HOW ANALYZING AND EVALUATING SCIENTIFIC FINDINGS OR TECHNICAL INFORMATION CAN INFLUENCE BELIEFS

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INTRODUCTION

Imagine that a group of community members has asked to meet with their state senator to talk about increased vandalism in their neighborhood. The senator assigns her top aide to set up a meeting with the parents, school officials, church officials, law enforcement, and youth advocacy groups to discuss their concerns. Once they meet, it becomes apparent to the senator that the groups share the overarching goal of reducing vandalism but disagree about why it has increased. Their ideas for responding to the problem differ dramatically depending on what they believe is causing the increase. None of the people at the meeting, except the senator, is familiar with recent social science data on juvenile crime, vandalism, or income inequality. In fact, some of the attendees said they don't care what academics say—they believe the police are not doing their job. What should the senator do? Do the data matter? Would the community be receptive to hearing from an expert on delinquency? Should she invite a local professor who has conducted research on vandalism to the next meeting? If so, what can she and the professor do to influence the parties to consider the data?

Dispute resolution by its very nature involves conflict between individuals or groups who are unable to come to an agreement. Many professionals find themselves in situations where resolving conflict is necessary—whether the dispute involves family members, friends, clients, colleagues, or community groups we engage with. This article is intended for those seeking to develop their dispute resolution skills—specifically, it will address skills applicable to issues and contexts requiring analysis of scientific and/or technical information.

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Those wishing to assist individuals or groups in resolving disputes involving technical or scientific data need skills to facilitate communication that will, ideally, lead to an agreement among parties who may have entered the dispute with different levels of knowledge and experience, in this case “scientific literacy.” It is important to understand the extent to which differing degrees of understanding of data and scientific methods for studying relevant issues can influence the emotional investment and the goals disputants bring to a conflict. Even seemingly simple disputes can involve rancorous debates that can, when not managed effectively, be divisive and prevent effective consensus or resolution. So, there is significant value for all parties to eliminate underlying sources of conflict that can inhibit the consensus building that is a condition precedent to effective conflict resolution.

In many instances, by the time a third party is involved in a conflict resolution process, the parties have already attempted to resolve the conflict independently and failed. As a result, professionals who are helping the parties may be faced with individuals who have staked out a position they are resistant to changing. Yet even the most straightforward conflicts often require a careful assessment of the basis for each participant’s position in order to identify an effective strategy for facilitating meaningful negotiation among the parties. This task is likely to be more complex when dealing with cases involving scientific or technical information. Disputants usually bring different levels of understanding regarding this information to the table and third parties must make efforts to clarify content so all parties can make informed decisions. This is critical because when involved parties do not have a complete understanding of the underlying sources of conflict, they may be more resistant to modifying previously held positions.

We focus below on how disparities in knowledge can be addressed and overcome and offer a context for understanding how attitudes of lay people toward scientific findings may be formed. Each of the co-authors of this article approach its subject differently but we draw from our different backgrounds and perspectives to find common ground in our need and desire to effectively translate data, often laden with jargon that renders it inaccessible to those who are not experts in the field, within contexts involving disputes for which such knowledge is critical to effective decision-making.[4]

We recognize that though disputes can be grounded in disagreements over interpretations of data it is not always easy to characterize or diagnose a problem as purely data driven. Often issues that involve application of data extend well beyond the data into the humanity of the dispute. It would seem that using information that is unequivocal, such as scientific data, would bring light to a controversy and serve as a foundation for shared decision-making. However, in application, the connection is not so direct and interpretation of the data is rarely unequivocal.[5]

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[4] This collaboration came about as a result of a graduate class that Kent taught for the Matsunaga Institute for Peace, part of the Public Policy Center, University of Hawaii, in the fall of 2015. Tummala was one of the outstanding students in her class. The power of translating scientific information into meaningful action intrigued them both and served as inspiration for this collective effort. Kent and Hippensteele collaborated previously on an article about the way that children learn about the law. Elizabeth Kent and Susan Hippensteele, *The Bill of Rights, Mediation, and Harry Potter*, HAWAII BAR JOURNAL, August 2008, p. 4.

[5] Peter Adler, Robert Barrett, Martha Bean, Juliana Birkhoff, Connie Ozawa, and Emily Rudin, "Managing Scientific and Technical Information in Environmental Cases," p. 6, published at the Mediate.Com website, http://www.mediate.com/articles/pdf/envir_wjc1.pdf. See also Hon. Alex Kozinski, *Criminal Law 2.0,* 44 GEO.L.J.ANN.REV.CRIM.PROC. (2015).

