an article disagreeing with their beliefs.¹⁰

SUMMARY OF THE CHALLENGES OF ATTENTION

We don't always pay attention to news and facts. Those providing factual content don't always present it in ways that draw our attention. And those deciding what content to consume don't always have the opportunity, ability, and motivation to seek out news and information. Those seeking to supply the public with information and/or to improve the communication of information must be aware of these substantial hurdles.

How we allocate our attention has profound implications for whether we come close to meeting any of the ideals of citizenship laid out in Part I. If we are not paying attention to news at all, it's difficult to see that any of the information requirements of the ideal models of citizenship would be met. If we're gravitating to partisan news, then the outcomes associated with the participatory model may be furthered, but those implied by the deliberative model are thwarted.

The Nature of Complex Information: Clearly Conveying Scientific, Policy-Relevant Facts is Hard

Scientists and policy experts know a lot – how particular policies affect citizens' lives and the likely consequences of potential action in the policy sphere. They also have methods and strategies for comparing alternative explanations or alternative policy options and ways to assess the quality of evidence and arguments. In short, science has the potential to be very valuable to society because it can help us sort through information. Scientists and policy experts can help direct our attention to the most effective ways to reach our goals and to increase the speed with which we are able to achieve them. So why don't we always listen to the experts?

Although experts will face the same attention challenges outlined above in getting citizens to pay attention to scientific facts, there are additional reasons why experts and evidence-based information are often ignored or underutilized. Scientific evidence is technical and both the subject and the procedures for developing scientific information are unfamiliar to much of the public. Sometimes there are conflicting findings resulting from a scientific study, or there are varying degrees of uncertainty about the conclusions (compounding this challenge is that findings are never completely certain). Scientific findings are often and increasingly in competition with alternative messages from other sources, who are often able to communicate more effectively because they worry less about being precise and accurate in their language. Table 3 summarizes these challenges and the effort required to overcome them.

TABLE 3. CHALLENGES IN COMMUNICATING EVIDENCE-BASED INFORMATION

ASPECTS THAT MAKE SCIENTIFIC AND POLICY INFORMATION CHALLENG- ING TO COMMUNICATE	WHY THEY ARE CHALLENGING	EFFORT NEEDED TO COMMUNICATE EFFECTIVELY
Complex and technical	Expertise is often required to understand the significance of new scientific findings.	Summarizing and simplifying informa- tion to increase accessibility. ¹¹
Unfamiliar	Ordinary citizens are unlikely to have personal experience with scientific and policy-related research or proce- dures. ¹²	Translating and connecting informa- tion to citizen everyday lives; ¹³ repeat- ing exposure. ¹⁴
Sometimes conflicting	Scientists don't always agree, and new evidence can over- turn prior conclusions. This is how science is supposed to work, ¹⁵ but it can lead to confusion, distrust, and/or ignoring scientific recommendations. ¹⁶	Providing context about how new find- ings fit into what is known already and avoiding overstating the importance of any one study.
Uncertain	Conclusions in social science are never final, and "scien- tists are trained to focus on uncertainty," ¹⁷ which makes them an easy target for those seeking to challenge or cast doubt on scientific findings. ¹⁸	Highlighting consensus when it exists and explicitly acknowledging uncer- tainty and limitations.
Competing with proprietary, partisan, or pseudo-scientific information	Separating quality information from junk science can be hard; ¹⁹ competing sources may have more motivation and/ or ability to communicate effectively than scientists (espe- cially if they care less about accuracy and uncertainty).	Emphasizing that transparency allows procedures and findings to be used or checked by anyone, providing value to society rather than private interests.

SUMMARY OF THE CHALLENGES OF COMMUNICATING COMPLEX INFORMATION

Many challenges to communicating scientific information are not unique. Scientists themselves struggle to keep up with information given the rapid rate of discovery, innovation, and the publication of new findings. In fact, scientists face the same fierce competition for attention as described in the previous section. But as outlined in the table above, the communication of scientific and policy-relevant facts is hard in part because of the nature of the information itself.

Simplifying and translating complex information in ways that make it accessible and relevant to citizens' daily lives without being inaccurate or misrepresenting the confidence we have in the findings is a tall order. And it is an even taller order when science is under fire, competing with those who have something to gain from discrediting or casting doubt on the evidence.

