similarities in the work of Herbert Simon and Ostrom. Both studied the limits of comprehensive rationality models. Both emphasized how human decision makers behave in actual settings in and around government. Both share a background in public administration at the local level, with extensive experience studying how individuals struggle with complex problems in equally complex organizational settings. Both are comfortable with ambiguity and messiness, but do not allow this to infect their own thinking, which remains clear. Both share Einstein's insight that a theory should be as simple as possible, but no simpler. Both received extensive funding from government agencies interested in solving practical, real problems of public administration and policy implementation, as well as general support for purely theoretical advances. Their feet-on-the-ground observations were somehow able to meet the heads-in-the-clouds theorizing halfway, with a transforming effect on both practical communities seeking answers to complicated problems and on intellectual communities with their own serious fault lines. If we learn nothing else, perhaps we should take pride in being a discipline where the observational and the deductive both have such great pride of place.

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As all readers of *Governing the Commons* know, Elinor Ostrom's focus in that work is on local communities engaged in activities such as fishing and agriculture, and on metropolitan areas such as Los Angeles. She is critical of many interventions from national and regional authorities as interfering with locally organized cooperation, and she hardly mentions international issues. Yet I will argue here that this book is potentially an important contribution to the study of world politics.

All life depends on a larger commons: the earth and its atmosphere. In the 1980s, when Ostrom wrote her great work, human beings were unaware of the dangers to the atmosphere posed by climate change; most of us now have been exposed to the enormous amount of evidence indicating that the earth's atmosphere is becoming warmer as a result of human emissions of carbon dioxide and other greenhouse gasses.[1] So should we now not be asking the questions that Ostrom asks about local commons about the global commons? Analytically, these questions are equally interesting, and in policy terms they are important to all human beings and other forms of life, rather than just to people in small communities scattered around the globe. Her work may travel even farther—to issues of conflict generated by cultural differences—if we take into account its arguments about how differences in interests among actors can affect cooperation. But we begin with the commons questions.

What is striking about these commons questions—local and global—is how much analytic resemblance they bear to each other. In both cases, what is at stake is a common-pool resource (CPR) that is subject to underprovision or overuse because no individual actor independently has an interest in preserving it. This malady of underprovision/overuse equally afflicts the traditional village commons and the earth's atmosphere. It should not be surprising, therefore, that there is a striking convergence between the literatures in political science that focus on these issues, even though they are entirely independent of one another in their origins.[2] In neither arena—world politics nor local governance of CPRs as studied by Ostrom—are there effective rules enforced hierarchically from above. Yet in both arenas, actors—principally states in world politics, individuals at local levels—seek to build rules that enable them to cooperate, by generating incentives to behave in collectively desired ways. The global and local literatures both focus on how institutions can provide information and reduce transaction costs; in both arenas actors rely on reciprocity to generate incentives,

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and in both arenas credibility is a crucial resource for actors involved in bargaining and rule making.[3]

Comparisons between different literatures dealing with analytically somewhat similar domains may be most valuable when they make conflicting arguments. In this brief comment, therefore, I wish to focus on the homogeneity or heterogeneity of actor *capabilities* and *interests.* What is the impact on a potentially cooperative system—in which there are potential gains to all participants from cooperation—of heterogeneity of actor capabilities and interests? Should we expect more cooperation among similar actors, or among different ones?

The literature in international economics and international political economy stresses the value of heterogeneity of interests for cooperation: gains from trade. Among self-sufficient small farmers, there may be little scope for economic cooperation in the form of economic exchange, precisely because their interests are so similar. Introduce a railroad linked to a city and rural–urban trade will increase dramatically, as a result of the complementary interests of producers and purchasers. The political economy literature of the 1970s also emphasized the value of heterogeneity in capabilities for cooperation. It developed the notion of "hegemonic stability theory": that systems dominated by a hegemon would be more peaceful and orderly than those in which a balance of power among roughly equal great powers prevailed.[4] Although the strong version of this view—that hegemony alone is necessary or sufficient for order—has been discredited, there remains considerable evidence that powerful states, with long time horizons, may be particularly willing to build institutions for cooperation, on their terms. As Lisa L. Martin says, "If a hegemonic state can afford to take the long view, the institutions it helps create will promote gains from cooperation."[5]