It is essential to take note of culture, income disparity, justice, power differentials, and a number of other factors that intersect with scientific literacy and pose unique challenges for dispute resolution.[6] Parties who disagree about what the science on a subject means may have fundamentally different values and perspectives from one another that influence their judgments. For instance, astronomers trained in western scientific methods concentrate their work on specific questions outside the Earth's atmosphere. They look at celestial objects and analyze them, using telescopes and other instruments to explain stellar phenomena.[7] The original Hawaiians used celestial navigation to find the Hawaiian Island chain and to navigate throughout the Pacific[8] and they looked to the skies to identify the best times for planting and other agricultural work.[9] Are not both sides grounded in science? What if the one party's definition of science is not highly valued or trusted by the other party?

SCIENTIFIC LITERACY[10]

The plain language definition of scientific literacy is "the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity."[11] Many people, whether from developing or developed

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[6] Peter Adler, Robert Barrett, Martha Bean, Juliana Birkhoff, Connie Ozawa, and Emily Rudin, "Managing Scientific and Technical Information in Environmental Cases," pp. 6 and 17, published at the Mediate.Com website, http://www.mediate.com/articles/pdf/envir_wjc1.pdf.

[7] https://aas.org/learn/planning-your-education.

[8] "Before the invention of the compass, sextant and clocks, or more recently, the satellite-dependent Global Positioning System (GPS), Pacific Islanders navigated open-ocean voyages without instruments, using instead their observations of the stars, the sun, the ocean swells, and other signs of nature for clues to direction and location of a vessel at sea." http://www.hokulea.com/education-at-sea/polynesian-navigation/polynesian-non-instrument-wayfinding/. See also, David Lewis, WE, THE NAVIGATORS: THE ANCIENT ART OF LANDFINDING IN THE PACIFIC (University of Hawaii Press, 2nd ed., 1994).

[9] "For ancient farmers, the position of the moon was an important consideration in planting and harvesting. The Polynesians who settled in Hawaii were very conscious of lunar positioning in planning the best days for planting and fishing. Cultures around the world found that considering the moon's position could make a difference in the success of agricultural, fishing and hunting ventures." http://www.westhawaiitoday.com/sections/news/local-features/simple-guidelines-gardening-moon.html.

[10] This article does not address "junk science" or unreliable science. For a fascinating commentary on this please see Hon. Alex Kozinski, *Criminal Law 2.0*, 44 GEO.L.J.ANN.REV.CRIM.PROC. (2015) and Hon. Alex Kozinski, "Rejecting Voodoo Science in the Courtroom," *The Wall Street Journal,* September 19, 2016.

[11] "Scientific Literacy," National Science Education Standards, accessed November 3, 2016, http://www.literacynet.org/science/scientificliteracy.html. It also includes specific types of abilities. In the National Science Education Standards, the content standards define scientific literacy. Scientific literacy means that a person can ask, find, or determine answers to questions derived from curiosity about everyday experiences. It means that a person has the ability to describe, explain, and predict natural phenomena. Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions. Scientific literacy implies that a person can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately. (National Science Education Standards, page 22).

global countries, have only a limited understanding of how western science is conducted and the research process through which it develops.

The dearth of public education about science is one reason the current model for communicating science to a lay public is largely ineffective.[12] Often research is conducted and published in jargon-filled peer review journals that few outside the discipline (e.g., medicine, astronomy, celestial navigation, etc.) can interpret. Exciting or novel findings will be shared with the lay public[13] through secondary messengers via television, print and online newspapers, internet blogs, radio, and the like.[14] Most media sources sift through research findings and present accessible summaries of high points to the public through a broadcasting service.[15] However, there is limited playtime for scientific news[16] and the popularity bias privileging headline-worthy information means much of what might be communicated will likely fail to make it into mainstream press.[17] Mass media outlets also have a business interest in maximizing advertising revenue that can further impact what stories they choose to run.[18]

Although communication of scientific findings through mass media may be broad reaching, this medium can be ineffective at presenting research findings accurately or in a translational manner that can be understood and applied by lay viewers. Further, science is not a single discipline and there are numerous methods, modes of analysis, and competing perspectives that a reader would need to be familiar with in order to fully understand findings published in scientific journals, so when the

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[12] Clark, Mary P. "Public's Knowledge of Science and Technology." Pew Research Center for the People and the Press RSS. Accessed May 07, 2016. The general lack of public knowledge is not limited to science. "Nearly 10% of college graduates in the U.S. think that Judy Sheindlin, aka 'Judge Judy,' is a U.S. Supreme Court justice," according to the ABA Journal, May 2016, page 14 (citing to "A Crisis in Civic Education," *American Council of Trustees and Alumni* (Jan. 13). "Judge Judy" is in fact the star of a highly-rated daytime television reality show.

