

Mind the Gap

Science Museums as Sources of Civic Innovation

Alison Kadlec

Abstract

While science museums may certainly be viewed as bridging institutions between science and society, their full *civic* potential is yet to be realized. As trusted, nonpartisan intermediary organizations and valued cultural institutions, museums and science centers are well positioned to frame important problems for productive public deliberation, and they may be uniquely equipped to help cultivate creative connections between policymakers, scientists and the general public. In an age when an increasing number of pressing public problems are marbled with scientific or technical complexity, the need to bridge the confounding gaps that exist between science and public life is more urgent than ever. Because they hold public trust as nonpartisan cultural centers, museums can impact civic issues on wide-scales without becoming politicized, and thus promote improved public problem-solving around vexing problems such as climate change, our energy future, and twenty-first century workforce development.

About the author

Alison Kadlec is Vice President of Public Engagement and Director of the Center for Advances in Public Engagement for Public Agenda, a non-profit, nonpartisan organization working to strengthen our democracy's capacity to tackle tough issues by bridging gaps between experts, leaders and the public. Kadlec is the author of the recent book *Dewey's Critical Pragmatism* (2006), about John Dewey's democratic theory and practice.

Museums & Social Issues, Volume 4, Number 1, Spring 2009, pp. 37-53.
Copyright © 2009 Left Coast Press, Inc. All rights reserved.

In an age when an increasing number of pressing public problems are marbled with scientific or technical complexity, the need to bridge the confounding gaps that exist between science and public life is more urgent than ever. While it is true that science and the scientific community are deeply respected in our society, scientific knowledge does not seem to exercise the sort of influence that it ought, given the incredible public significance of the work undertaken by scientists in every area imaginable. The seemingly inexorable gap between science and society is somewhat of a mystery, but it is not a mystery that can be unraveled simply by focusing on the failures of the public and leaders to listen well enough to scientists. Instead, the blame for those gaps that prevent the scientific community from having appropriate influence in the public sphere must be shared and spread, and laid as much at the feet of the scientific community itself as at the door of the public. As Daniel Yankelovich, social science researcher and co-founder of Public Agenda, has argued, the scientific community's principal concern with influencing policymakers is not sufficient.

Scientists' efforts must not be confined to engaging policy elites but must extend to the general public as well. In our democracy, no major initiative can succeed without broad public support, which can be especially challenging to garner for proposals that require sacrifice or changes in lifestyle. Further, in many policy arenas the only way to offset special interest lobbying is to mobilize the public against it (Yankelovich, 2003).

Failure on the part of the scientific community to communicate effectively with the public, in language that resonates with public concerns and values, is as much to blame for the gaps as are myths, misconceptions and low levels of scientific literacy on the part of the public and elected officials. The heart of the matter is that "science and the rest of society operate out of vastly different worldviews" (Yankelovich, 2003). Scientists share a worldview that presupposes rationality and orderliness, while the nonscientific world of everyday life is riddled with disorder and irrationality. Scientists use a clear method to accumulate

knowledge, but policymakers must often include and rely on non-scientific ways of knowing in decision-making processes. Further, whereas scientists are comfortable with the metrics of probabilities and take the long view of knowledge production, the public and policymakers experience problems in ways that make them impatient for answers and are therefore uncomfortable with assessing risk in terms of probabilities. While the gaps between science and society have been beneficial for giving scientists professional autonomy to do their research, the price for this autonomy is too high for society to bear; too many of the issues that affect our wellbeing as individuals and our survival as a species are fundamentally issues of science and technology, and so we must find more, new, and better ways to bridge the gaps.

Efforts on the part of the scientific community to bridge the gaps historically focused on increasing the public's scientific literacy. While some level of scientific literacy is certainly vital for effective navigation of difficult issues, the nature of the gaps is such that they cannot be closed by literacy efforts alone. What is needed are new methods and approaches that, on the one hand, translate science in ways that resonate with public concerns and, on the other hand, help scientists understand and appreciate the value and reality of the public's non-scientific ways of knowing. The scientific community must direct efforts toward new forms of public engagement.

To better engage the public, [the scientific community should] shift from the goal of "science literacy" to the goal of reaching sound "public judgment" on scientific issues, and use specialized forms of dialogue to advance this goal. Although framing options for top-level decision makers is a necessary condition for winning greater influence, it is not sufficient. Important policy changes also require broad-based public support. At present, though, the voters are largely disengaged, reluctantly abandoning decisions that affect their lives to experts they do not trust. Scientists hold the key to breaking the deadlock, at least on science-laden issues. But to do so, they need to rethink the goals and strategies of public engagement (Yankelovich, 2003).