The Nature of the Media System: News Organizations Struggle to Provide Facts

News media and journalists are under constant pressure. Like ordinary citizens and scientists, journalists also struggle with information overload and limited time and attention to devote to key issues. As key civic educators, many reporters also wrestle with the challenges of translating complex information into something that citizens will want to consume, and they attempt to do so in many cases with tight deadlines, often with limited resources. Some story assignments may take them out of their area of expertise, such that journalists also must try to learn quickly what the new story developments mean in the context of the bigger picture.

If that weren't enough pressure, most news organizations in the United States operate as for-profit businesses that need to keep an eye on their ratings, circulations, and page views (as well as those of their competitors) to ensure that they stay in business. In a very real sense, news outlets depend upon attracting and keeping audiences to sell their information product. As technological developments increase the speed of information transmission and number of devices and applications through which citizens can encounter news, many media organizations are struggling to keep up and engage audiences on an increasingly diverse array of platforms. More research is needed to understand the consequences of engagement on different platforms, but some preliminary work suggests that the rise of mobile devices (smart phones, tablets) may decrease time spent with news. As we have already discussed, the competition for limited audience attention is fierce, and news organizations are increasingly competing not just with other news outlets but also increasingly with non-traditional sources including individuals who seek to spread (mis/dis)information.

SUMMARY OF THE CHALLENGES WITH COMMUNICATING INFORMATION

In a world where attention is limited, competition is stiff, complex information is hard to digest and translate, and large proportions of audiences gravitate toward entertainment and don't really understand science or policy, it is easy to see why communicating information about scientific topics may take a backseat to other considerations. Of course, some audiences are interested in these topics, and in a competitive marketplace, niche news outlets will arise to meet that demand, but not all models of democracy can thrive when only some citizens are informed on key topics that might improve democratic decision-making. As we will tackle more explicitly in the next section, we contend that there are ways of engaging citizens with news about complex topics and even strategies that could help improve efforts already underway.

PART III. **STRATEGIES FOR PROVIDING ENGAGING AND ACCURATE INFORMATION**

Fortunately, science itself can help news providers with many of the challenges outlined in Part II. The methods and procedures that help to fuel scientific and policy-relevant discovery can also help to identify ways of communicating information in engaging ways that don't trade away accuracy. There are entire fields devoted to the study of science communication and political communication that can shed insight into how, when, and why particular messages are more or less likely to be viewed and to resonate with audiences.

Recognizing that the news media largely operate as for-profit businesses competing for audiences, any proposal to change scientific and political coverage must align with news organizations' economic incentives. In other words, improving the information provided by news organizations needs to consider ways of increasing – or at the very least not losing – audiences in the process.

It is a happy coincidence that the business incentives to draw eyeballs *could* coincide with the drive to create engaging information content. And the information content that engages audiences *could* inform the public in ways consistent with the normative democratic models outlined in Part I. To identify best practices, political and science communication scholars can help news organizations identify both how to garner attention and how to communicate complex information in ways that bolster citizen interest and understanding of the material.

There are several research questions that we believe should guide our path forward:

 How can we motivate people to pay attention? Those seeking to convey scientific and policy-related information should consider using various triggers to make their points. When discussing the consequences of not vaccinating, for instance, automatic triggers – images of children – are often used. In political contexts, delivering information in emotionallyevocative ways may be an effective way to gain audience attention. Deliberative triggers to encourage people to enact their civic duty and seek outs news and information also may be effective.

- What can we do to address demand-side attentional constraints to help improve and encourage news engagement? To reach audiences with important information, putting it up on a website is not enough. Figuring out where the audience naturally goes for news and information and creating content in keeping with what they typically consume can go a long way toward overcoming barriers to access. Basic research about where an audience typically gathers news and information and then carefully understanding how that information is presented can help get the word out about important information.
- How can complex information be shared with audiences? Here, we can look at new ways of conveying information like online videos, virtual reality, flow charts, and infographics. Systematically testing whether these techniques improve learning could demonstrate their efficacy.
- How can we incentivize accuracy and appropriately communicating uncertainty? Research suggests that the inclusion of study limitations in news coverage of cancer research can increase trust in both journalists and scientists.²⁰ Further work is needed to determine whether these findings apply to scientific topics more broadly, and additional research could provide guidance on how best to encourage reporters to include such statements.

To do this work well, multiple partners will need to be involved. We outline the groups we think are key to the process in Table 4.

