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Book review: Susanne C. Moser and Lisa Dilling (eds.), Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change (Cambridge: Cambridge University Press, 2007). xx + 549 pp. ISBN 9780521869232, £75.00 (hbk); ISBN 9780521049924, £31.99 (pbk)

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The success of policies designed to mitigate climate change depends critically on their public acceptability. Comprehensive policies – for example, a carbon tax – exploit both behavioral and technological responses, but real-world policies typically emphasize the latter. Comprehensive policy implementation is inhibited by short terms for elected officials and an electorate opposed to increases in the price of carbon-intensive goods and activities. Those among us engaged in policy-making who bemoan these political difficulties may find that this volume provides methods for improving the attractiveness of policies which include behavior change (recast here as social change) through effective communication. Academics will also find the volume useful, especially those interested in communicating their work with the public.

This 32-chapter volume, edited by Susanne Moser and Lisa Dilling, was inspired by a three-day multidisciplinary workshop held at the National Center for Atmospheric Research which brought together over 40 individuals whose expertise spanned research and academia, government, non-profit advocacy, business, religion, and other fields. It comprises three sections clearly tied together by their emphases on actionable policies. The first addresses overcoming barriers by shaping climate discourse to build consensus around the urgency of action. The second part is a broad selection of both case studies and concrete proposals for facilitating such action which cut across all levels of government from the city and regional up to statewide and national levels, and the third concludes.

One barrier to successful communication is the use of pre-existing mental models to make sense of and act on phenomena ranging from the simple and mundane (home thermostats) to the complex and exceptional (climate). With respect to the latter, Bostrom and Lashof note that mental models of ozone depletion and natural weather cycles have confused public understanding of climate change causes and solutions since the early 1990s. Chess and Johnson add that the idea that industrial pollution is somehow responsible for climate change obfuscates the public's knowledge about the greenhouse-gas implications of their own energy consumption. This clouds the landscape of possible mitigating actions and possibly discourages such actions altogether since cause and effect are not properly established. Compounding these difficulties are more general issues with human cognition highlighted by Grotzer and Lincoln. Namely, that we find it difficult to assign causation when effects are spatially or temporally distant, non-obvious, non-linear and decentralized. Since climate change exhibits all of these properties, connecting our local actions to this global problem becomes nearly impossible.

As noted in the introduction by Moser and Dilling, overcoming these barriers will not occur by simply providing "better information … more knowledge, or more effective communication alone … ." (p.11). Chess and Johnson suggest instead, with substantial support from the behavior change literature, that successful communication of policy in support of change requires the identification of the beliefs and values of the target population. The information provided must then be tailored accordingly. Grotzer and Lincoln propose finding narratives that bridge lay and expert mental models (but not necessarily replacing the former with the latter) and shifting the focus from providing knowledge about specific actions (driving less) to emphasizing when and how those actions can apply (planning trips for the next day on the evening before to minimize travel) as successful climate communication strategies. However, even when the provided information follows these guidelines, challenges still remain. Bateson argues that unless and until individuals see themselves as a part of the process of global change, they will be reluctant to participate in mitigation strategies that involve changing behavior.

Dunwoody follows this thread, investigating factors which contribute to the success of large-scale information campaigns. She determines that they work best if beliefs are only partially formed

and/or moderate, and if they can be sustained over long periods of time. However, the rapid nature with which we obtain information from media sources prohibits the reception of detailed science-based explanations. Further, the persistence of "balance" in the media can confuse individuals obtaining information quickly, leading to the belief that neither position (on anthropogenic influence, for example) is correct, but that both are plausible.

Since simple information dissemination is ineffective, it may be tempting to exploit emotional responses, such as fear, to communicate urgency by emphasizing the likelihood of extreme events. However, Moser notes that "emotions can be powerful motivators as well as de-motivators of action … playing with emotional appeals to create urgency is like playing with fire" (p.69). This is exemplified by the purchase of a sport utility vehicle as protection against a changing climate. Such appeals only lead to action when individuals feel personally vulnerable and self-efficacious. The conclusion is not to eliminate the communication of possible extreme outcomes, but to couple this information with a hopeful and attainable future vision. Moser argues that this can be accomplished by communicating clear, accomplishable goals and providing individuals with simple instructions, feedback, and a sense of control.

An example of the successful implementation of climate change communication is given in Rabkin and Gershon's chapter on Portland's "Low Carb Diet." The program's goal was to achieve household-level greenhouse gas emissions reductions using the principles and approaches of community organizing which are typically reserved for issues of immediate importance such as job creation or toxic pollution. By focusing on neighbor-to-neighbor interactions, simple carbon-saving measures (shorter showers, attic insulation, appliance replacement), and by providing a concrete goal (5000 pound reduction in carbon dioxide equivalent emissions over one year), more than half of the participating households were on track to reach the goal after the initial 30-day time period. The Portland experience embodies a model of social change that sees individual and community-level actions spurring progressive policy outcomes as opposed to legislating from the top down.