[13] Nguyen, David H. "Three Ways for Scientists to Communicate Their Results of Scientific Research." Three Ways for Scientists to Communicate Their Results of Scientific Research | The Classroom | Synonym. Accessed November 10, 2016.

[14] "Guide to Successful Communications." Research and Innovation. Accessed May 07, 2016.

[15] Feldman, Lauren and A. Leiserowitz. "The Mutual Reinforcement of Media Selectivity and Effects: Testing the Reinforcing Spirals Framework in the Context of Global Warming." Journal of Communication 64.4 (2014): 590-611. Accessed November 10, 2016.

[16] Clark, Mary P. "Public's Knowledge of Science and Technology." Pew Research Center for the People and the Press RSS. Accessed 2016. Funk, Cary and Lee Rainie. "Public and Scientists' Views on Science and Society." Pew Research Center Internet Science Tech RSS. Accessed 2016.

[17] Peters, Hans P. "Gap between Science and Media Revisited: Scientists as Public Communicators." Proceedings of the National Academy of Sciences of the United States of America. Accessed 2016. *See also* Roche, John P., "Limited Precision in Print Media Communication of West Nile Virus Risks." Science Communication (2003): 353-65. Accessed November 10, 2016. Roche and Muskavitich recommend that a number of variables be looked at in verifying the validity of secondary sources, including the diversity of sources used by the journalists, level of authority of those sources, degree of background information provided, accuracy of headlines, and provision of additional sources of information for readers.

[18] Holcomb, Jesse. "Cable News: Fact Sheet." Pew Research Centers Journalism Project. Accessed 2016. For example, in 2014 according to Statista, News Corp Ltd./21st Century Fox (owner of Fox News) had a revenue over $30 billion and Time Warner Inc. (owner of CNN) had a revenue of over $20 billion. "The 25 Largest Media Companies Worldwide by Revenue 2014." *Statista*. Statista, n.d. Web. 07 May 2016.

media report new findings, they may only view one aspect of an issue and may not address methodological concerns, opposing studies, or alternative interpretations of findings. An example can be seen in environmental science. There may be multiple disciplines--hydrologists, biologists, and planetary geoscientists, for instance–who may be involved in a land use controversy and scientists from each discipline may regard the issue differently.[19] And the "experts" may not agree on solutions.

Another important factor to consider regarding public reliance on mass media for scientific information is that, according to the National Science Foundation, trust in the popular press, television, and the scientific community has dropped significantly over the past 30 years.[20] Skeptics point to scientists' alignment with business interests[21] and changing views and conclusions on specific topics as evidence of scientists' unreliability.[22] Further, some perceive science as overly politicized and beholden to industries that fund research.[23] Nutrition science, for example, has long been dogged by criticism that it is subject to influence from the farm, agriculture, and pharmaceutical

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[19] "Classically trained theoretical scientists are less likely to offer solutions or make practical conclusions than applied scientists are. Conversely, they are more likely to identify further questions that could be explored and answered. Applied scientists are more likely to offer a range of solutions, and professions such as medicine, engineering, and the design professions are more likely to offer specific fixes." Peter Adler, Robert Barrett, Martha Bean, Juliana Birkhoff, Connie Ozawa, and Emily Rudin, "Managing Scientific and Technical Information in Environmental Cases," p. 20, published at the Mediate.Com website, http://www.mediate.com/articles/pdf/envir_wjc1.pdf.

[20] Estes, Matthew. "Young Americans' Growing Distrust of Science." Harvard Political Review. Accessed 2016.