While science museums certainly view themselves as bridging institutions between science and society, their full *civic* potential is yet to be realized. Can science museums do more to bridge the science/society divide? Can science museums help translate the worldviews of scientists and the public for each other in ways that make collaborative problem solving possible? Can museums become civic resources for evidenced-based decision making and social change in the communities they inhabit and serve, while still retaining their status as trusted cultural treasures?

This paper approaches these questions from the position of a democratic theorist and public engagement practitioner who has no particular background in science or experience with the institutional culture of science museums. Because my chief interest is in improving the quality of our democracy and because I approach these questions from outside the scientific community, I am far less interested in advocating on behalf of expanding scientific literacy for the public than advocating for new, more creative approaches to inspiring the public's curiosity about, interest in, and active engagement with pressing issues of common concern that are science-intensive. It is through this lens that this paper looks at science museums and wonders what more they can be doing to participate in the civic infrastructure of our communities and nation. Making a case for science museums as civic hubs for public problem solving does not strip them of their identity as cultural institutions or politicize their missions, but adds civic orientation to the identity of science museums that builds on and deepens the public trust that the museums have already secured.

The Unique Civic Potential of Museums

Whether it is around specific issues like climate change and our energy future, or more general issues like the ever-expanding role of technology in our daily lives, science museums have a unique capacity to raise awareness about overwhelming problems in hopeful, manageable ways. Although awareness building is an extremely important role that museums can and do play, museums also have the opportunity to play a larger civic role.

As trusted, nonpartisan intermediary organizations, they are

in a position to frame important problems for public deliberation in compelling ways. They may be uniquely able to connect policymakers with scientists *and* scientists with the general public in novel ways.¹ Science museums are well suited to serve as sources of civic innovation in the communities they serve by creating uncommonly productive opportunities for the public to engage global issues like climate change in localized action-oriented ways, and by helping to forge connections and channels of communication between and among formal stakeholders, policymakers, and various civil society actors such as “grasstips” leaders, community-based organizations, businesses, and educational institutions that all have important roles to play in addressing the local and regional expressions of science-intensive challenges like energy use.

Yankelovich’s theory of public judgment (1991) provides a vehicle for exploring the civic potential of science museums to win greater influence for science *and* create new opportunities for ordinary citizens and other non-scientists to become reliable, thoughtful partners in public problem solving around science-intensive issues. Public opinion research and public engagement around science-intensive issues is of increasing interest, largely because of the overwhelming importance of, and pressing need for, progress on science-laden issues like climate change, energy, and workforce development for our twenty-first century “knowledge economy.”

The Stages of Public Judgment and The Role of Museums

In *Coming to Public Judgment*, Yankelovich (1991) argues that traditional public opinion research fails to grasp that public opinion about issues is not static. As a result, most public opinion research can provide a snapshot of people’s knee-jerk reactions, but it cannot really tell us anything about people’s considered opinions because thoughtful judgment and effective engagement with public problems do not occur automatically. Rather, people’s views about issues can develop and change over time from disconnected, poorly informed reactions to more thoughtful

and considered conclusions, from changeable public opinion to settled public judgment. According to Yankelovich, this process evolves through three distinct stages, and effective public engagement requires understanding where people are in this process and creating the conditions for them to advance toward thoughtful judgment.

People often approach an issue initially with strong, emotionally laden feelings and opinions that tend to be unstable and changeable. They may not understand an issue or problem particularly well. They may not have thought through the consequences of their opinions, and resist confronting realistic costs and trade-offs. The quality of public opinion at this stage is raw and unformed. However, when people's views have progressed through all the stages, their ideas become solid and stable, and they accept the consequences of the views they hold. Often, if furnished with proper conditions and opportunities, they are willing to get actively involved as reliable partners in public problem solving. Movement through the stages is never neat or unidirectional; there are often stumbling blocks and false starts, and the process, which might be thought of as a kind of civic learning curve, is more "two steps forward, one step back" than it is a steady march toward thoughtful, considered judgment. However, not only is it possible for people to move through these stages effectively, it is also possible for nonpartisan intermediary institutions, like science museums, to help accelerate this movement toward thoughtful judgment.