The top-down approach is exemplified by Santa Monica's Sustainable City Plan, as described by Watrous and Fraley. Although the text speaks of a strong focus on behavior change

and individual actions, the results indicate that citywide emissions were modest and that public knowledge of the program's existence was low, but growing as of 2004. Support for policy cannot be garnered without public knowledge. This could speak to a larger issue of a generally disinterested affluent public – Pratt and Rabkin utilize survey data collected from San Diego, California, to note that the most pressing "environmental" issue of concern to residents was traffic congestion, even considering San Diego's largely imported water supply and continuing problems with air quality.

These previous cases address climate change communication in affluent areas. Engaging communities of color and other disadvantaged populations is discussed by Agyeman *et al*. They point out that these communities have contributed comparatively little to the causes of climate change but are expected to bear a disproportionate amount of the impacts, and they call for equitable policies that consider this mismatch. They suggest that linking environmental justice concerns related to air quality or natural disaster risk to climate mitigation strategies on a local level could help to mobilize action. The authors do not detail how this could be accomplished while avoiding mental model confusion.

The business community is specifically addressed as well; however, some of the arguments in support of corporate action undermine previous claims made in the book. Arroyo and Preston, for example, look to the Montreal Protocol and the associated phase-out of chlorofluorocarbons (CFCs) for an example of how the business community might respond to climate change. What they fail to fully acknowledge is that CFCs had readily available and cost-effective substitutes that were easily deployed as replacements, whereas the situation is quite different with most currently carbon-intensive fuels. Referencing previous general technological solutions as evidence in support of a similar hope for climate change is disingenuous, and risks public confusion.

Appeals to the bottom line are unavoidable when discussing corporate and individual actions. To generate support for climate policy, cost-savings are certainly important to emphasize at least in the short term. However, Michaelis notes that taking a longer term vision requires recognition of our own consumptive patterns as the root cause of climate change. To begin to address this requires at the very least a reconceptualization of our economic interactions that is largely absent from

this volume. This would include the acknowledgement that society will be required to incur some costs over the long term as absolute reductions in greenhouse gas emissions are required – win-win policies and cost savings can only take us so far. Eventually, as Atcheson points out, the externalities of climate change must be priced to achieve mitigation.

Supplementing the chapters already discussed are others that serve to broaden the book's focus, including topics dealing with climate change contrarians (McCright), and the personal experiences of an Episcopalian priest preaching about climate change to her congregation (Bingham). This latter chapter provides a unique insight into a non-scientist communicating about climate change with a lay audience. Mitigation is the favored response in this volume, but McNeely and Huntington discuss adaptation in Alaska, where climate impacts and adaptation are already affecting the native population but no collective mitigating response has emerged. They note the importance of genuine dialogue among stakeholders to arrive at collective solutions, which is also emphasized by Regan.

This book is successful at bringing various disciplines together in one arena to identify appropriate communication strategies to support climate mitigation policies. Its strongest message is that enough is known about how individuals perceive climate change and the associated risks to successfully craft communication and policy simultaneously, resulting in public support and participation. For those looking for an overview of this exciting and emerging interdisciplinary area, this book provides an excellent starting point.

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Angus Clarke and Flo Ticehurst, *Living with the Genome: Ethical and Social Aspects of Human Genetics* (Basingstoke: Palgrave Macmillan, 2006). Xiii + 327pp. ISBN 978 1 4039 36218, £19.99.

Are you in need of a collection of concise and accessibly written articles on the social and ethical aspects of human genetic research, but intimidated by the prospect of carrying the five-volume, three-million word *Encyclopedia of the Human Genome* home from the library? *Living with the Genome* offers a selection of 42 entries on topics such as eugenics and genetic counseling reprinted from the *Encyclopedia*, written by many well-known and highly regarded authors working on the ethical and social aspects of human genetic research. This collection of economically written articles in an economically priced volume would be a useful addition to many social scientists' bookshelves, and an excellent text for an undergraduate course on the social aspects of contemporary genetic research.

The entries are arranged into six sections: research and commercialization, genetic counseling and screening, disability and eugenics, genetic explanations, and finally, reproduction and cloning. The articles are written with the general rather than specialist reader in mind; and are concise, averaging five or six pages in length. A glossary is also included at the beginning of the book for those unfamiliar with the scientific or philosophical terms used throughout. The volume's entries cover a wide variety of topics and perspectives on issues such as the merits of screening programs or the ethics of human cloning. The diversity of the first section illustrates this point: the topics covered range from gene patenting to informed consent, and the methodological approaches taken by the authors run the gamut from ethnography to literature reviews to more pointed personal opinion pieces.

The section on the interpretation and representation of genetic knowledge contains some of the richest material on public understanding of genetics, and many of the authors featured in this section will be familiar to readers of *Public Understanding of Science*. The articles collected here offer some interesting contrasts on how members of publics understand genetic information. For example, Dorothy Nelkin's article summarizes the argument put forward in her classic book (Nelkin and Lindee 1995) that the gene is "less a biological entity than a cultural icon" (p.171), and that genetic explanations have become a powerful means of justifying stereotypes and social inequalities. Jon Beckwith and Joseph Alper (pp.203-209) similarly argue that the social salience of categories such as race and intelligence makes genetic research into these traits potentially dangerous, and they urge fellow scientists to "avoid even a hint of exaggeration" (p.208) when communicating their research results to the public. In contrast to these arguments for the strong (and