[21] Scientists need funding for their research. Historically, scientific research has been sponsored by the government in order to maintain its autonomy and protect it from business interests. However, due to recent reductions in federal funding, scientists are starting to turn to other sources of capital. Gloria Water, the Vice President and Associate Provost for research at Boston University mentions that, "the other likely source of research funding—industry—prefers to direct its money to projects that affect the bottom line. 'Industry is focused on applied research that will result in the development of products with immediate commercial application'" Jahnke, Art. "Who Picks Up the Tab for Science?" History and Future of Funding for Scientific Research. Accessed May 07, 2016. As scientists continue to look for backing, the perception is that their autonomy is limited and their results are less likely to be viewed as valid and unbiased sources of information.

[22] *Id.* As a discipline that is constantly fluctuating due to new research, scientific conclusions change and this can influence how often the public believes its message. One of the most relevant case studies of this is the use and subsequent banning of dichlorodiphenyltrichloroethane or DDT as a pesticide in the United States. DDT was one of the first synthetic pesticides developed by scientists in the 1940s to combat insect-borne human diseases that were posing serious health risks. "DDT - A Brief History and Status." *EPA.* Environmental Protection Agency, n.d. Web. 07 May 2016. At the time, it was lauded as extremely effective and began to be used across the country and world. However, in the 1960s scientists starting noticing negative environmental and toxicological effects from the pesticide, and after a public outcry from Rachel Carson's book *Silent Spring* was eventually banned in 1972. *Id.* Though other studies have been conflicted as to whether or not DDT is actually as harmful as it is claimed to be, it serves as a prime example of how scientific research can be proven wrong and in the process question the validity of scientific institutions. Edwards, J. Gordon. "DDT: A Case Study in Scientific Fraud," *Journal of American Physicians and Surgeons* 9.4 (2004): 83-88. Web. 6 May 2016. As the public continues to lose faith in mainstream media and the scientists doing research, the challenges to overcome become increasingly complex and dramatic.

[23] Peter Adler, Robert Barrett, Martha Bean, Juliana Birkhoff, Connie Ozawa, and Emily Rudin, "Managing Scientific and Technical Information in Environmental Cases," p. 10, published at the Mediate.Com website, http://www.mediate.com/articles/pdf/envir_wjc1.pdf.

industries and has, to a significant degree, struggled to find support for studies exploring nutrition-health connections.[24] The public has a significant stake in accurate interpretation of what are often conflicting reports (e.g., whether and what types of "fats" are part of a good nutritional practice, how exercise affects how much and what we should eat, and so forth).

MENTAL MODELS AND ATTITUDE CHANGE

"Mental models" affect the way people perceive messages.[25] A mental model "represents a person's thought process for how something works…[and] help[s] shape actions and behavior, influence[s] what people pay attention to in complicated situations and define[s] how people approach and solve problems."[26] Mental models act as the frameworks through which people see the world and more importantly how they fit new information into their current worldview. Broadly speaking, these models offer important clues about how people evaluate evidence that either supports or refutes what they already think or know. Advances in cognitive science can help scientists and lay people identify sources of bias that can interfere with effective communication and knowledge acquisition.

There are many forms of cognitive bias that affect how individuals respond to new information but for purposes of this discussion, five are most relevant: framing effect, stereotyping, just-world hypothesis, belief bias, and confirmation bias. While most people think of bias as conscious beliefs that can be changed through effort and self-reflection, the most pernicious forms of bias are implicit, i.e., they are activated involuntarily and are not accessible through introspection.

The *framing effect* involves the tendency for people to draw different conclusions from the same information, depending on how, or by whom, the information is presented. For example, ground beef sold in the U.S. is typically labeled to inform consumers of its fat content. But unconscious emotional reactions cause most of us to prefer buying meat labeled 80% lean over meat labeled 20% fat even though the fat content of each package is the same.[27]

Stereotyping is another form of cognitive bias that can influence conflict resolution. Stereotypes can be explicit or implicit (unconscious) and involve expectations that groups of people will have certain characteristics in the absence of information about specific members of that group. Stereotypes produce expectations about how members of that group will think and behave and can be positive, negative, or neutral. They are often robust and not easily changed. Instead, when confronted with an individual who does not conform to a stereotype held about a group they are part of (e.g., rude doctors, rigid astronomers, emotional women) most people will assume the person they met is atypical of the group.

The *just-world hypothesis* is another powerful form of cognitive bias that refers to the tendency for people to believe the world is fundamentally just, causing them to rationalize an otherwise inexplicable injustice as deserved by the victim(s). An example of this can be seen in the

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[24] Colin T. Campbell, T. *Whole: Rethinking the Science of Nutrition.* Dallas, TX: BenBella Books, 2013.