TABLE 4. KEY PARTNERS IN COMMUNICATING EVIDENCE-BASED INFORMATION

KEY ACTORS	TRANSLATION/EDUCATION EFFORTS	INCENTIVES/AGGREGATORS
JOURNALISTS	JOURNALIST TRAINING PROGRAMS	PLATFORMS
Journalists could be given free rein to think outside the box and figure out creative ways of delivering content. They might draw inspiration from other industries, like film, that have successfully captured mass attention on some occasions.	Journalistic training programs that educate reporters about the basics of the scientific method; how to read, analyze and interrogate evidence; and how to report on research without being inaccurate and keeping the broader body of knowledge in mind may be especially important.	Platforms like Facebook could dedicate more resources to understanding and sharing insights on when news and scientific information are compelling for audiences. Facebook has intervened in public life before – encouraging organ donation, for example. Helping to identify ever-evolving best practices in providing the public with news and information to complete their role in a democracy seems well within platforms' purviews.

ACADEMICS

Academics can propose and evaluate new ways of conveying accurate information. Newsrooms do not always have access to data about dependent variables like citizen knowledge and trust. Scholars do. Research up front is important because good intentions in creating content to inform and engage does not always have the desired effect.

SCIENTIST TRAINING PROGRAMS

Scientists are not always well-equipped at translating their work for public audiences. Communicating to the public is imperative as scientific facts are becoming more difficult to identify in an environment awash in misleading and partisan information. For this reason, efforts to help scientists communicate with the public could be particularly important.

FOUNDATIONS

Foundations could incentivize the work of creating attention-grabbing and informative messages more than they already do, whether financially or by creating forums for information exchange. Creating a database of researchers interested in doing this kind of work, for example, could be a promising step, and foundations could further incentivize collaboration between scholars, platforms and/or journalists.

SCIENTIFIC ORGANIZATIONS

Scientific organizations should dedicate more resources to exploring new and creative ways of delivering information. The Centers for Disease Control and Prevention, for instance, has used narratives to try to educate the public about vaccination, albeit with questionable success.²¹

ORGANIZATIONS SPREADING SCIENTIFIC INFORMATION

Additional effort could be put into spreading the word about academic efforts to translate research implications to wider audiences such as those already happening at **Scholar Strategy Network**, **The Conversation**, The Upshot, Monkey Cage, and Mischiefs of Faction.

PROFESSIONAL ASSOCIATIONS

Professional associations could maintain a database of scientific experts, searchable by topic, who agree to be accessible to journalists seeking comment or contextual information. Some efforts on this front already exist (like the #WomenAlsoKnow database in political science, designed to diversify experts in news), and those efforts could be broadened to additional disciplines and further disseminated.

CONCLUSION

The public has information needs. Whether deciding on vaccinating one's children, or for whom to vote, critical everyday decisions depend on accurate information. As we outline in Part I, what sort of information is needed depends on the end in mind. End goals of citizen participation evoke different informational needs than end goals of deliberation or effective use of cues and shortcuts like partisanship. Yet underlying every conception of citizenship we reviewed is the idea of information. The type of information required varies, but the need for information remains constant, and evidence-based information can be especially helpful in all cases.

It all seems so easy – just give the public information! But as we show in Part II, the task is far from simple. The public must be motivated and able to pay attention to information. And there are attentional patterns that could work at cross-purposes with establishing a well-informed populous. Partisan news can provide slanted interpretations and selected facts that are at odds with deliberative and fully informed models of citizenship. Emotional content can attract attention to news that may not always be in keeping with informing the public. People also need the requisite background knowledge to learn new facts, and must have access to new information. Paywalls and inaccessible writing make addressing informational gaps difficult. Scientific and policy information itself is also part of the problem. Policy briefs and academic journal articles often do not make for compelling reading even for experts let alone journalists or citizens. And the uncertainty inherent in studying difficult-to-predict humans makes it more challenging to convey information to the public.

But all hope is not lost. We need sustained efforts to determine how to tailor information in ways to overcome informational deficits and educate the public. Part III outlines a vision of wedding creative engagement with the transmission of evidence-based facts. Instead of using a textbook, an academic journal article, or – dare we say it – a standard news article, we need to think outside of the box. Finding strategies for artfully conveying complex information in ways that break down attentional and trustbased barriers represents the most important challenge in our politically tumultuous time. Bringing scientific methods of assessment to the table – and fostering further collaborations across academia and practitioners – to help with the challenges holds promise.

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