So the international relations literature has leaned toward the view that at least some types of heterogeneity in interests and capabilities generate cooperation. Indeed, bargaining linkages may result from heterogeneity, as actors seek political gains from trade. But the IR literature has never held that heterogeneity as such is order-producing: indeed, the literature on conflict suggests that certain forms of similarities in domestic structure—in particular, the presence of democracy in both members of a pair of states—facilitate cooperation.[6] The types of heterogeneity and issue domains seem to matter.[7]

Work by Ostrom and other students of small-scale CPRs, by contrast, stresses how heterogeneity *inhibits* cooperation. Ostrom has studied irrigation systems in Nepal, where there are strong differences in interest and in capabilities between farmers at the head of the canal and those below them. The head-enders have interests in taking water until its net marginal productivity is zero, even if it would be more valuable to the tail-enders. Unless they need the tail-enders (for example, for labor to maintain the canals), they will capture the bulk of the water, cooperation will be nonexistent or minimal, and the results will be economically inefficient.[8] Similarly, Gary Libecap has studied the common-pool problem in oil fields. He finds that heterogeneities in size of plots, in location relative to the center of the pool, and in information inhibit cooperation, as opposed to situations in which leases are homogeneous and the information available to participants is the same.[9]

These differences in view should make us think about the conditions under which heterogeneity or homogeneity of interests and capabilities promotes cooperation in situations characterized by an absence of hierarchical rule.

Climate change is obviously amenable to CPR analysis, since it is a common-pool resource. Furthermore, efforts to construct a single integrated and comprehensive international regime to limit the magnitude of emissions have clearly failed. Instead, there is a decentralized "regime complex" for climate change, which in many ways looks more like Ostrom's decentralized local institutions for the commons than like either a national state or a coherent, integrated international regime.[10] Ostrom and her colleagues have studied how particular changes—such as in the need for labor to repair irrigation ditches—alter the dynamics of such decentralized systems. It would be valuable to do the same at the global level. For instance, how would a dramatic reduction in the costs of reducing power plant emissions affect the complex linkages between developed and developing countries created by a global cap-and-trade system? And what would be the impact of large heterogeneities—in information, or in costs—between developed and developing countries involved in a system of climate mitigation?

In the world of 2010, there is another salient problem, farther from Ostrom's field of study but to which its emphasis on heterogeneity is relevant: the relationship between cultural heterogeneity and political violence. The attacks of 9/11, the wars waged by the United States and its allies in Islamic countries (Afghanistan and Iraq), and the reports of attempted *jihad* by American citizens who have become radical Islamists, have all focused attention on nonstate actors and violence in world politics. "Billiard-ball" game-theoretic models with homogeneous states as units seem quite irrelevant to these issues. In contrast, local CPR models that emphasize the conflict-inducing impact of heterogeneity seem increasingly relevant. Asymmetries in information, a topic addressed by the literature on commons problems, seem particularly intriguing. Asymmetries in information can motivate attacks—when the "information" in question concerns holy duties or alleged attacks on Islam by Christianity—but can also create opportunities for combating terrorism. And homogeneity in information—common knowledge among adherents to Islam who are committed to peaceful coexistence with members of other cultures that jihadists are dangerous to themselves as well as to peace more

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generally—could be crucial in generating cooperation in order to control organized nonstate violence. It seems to me that we could generate some interesting hypotheses about the impact of cultural homogeneity and heterogeneity from the theories of Ostrom and her colleagues, and from experiments or observations informed by this literature.

Ostrom's work has been more systematic than most of the parallel work in international relations, partly because she has studied isolated communities in fieldwork, and partly because experimental work can model the conditions of individuals in local communities better than the more complex interactions between governments, themselves responsible in very different ways to their constituencies. But Ostrom has, by and large, not been very interested in applying her insights to world politics. As a result, there are, it seems to me, unexploited opportunities for investigators who seek to understand such issues as the spread and control of international terrorism, or how heterogeneities affect responses to climate change.