[25] P.N. Johnson-Laird, *Mental Models: Towards a Cognitive Science of Language, Inference, and Consciousness.* Cambridge: Cambridge University Press, 1983.

[26] Center for Research on Environmental Decisions. *The Psychology of Climate Change Communication: A Guide for Scientists, Journalists, Educators, Political Aides, and the Interested Public.* New York: Trustees of Columbia University, 2009.

[27] Miller, Greg, "Neuroscience News of the Week", *Science Magazine*, Friday August 6, 2006.

case of rape victims and their perpetrators. Despite the fact the majority of people, in theory, view rape victims as not responsible for an assault, people with a higher belief in a "just-world" are more likely to place blame on victims as responsible for the situation.[28] Conflicts involving charges of environmental racism are sometimes met with suggestions that those affected should just move away from the contamination, reflecting the belief that members of a community living near a toxic waste dump, for instance, get what they deserve.

When someone's evaluation of the logical strength of an argument is colored by their prior belief in the truth or falsity of the conclusion, cognitive scientists refer to the phenomenon as *belief bias*. Vroling and de Jong explored the effect of belief bias among socially anxious individuals to conclude that the phobias associated with severe social anxiety are not evidence of faulty reasoning. Instead, socially anxious people have difficulty judging anxiogenic information as false and reassuring-contradicting information as true--the combination prevents correction of false cognition and sustains phobia.[29]

Finally, *confirmation bias* refers to the tendency to search for or interpret evidence and information in a way that confirms one's preconceptions. Cognitive scientists have studied this form of bias for decades in diverse contexts including banking, medicine, politics, religion, and management. Some especially interesting findings involve medicine and pseudoscience.[30] A widely publicized contemporary example involves purported links between autism and vaccinations. Numerous popular press accounts allege vaccinations may be responsible for a rise in autism diagnoses and parents of autistic children may be especially vulnerable to confirmation bias as they struggle to find an explanation for their child's condition.

Third parties and scientists alike must consider their own biases as well as those of their audiences in order to understand how biased beliefs and attitudes influence the effectiveness of their communication.[31] Many scientists will have preconceptions of their audiences (stereotypes) and their views "about the process they are involved in and the individuals they are interacting with will have an important impact on those processes."[32] Scientists and third parties need to understand their own preconceptions about lay people they are communicating with in order to tailor messages respectfully and effectively.

WHERE THE RUBBER MEETS THE ROAD

The senator who meets with community members who do not understand or care about the data has a challenge before her. There are, however, some tools and strategies she could use and

[28] Leif.A Stromwell, Helen Alredsson, and Sara Landstrom, "Rape victim and perpetrator blame and the Just World hypothesis: The influence of victim gender and age." *Journal of Sexual Aggression*, Vol. 19, No. 2 (2013).

[29] M.S. Vroling and P.J. de Jong, "Threat-confirming belief bias and symptoms of anxiety disorders." *Journal of Behavioral Therapy and Experimental Psychiatry* 41.2 (2010): 110-6.

[30] Singh, Simon and Ernst, E. *Trick or Treatment? Alternative Medicine on Trial.* London: Bantam Books, 2008.

[31] Davies, Sarah R. "Constructing Communication: Talking to Scientists About Talking to the Public." *Science Communication* 29.4 (2008): 413-34.

[32] *Id.*

below we provide options that can serve as starting points from which targeted approaches can be developed for specific contexts and issues.

Back to the opening scenario: the state senator needs to prepare to talk with community members about increased vandalism in their neighborhood. She assigns her top aide to set up a meeting with the parents, school officials, church officials, law enforcement, and youth advocacy groups to discuss their concerns. Once they meet, it becomes apparent to the senator the groups share the overarching goal of reducing vandalism but disagree about why it has increased. Their ideas for responding to the problem differ dramatically. None of the people at the meeting, except her, is familiar with recent social science data on juvenile crime, vandalism, or income inequality. In fact, some of the attendees said they don't care what academics say—they believe the police are not doing their job. Should she invite a local professor who has conducted research on vandalism to the next meeting? If so, what can she and the professor do to influence the parties to consider the data?

This scenario reflects not only a low level of scientific literacy among parties but also potential sources of cognitive bias the senator needs to accommodate. Simply offering up data and encouraging meeting attendees to review and incorporate it into their thinking is unlikely to be effective—the framing effect, belief bias, and confirmation bias are all likely to influence participants' ability to resolve their dispute amicably and effectively. At the same time, the growing body of evidence that juvenile crime and vandalism are not effectively addressed by traditional policing is critical and in order for the community to develop an effective intervention, the data must be considered.