Stage One: Consciousness Raising

- **Dawning Awareness**
- **Greater Urgency**

When people first become aware of a public problem, they typically don't react with a pressing need to take action. As media depictions of an issue grab the public's attention, people will begin to acknowledge the problem, but there is little urgency at this point. Citizens are aware of many problems, but only a few rise to the top of their list of priorities. At this early stage, misinformation

and misconceptions are particularly powerful and must be counteracted for forward progress to occur. As awareness builds and the largest myths and misconceptions are shed, a sense of urgency develops. The dominant sentiment here is often a panicky appeal to “do something!” Urgency is a good thing, but it is not sufficient, because simply being worried about a problem does not mean that one has a firm grasp on the problem or how it might be addressed. Moreover, fear-fatigue can become a significant obstacle to public engagement with difficult issues.

Public attitudes toward climate change are a prime example. Public concern about climate change has increased dramatically in the last several years, but public understanding of the issue continues to be riddled with misconceptions about the time frame of consequences and to be colored by a kind of hope-deficit that makes the problem seem too big to address. For example, in focus groups that Public Agenda conducted in 2006, the participants in the group considered themselves aware of the problem, but many expressed a kind of fearful hopelessness while others seemed to have a significantly distorted view of the problem (Public Agenda, 2006b).

On the hope-deficit side, people said things like:

It’s just like a huge thing and I can’t really do anything to stop it.
So I don’t think about it that much.

–female high school student

The first thing that comes to mind when I think of global warming is fear. Living in fear is what comes to mind.

–female adult

On the misconception side, people said things like:

It’s scary, but it’s my kid’s kid’s kid’s kids who will be most affected [by climate change]...not me or my kids.

–male high school student

[When I think of global warming] I think of that movie *The Day After Tomorrow*, with like huge chunks of ice coming out of the sky.

–male adult

These comments are typical of what the study found across several focus groups with the general public, and they suggested the need for new forms of engagement to overcome myths and provide accessible information without overwhelming people.

The Role of Museums in Stage One: Busting Myths, Building Hope, Fostering Imagination

In *Winning Greater Influence for Science*, Yankelovich (2003) argues that our society has excellent mechanisms for raising awareness about problems, but a dearth of mechanisms for helping move people from awareness to engagement with issues. He points to media, political and civic leaders as the sources for this awareness building but notes that, “all too often, the media beat the drums for an issue, get people aroused, and then abandon it for the next issue, leaving the public hanging and the issue unresolved.” It is also fair to say that few things get people’s attention as quickly as fear, and media outlets understand this well. As a result, when it comes to science-intensive issues like climate change and energy, the public receives brief intense blasts of frightening information and images that serve to raise awareness but do little to bridge from awareness to engagement.

As the quotes above show, when people are overwhelmed by fear about an issue, they tend to disengage and close their minds to a problem. This is a natural response, but one that can be battled, and the balance between raising awareness and maintaining hope or expectations for a solution seems to be largely a matter of helping to free people’s imaginations so they can process important information *and* experience a problem in an awe inspiring and intrinsically hopeful way. Museums are in an excellent position to raise awareness and spur a sense of urgency about issues, yet they are able to do so in ways that prime the pump of public imagination and inspire a kind of awe and wonder that is phenomenologically optimistic.

Stage Two: Working Through

- Reaching for Solutions
- Wishful Thinking
- Weighing the Choices

In this stage, the public begins to look at alternatives for dealing with issues, converting free-floating concern into calls for action. Often, attention focuses on choices that experts or policymakers have presented without fully describing the implications. This stage can be a period of stunningly false endorsements: that is, the public expresses support for a proposal but backs down as soon as the costs and trade-offs are clarified. This is where framing issues for deliberation is most vital, and it is where the most difficult work is done. By *working through*—a term which encompasses rational thought as well as feelings and ethical concerns—people come to understand that easy, cost-free solutions are unlikely to work, and that seemingly simple solutions may have downsides. When people have been able to work through an issue, they are more likely to accept the consequences of their opinions, accept that there are no easy answers, and accept notions of compromise or sacrifice. Information and scientific literacy are not enough during the working-through process. As Yankelovich argues, citizens do not need to be secondhand scientists, and they do not need to understand the technicalities of an issue. Rather, they need to be given a few key pieces of information to help them get past key misconceptions, and a range of choices or approaches for addressing the problem, presented in non-technical language that will help them weigh the costs and trade-offs involved in any proposed approach.