Ostrom has made major contributions to political science and to our understanding of cooperation and institutions, and it would be unfair to demand of her that she extend her vision to world politics. But we can ask why none of her students or followers seems to have had the imagination and boldness to think about applying her theory and methods to this domain. Experimental work is just beginning to make an impact on the study of world politics; to make more of an impact, it needs to tackle important questions and to build on a rich theoretical literature as well as experimental method.[11] Ostrom's theory, as noted here, builds on a number of assumptions—in particular, lack of hierarchy—that are more applicable to world politics than to studying the modern bureaucratic state. It could "leap the gap" between local and global without the investigators worrying about whether it can "scale up" to the national level in between.

Creative political science is not principally about applying new techniques—whether borrowed from economics, statistics, or other branches of our own field—to old problems. More fundamental innovations involve thinking in new ways about problems that have stumped former generations. Ostrom has thought in new ways about politics, institutions, and cooperation under nonhierarchical conditions. It is high time that both investigators working out of her tradition, and students of international relations in general, paid more attention to the implications of her work for the study of world politics. If they do, and the results are fruitful, Elinor Ostrom may yet be seen as a major theorist, even if implicitly, of world politics.

Notes

1 Metz et al. 2007; Stern et al. 2006; Aldy and Stavins 2007; Aldy and Pizer 2009.
2 Elinor Ostrom and I have made this point in joint work, which, however, has not received much attention. See Keohane and Ostrom 1995.
3 Keohane 1984; *Governing the Commons*.
4 Kindleberger 1973; Krasner 1976.
5 Martin 1995, 75.
6 There is a huge literature on the "democratic peace." See, for instance, Maoz and Russett 1993; Bueno de Mesquita et al. 1999.
7 Martin 1995.
8 Ostrom 1995.
9 Libecap 1995: 171–72.
10 Keohane and Victor 2009.
11 For an example of experimental work applied to problems of civil war, see Tingley and Walter 2010.

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Elinor Ostrom's *Governing the Commons* is an outstanding example of interdisciplinary research, and a particular example of how much the discipline of political science has to offer other disciplines.[1] Starting with the problem of maximizing the economic value of common resources, the work demonstrates how core concepts of political science—such as voluntary organizations, institutional development, and norms—can illuminate a problem that was previously seen in narrow economic terms.[2]

Ostom's contribution was made possible by her reframing the debate about the "tragedy of the commons" (Hardin 1968). In this famous debate, the alternatives were framed as private property vs. central authority. The theoretical questions asked tended to be shaped by these two frames.[3] Implicit in both the frame of private property and the frame of central authority is the notion that decisions are made by one or more individual decision makers operating independently. But Ostrom's observations in real-world settings such as inshore fishing and allocation of irrigation water showed that repeated interactions among the users of a common resource often allowed them to build institutions that could provide effective monitoring and discipline of free riders, thereby achieving efficient and sustainable use of the resource. In effect, Ostrom introduced a new frame, a frame based on the concept of management by the users themselves. Eventually, even Garrett Hardin agreed that he could have called his article "Tragedy of the Unmanaged Commons" (Hardin 1994).

Ostrom herself is well aware of the problems of doing interdisciplinary research. As she once put it, "the disciplinary huts of many modern universities do not really enable one to have effective intellectual exchange across disciplines" (as quoted in Zagorski 2006). Her own background is in political science, from her undergraduate major through her doctorate and her entire career spent as a professor of political science. But she and her husband, Vincent Ostrom, saw the need to go beyond political science. They took matters into their own hands when they arrived at Indiana University. Starting in 1969 they began a weekly informal seminar to discuss ideas across the social sciences, and within a few years this was institutionalized in a form that lives on to the present day, further encompassing business and the biological sciences. As a full professor, Elinor Ostrom spent eight months in 1981 and again in 1988 working closely with economists and others at the Center for Interdisciplinary Research at Bielefeld University in Germany to develop further interdisciplinary research networks.

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