One strategy the senator may employ involves asking community members to bring evidence that supports their explanation of the source of the problem to an early group meeting. This assignment puts control of information retrieval into all participants' hands rather than delegating it to a single group attendee (such as law enforcement) and increases the chance that meeting attendees will accurately identify sources of the problem. But it also means some groups will not be able to justify their positions and because they made this determination on their own, this strategy may increase participants' open-mindedness to new information whether presented by other group members or gathered and distributed by the third party. At that point participants may be more open to hearing about the professor's work.

The professor, or any other "expert" working with groups of non-scientists, must carefully consider how to craft her message so that she accommodates participants' level of scientific literacy. The human brain processes new information both analytically and experientially. According to the Center for Research on Environmental Decisions, "the *experiential processing system* . . . controls survival behavior and is the source of emotions and instincts . . . and the *analytic processing system* . . . controls analysis of scientific information."[33] Presenting material in multi-faceted ways that trigger both emotional and analytic responses is likely to be the most effective approach for the professor.[34]

The professor will need to ensure the conversation is relevant to the needs of group and is understandable (i.e., avoids jargon and discipline specific terms of art).[35] The focus should be on

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[33] Center for Research on Environmental Decisions, *The Psychology of Climate Change Communication*.

[34] *Id.*

[35] Marshall, Melissa. "Talk Nerdy to Me." TED. Accessed 2016. May, Kate T. "6 Speaking Tips for Scientists and Engineers." TED Blog. Accessed 2016.

"what motivates people and causes them to move" (i.e., compromise on a position). Generally, examples, stories, and analogies bolster connections.[36] As Jonathon Gotschall, a professor and literary scholar, states: "stories are perhaps 'the main cohering force' in human life, helping us learn right from wrong and encouraging us to act ethically. They teach us about the world while infecting us with emotions. This combination has been shown to change attitudes and is often more effective than nonfiction at changing beliefs."[37] So in our example, if the professor wants the community group to value her data on vandalism, she needs to frame it through the group's cultural lens[38] and present it with a story-like flow. Her ideal message should be straightforward, direct, jargon-free, and include information participants' can relate to their own experience. She should focus on big issues rather than minutia, tailored to meet the concerns of participants. The use of narrative to make important points can help contextualize and de-mystify scientific concepts the professor is providing.[39]

Despite doing this, the group likely may not be satisfied. Some of the group members may be upset because they were already convinced the police are not doing their job and are to blame for the increased vandalism. The senator will want to better understand the reasons and emotions behind those beliefs and she may want to set up additional meetings or processes to focus on those concerns. She will have her work cut out for her in keeping the focus of *this* meeting process on vandalism, but if she lets the focus drift, then she runs a risk of losing an opportunity to solve the vandalism issue and the group runs the risk of losing the opportunity to have their concerns heard and addressed.

In addition to thinking about how others intellectually process scientific and other findings, we need to look at our own intellectual processes because we too are fallible. A.M. "Marty" Stroud III was a former state prosecutor in Shreveport, Louisiana. After it was proved that Glenn Ford, a man he had prosecuted and who spent 30 years on death row was innocent, he wrote an apology that was printed in the *Shreveport Times*. This excerpt shows his remorse:

> *At the time this case was tried there was evidence that would have cleared Glenn Ford. The easy and convenient argument is that the prosecutors did not know of such evidence, thus they were absolved of any responsibility for the wrongful conviction.*

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[36] "In the face of unequal access to scientific and technical expertise, discourage the use of overly sophisticated presentations by one side. Power-Point presentations, slick graphs and charts, and complex maps can create an overwhelming sense that certain solutions are pre-destined. Instead, or in addition, use jointly constructed decision trees, flow charts, cognitive maps, and other visual tools to help display the thinking of the parties as regards content and process." Peter Adler, Robert Barrett, Martha Bean, Juliana Birkhoff, Connie Ozawa, and Emily Rudin, "Managing Scientific and Technical Information in Environmental Cases," p. 28, published at the Mediate.Com website, http://www.mediate.com/articles/pdf/envir_wjc1.pdf.

[37] Suttie, Jill. "The Storytelling Animal." Greater Good: The Science of a Meaningful Life. Accessed November 10, 2016.