For example, a recent gap analysis study that Public Agenda conducted to compare experts' and the public's attitudes toward energy issues suggested that there is a great deal of wishful thinking about alternative energy technologies (Public Agenda, 2008). It is not that citizens have an unrealistic view of the importance of renewable technologies or about their availability, but that they do not have a strong grasp of the costs, trade-offs and challenges

involved in bringing these technologies to market. While special interests certainly do play a role in shaping the prospects of various alternative energies, the study found that people tended to get hung up on the issue of corruption in ways that prevented them from grappling with the costs and trade-offs involved in making various alternative technologies widely and affordably available to the public.

The Role of Museums in Stage Two: Framing Issues for Public Deliberation

The concept of framing, once mainly the domain of academic research in the fields of sociology, psychology, linguistics and media, is now a mainstream political idea and strategic practice (Bai, 2005). Framing refers to how issues are defined, shaped through narrative or metaphor, and presented in order to have certain impacts (Entman, 1993). For the most part, framing is utilized by political parties and interest groups desiring to gain an edge with the public. However, when the concept of framing is reduced to the domains of persuasion or manipulation, a great civic opportunity is lost. As Will Friedman argues in his article, "Reframing Framing," framing *for persuasion* reduces complex real-world issues to zero-sum, polarizing, black-or-white positions that ignore the complexity of difficult issues and deny citizens the much needed opportunity to grapple with difficult problems in thoughtful ways. He describes and juxtaposes two types of framing, *framing-for-persuasion* and *framing-for-deliberation*.

The first involves defining an issue to one's advantage in the hopes of getting an audience to do what you want it to do. The latter involves clarifying the range of positions surrounding an issue so that citizens can better decide what they want to do. Framing-for-deliberation sometimes happens naturally, when rich public debates evolve in such a way that they help citizens sort through competing frames, arguments and policies (Friedman, 2006).

Science museums are in an excellent position to frame issues for deliberation through the creation of materials and

programming that present a range of options for dealing with a problem in nonpartisan ways. For example, by creating nonpartisan guides to policy debates associated with museum topics, and by creating deliberative opportunities like carefully designed public forums, museums could provide an overview of the range of approaches to a problem and the trade-offs involved in each, helping the public to grapple with issues in language that resonates with their values and perspectives (rather than that of experts and special interests).

Stage Three: Thoughtful Judgment...and Beyond

- **Taking a Stand Intellectually**
- **Making a Responsible Judgment Morally and Emotionally**

Taking a stand intellectually and making a responsible ethical judgment are connected, but different. People are quicker to accept change in their minds than in their hearts. When one takes a stand intellectually, one accepts an idea but does not act on it until one moves to that next phase where one makes an ethical decision about how to act. The intellectual resolution requires people to clarify fuzzy thinking, reconcile inconsistencies, consider relevant facts and new realities, and grasp the full consequences of choices. The emotional resolution requires people to accommodate themselves to different situations, change their own thinking and behavior, and confront their own ambivalent feelings. Even when one has taken a stand intellectually, the next step to making personal changes in one's own life is not easy or automatic.

People have a remarkable capacity for living with contradictions. For example, the gap analysis studying attitudes toward energy issues found that participants in focus groups were surprisingly willing to take the blame when pressed to explain the sources and causes of the nation's energy challenges (Public Agenda, 2008). They pointed to how wasteful people are and how indulgent people can be in their energy consumption, and they even suggested that personal sacrifices would be needed to address the energy problem. At the same time, very few people

in the group appeared eager or ready to make sacrifices in their *own* life. The move from taking an intellectual stand to integrating that commitment into personal life is a difficult one, but when furnished with the proper conditions and opportunities it can be made easier.

The Role of Museums in Stage Three: Personalizing Public Problems, Providing Stepping Stones for Change

Museums are in an excellent position to help citizens integrate intellectual knowledge with personal values. For example, the energy gap research found that one of the main gaps between experts and the public concerns the relationship between conservation and energy efficiency. Aside from reform of special interest influences in politics, the public tends to view personal sacrifice as the main answer to energy challenges. Yet, as noted above, most seem to have an intellectual grasp of the necessity for lifestyle changes, but are not comfortable with sacrificing personal comfort. Experts on the other hand, while agreeing that irresponsible consumption is a significant driver of the energy problem, placed much less emphasis on the concept of personal sacrifice than on the need to make energy use more efficient. In fact, most experts said that greater and more expedient conservation gains are likely to come through efficiency efforts than through consumer sacrifice, and many even suggested that efficiency efforts could serve as a vital stepping stone toward lifestyle changes (Public Agenda, 2008).