[38] Moser, Susanne C. and Lisa Dilling. "Communicating Climate Change: Closing the Science-Action Gap." Communicating Climate Change. Accessed November 10, 2016. Framing, "provides essential context for people to make sense of an issue."

[39] May, Kate T. "6 Speaking Tips for Scientists and Engineers." TED Blog. Accessed November 10, 2016. Encourage simple visual aids that are interesting and encourage the presenter to wait while people go over their materials. Kaner, Sam. *Facilitator's Guide to Participatory Decision-making.* John Wiley and Sons, Inc., 2007, p. 108.

I can take no comfort in such an argument. As a prosecutor and officer of the court, I had the duty to prosecute fairly. . . . My fault was that I was too passive. I did not consider the rumors about the involvement of parties other than Mr. Ford to be credible, especially since the three others who were indicted for the crime were ultimately released for lack of sufficient evidence to proceed to the trial.

Had I been more inquisitive, perhaps the evidence would have come to light years ago. But I wasn't, and my inaction contributed to the miscarriage of justice in this matter. Based on what we had, I was confident that the right man was being prosecuted and I was not going to commit resources to investigate what I considered to be bogus claims that we had the wrong man.

My mindset was wrong and blinded me to my purpose of seeking justice, rather than obtaining a conviction of a person who I believed to be guilty. I did not hide evidence, I simply did not seriously consider that sufficient information may have been out there that could have led to a different conclusion. And that omission is on me.

Furthermore, my silence at trial undoubtedly contributed to the wrong-headed result.

I did not question the unfairness of Mr. Ford having appointed counsel who had never tried a criminal jury case much less a capital one. It never concerned me that the defense had insufficient funds to hire experts or that defense counsel shut down their firms for substantial periods of time to prepare for trial. These attorneys tried their very best, but they were in the wrong arena. They were excellent attorneys with experience in civil matters. But this did not prepare them for trying to save the life of Mr. Ford.

The jury was all white, Mr. Ford was African-American. Potential African-American jurors were struck with little thought about potential discrimination because at that time a claim of racial discrimination in the selection of jurors could not be successful unless it could be shown that the office had engaged in a pattern of such conduct in other cases.

And I knew this was a very burdensome requirement that had never been met in the jurisprudence of which I was aware. I also participated in placing before the jury dubious testimony from a forensic pathologist that the shooter had to be left handed, even though there was no eye witness to the murder. And yes, Glenn Ford was left-handed.

All too late, I learned that the testimony was pure junk science at its evil worst.

In 1984, I was 33 years old. I was arrogant, judgmental, narcissistic and very full of myself. I was not as interested in justice as I was in winning.[40]

[40] SHREVEPORT TIMES, March 8, 2015 (http://www.shreveporttimes.com/story/opinion/readers/2015/03/20/lead-prosecutor-offers-apology-in-the-case-of-exonerated-death-row-inmate-glenn-ford/25049063/). See also Hon. Alex Kozinski, *Criminal Law 2.0*, 44 GEO.L.J.ANN.REV.CRIM.PROC. (2015) at xxxvii.

CONCLUSION

Every day we must process and interpret information in our daily lives that arrives via various sources including books, newspapers, magazines, the internet, and social media. In order to resolve disputes whether at home, work, or in our communities, we must learn to accommodate and manage our own and others' biases and resistance to information that conflicts with what we thought we knew or want to believe. Even issues that seem "cut and dry" may not be and may instead present complexities of information we did not imagine.

There are serious issues facing society that need to be addressed; many of them involve interpretation and application of increasingly complex technical and scientific information. How do we combat climate change and rising sea levels? How can we prevent increased incidence of diabetes, obesity, and high blood pressure in the western world? What can we do to reduce the manufacturing of toxic material that ends up in dumps throughout the world?

Conversations that include the community and effective application of technical information and scientific research can help us collectively find answers to the problems that vex us. But for such conversations to be productive we must develop strategies capable of engaging stakeholders with varying levels of scientific literacy.

Perceptual bias adds complexity to the challenge of processing information we need to function effectively as responsible citizens. Recognizing and accepting such biases exist in ourselves and others is key to engaging deeply with strategies for overcoming their effects on our beliefs and problem-solving efforts. Our communities are strengthened considerably when stakeholders are well informed and have a meaningful voice in decisions and controversies affecting their lives and those of their families, friends, and neighbors.