Many science museums are now or will be taking up the issue of energy use and our energy future through a variety of exhibits, and it seems that they could easily provide the valuable public service of connecting the dots between conservation, efficiency, and lifestyle. Exhibits and programs that provide information, ideas, and community resources for the public and for educators can help people move down the path toward living in a way that is consistent with their intellectual understanding of the energy problem. This example of energy use is but one of countless opportunities that museums have to help the public come to sound judgment on difficult issues.

Going Forward: From Working *Through* to Working *On*

Where Yankelovich is interested in people's capacity to work through complex issues, this article suggests considering the difference between *working through* issues and *working on* shared problems. It is one thing to do the hard work of grappling with issues and changing behavior to be consistent with considered judgments, and it is another to then view participation and active engagement in the community as an extension of this ethical judgment. In the field of political science, the term *civic efficacy* refers to the two-pronged belief that becoming actively involved in one's community is a reasonable way to address shared problems *and* that it is worth the time and energy to get involved because one can make a difference. What might it look like for museums to inspire a sense of civic efficacy on the part of citizens and create opportunities for citizens to become actively engaged as valuable partners in public problem solving? Museums have the position and opportunity to forge connections and channels of communication between and among formal stakeholders, policymakers, and various civil society actors such as grassroots leaders, community-based organizations, businesses, and educational institutions that all have important roles to play in addressing the local and regional expressions of science-intensive challenges like energy use.

The Case of STEM Education and Twenty-first Century Careers

Public Agenda's work around science, technology, engineering, and mathematics (STEM) education and workforce development issues in formal education systems may provide some suggestions for ways that museums could address civic efficacy, particularly in relationship to STEM education. National research and research in Kansas and Missouri suggest that while parents and students have a measure of appreciation for the role that STEM education will play in the future world of work, this appreciation remains thin, with relatively few seeming to absorb the personal implications (Public Agenda, 2006a). Alarming statistics about the U.S.'s international standing in STEM achievement and about the

extent to which achievement in these subjects is likely to create or constrain opportunities for Americans to earn family-sustaining wages abound, yet the general public is clearly not on the same page as leaders.² Research shows that it is not enough to just *tell* the public that these subjects are important, nor is it particularly effective to focus communications strategies on global competitiveness. For the dialogue and deliberation about success in the twenty-first century knowledge economy to be effective, it must be complemented by intensive efforts to provide the public with experiences that can inspire interest in these subjects, to deepen public understanding of the range of interesting careers available to those who achieve at high levels in these subjects, and to create opportunities for public participation in identifying and addressing the obstacles that exist to inspiring interest and achievement in these subjects.

To address these goals, Public Agenda launched a three-year public engagement campaign in the Kansas City region on the subject of “Ready for 21st Century Careers,” and has been working with a wide range of local partners. Through this project we have learned that the civic vitality of a community or region depends both on more effective approaches to citizen engagement and on improving methods of communication among formal stakeholders, civil society actors, policy makers and experts to help them collaborate in fresh ways outside of their silos on shared public problems. There is a great deal of work to be done to build capacity for collaborative problem solving on multiple levels, and institutions like science museums are particularly well positioned to serve as civic agents to help create the connective tissue in their communities that is needed for progress to be made on complex, multifaceted problems, including ensuring that all students receive the education they need for success in our twenty-first century STEM-heavy knowledge economy.

The Role of Museums: Activating Citizens, Connecting Civic Society Actors

The following three clusters of examples are representative, but not even remotely exhaustive, of the kinds of things many

museums are, and most museums could be, doing to build civic capacity for progress on an issue like STEM education for the twenty-first century economy:

1) *Expose Public to STEM Careers.* Museums could shape exhibits and programs that expose visitors to the range of career opportunities available to people who have a strong background in STEM subjects. By illuminating how interesting and creative various STEM-intensive careers are, museums could help overcome the popular misconception that math and science lead to boring and isolating jobs. For example, careers in design and music and the arts that are STEM-heavy are particularly unknown to the general public. In addition, museums could create public engagement programming and Science Café experiences that allow students and their families to interact with young professionals in a range of STEM-related careers, and/or that focus on helping adults change their career paths by learning new skills for the knowledge economy. These sorts of interactive engagement opportunities can be powerful tools for both exposing people to careers they may never have considered and accelerating the public's learning curve about the nature of technology education.³

2) *Support Teachers, Linking Educational Institutions.* Museums typically have strong links with schools in the community, often providing professional development support and resources to help teachers make STEM subjects exciting to young children. Museums also work with middle and high schools to do things like host afterschool programs around STEM subjects, or even providing homework help in the intrinsically interesting museum environment. In addition, museums could play an important role in helping to create the vital and sadly lacking connections between the K-12 system and post-secondary institutions in their communities by hosting conferences for P-20 educators and policymakers to identify ways to better prepare our youth for the rigors of college level STEM content.

3) *Promote Economic Development and Policy Innovation.* Museums could design processes or programs for policy makers and economic/workforce development agencies to support student achievement, expand post-secondary opportunity, and

deliver new forms of job training to help incumbent and displaced workers get the skills needed for jobs that pay family-sustaining wages, and to create a more flexible workforce capable of attracting business and industry to the region. Museums could serve as neutral ground for policymakers and elected officials to work together, and because of museums' unique capacity to frame issues for deliberation they could also create conditions that are conducive to policy innovation and bipartisanship. In addition, because science museums are typically found in cities, they could also play a vital role in helping municipal leaders think about economic development in creative new ways by serving as a resource, touchstone, and civic connector in the community. As much as the general public can benefit from the way museums present issues and information, policy makers, elected officials, and municipal leaders who are daily mired in "business as usual" politics would benefit enormously from the phenomenologically optimistic experiences that museums often offer.

Conclusion

As museums build on their ability to engage the public by providing unique forums for policy innovation and by facilitating communication between scientists and the public in accessible ways that recognize the value and importance of non-scientific ways of encountering the world, they move toward a model of civic engagement. This image of the museum as fundamentally a *civic* institution is not necessarily a political one. In fact, for museums to serve a civic mission, it is imperative that their trusted nonpartisan status be safe-guarded and preserved. Science museums can be both the treasured cultural institutions and sources of community pride that they have always been *and* vital sources of civic innovation.

Notes

1. For a more detailed discussion of the need for civically oriented non-partisan intermediary organizations to improve the quality of our democracy, see Kadlec and Friedman, "Deliberative Democracy and the Problem of Power." *Journal of Public Deliberation*, 2006.
2. In 2003 the U.S. ranked 24 out of 29 industrialized nations in an international standardized test of mathematics skills and knowledge. See the NCES/PISA report at <http://nces.ed.gov/pubs2005/2005003.pdf> In addition, the Bureau of Labor Statistics estimates that 60% of the new jobs in the twenty-first century will require the kinds of STEM skills that are possessed by only 20% of the current workforce. <http://www.bls.gov/emp/emptab7.htm>
3. Our research found that the public's understanding of what constitutes technology education is especially fragmentary and ill-formed. While experts and leaders define technology education with terms such as "design," "innovation," "engineering" and the "built environment," in focus groups parents and students described technology education primarily in terms of computer literacy. Additional qualitative research could assess public perceptions and attitudes toward technology education, and inform the design of exhibits aimed at correcting these misconceptions and building public understanding of technology education.

References

- Bai, M. (2005, July 17). The Framing Wars. *New York Times*.
- Entman, R. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication* 43(4).
- Friedman, W. (2006). *Reframing framing*. Public Agenda, The Center for Advances in Public Engagement, Occasional Paper 1.
- Public Agenda (2006a). *Important, but not for me: Parents and students in Kansas and Missouri talk about math, science and technology education*. Unpublished report produced with support from the Ewing Marion Kauffman Foundation.
- Public Agenda (2006b). *The public and global warming*. Unpublished memo report produced with support from the American Association of the Advancement of Science.
- Public Agenda (2008). *Putting the pieces together: How do citizens and experts see the energy issue?* Unpublished report produced with support from Kettering Foundation.

- Yankelovich, D. (1991). *Coming to public judgement: Making democracy work in a complex world*. Syracuse University Press: Syracuse NY.
- Yankelovich, D. (2003). Winning greater influence for science. *Issues in Science and Technology Online* <http://www.issues.org/19.4/yankelovich.html>